



Boral Cement Limited

Berrima Works

Dust Management Plan (Appendix 5 of OEMP)

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Rev.1	01 September 2014	Progress update of dust management on site	Alex Wnorowski
Rev.2	26 March 2018	Update to include new requirements from Modification 9 development consent	Mike Curley
Rev.3	28 April 2020	Minor changes to reflect Hi Cal storage	Greg Johnson
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1. PURPOSE

This Dust Management Plan (the Plan) applies to the Boral Berrima Cement Works (the Works) site located at New Berrima, NSW.

This Plan was originally prepared to meet the requirements of the Pollution Reduction Program 6 (PRP 6) “Control of Fugitive Dust” incorporated into the site’s Environment Protection Licence (EPL) No 1698 by the NSW Environment Protection Authority (EPA).

The overall aim of the Plan is to reduce offsite dust impacts to below the adopted values of:

- deposited dust – measured as annual rolling mean of 4 g/m²/month (as per AS 3580) using dust deposition gauges placed in the EPA-approved boundary locations;
- PM₁₀ and total suspended particulates (TSP) – measured using high volume air sampler (HVAS) equipment located offsite on Berrima Rd. as follows:
 - annual mean for PM₁₀ of 25 µg/m³;
 - annual mean for TSP of 90 µg/m³; and
 - 24-hr average mean for PM₁₀ of 50 µg/m³.

The Plan applies to all aspects of the Works. The focus will be on activities identified in the Plan as high and medium priority as the reduction of dust generation in these areas is expected to have the biggest impact on the overall success of dust mitigation.

2. SCOPE

This Plan addresses:

- current plant dust sources, issues and limits;
- monitoring dust emissions from the plant;
- compliance with relevant legislative requirements;
- provision of measures to manage the impact of all the dust issues at the site; and
- the management of non-compliance, if identified.

The Plan incorporates dust related conditions in the development approvals (DAs) for Kiln 6 (DA No. 401-11-2002-i) and Cement Mill 7 (DA No. 85-4-2005-i), including the consolidated DA for modifications 1 to 15 to DA No. 401-11-2002-i and EPL.

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3. DEFINITIONS

Table 1 Definitions

Term	Definition
EMS	Environmental management system. A collection of formally approved documents that define the Company's management practices aimed at protection of environment and minimisation of any adverse impacts on land, air, water and the community.
ESP	Electrostatic precipitator
SOP	Standard operating procedure. A formal procedure for undertaking complex and recurring tasks where neither physical nor environmental layout will change.
SWMS	Safe work method statement
HVAS	High volume air sampler
OEMP	Operational environment management plan
EPL	Environment protection licence
EPA	Environment Protection Authority
DA	Development approval

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4. RESPONSIBILITIES

The dust management responsibilities of personnel are summarised Table 2.

Table 2 Responsibilities

<i>Employees</i>	<p>Responsible for ensuring that the dust issues for their work are minimised. This includes:</p> <ul style="list-style-type: none"> ➤ observing any dust emission standards and procedures that apply to their work or operations; ➤ taking action to minimise or prevent dust emissions; ➤ identifying and reporting dust emissions; ➤ monitoring, reporting and assisting in the control of dust emissions to keep within approved levels.
<i>Team Leaders / Front Line Supervisors</i>	<p>Responsible for minimisation of dust emissions arising from work methods and the working environment. This includes:</p> <ul style="list-style-type: none"> ➤ identifying, reducing and preventing dust emissions; ➤ monitoring operations and maintenance work to ensure dust emissions are maintained within approved levels; ➤ initiating action to prevent dust incidents; ➤ identifying, reporting and recording dust emission incidents; ➤ initiating corrective actions to overcome dust emission incidents.
<i>Production Manager, Technical Manager and Engineering Manager</i>	<p>Responsibility and authority to ensure that the site environmental dust objectives are achieved. This includes:</p> <ul style="list-style-type: none"> ➤ ensuring staff are trained with respect to dust awareness, responsibilities, instructions and procedures; ➤ ensuring dust emission incidents are investigated and corrective and preventative action taken; ➤ ensuring operations comply with the conditions of DAs, EPL and relevant legislation; ➤ reviewing operations and implementing strategies to reduce dust emissions from the Works. ➤ developing and implementing contingency plans as required to remedy dust emissions and minimise dust complaints.
<i>Environmental Business Partner</i>	<p>Responsible for:</p> <ul style="list-style-type: none"> ➤ ensuring periodic dust monitoring is carried out. ➤ ensuring that an appropriate management plan is developed

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	<p>and implemented if dust emission limits are found to have been exceeded.</p> <ul style="list-style-type: none"> ➤ reviewing dust emission complaints received to determine if particular dust issues/trends are being identified.
<p><i>Site Operations Manager</i></p>	<p>Responsible for:</p> <ul style="list-style-type: none"> ➤ approving any communications to external parties on dust generating activities before their release. ➤ ensuring all personnel are aware of EPL, DA and other regulatory requirements relating to dust. ➤ implementing Boral environmental policy on site; ➤ ensuring site environment performance objectives and targets are established, monitored and achieved; ➤ defining responsibilities for the OEMP; ➤ ensuring the availability of resources; ➤ communicating the importance of the OEMP and meeting the statutory and regulatory requirements; ➤ Conducting management reviews of the OEMP; ➤ Ensuring that material environmental incidents are immediately reported to 5 compulsory government authorities; ➤ verifying the implementation of corrective and preventive actions; and ➤ recognising and responding to community concerns.

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5. REGULATORY REQUIREMENTS

The Works are subject to a number of regulatory requirements governing the generation and management of fugitive dust emissions. These include, but are not necessarily limited to:

5.1 Protection of the Environment Operations Act 1997

Section 124 requires “the occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier’s failure:

- to maintain the plant in an efficient condition, or
- to operate the plant in a proper and efficient manner.”

Section 126 requires “the occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier’s failure to deal with those materials in a proper and efficient manner.

5.2 Environment Protection Licence No. 1698

The Works operates under EPL No. 1698, with the conditions in Table 3 applicable to fugitive dust emissions:

Table 3 Relevant EPL conditions

Clause	Requirement
O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

5.3 Kiln 6 Upgrade Development Consent

Approval for Kiln 6 was granted on 12 May 2003 (last modified in 2023 (Modification 15)). The conditions in Table 4 are applicable to dust emissions.

Table 4 Development consent conditions

Condition	Requirement
3.7	The Applicant shall design, construct, operate and maintain the cement works

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	upgrade in a manner that minimises dust emissions from the site and complies with the EPL.
3.7A	The Applicant shall apply all reasonable and feasible measures to minimise the generation of dust from coal stockpiles, including but not necessarily limited to: <ul style="list-style-type: none"> a) compaction of stockpile batters to minimise pick up of dust; b) installation of water sprays or use of a water cart to keep stockpile surfaces wet, if dust is being generated; and c) cessation of stockpile generation during periods of high wind, if dust generation cannot be controlled.
3.8	The applicant shall take all practicable measures to ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered at all times except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times.
3.9	All trafficable areas and vehicle manoeuvring areas on the site shall be maintained in a condition that will minimise the generation of emission of wind blown or traffic generated dust from the site at all times.

5.4 Boral Group Environmental Policy

Boral Environmental Policy confirms the Group's support to the principle of sustainable development and requires that all sites and facilities comply with environmental regulations, standards and codes of practice relevant to the particular business as the absolute minimum requirement.

6. CURRENT DUST MONITORING

Air Quality monitoring, including gravimetric dust monitors and locations are detailed in Section 5.2 of CMT-ENV-003 Berrima Air Quality Management Plan.

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7. DUST MANAGEMENT MEASURES

7.1 Unsealed Haul Roads

Boral Cement is aware of the high dust generating potential of unsealed internal haul roads. The volume of dust generated is related to the road type, number of truck movements, truck speed and weather conditions.

Improvements to date

Some of the roads which were unsealed at the start of PRP6 are now sealed, some were closed for traffic and some are still remaining.

Wheel-wash facilities have been installed in two locations on unsealed sections of internal roads (before key intersections from unsealed to sealed roads) to prevent tracking of dust to sealed roads).

Management measures

The following measures will be undertaken to minimise fugitive dust from the unsealed haul roads:

- Selection of dedicated main haul routes and restriction of access to other unsealed roads or areas on a 'need to use' basis.
- Progressive sealing of unsealed haul roads.
- Availability of a suitable water cart with spray facilities for use as frequently as necessary to prevent the emission of fugitive dust. Note that during windy conditions and in prolonged dry weather water spraying will be required repeatedly during the day.
- Consideration of use of dust suppression agents to reduce the need of water sprays, if viable.
- Restriction of speed to 20km/hr on unsealed haul roads.
- Discipline in immediate cleaning of any material spilled onto a road. This will prevent it being pulverised into potentially fugitive dust. Truck drivers have a responsibility to immediately report spills to the Control Room.

7.2 Quarry and Crushing/Grinding Operations

When undertaking Quarry operations and outdoor Crushing and Grinding operations the following is considered:

- Raw material storage and batch processing.
- Planning how to cope with adverse weather conditions during operations.
- Water sprays onto material during the Quarrying process including ripping, stockpiling and loading of trucks.
- Water sprays during the outdoor Crushing/Grinding process including unloading, loading into crusher, crushing, crushed material exit, creation of crushed material stockpiles and loading of vehicles.
- The location of the external crushing units to minimise impacts from dust, noise etc.
- Management of haul roads including the use of water sprays, dust suppression agents,

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minimising dust track out to sealed roads etc.

- Minimising dust from haul truck loads (such as covers, load wetting, etc).

7.3 Outdoor Stockpile Management

Boral Cement Berrima requires the ability to stockpile outdoors raw materials, solid fuels and in certain circumstances clinker to conduct its operations under different market conditions. The generation of dust in outdoor storage may occur during transport to and from, unloading, construction, storing and extraction from the stockpiles. The following measures are undertaken to minimise fugitive dust from stockpile areas:

- Where possible, consolidation of existing stockpiles to reduce their overall numbers and footprint.
- Truck speed restriction to 20km/hour in stockpile areas.
- Restriction of outdoor stockpile height to a maximum of 8m outside of the quarry in areas where sprinklers are not available.
- Compaction of stockpile batters to minimise wind pick up of dust.
- To keep stockpile surfaces damp in dry weather, installation of water sprays for all stockpiles except clinker or use of a water cart with pumping facilities if adequate water sprays cannot be installed.
- Weather conditions, especially the strength and direction of wind, must be considered where any works are occurring on stockpiles. Adverse weather, in particular strong southerlies in drought conditions, can potentially cause significant impacts in the neighbouring residential area to the north of the Works. When such conditions are experienced or predicted, stockpile creation and extraction activities should be stopped until the weather changes.
- Stockpile operations, due to being especially weather-sensitive, should be managed by the Production Services and Logistics in cooperation with Shift Supervisors. Work schedule should be reorganised in adverse weather to minimise stockpile disturbance. Also, more frequent automatic or manual sprinkler system operation or water truck spraying.
- Progressive removal of stockpiles from high elevation areas to more appropriate low or below normal ground level areas e.g. to shale quarry areas not required for operations.
- Construction and vegetation of earth bund walls around dust-prone areas.
- Consideration of vegetation or engineered screens to be placed around stockpiles.
- Consideration of the possibility of using crusting agents for the management of dust generating stockpiles where they are to be undisturbed for more than 4 months.
- Management of the Hi Cal storage area in the Shale Pit includes the tarping of material.
- Management of tyre chips includes the storage of the chips within designated bunkers built to a height of 2.7m. Stockpiles will not be higher than the constructed walls. Bunkers are roofed.

SWMS must be prepared before the establishment of new stockpiles or significant handling/modification of existing stockpiles. At a minimum the SWMS should consider the following issues:

- materials to be stockpiled;
- location;

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- anticipated volume;
- dust generating potential;
- duration that the material is to be stockpiled; and
- Environmental risks, impacts and controls.

Standard operating procedures for stockpile management should also be developed and implemented to minimise the potential to generate fugitive dust.

The Environment Business Partner shall be made aware prior to the commencing of any new activities or modifications to existing activities at the stockpiles which may result in generation of excessive dust or any other environmental impacts.

7.4 No.6 Kiln Stack Emissions

No. 6 Kiln at Berrima is equipped with an Electrostatic Precipitator (ESP) and a bag filter for dust arrest. The ESP trips may cause a short spike of emissions but are closely watched and controlled to avoid excessive emissions. The particulate limit is 50 mg/m³ measured as a 24-hr average by a continuous meter.

7.5 Kiln Operational Controls

Maintenance of optimal operational conditions for No.6 Kiln will ensure that the likelihood of dust emissions is minimised. The kiln will be stopped if dust emissions are elevated and only restarted when emissions are addressed.

7.6 Sealed Internal Haul Roads

Boral Cement Berrima has an existing sealed internal road network for movement of materials and personnel. Sealed roads, if not maintained properly, can contribute significantly to fugitive dust. The following measures will be undertaken to minimise fugitive dust from sealed roads:

- Roads to be maintained in good working order with no large potholes.
- A street sweeper to be regularly used.
- Effective and disciplined covering of loads.
- Truck speed when carrying a covered load on sealed roads inside the plant to be limited to 50km/hr.
- Truck speed when carrying an uncovered load inside the plant to be limited to 20km/hr.
- Trucks carrying uncovered loads on internal roads, if cannot be avoided, to be loaded below 300mm of the freeboard.
- All trucks with a load must be covered on leaving the site.
- Immediate cleaning of any material spilled onto a road to prevent it being pulverised into potentially fugitive dust. Truck drivers have a responsibility to immediately report spills to the Control Room.
- Material from the interface between sealed and unsealed roads should be removed to limit the tracking of material and dust generation.
- Wheel wash facilities are provided for use by trucks entering intersections from unsealed to sealed roads.

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7.7 Unsealed Surface Areas

Exposed or unsealed areas have a potential to generate fugitive dust. The following measures will be undertaken to minimise fugitive dust from unsealed exposed areas:

- Minimising vehicle access through the use of bollards or road blocks (see Photo 3).
- Progressive re-vegetation (see Section 9),
- Progressive sealing, and
- Use of dust suppressants where temporary access is required.



Photo 3: Rock blocks in place to restrict vehicle movements to the stockpile area.

7.8 Truck Loading from Clinker Silo

Boral Cement has a clinker storage silo designed for the loading of clinker onto trains (see Photo 4) with little or no generation of fugitive dust. With the installation of a telescopic chute in 2012, this facility is able to load clinker onto road trucks, significantly reducing dust emissions from truck loading operations.

The present rail loading system from the clinker silo comprises three chutes configured to fit and seal over the three openings of a normal rail wagon. The chutes are connected to a single counterbalance system which makes them raise and lower together. With rail wagons, the two outer chutes are used for loading and the central chute is used for extracting the displaced air & fugitive dust to a dust collector where the dust is recovered and fed back to the wagon via one of the loading chutes.

The proprietary telescopic central loading chute assembly from a US company is designed to fill at a very high rate and is equipped with an integral dust collection system. The chute commences filling the truck close to its floor with detection devices automatically raising the chute while maintaining a minimal gap between the loaded materials and the enclosing chute skirts. The integral dust filter returns the collected dust to the truck.

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The loading operations are closely monitored in case process upsets result in elevated fugitive dust emissions.



Photo 4: Silo for the loading of clinker into trains and trucks

7.9 Operational Buildings

Operational buildings generally contain plant and machinery or are used for storage. The following activities will help to contain and minimise dust inside the buildings:

- Building doors/gates are to be kept closed/sealed to contain dust and noise, as well as improve safety and visual amenity.
- Dust collectors to be regularly maintained to provide effective de-dusting. They should be periodically inspected, and their maintenance planned in accordance with those inspections. Records to be kept of the inspections and of any remedial work carried out;
- Any excessive dust accumulated indoors to be regularly cleaned/removed;
- Dust spills and dust accumulated outside of buildings to be promptly removed;
- Clinker, being a material with high dust-generation potential during handling, should be stockpiled indoors as far as possible. This also prevents product losses due to inadvertent contact with moisture.

7.10 Routine Plant Operations

All plant operations including those of **Kiln, Cooler, Cement Mills, Raw Mills, Crushing, Cement Storage, Dispatch** and other operations mentioned previously are to be conducted in a manner that minimises fugitive dust emissions. Standard Operating Procedures (SOPs) and

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SWMS should specifically address environmental issues, in particular fugitive dust minimisation. Specific actions, procedures and processes are to be incorporated to all potentially dust-generating activities.

Special attention should be given to eliminating or minimising impacts from plant operational activities such as those below which have previously resulted in high fugitive dust emissions:

- Cleaning of blocked Kiln Preheater cyclones.
- Spillages and their cleaning from buildings at high elevations.
- Material transfer points due faulty or inadequate dust collection systems, belt cleaning equipment etc.
- Operation of equipment such as elevators, silos etc., with faulty ventilating dust collectors.
- Process faults due to incorrect procedures such as those that sometimes occur with K Damper, RM7 Fresh air damper etc.
- Process buildings and storage buildings with open or faulty doors.

8. LANDSCAPING AND REVEGETATION PROGRAMME

A major re-vegetation programme is being undertaken on site. The re-vegetation program was to accomplish the following main functions:

- Provide wind breaks for areas where dust may be generated through daily operations such as storage, loading, unloading etc.
- Reduce dust pickup from exposed areas. Vegetation is the most effective way of control of fugitive dust from exposed areas.
- Capture and immobilise dust generated during operations.
- Increase visual amenity.
- Enhance natural habitat.

Trees, shrubs and ground cover varieties indigenous to the local area were planted along with hydromulching, which incorporates native seed mixes. The initiative is following the Pollution Reduction Program (PRP 9) Landscape and Rehabilitation Works that was included in the EPL in 2012.

9. COMMUNICATION, REPORTING AND TRAINING

10.1 Incident Reporting

Incidents and non-conformances are managed in accordance with the emergency plan and pollution incident response management plan (attached to the OEMP) and safety management system (the system is on the Boral Cement intranet).

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See Section 6 Incident and Non-Conformance Response within the Berrima OEMP.

10.2 Pollution complaints

Boral Cement will record air pollution related complaints in accordance with Condition M6 of the EPL and the complaints and dispute resolution procedure in Section 5.3 of the OEMP.

10.3 Annual Reporting

Boral Cement has various reporting and record keeping requirements defined in the DAs and the EPL. Condition 7.3 of the consolidated consent requires preparation of an annual environmental management report (AEMR) and Condition R1 of the EPL requires preparation of an annual return. Refer to sections 5.2.1 and 5.2.2 of the OEMP for details.

10.4 Record Keeping

Record keeping is undertaken in accordance with Site Procedure **SP05-01-01 Document Control – Electronic Data**.

- Boral Cement maintains a document storage system named WizBiz to facilitate effective management and document control over controlled documents.
- SIMs/Sequence software is mandatory to record all incidents on site, with any actions arising that are tracked until progressed and closed.

All records are to be kept for the time periods required by statutory timeframes and/or Boral policies (Refer to Boral HSEQ Group Standard GRP-HSEQ-2-04-Documents Control and Records Management).

10.5 Training

Boral Cement undertakes an Environmental Awareness training programme for its employees. The Environmental Awareness training includes, among others:

- environmental legislative requirements applicable to the Works;
- responsibilities of each level of employees in ensuring environmental compliance and improvement;
- typical environmental breaches / non compliances, how they can be minimised or reduced and reporting protocols;
- video and photographic recordings of environmental incidents including fugitive dust emissions and their rectification (before and after) to generate performance improvement and encouragement;
- training of Berrima personnel, especially truck drivers and road maintenance staff, in terms of compliance with this Management Plan.

Boral Cement also communicates its environmental performance as required to Regulators, Senior Management, employees and local community in appropriate formats such as reports, newsletters etc.

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