
Environmental Management Strategy

BADGERYS CREEK QUARRY AND BRICK MAKING FACILITY

September 2013

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1. Introduction

1.1. Purpose

This Environmental Management Strategy (EMS) has been prepared to:

- provide the strategic framework for environmental management of the project;
- identify the statutory approvals that apply to the project;
- describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
- describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the course of the project;
 - respond to any non-compliance;
 - respond to emergencies; and
- include:
 - copies of any strategies, plans and programs approved under the conditions of approval; and
 - a clear plan depicting all the monitoring required to be carried out under the conditions of approval, EIP and PRMP

This Environmental Management Strategy also satisfies the Conditions of Approval (CoA) for the project, in particular Schedule 5, Item 1 *Environmental Management Strategy*.

1.2. Scope and Application

This EMS is applicable to the quarrying, rehabilitation, brickmaking, and product storage and dispatch of Boral in its Badgerys Creek operations.

This EMS should be read in conjunction with the following environmental management sub-plans:

- Water Management Plan
- Air Quality and Greenhouse Gas Management Plan (AQGHGMP)
- Noise Management Plan (NMP)
- Waste Management Plan (WMP)
- Aboriginal Heritage Management Plan (AHMP)
- Transport Management Plan (TMP)
- Rehabilitation Strategy
- Rehabilitation Management Plan

1.3. Definitions and Abbreviations

Conditions of Approval	Conditions contained in Schedules 2 to 5 of the Project Approval under Section 75J of the EP&A Act for the Boral Badgerys Creek Quarry and Brick Making Project
Director-General	Director-General of the Department of Planning and Infrastructure, or delegate.
Incident	A set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the conditions of approval
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
NOW	NSW Office of Water
Rehabilitation	The treatment or management of land disturbed by the project for the purpose of establishing a safe, stable and non-polluting environment, and includes remediation

1.4. Quarry and Brick Making Facility Shutdown

In April 2012, the proponent, Boral Clay and Concrete (NSW) announced the temporary shutdown of the quarry and brick making facility with effect from 30 March 2012. As at April 2013, the facility remained shut down. Boral will review its operations at a future stage, considering market conditions and business needs to determine when operations will recommence.

During the shutdown period, activities at the facility will be limited. Hence, the opportunity for interactions with the environment during this period is limited. Notwithstanding, Section 5.1 of this EMS describes the management measures to be employed during the shutdown.

2. Strategic Framework for Environmental Management

2.1. Boral Environmental Policy

Boral embraces the principle of sustainable development and is committed to pursuing industry specific best practice. Boral's commitments in relation to the environment (as specified in its *Environmental Policy*) include:

- conducting its operations to minimise environmental risk and, wherever practicable, eliminate adverse environmental impacts;
- continual improvement of environmental performance including regular review and the setting of rigorous environmental objectives and quantified targets – particularly with regard to:
 - efficient use of energy (including appropriate use of alternative fuels);
 - conservation of water;
 - minimisation and recycling of wastes;
 - prevention of pollution; and
 - effective use of virgin and recovered resources and supplemental materials.
- open, constructive engagement with communities surrounding operations;
- reducing greenhouse gas emissions from processes, operations and facilities;
- protecting and, where possible enhancing biodiversity values at and around its facilities;
- complying with environmental legislation, regulations, standards and codes of practice relevant to the particular business as the absolute minimum requirement in each of the communities in which it operates;
- conducting business with suppliers and contractors who have a commitment to the values and objectives contained in its environmental policy;
- consulting and collaborating with customers and suppliers in the development of sustainable products;
- remediating its contaminated sites to standards internationally acceptable for the site purpose.

In relation to Health and Safety, Boral is committed to providing safe and healthy working conditions for all people involved in the business, including contractors, visitors and the general public. An induction would be held for all personnel prior to the commencement of works at the Project Site to raise awareness of Boral's Occupational Health and Safety (OH&S) plan.

2.2. Environmental Context

Boral is operating an existing quarry in Badgerys Creek, extracting clay resources and using these to manufacture bricks for the construction industry. These quarrying and brick making activities have been undertaken on the site for the past 30 years. Boral has received development approval to continue operations on the site, including extracting from existing and future new pits.

Quarrying is carried out in campaigns of two - to three-month periods per year with extracted clay stored in stockpiles for brick making operations which run the entire year. Finished products are stored within the site for dispatch by trucks. The site also receives other raw materials required for brick making.

The Project can be summarised as follows:

- extraction of raw materials from the site in the order of 420,000 tonnes per annum (tpa), of which 10% would be comprised of clay and 90% shale, involving:
 - extraction from Pit 3 to an approximate depth of 35m; and
 - establishment of Pits 4 (14.21ha) and 5 (19.5ha) and extraction in these pits to a depth of approximately 35m.
- excavation of 3,000,000 tonnes of overburden in total over the life of the project and retention on site;
- brick production in the order of 252,000tpa;
- import of raw materials required for brick making in the order of 20,000tpa;
- associated handling, packaging, storage and transport of bricks;
- associated construction of bunds and stockpiles; and
- maintenance and rehabilitation works.

2.3. Environmental Management Strategy

The environmental management strategy for Badgerys Creek can be summed up as follows

- continue extraction of identified shale and sandstone resources within existing pit 3, which would productively use remaining valuable resource on site;
- locate new quarrying pits 4 and 5 to avoid significant vegetation, flood-prone land and the environmentally sensitive Badgerys Creek corridor;
- utilise existing surface infrastructure and facilities for quarrying and brick making, to add economic viability of the project and avoid the introduction of new transport routes;
- maximise water reuse and maintain zero offsite discharge of surface run-off;
- stabilise existing stockpiles through revegetation and avoid the creation of new or larger stockpiles through the placement of overburden and unusable material into Pit 2;
- continue to implement environmental management and monitoring measures
- plan for the rehabilitation and end of use of the quarry, which could include future light industrial land use, or continuation of quarrying and brickworks subject to assessment of economic viability of remaining clay deposits within the site.

In 2012, Boral reviewed its brick production capacity due to current uncertain economic conditions and downturn in residential housing activity. Boral determined that the reduced demand could be supplied by its Bringelly Brickworks and therefore decided to temporarily shut down production at its Badgerys Creek facility. Quarrying and brick production will be suspended during the shutdown period but ongoing facility and equipment maintenance will be carried out. Operation of the retail display facility and the occasional dispatch of bricks from the remaining inventory on-site will continue.

Boral has sought a Section 75W modification to the conditions of approval for the expansion of the Badgerys Creek operations so that relevant environmental management measures can be modified or deferred during the shutdown period.

2.4. Aspects and Impacts

The quarrying and brick making activities at the Badgerys Creek facility can be group clustered as follows:

- clay winning and stockpiling (including overburden removal);
- clay preparation (including crushing and size reduction);
- extrusion;
- drying;
- setting;
- firing;
- packaging;
- product distribution;
- ancillary activities/works including:
 - stormwater management;
 - sewage treatment;
 - operation of diesel generator; and
 - storage and handling of fuel.

The environmental aspects from these activities include:

- ground disturbance;
- noise;
- dust generation;
- air emissions;
- waste generation;
- surface runoff;
- groundwater movement;
- containment of oils, fuels and chemicals;
- resource use, including water, electricity and kiln fuel; and
- rehabilitation.

The Environmental Assessment of the project identified potential impacts from the above aspects of the project and outlined a suite of mitigation measures. These mitigation measures are being adopted in this Environmental Management Strategy, and framed within Boral's environmental policies and procedures for its facilities of similar nature.

2.5. Risk Assessment

Boral maintains an Environmental Risk Register for the Badgerys Creek Quarry operation. (A copy of this Register is attached for reference). The register assesses the environmental impacts of the quarrying and brick making activities of the Badgerys Creek facility and ranks the associated environmental risks from low to high to flag where appropriate risk mitigation measures need to be put in place. The Environmental Risk Register is reviewed periodically to assess residual risks and provide for enhanced risk mitigation measures as required.

3. Regulatory Framework

3.1. Relevant Environmental Legislation and Planning Instruments

- *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*
- *Environmental Planning and Assessment Act 1979 (EP&A Act)*
- *Water Management Act 2000*
- *Protection of the Environment Operations Act 1997 (POEO Act)*
- *Protection of the Environment Operations (Clean Air) Regulation 2008*
- *Noxious Weeds Act 1993*
- *National Parks and Wildlife Act 1974 (NPW Act)*
- *Threatened Species Conservation Act 1995 (TSC Act)*
- *Native Vegetation Act 2003*
- *Fisheries Management Act 1994*
- *Contaminated Land Management Act 1997 (CLM Act)*
- *Roads Act 1993*
- *Road Rules 2008*
- *Mining Act 1992*
- *Local Government Act 1993*

The following planning instruments are relevant to the project:

- State Environmental Planning Policy (SEPP) (Major Development) 2005;
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007;
- SEPP (Sydney Region Growth Centres) 2006;
- SEPP 33 Hazardous and Offensive Industries;
- SEPP 44 Koala Habitat Protection;
- SEPP 55 Remediation of Land
- Liverpool Local Environmental Plan.

3.2. Standards and Guidelines

- Applying SEPP 33-Hazardous and Offensive Development Application Guidelines, developed by the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR, 1994)
- Other aspect-specific Standards and Guidelines are listed under the various environmental management sub-plans.

3.3. Approval Requirements

- Project Approvals (under Sec 75J of the EP&A Act 1979), with the following relevant noise quality criteria:

3.4. Permits and Licences

The site is subject to an Environment Protection Licence (EPL) issued under the NSW POEO Act. The EPL includes the following requirements in relation to air quality and noise management and monitoring measures:

- Air emissions monitoring from the brick making facility including the kiln exhaust stack and the dryer exhaust stack;
- Load limits for pollutants including coarse particulates (air), fine particulates (air), fluoride (air), nitrogen oxides (air), nitrogen oxides – summer (air) and sulphur oxides (air).
- Noise from the premises (excluding mobile plant) must not exceed:
 - An L_{A10} (15 minute) noise emission criterion of 55dB(A) (0700 to 2200) Monday to Saturday and 0800 to 2200 Sundays and Public Holidays; and
 - An L_{A10} (15 minute) noise emission criterion of 40dB(A) at all other times, except as expressly provided by this licence.
- Noise from the operation of mobile plant must not exceed:
 - An L_{A10} (15 minute) noise emission criterion of 50dB(A) > (0700 to 2200) Monday to Saturday and 0800 to 2200 Sundays and Public Holidays; and
 - An L_{A10} (15 minute) noise emission criterion of 40dB(A) at all other times, except as expressly provided by this licence
- An emergency response plan must be prepared and implemented for the premises.
- The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

The EPL requires that the Proponent complete an Annual Return including a Statement of Compliance and a Monitoring and Complaints Summary for submission to EPA.

In addition, a Pollution Reduction Program has been completed on the premises consisting of the trial use of recycled water procured from the Worth Recycling plant at South Windsor for brick manufacturing at the premises.

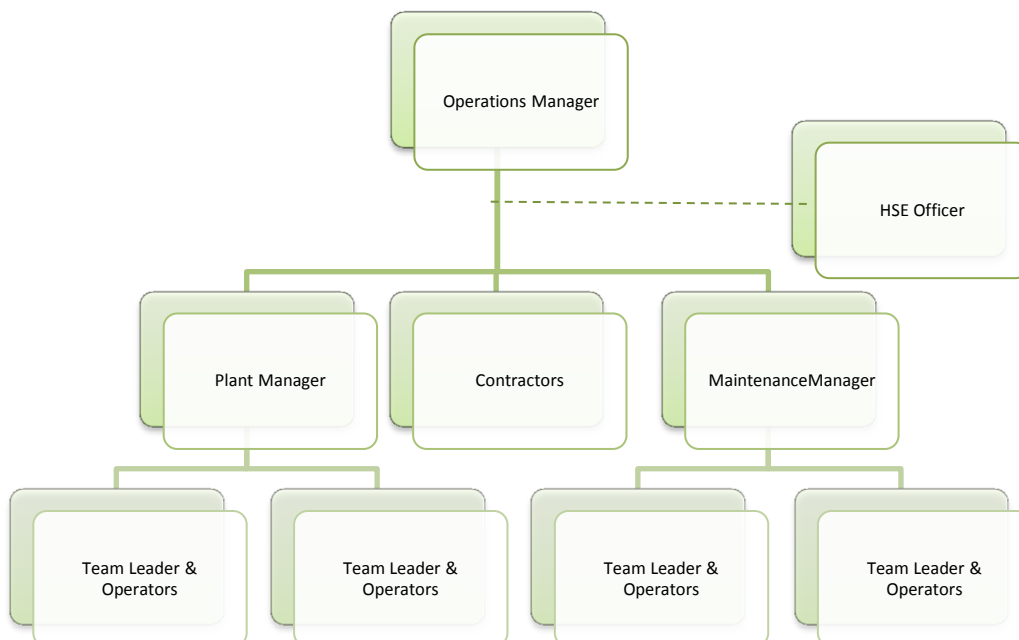
A second Pollution Reduction Program consisting of the development of new load limits for coarse particulates and sulphur oxides emissions is also identified on the EPL.

4. Organisation, Training and Resource Requirements

4.1. Organisation, Roles and Responsibilities

Environmental management for the Badgerys Creek facility is overseen by the Health Safety and Environment (HSE) Officer but the environmental management measures throughout the production process are implemented through the facility organisation shown schematically below.

The Operations Manager will be ultimately responsible for the general operations of the Badgerys Creek facility including the environmental management.



Roles and responsibilities will be developed further with input from site management. Specific responsibilities in respect of environmental management measures are shown in Section 5.

4.2. Training

Project personnel would be required to attend an induction and/or training prior to the commencement of the works at the Project Site. The induction would ensure that all personnel are fully aware of their WH&S and environmental responsibilities and gain the necessary knowledge and skills to fulfil their responsibilities.

Induction would address general environmental and WH&S management issues including:

- introduction to Boral Bricks and overview of scope of operations;

- overview of Company Policies, including WH&S and environmental and explanation of company safety culture and standards;
- overview of scope of operations at Badgerys Creek;
- description of proposed works/project to be conducted;
- location of, and respect for neighbours and adjoining properties;
- permitted hours of quarrying operations/specific noise limitations;
- site WHS requirements including:
 - heavy and light plant and equipment operations/restrictions;
 - site Traffic control and Traffic Management Plan/hours of operation/access;
 - Job Safety Analyses / Safe Work Method Statements / Risk Assessment / WHS legislative requirements / Hazards/ Controls / Systems and Procedures;
 - authority to work permits;
 - emergency response and notification including site evacuation / fire etc;
 - chemical handling and storage;
 - manual Handling; and
 - spill response and procedures;
- emergency contacts and incident reporting procedures;
- supervisors and key personnel;
- site dust and noise monitoring and requirements;
- waste controls and recycling;
- site water controls and systems including erosion control;
- restricted areas and special operations/sensitive areas; and
- location and description of site facilities/amenities.

Where identified in the risk assessment the following items would be included in the induction:

- discharges to air/water;
- cultural issues and notification processes should work be carried out in a sensitive area; and
- weed and pest control and flora and fauna preservation/fire controls.

4.3. Resource Requirements

Specific resource requirements are outlined in the various environmental management sub-plans for the Badgerys Creek Quarrying and Brickmaking Facility. These include environmental monitoring equipment.

For specialist environmental monitoring, Boral will engage the following:

- air quality specialists for stack monitoring;
- acoustic specialists, for noise monitoring; and
- NATA-accredited analytical laboratories for water and dust analysis.

5. Environmental Management Measures

The following environmental management measures are from the Statement of Commitments of Boral for the Badgerys Creek Quarry and Brick Making Project:

Item	Action	Responsible Staff	When
General			
1	All practicable measures will be implemented to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the Project.	All staff	At all times
Air Quality			
2	<p>An Air Quality and Green House Gas Management Plan (AQGHGMP) for the project will be prepared to the satisfaction of the Director-General. The AQGHGMP will outline the purpose, methodology and expected outcomes of the dust monitoring, and will include the following content:</p> <ul style="list-style-type: none"> • dust fraction to be measured, i.e. TSP, PM₁₀, PM_{2.5} etc.; • equipment to be used to measure selected dust fraction; • frequency of the monitoring, i.e. sample collection schedule; • duration of the monitoring program; • location of the monitoring station/s; • standards/guidelines that are to be followed for location/construction of the monitoring station, equipment calibration, collection of samples and analysis of samples; • calibration methodology and schedule; • reporting procedure; • regulatory guidelines and compliance criteria; • action levels and contingency measures in the event that pollutant concentrations approach or are likely to exceed the relevant compliance criteria; and • a consultation program that involves nearby agricultural producers and residents, in order to determine if the dust mitigation measures are being effective. 	HSE Officer	At project start
3	<p>Dust and emissions from the Project Site will be controlled using the following measures:</p> <ul style="list-style-type: none"> • haul roads to be watered at a rate equal to or greater than 2 L/m²/hr; • unloading of trucks containing raw or unusable extracted material to be controlled using water sprays; • dust from the raw material stockpile to be controlled using water sprays; • dust from existing stockpiles of unusable material and open pits to be controlled using water sprays with chemical additives (surfactants); • completed pits to be revegetated as soon as practicable after completion of quarrying activities; • disturbed soil surfaces to be revegetated in accordance with the Rehabilitation Plan for the Project Site; • operational practices to be reviewed to ensure 'best 	Site staff and contractors	At all times

practice' techniques are being employed and that operational equipment is working efficiently;

4	A reactive dust management program will be implemented during quarrying activities. The reactive program will form part of the AQGHGMP. The reactive management program will involve a combination of instantaneous dust monitors and an on-site meteorological station. The dust monitors will be located on the boundary of the site between the dust emitting activities and the most affected receptors, and alert the operators when dust levels approach or exceed criteria levels. If the dust levels reach a pre-determined warning or critical concentration and the winds are shown to be blowing from the Site towards the monitor (i.e. the site is likely to be contributing to the elevated dust levels and potentially affecting receptors), prearranged actions will be taken to minimise the Site's dust emissions. Once the dust concentrations return below the warning level, the additional mitigation measures can cease and quarrying operations return to normal. The warning or critical concentration levels will be chosen in consultation with OEH and represent levels that provide the Site enough time to implement mitigation measures and/or inform personnel to cease works.	HSE Officer	Quarrying campaign periods
Noise			
5	All practicable measures will be implemented to undertake the development in a way that minimises the noise generated. These measures include the following in relation to operation noise management:	All staff	At all times
6	Quarrying activities at the Project Site will be conducted only between the following hours: <ul style="list-style-type: none"> 7.00 am to 6.00 pm Monday to Saturday 	Site Manager, Quarrying contractor	Quarrying campaign periods
7	The Brick making facility will be operated and storage yard activities conducted within the at the Project Site 24 hours a day, Monday to Sunday.	Site Manager	At all times
8	Deliveries and dispatch will be conducted only between the following hours: <ul style="list-style-type: none"> 6.00am to 10.00pm Monday to Friday 6.00am to 6.00pm Saturday 	Site Manager	At all times
9	A 5 dB(A) noise reduction treatment will be applied to all dozers and excavators used in the quarrying operations.	HSE Officer	Quarrying campaign periods
10	A 5 dB(A) of attenuation treatment will be applied to the front end loader operating as part of the brick works.	HSE Officer	At all times

11	An earth bund of a minimum height of 10m will be constructed along the northern and part of the western Project site boundaries, and 7m along the eastern Project Site boundary and part of the southern Project Site boundaries as shown in Figure 6 and Appendix B of the Noise Assessment Addendum Report. The earth mound will be constructed in stages as specified in Figure 6 of the Noise Assessment Addendum Report.	Site Manager	Noise bund construction period
12	Overburden material will be removed using excavators only in pits where the use of a dozer exceeds the noise criteria.	Site Manager	At all times
13	Smaller dozers will be used during raw material removal stages where the predicted noise levels from larger dozers exceed the noise criteria.	Site Manager	At all times
14	Construction works associated with the earth bund will be limited to 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays.	Site Manager	Noise bund construction period
15	Best practicable means of controlling noise during the construction of the noise berm will be adopted. Noise mitigation measures will be included in a construction noise and vibration management plan which will form part of the construction management plan to minimise the noise impact at sensitive receivers. This may include the work practices described below as detailed in Section 8 of the Noise Assessment Addendum Report:	HSE Officer	Noise bund construction period
16	A 5dB(A) of attenuation treatment will be applied to dozers operating as part of the noise berm construction activities.	HSE Officer	Noise bund construction period
17	All construction activities associated with the construction of the noise berm will be subject to the standard noise and vibration mitigation measures described in Section 8.2 of the Noise Assessment Addendum Report.	HSE Officer	Noise bund construction period
18	Unforeseen noisy activities will be subject to additional mitigation measures depending on the extent of predicted or measured impacts.	HSE Officer	Noise bund construction period
19	In case high impact noise activities, such as those likely to generate noise levels above L_{Aeq} 75dB(A) or activities likely to generate noise with intermittent, impulsive, tonal or low-frequency characteristics, are required during the construction of the noise berm, adjacent sensitive receivers will be appropriately notified prior to works commencing and respite periods will be implemented.	HSE Officer	Noise bund construction period
20	The mitigation measures described in Section 8.5 of the Noise Assessment Addendum Report will be implemented in order to minimise the impact of noise exceedences from heavy vehicles (i.e. trucks and dump trucks) moving around the site.	Site Manager	Noise bund construction period

21	Bulk earthwork machinery will be selected and maintained by Boral and/or its appointed contractors as specified in Section 8.6 of the Noise Assessment Addendum Report.	Site Manager and Contractors	Noise bund construction period
22	Broadband reversing alarms or other non-tonal vehicle movement and warning alarms will be fitted to all machinery on site (quarrying, brick making and storage yard machinery). The potential noise impact associated with reversing alarms will be managed and minimised via a combination of proactive driver/operator training and operational procedures as detailed in Section 8.6 of the Noise Assessment Addendum Report.		Noise bund construction period
23	A noise monitoring programme which would involve attended noise monitoring at a number of nearby identified receiver locations will be implemented.	HSE Officer	At all times
24	Consultation will be undertaken with identified nearby residential receivers (as detailed in Section 8.9 of the Noise Assessment Addendum Report) that are predicted to exceed the recommended noise criteria to inform them of the timing and duration of the work.	HSE Officer	At all times
25	A noise complaint register will be maintained.	HSE Officer	At all times
Surface Water			
26	Surface water on the Project Site will be managed in accordance with the SWMP prepared for the Project Site (ERM, 2002), including Addendum dated April 2010 (AECOM, 2010) and included as Appendix C to the EA.	Site Manager	At all times
27	If during the operational phase of the quarry or on completion of the quarry operations, the water from the pits/dams is to be used in the brick making process or reused at other premises offsite etc, a licence will be obtained from the NSW Office of Water (NOW).	HSE Officer	When using pit/dam water
Groundwater			
28	A Groundwater Monitoring Program for the Project Site will be prepared and implemented generally in accordance with the methodology provided in Chapter 11 of the EA, subject to consultation with the NOW and the satisfaction of the Director-General of the DP&I. The program will commence within 12 months of the recommencement of quarrying operations.	HSE Officer	Within 12 months of recommencement of quarrying operations
29	Results of the Groundwater Monitoring Program will be reported to the Director-General of the DP&I and the NOW on an annual basis.	HSE Officer	Annually
30	Appropriate management measures in relation to groundwater as indicated by the Monitoring Program and agreed with the Director-General will be implemented.	Site Manager	At all times
31	A licence to authorise any groundwater monitoring installation, required as part of this project, will be obtained from the NOW prior to any drilling commencing.	HSE Officer	Prior to any drilling

32	<p>An alluvial aquifer mapping and assessment program will be implemented to inform:</p> <ul style="list-style-type: none"> • the definition of the boundaries of the alluvial system; • adjustment to the extent of proposed pits to avoid impacts to the alluvial aquifer; • the establishment of further mitigation measures (if required) to minimise potential impacts upon the alluvial aquifer. • this program will commence within 12 months of the recommencement of quarrying operations and the results will be reported to the NOW and the Director-General of the DP&I. 	HSE Officer	Within 12 months of recommencement of quarrying operations
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Rehabilitation

33	Rehabilitation works at the Project Site will be carried out in accordance with the RP prepared for the Project Site and included as Appendix D to the EA.	Site Manager	Progressively, based on Rehabilitation Plan
34	A Final Landform Rehabilitation Plan will be prepared in consultation with the OEH and DP&I two years prior to the completion of all approved quarrying activities.	HSE Officer	Two years prior to completion of quarrying

Traffic and Transport

35	<p>Traffic movements to and from the Project Site will be managed generally in accordance with the following:</p> <ul style="list-style-type: none"> • personnel operating trucks and vehicles to and from the Project Site would be required to undertake a site-specific health and safety induction, specifying operating hours, avoidance of the AM and PM peak periods and vehicle speed limits on Martin Road; • a heavy vehicle protocol would be developed for the Project Site and distributed to relevant staff and contractors during induction procedures. The protocol would deal with such issues as timing of vehicle movements, idling of vehicles, speed limits and parking; • unnecessary vehicle movements would be minimised where possible; and • deliveries would be scheduled on larger capacity 'Truck and Trailer' vehicles rather than 'Truck Only' vehicles where possible to minimise truck movements. 	HSE Officer	At all times
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Cultural Heritage

36	<p>The Proponent will adopt the following measures in relation to the management of cultural heritage on the Project Site:</p> <ul style="list-style-type: none"> • isolated find BC-01-09 would be collected prior to works commencing; • the location of quarry pit 5 and the noise attenuation berm would be modified so as to not encroach within 60m of Badgerys Creek; • salvaged heritage material would be returned to the location they originated from as per the Code of Practice for archaeological Investigation of Aboriginal Objects in NSW and the procedure outlined in the Aboriginal 	Site Manager and HSE Officer	At all times
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- Heritage Assessment Addendum;
- should relics be uncovered during the course of the approved works, works will cease. In cases where historical items have been uncovered, the NSW DP&I's Heritage Branch will be advised or should indigenous items be uncovered the National Parks and Wildlife Service will be advised;
- workers/contractors will be informed of their obligations under the NPW Act 1974, namely that it is illegal to disturb, damage or destroy a relic without the prior approval of the Director General of the OEH; and
- should human remains be found in, on, or under the land during construction, the responsible party will:
 - contact the local police;
 - not disturb or excavate the remains;
 - immediately cease all work at the particular location;
 - notify the OEH office as soon as practicable and provide any available details of the remains and their location; and
 - not recommence any work at the particular location until authorised in writing by the OEH.

Ecology

37	<p>The following measures will be adopted in relation to the removal of any trees on the Project Site:</p> <ul style="list-style-type: none"> • the canopy of the trees to be visually inspected prior to clearing to assess for the presence of fauna. Where bird species are detected the tree is to be nudged prior to felling to encourage the fauna to vacate the tree prior to felling. Trees to be left in situ until the birds leave the canopy; • felled trees are to be left in-situ for at least 24 hours to allow fauna species to relocate. Qualified personnel are to be on hand to check for wildlife and relocate them; • felled wood is to be relocated to the remnant woodland (and not placed in piles) or chipped and used in rehabilitation areas; • Should any wildlife be inadvertently injured during the proposed works, WIRES or an accredited veterinarian will be contacted; • a 60m buffer area will be provided along Badgerys Creek and the Badgerys Creek tributary. Rehabilitation works are to be undertaken in this area in accordance with the RP prepared as part of this EA; and • five native trees will be planted for each mature native tree that is removed. The plantings will be located adjacent to the riparian vegetation along Badgerys Creek and its tributary. 	HSE Officer	At all times
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Waste

38	<p>Waste in relation to the Project will be managed in accordance with the WMP for the Project Site.</p>	HSE Officer	At all times
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Mineral Resources

39	Annual production data will be provided to the Mineral Resources Branch of NSW Industry and Investment, as and when requested.	Site Manager	As required
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Environmental Management

40	<p>An EMP for the Project Site will be prepared to provide environmental management practices and procedures to be followed during the operation of the Project. The EMP will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • identification of statutory and other obligations that the Proponent is required to fulfil in relation to operation of the Project; • a description of the roles and responsibilities for all key personnel involved in environmental management of the Project; • the environmental policies and principles to be applied to the operation of the Project; and • a description in general terms how the environmental performance of the Project would be monitored and managed. 	HSE Officer	At all times
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5.1. Shutdown Period Environmental Management Measures

During the shutdown period, the site's Health Safety and Environment Manager will be based at Badgerys Creek and will maintain a weekly environmental inspection regime including:

- Property boundary integrity, internal dam levels and neighbouring creeks;
- Raw material quarry pits and access roads;
- Internal access roads (paved and unsealed);
- Water tanks - water recycling (empty) and fire fighting supply tanks;
- Waste material areas and sewage treatment plant;
- Oil store, diesel tank and chemical store;
- Internal drainage from hardstands and access roads; and
- Factory buildings (internal and external).

The HSE Manager will also maintain regular contact with neighbouring residents to resolve any issues. The following management measures will be implemented during the shutdown period.

Air Quality

As there is no quarrying or other plant activity on site during the shutdown, potential dust sources are insignificant. Similarly, there will be negligible pollutant emissions. Minor fugitive dust emissions may occur from stabilized stockpiles; however these would be less than background levels.

The HSE Manager will inspect potential dust sources and arrange for rehabilitation where any significant fugitive emissions are detected. Rehabilitation may include stabilisation or mechanical sweeping to remove residual particulates.

Noise

Potential noise sources during the shutdown period will be limited to employee vehicles (less than 20 movements per day), display centre customer vehicles, occasional truck movements despatching sundry finished products and forklift operations in the product yard.

These activities are not expected to generate significant noise impact at nearby residences; however the HSE Manager will be available to respond to any complaints from nearby residents.

Water Management

At the time of shutdown, the water management system was internally-draining; hence the risk of polluted water discharges is negligible. Sufficient capacity remains in Pit 1 to easily store a foreseeable storm event and water in Pit 2 and Pit 3 is at low levels.

Should water levels exceed acceptable thresholds controlled releases would be made via the pollution control dams, with associated monitoring of receiving waters in accordance with Environment Protection Licence requirements.

Rehabilitation

The most recent quarrying campaign was in Pit 3 and was completed in winter 2011. Following that campaign, the Pit 3 was stabilised in accordance with the rehabilitation plan. Similarly, all raw material and overburden stockpiles are stabilised or rehabilitated.

The HSE Manager will inspect the site on a weekly basis to ensure the rehabilitated areas remain stable.

Traffic and Transport

Traffic during the shutdown period will comprise light vehicles (display centre customers and Boral office staff) and occasional truck movements despatching product (maximum 10 truck movements per day). This level of traffic will not impose any significant burden on the local traffic network.

Cultural Heritage

There will be no interaction with cultural heritage material during the shutdown.

Ecology

There will be no interaction with ecological communities during the shutdown.

Waste

Waste sources during the shutdown period will be limited to domestic-type waste from the administration offices. This will be managed and disposed in accordance with the Council waste management regime.

Reporting

Boral will meet its reporting obligations under the facility's Environment Protection Licence.

The Department of Planning and Infrastructure will be advised of any changing circumstances or inadvertent environmental interactions.

6. Monitoring

6.1. General

Inspection, monitoring and auditing would be undertaken to assess and record whether activities are in compliance with regulatory requirements and the objectives outlined in the Health, Safety and Environment Management System, which guides Project Site operations.

In addition to the conditions of the Minister's approval and the Proponent's SoCs, the proposed works would be carried out in accordance with:

- the relevant requirements of any future Mining Lease; and
- conditions specified pursuant to the EPL.

6.2. Environmental Monitoring

The following environmental parameters will be monitored:

Aspect	Parameters	Frequency	Compliance Criteria
Air emission (Kiln Stack and Dryer Exhaust Stack))	<ul style="list-style-type: none"> - Chlorine - Dry Gas Density - Hydrogen fluoride - Moisture content - Molecular weight of stack gases - Nitrogen oxides - Odour - Temperature - Total Solid Particles - Type 1 substance - Type 2 substance - Velocity - Volatile organic compounds - Volumetric flowrate 	Every 6 months	EPL684
Noise (from premises and from mobile plant)	L_{A10} (15min), L_{Aeq} (15min) , L_{A1} (1 min)	<p>Attended – twice weekly for first month then weekly thereafter during quarrying campaigns;</p> <p>Unattended – monthly;</p> <p>Targeted investigation – in response to a noise complaint</p>	EPL684, NMP

Aspect	Parameters	Frequency	Compliance Criteria
Construction noise	L_{Aeq} (15min)	as required during construction	NMP
Traffic noise (along Martin Road)	L_{Aeq} (15min)	Unattended, three-monthly	NMP
Dust	TSP, PM_{10} , $PM_{2.5}$	Monthly	AQGHGMP
Groundwater	In accordance with Groundwater Monitoring Program to be prepared within 12 months of recommencement of quarrying operations		

The location, frequency, duration and methodology for the above environmental monitoring are detailed in the respective management sub-plans.

During the shutdown period, there will be no quarrying and brick making activities, with site activities limited to facility maintenance, operation of the retail display and occasional dispatch of bricks from the inventory remaining on-site. During this shutdown period, it is considered that dust, air emissions and noise levels are highly unlikely to exceed criteria. Therefore, compliance monitoring for dust, air emissions and noise would not be carried out during the shutdown period.

6.3. Inspections

Monitoring of the implementation of the various management plans will be undertaken as part of regular site inspections by the HSE Officer. Inspection of activities would be undertaken on a regular basis by supervisory staff. On-going monitoring of these activities is essential to ensure compliance with regulatory requirements and conditions of approval.

6.4. Environmental Auditing

Independent environmental audits would be undertaken in accordance with the Conditions of Approval to assess the compliance of the Project with regulatory requirements during construction and operation. This audit will:

- be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
- include consultation with the relevant agencies;
- assess the environmental performance of the project and assess whether it is complying with the requirements in this approval and any EPL or Mining Lease EPL applicable to the site (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
- recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under the abovementioned approvals.

The audit team will be led by a suitably qualified auditor and include experts in any field specified by the Director-General.

Boral will submit a copy of the audit report within six (6) weeks of receiving the Final version, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.

Boral would ensure that records are kept of all auditing that is conducted. Based on results of the audits, Boral management and HSE Officer will conduct reviews and where practicable implement any recommended corrective actions towards identified environmental impacts or concerns of the project.

6.5. Environmental Performance Review

Within twelve (12) months of recommencement of quarrying operations and brickmaking, and annually thereafter, Boral will review the environmental performance of the project. In accordance with the conditions of approval, the review will cover the following:

- description of the development and any rehabilitation carried out during the review period;
- description of the development that is proposed for the following period;
- review of monitoring results;
- review of complaints records;
- review of non-compliance and actions taken to address these;
- identification of trends in the monitoring data over the life of the project;
- identification of any discrepancies between the predicted and actual impacts of the project and assessment of potential causes; and
- description of measures to be implemented to improve environmental performance

The annual review report will be submitted to the Director-General.

6.6. Strategy and Plan Review

This environmental strategy and the management sub-plans prepared for the project will be reviewed and revised as required within three (3) months of the following:

- the submission of an annual review (refer Section 6.5);
- the submission of an Incident Report (refer Section 7.2);
- the submission of an audit report (refer Section 6.4); and
- any modification to the conditions of approval (unless the condition requires otherwise).

This is in accordance with the intent of the conditions of approval to ensure that strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

7. Reporting

7.1. Environmental Reporting

Environmental reporting is carried out both through the Boral Sitesafe internal reporting system, on a daily basis, and directly to senior management through monthly reports. Reporting will cover the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedences of impact assessment criteria and/or performance criteria

The key features of the Environmental reporting system include:

- daily inspection and identification of issues by supervisory staff.
- entry into the Boral Sitesafe System which provides:
 - unique identification of each issue including non compliance;
 - description of the issue;
 - investigation;
 - actions;
 - action completion timeframe and responsibility;
 - monitoring of action due dates and close out;
 - management signoff; and
 - data base of records / incidents.
- the Observations section of Sitesafe allows stakeholder consultation and meetings to be recorded and actions allocated.
- any internal or external auditing actions are entered into the Sitesafe database.

An Environmental Report is submitted to Boral Senior Management monthly detailing:

- any site non compliance with statutory and licence requirements;
- inspections and audits by statutory authorities;
- any project or improvement work being conducted on site; and
- any complaints received during the month.

In accordance with the Conditions of Approval, Boral will provide regular reporting on the environmental performance of the Badgerys Creek project on its website, in accordance with the reporting requirements in the plans and programs approved under the conditions of approval.

7.2. Reporting under the Conditions of Approval

In accordance with the conditions of approval, Boral will provide the following reports to the Director-General within the nominated timeframe:

Report	Timeframe	Responsibility	Reference to Condition of Approval
Annual Review report	to be provided annually starting from twelve (12) months after recommencement of quarrying operations and brickmaking	HSE Officer / Operations Manager	Sch 5, Sec 3
Revision of Strategies, Plans and Programs	within the timeframe shown in Section 6	HSE Officer / Operations Manager	Sch 5, Sec 4
Incident report	to be notified as soon as practicable, with a detailed report to be provided within seven (7) days of the date of the incident	HSE Officer	Sch 5, Sec 5
Audit report	within six (6) weeks of the completion of the audit or as agreed with the Director-General	HSE Officer	Sch 5, Sec 7
Air quality audit report	prior to commencement of quarrying operations in Pit 5	HSE Officer	Sch 3, Sec 13
Summary of truck movements	To be provided on a quarterly basis	HSE Officer / Plant Officer	Sch 3, Cl 26
Annual production data	To be provided to the Mineral Resources Branch of NSW Industry and Investment, as and when requested	HSE Officer / Operations Manager	Appendix 6

7.3. Notification of Environmental Harm

In accordance with the EPL for the Badgerys Creek facility and the *Protection of the Environment Legislative Amendment Act 2011 (NSW)*, Boral will notify the EPA and other required authorities of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident. Notifications will be made to the Environmental Line service on 131 555.

Boral will provide written details of the notification to the EPA within seven (7) days of the date on which the incident occurred.

8. EMS Forms and Procedures

8.1. Forms

- Hot Materials and Gases Inspection Checklist
- Internal haul Road Inspection Checklist
- Light vehicle Inspection Checklist
- Site Specific Monthly Inspection Checklist

8.2. Standard Procedures

BC-ESOP-101 Standard Operating Procedures – Waste Management (Issue 3, dated 14/07/2011).