General environmental duty

Code of practice
for the
concrete batching industry

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1. Introduction

This environmental code of practice has been prepared to provide guidance to operators to help them comply with the *Environmental Protection Act 1994* by meeting their general environmental duty. The code also outlines the environmental best management practices of leaders in the industry.

Under Section 319 of the *Environmental Protection Act 1994,* all persons in Queensland must fulfil their **'general environmental duty'**. This is defined as follows: ***'A person must not carry out an activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm'.***
See Appendix 1.

This document describes the concrete batching industry, its potential impacts on the environment, and how those impacts can be mitigated against in the interests of achieving environmental compatibility and complying with the *Environmental Protection Act 1994.*

Although this environmental code of practice is a voluntarily adopted standard for the concrete batching industry in Queensland, complying with this code provides the operator with a defence against a charge of unlawfully causing environmental harm and several other charges to the extent the code is relevant. If you do not comply with this code you may still rely upon the defence of complying with your general environmental duty, but will have to show how you met your general environmental duty another way.

2. Objective of the code

The environmental code of practice aims to

- describe environmental issues and challenges confronting the concrete batching industry in Queensland
- assist operators to better consider the environment with which they interact
- guide concrete batching planning to ensure site, design and operations meet requirements of decision-making authorities
- provide advice to decision-making authorities to enable them to make consistent decisions in respect to concrete batching plants
- suggest practical measures to minimise environmental and social impacts
- allow industry to establish a benchmark environmental performance
- demonstrate to the community the environmental compatibility of the concrete batching industry

3. Scope of the code

This environmental code of practice addresses environmental aspects of concrete batching operations. It does not cover environmental issues to do with siting or construction, and does not cover aspects covered by other legislation such as occupational health and safety.

The code does not restate any requirements of the *Environmental Protection Act 1994*, nor does it override or replace federal, state or local government legislation, regulation, plans or policies. This code shall apply to all new concrete plants constructed in Queensland following the approval of the code, and shall apply to existing plants where appropriate. Where conflict between the code and existing approval conditions arise, the code will be overridden by the approval conditions.

4. Commencement date

This environmental code of practice commenced on 8 August 2014 and has effect for seven years. To continue to have effect the code of practice must be reviewed and approved by the Minister by 7 August 2021. Industry members are encouraged to provide feedback and to report new initiatives to their associations, so the codes can evolve through each review.

5. Authorisation and amendment of the code

Under section 318E(1) of the *Environmental Protection Act 1994*, the Minister may, by gazette notice, make codes of practice stating ways of achieving compliance with the general environmental duty for

an activity that causes, or is likely to cause, environmental harm. Once the code has been gazetted it may also be amended by gazette notice.

6. Acknowledgement

The department acknowledges the work of the Cement, Concrete and Aggregates Australia and the Local Government Association of Queensland in the preparation of this code of practice.

7. About concrete batching

Concrete batching consists of producing concrete or concrete products by mixing cement with sand, rock, aggregate or other similar materials. In a concrete batching plant, the raw materials are mixed using a front end loader or overhead bin concrete batching techniques.

For front end loader plants, a front end loader is used to transport coarse and fine aggregates from a ground level storage bin to an aggregate weigh hopper. The aggregate is then added to an agitator. Cement and fly ash are weighed in a separate hopper and transferred to the agitator. Water is added to the agitator. The concrete is mixed, ready for final slumping, inspection and transportation to the customer/building site.

For overhead bin batching plants, coarse and fine aggregates are stored in separate bins. Aggregates are transferred from the bins to a compartmentalised overhead storage hopper by conveyor belts. A weigh hopper is situated directly beneath the overhead storage hopper, where aggregate is weighed and transferred to the agitator. Cement and fly ash are stored in separate overhead silos. They are weighed in a separate hopper and dropped into the agitator. Water is added, along with any required admixtures and the concrete is mixed, ready for final slumping, inspection and transportation to the customer/building site.

Wet mix plants are those plants where concrete is pre-mixed in the plant before the mixture is loaded into the agitator truck, rather than raw materials being loaded dry, along with water, into the agitator bowl. These plants may be associated with either front end loader or overhead bin plants.

There are two potentially conflicting aspects to concrete batching that all batching plant operators must remain cognisant of.

On the one hand it is a business imperative that batching plants are located as close to the market as possible - that is, close to residential and commercial areas where the concrete, a time perishable product, is used. As concrete is a heavy product, the closer to the market the plant is the less diesel used and the more sustainable the manufacture and delivery of the material becomes.

On the other hand there are emissions naturally associated with concrete batching that may result in impacts on the surrounding community and natural environment if not correctly managed. These emissions include:

- Dust – cement, fly ash and lime must all be stored dry to prolong shelf life; and aggregates and sand transported damp to reduce fuel transport usage. Storage and use of fine particulates includes the risk of airborne emission.
- Noise – raw material delivery, handling, loading and mixing of concrete results in generation of noise.
- Water – cement, fly ash and lime are naturally alkaline products, which will generate alkaline water during batching.

The challenge for concrete batching plant operators is to manage the environmental and community risk whilst remaining close to the market. Remaining cognisant of potential impacts and using this code will assist the operator in operating sustainably.

8. Using the code of practice

There are a number of environmental risks associated with concrete batching.

These include:

- release of dust and/or particulates into the air

- release of high pH and contaminated water and sediments
- noise from handling, mixing and transport operations
- waste management

The codes of practice

- ***give practical guidance*** on how environmental best management practices can be achieved in the concreting industry sector
- ***should be followed*** unless there is an alternative course of action that achieves the same or a better environmental objective.

Environmental objectives are objectives or goals that the Queensland Government considers are necessary for concrete batching operators to achieve in order to meet the 'general environmental duty' described under the *Environmental Protection Act 1994.*

The environmental objectives relevant to the concrete batching industry are as follows:

- *The activity will be operated in a way that protects the environmental values of air*
- *The activity will be operated in a way that protects the environmental values of waters*
- *The activity will be operated in a way that protects the environmental values of land*
- *The activity will be operated in a way that protects the environmental values of the acoustic environment*
- *Any wastes generated, transported, or received as part of carrying out the activity are managed in a way that protects environmental values.*

Performance outcomes are the end result that the operator needs to achieve to meet the environmental objectives. There are four performance outcomes in this code of practice. You may decide to use one or more of the suggested control measures to achieve the performance outcome or you may choose to use your own control measure. However, if you do not use the suggested control measures, you will **not** be able to rely on complying with the code as a defence if you cause unlawful environmental harm. You may still rely upon the defence of complying with your general environmental duty, but will have to show how you met your general environmental duty another way.

Note: Some performance outcomes provide the option for an environmentally harmful activity to be prevented or minimised. Prevention is the more desirable outcome. If the operator selects to minimise the harmful activity it must be demonstrated that consideration has been made to the following:

- *sensitivity of the receiving environment*
- *nature of the harm*
- *existing technical knowledge for the activity*
- *feasibility to relocate activity*
- *financial implications of using different control measures*

Suggested control measures are examples of ways of achieving the performance outcome and are considered minimum requirements for complying with this code of practice. In some cases, a number of compliance control measures may be listed for one process. In these cases, you are advised to aim for the control measure or combination of control measures that is most likely to achieve the performance outcome for that process. Alternatively, you may be able to meet a performance outcome in a manner that is not listed in this code of practice (effectively choosing your own control measure).

If you choose to use your own control measure, you will **not** be able to rely on complying with the code as a defence if you cause unlawful environmental harm. You may still rely upon the defence of complying with your general environmental duty, but will have to show how you met your general environmental duty another way.

Best practice measures are control measures considered to be in addition to the minimum requirements and are what industry leaders are achieving. Best practice incorporates concepts such

as cleaner production, waste minimisation, recycling and reuse. Use of best practice control measures may help to improve industry standards and progress towards best practice in the industry. You do not have to meet the best practice measures to comply with the general environmental duty.

Best practice measures are marked with a  in the text.

In order that sustainable outcomes are achieved for both the concrete batching industry and the environment, the industry will endeavour to follow the principle of BATNEEC – Best Available Technology Not Entailing Excessive Cost.

Develop a plan to protect your environment, reduce your business risks and gain a competitive advantage

An environmental management plan or system identifies environmental risks caused by the operation and puts activities in place to manage these risks. The performance outcomes and examples for meeting environmental objectives listed in this document will form a solid basis for creating your management plan or system.

By reducing your environmental impact and adopting eco-efficient practices, you will be able to:

- minimise your environmental risk
- measure, plan and implement control measures to reduce energy, water, waste and materials
- enhance product quality and productivity
- improve financial performance
- reduce your business' carbon footprint

A management plan or system should achieve the following outcomes:

- all potential environmental risks from the activity are identified and control measures are in place to prevent or minimise the potential for environmental harm
- contingency measures are in place to avoid environmental harm in the event of unforeseen circumstances or natural disasters (e.g. flood)
- staff are trained and aware of their requirements of the *Environmental Protection Act 1994*
- reviews of environmental performance are undertaken periodically
- records of monitoring, incidents and complaints are kept.

*By developing and following an **environmental management plan or system** your business can demonstrate that all reasonable care is being taken to avoid causing environmental harm. Your business will be able to use this reasonable care, or due diligence, as a defence for compliance purposes.*

Provide staff training

Encourage environmental awareness and responsibility amongst staff by providing appropriate staff training. It is your staff who will ensure that your operation remains compliant by recognising and minimising environmental hazards.

Concrete batching processes

Dust from cement, sand and aggregates is generated by many activities, such as:

- loading and transport of materials
- storage of materials
- batching processes.

Performance outcome 1:

Dust and particulate emissions from all activities associated with the concrete batching process must be controlled in order to prevent or minimise nuisance at surrounding premises.

⚠ Dust from activities can enter neighbouring properties causing nuisance and lead to complaints. This may lead to an investigation by authorities regarding compliance of the activities being carried out.

✓ Suggested control measures

- ☐ Ensure that incoming and outgoing truckloads of sand, aggregate and concrete wash out are covered during transport if there is a possibility dust may be emitted.
- ☐ Ensure that trucks leaving the premises are clean, focusing on draw bar and tail gate, to prevent material causing dust nuisance and being tracked onto external roads.
- ☐ Regularly water sand and aggregate stockpiles to keep down dust emissions.
- ☐ Enclose stockpiles on three sides and keep storage levels at least 0.5 metres below the tops of the walls and at least 0.5 metres inside the open ends of the enclosures; or use other measures such as screening or roofing to minimise dust emissions.
- ☐ Ensure that cement and fly ash silos are fitted with overfill protection and dust filtration systems, and properly maintain the systems and filters.
- ☐ Use a burst bag detector system that has ducting to 1 m of ground level adjacent to the silo-filling pipe.
- ☐ All elevated hoppers, conveyors and dusty transfer points shall be sheltered from the wind.
- ☐ Prevent and clean up any spillages or dust accumulation on driveways or sealed roads.
- ☐ Regularly water or otherwise maintain unsealed roads to minimise dust emissions to prevent nuisance from traffic movements. Care should be taken to prevent material being tracked onto roadways.
- ☐ Roof and enclose truck loading bays.
- ☐ Use water sprays or filtered dust extraction systems around gob hoppers and across open sides of enclosures.
- ☐ Ensure any emission control equipment is regularly maintained.

	 Install drive over in ground storage bins where practicable.  Use Reverse Pulse filters rather than the ‘green bag’ type filters.  Seal all internal roadways.  Roof incline conveyors and enclose on at least one side.  Consider screening at the boundary of the premises and / or around high dust generating activities. Screening may include shade cloth and / or vegetation.

Water

Performance outcome 2.1:

Storm and process water must be appropriately managed to prevent or minimise the release of contaminants offsite and including to ground water.

Definitions:

pH neutral: Water that falls in the range 6.5 to 8.5, specifically defined by the Environmental Protection Regulation 2008 Schedule 9.

Contaminated water: In the concrete batching industry, refers to water that has contacted alkaline materials used in batching, or originated from alkaline areas, and become alkaline (pH greater than 8.5). Examples of alkaline areas include cement and fly ash storage and loading, agitator truck loading, slumping and washing points, recycled water pits, slurry agitator pits, 'first-flush' collection pits and concrete waste drying and storage.

Dirty water: In the concrete batching industry, refers to water that has contacted particulate materials such as sand and dirt and become laden with suspended solids. Dirty water originates from aggregate storage areas not affected by cementitious materials and sediment settling basins. Typically, but dependent upon approval conditions, water with greater than 50 mg/l suspended solids would be referred to as dirty.

Clean Water: Water that originates from areas not impacted by alkaline or dirty materials.

Pollutants for concrete batching operations can impact on the land and waterways by:

- increasing soil and water pH affecting aquatic life
- increasing the turbidity or cloudiness of waterways
- destroying the functionality of wetlands
- providing a medium for weeds to establish.

In addition, contamination of soil and groundwater by petroleum and other chemicals can result in increased site clean-up liabilities for business.

Storm water is a valuable resource that can be captured and used in the process, which saves the use of mains water and reduces the risk of off site harm.

✓ Suggested control measures

- Ensure that the first flush of contaminated water from areas such as cement and fly ash storage, concrete loading, agitator bowl washing and slumping, concrete wash out storage and truck washing areas is collected in in-ground pits or tanks. Maintain sufficient freeboard for rain events to ensure that contaminated water is not permitted to leave the site. The required first flush capture capacity is equivalent to 0.02 metres (20 mm) multiplied by the area of the 'contaminated area' – that is 0.02 metres x length x breadth) i.e. a first flush capacity able to hold a 20 mm rain event.

	• Ensure dirty water from the sand, aggregates and front end loader areas is captured in in-ground pits and tanks. • Reuse captured water for batching of concrete in order to maintain sufficient freeboard for rain events. • If contaminated water must be discharged, ensure that water is pH neutral prior to release. • If dirty water must be discharged, ensure that pits and tanks have adequate capacity for settling out sediment. Alternately other means of treatment such as filtration may be employed to ensure that suspended solids discharge limits are met. • Regularly inspect and clean out in-ground wedge pits to maintain adequate sediment holding capacity.
	 Design the batching plant so that it is segregated into contaminated (alkaline), dirty (sand and aggregate storage) and clean areas (e.g. building rooves and car parking) to assist with water management. Divert clean stormwater away from contaminated and dirty operational areas.  Reuse water captured water for slumping and dust suppression.  Maximise the capacity for holding harvested rainwater to minimise the use of mains water.  Use the safe alternative of CO_2 neutralisation to treat alkaline water prior to discharge.  Develop a site storm water management plan that describes the correct management of all water on the site.

Storage of chemicals and potential contaminants

Performance outcome 2.2:

Storage of fuel, lubricants and other chemicals must be managed to minimise releases of contaminants.

✓ Suggested control measures

- Store all fuels, oils and chemicals in an impervious bunded area or compound capable of holding 110% of the volume of the largest tank or 25% of total maximum drum inventory, whichever is the larger.
- Clean up all chemical spills promptly.
- Keep Material Safety Data Sheets (MSDS) for all hazardous substances used or stored on site.
- Maintain a fully serviced spill response kit on site.

Store all chemicals in a roofed or enclosed area to avoid stormwater becoming contaminated.

Cleaning equipment and vehicles

Performance outcome 2.3:

Cleaning of equipment and vehicles minimises contamination of soil and water.

✓ Suggested control measures

- Ensure that the truck wash area drains into the contaminated water collection and recycling pits.
- Store truck wash chemicals in an impervious bunded area or compound capable of holding the volume of at least the largest tank and/or 25% of total maximum drum inventory.

Allocate a designated truck wash area within the contaminated area to avoid contamination of dirty and clean water across the site

Noise

Noise sources at batching plants may include:

- truck and front end loader engine noise
- reverse warning devices
- truck air brakes
- aggregate delivery to bunkers and hoppers
- swinging, scraping, loading devices
- hydraulic pumps
- conveyor belts
- compressors
- air valves
- filters
- opening and closing gates
- radios
- alarms
- amplified telephones
- public address system

Performance outcome 3:

Noise nuisance must be prevented or minimised at noise sensitive places.

Noise from concrete batching operations can cause conflict between operators and the community.

Refer to *Environmental Protection Act 1994 Part 3B* for noise standards

✓ Suggested control measures

- Maintain a system for capturing complaints and addressing them.
- Where noise sensitive receptors are nearby ensure that noise emissions from noisy equipment are managed appropriately, including using measures such as acoustic shielding or enclosures, and silencers.
- Ensure that reversing alarms are of the squawker type rather than beepers.
- Only operate within your approved operating hours.
- When operating outside of normal operating hours, consider consulting with your neighbours to avoid complaints.
- Limit where practicable the operation of trucks and other heavy machinery to appropriate hours.
- Ensure that all equipment and vehicles are adequately maintained.

Locate your plant in an appropriately zoned industrial area and away from sensitive noise receptors.

Use the layout of buildings and natural topography as noise barriers where possible. Cost effective landscaping improvements (e.g. fencing and mounds) can be implemented to reduce noise emissions and therefore the potential for complaints.

Waste

Performance outcome 4:

Waste production and disposal must be minimised and waste must be managed to prevent environmental harm.

Producing waste has impacts from extracting resources to disposal in landfill. Disposal has significant environmental impacts from transporting the waste for disposal, to potential leachate, odour and greenhouse gas emission impacts.

Waste management practices should follow the legislated waste management hierarchy. These are prioritised below from the most preferred to least preferred options

- Avoid producing any waste
- Reduce the generation of waste
- Reuse as much as possible
- Recycle as much as possible
- Disposal of waste

✓ Suggested control measures

- Ensure that regulated wastes (Environmental Protection Regulation 2008 Schedule 7) are disposed of in accordance with waste legislation. Regulated wastes include, but are not limited to: alkaline water, concrete wash out, waste oil, coolant, contaminated diesel fuel and other vehicle fluids.
- Ensure that waste tracking forms are retained for regulated wastes.
- Segregate wastes and recycle those that may be recycled. Clearly label waste containers to encourage use. Examples of recyclable wastes include metals, paper and cardboard, plastics and concrete wash out.
- Only put inert, solid waste into industrial bins and general rubbish.

Minimise the generation of waste through careful planning and execution of concrete production.

Appendix 1: General obligations under the *Environmental Protection Act 1994*

General environmental duty

The *Environmental Protection Act 1994* section 319 states that we all have a general environmental duty. This means that we are all responsible for the actions we take that affect the environment. We must not carry out any activity that causes or is likely to cause environmental harm unless we take all reasonable and practicable measures to prevent or minimise the harm. To decide what meets your general environmental duty, you need to think about these issues:

- the nature of the harm or potential harm
- the sensitivity of the receiving environment
- the current state of technical knowledge for the activity
- the likelihood of successful application of the different measures to prevent or minimise environmental harm that might be taken
- the financial implications of the different measures as they would relate to the type of activity.

It is not an offence not to comply with the general environmental duty however maintaining your general environmental duty is a defence against the following acts:

- an act that causes serious or material environmental harm or an environmental nuisance
- an act that contravenes a noise standard
- a deposit of a contaminant, or release of stormwater run-off, mentioned in section 440ZG.

Duty to notify

The duty to notify (section 320 of the *Environmental Protection Act 1994*) requires a person or company to give notice where serious or material environmental harm is caused or threatened to occur. Notice must be given of the event, its nature and the circumstances in which the event happened. Notification can be verbal, written or by public notice depending on who is notifying and being notified.

For more information on the duty to notify requirements refer to the guideline 'The duty to notify of environmental harm' (EM467)[1].

[1] Available at **www.qld.gov.au**, using the publication number EM467 as a search term.

Relevant offences under the *Environmental Protection Act 1994*

1. Causing serious or material environmental harm (sections 437-439)

Material environmental harm is environmental harm that is not trivial or negligible in nature. It may be great in extent or context or it may cause actual or potential loss or damage to property. The difference between material and serious harm relates to the costs of damages or the costs required to either prevent or minimise the harm or to rehabilitate the environment. Serious environmental harm may have irreversible or widespread effects or it may be caused in an area of high conservation significance. Serious or material environmental harm excludes environmental nuisance.

2. Causing environmental nuisance (section 440)
Environmental nuisance is unreasonable interference with an environmental value caused by aerosols, fumes, light, noise, odour, particles or smoke. It may also include an unhealthy, offensive or unsightly condition because of contamination.

3. Depositing a prescribed water contaminant in waters (section 440ZG)
Prescribed contaminants include a wide variety of contaminants listed in Schedule 9 of the Environmental Protection Regulation 2008. It is your responsibility to ensure that prescribed contaminants are not left in a place where they may or do enter a waterway, the ocean or a stormwater drain. This includes making sure that stormwater falling on or running across your site does not leave the site contaminated. Where stormwater contamination occurs you must ensure that it is treated to remove contaminants. You should also consider where and how you store material used in your processes onsite to reduce the chance of water contamination.

4. Placing a contaminant where environmental harm or nuisance may be caused (section 443).

Relevant offences under the *Waste Reduction and Recycling Act 2011*

1. Littering (section 103)

Litter is any domestic or commercial waste and any material a person might reasonably believe is refuse, debris or rubbish. Litter can be almost any material that is disposed of incorrectly. Litter includes cigarette butts and drink bottles dropped on the ground, fast food wrappers thrown out of the car window, poorly secured material from a trailer or grass clippings swept into the gutter. Litter can also be an abandoned vehicle. However, litter does not include any gas, dust, smoke or material emitted or produced during, or because of, the normal operations of a building, manufacturing, mining or primary industry.

2. Illegal dumping of waste (section 104)

Illegal dumping is the dumping of large volumes of litter (200L or more) at a place.

Ensure that all wastes that are taken offsite are taken to a facility that can lawfully receive them.