

## Concrete batching

Updated September 2009<sup>1</sup>

*EPA 427/09: This guideline provides information to those involved in the management and operation of concrete batching plants, to assist with compliance with the Environment Protection Act 1993. Concrete batching plants are defined as works for the production of concrete or concrete products that are manufactured by mixing cement, sand, rock (metal), aggregate or similar materials.*

### **Environment Protection Act 1993**

The principal legislation addressing pollution in South Australia is the *Environment Protection Act 1993* (the EP Act). In particular, section 25 imposes the general environmental duty on all persons undertaking an activity that pollutes (or might pollute) to take all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

Concrete batching is a prescribed activity of environmental significance under Schedule 1 of the EP Act; these activities require an authorisation in the form of a licence. Plants with a total capacity of less than 0.5 m<sup>3</sup> of concrete product per production cycle do not require an EPA licence, however the information contained in this guideline is applicable to both licensed and non-licensed plants.

Environment protection legislation also includes Environment Protection Policies (EPP), which outline recommendations and mandatory requirements for the protection of a particular aspect of the environment, such as air quality.

### **General site considerations**

Turbid and highly alkaline wastewater, dust emissions and noise are the key potential impacts associated with concrete batching plants. Where possible concrete batching plants should be sited such that impacts on the environment or the amenity of the local community from noise, odour or polluting emissions are minimised.

### **Separation distances**

The EPA publication, *Guidelines for separation distances* (2007), sets out the recommended separation distances from houses or other sensitive land uses, and should be used by planning authorities, developers, planning consultants and the community as a tool in the development application processes for new or expanding developments. The recommended separation distances contained in these guidelines are based on the assumption that 'best available technology economically achievable' (BATEA) is implemented. Buffers or separation distances should not be used as an alternative to source control and cleaner production methods.

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<sup>1</sup> Last updated September 2003.

The EPA recommends a minimum separation distance from housing or other activities of 100 metres. Site-specific circumstances (eg local topography, state-of-the-art technology) may indicate a reason for amending the recommended separation distance. For further information please refer to Guidelines for separation distances on the EPA website.

If a mobile batch plant is used for the preparation of concrete, the plant must not be positioned closer than 50 metres to an environmentally sensitive location. In addition, where possible a buffer zone of 100 metres from any township, municipality or residential dwelling should be provided when batching concrete.

## **Air quality management**

### ***Environment Protection (Air Quality) Policy 1994***

Regulation of air pollution is primarily governed through the *Environment Protection (Air Quality) Policy 1994* (Air Policy). Section 4 of the Air Policy requires that the best practicable means of control be used to minimise air pollution from an activity.

The Air Policy also specifies maximum pollution levels in the Schedule to the policy. The maximum level of concentration of solid particles, at testing points determined in accordance with this policy, is a total mass of 250 mg/m<sup>3</sup> of residual gases after completion of the process and before amalgamation with air, smoke or other gases.

### **Air quality consideration**

Operators of industrial premises must take all reasonable and practicable measures to minimise air quality impacts from their operations.

In the case of concrete batching plants, cement, sand and aggregates can produce dust which may enter neighbouring premises and adversely affect amenity value. The best way to avoid offsite problems is to prevent the release of the dust through good design and management techniques. The provision of natural or artificial wind barriers such as trees, fences and landforms may help control the emission of dust from the plant.

### **Road and yard dust**

The most effective means of reducing dust emissions at batching plants is to hard-surface roadways and any other areas where there is a regular movement of vehicles. Access and exit routes for heavy transport vehicles should be planned to minimise noise and dust impacts on the environment and amenity of the locality. Where it is not practicable to hard-surface a site (eg at a short-term location), there are a number of alternatives to suppress dust emissions from unsealed yards and roadways, including:

- armouring (a thin layer of high quality pavement material is placed on the pavement surface)
- chemical suppressant products
- regular light watering.

Dust emissions due to vehicles can be minimised by reducing travel distances within the site by appropriate site layout and design, the use of wheel and truck wash facilities at site exits, and the introduction of vehicle speed limits. All concrete batching plant sites should demonstrate good maintenance practices, including regular sweeping to prevent dust build-up.

### **Fugitive dust**

The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a leeward position to minimise the effects of the wind. Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and reduce water usage.

Aggregate stored on site in stockpiles should be contained within three-sided storage bunkers with windshields that project 0.5 metre above the bunker wall. Drive-over in-ground aggregate storage bins should be shielded on at least two

sides to 0.5 metre high for the full length and width of the bin. Where overhead aggregate storage bins are not totally enclosed, aggregate should not be loaded within 0.5 metre of the top of the walls.

Conveyors must be designed and constructed to prevent fugitive dust emissions. This may include covering the conveyor with a roof, installing side protection barriers and equipping the conveyor with spill trays, which direct material to a collection point. Belt cleaning devices at the conveyor head may also assist to reduce spillage.

Mixer loading areas should be roofed and enclosed on either two (drive-through) or three sides. Water sprays and a robust curtain of suitable design, or an effective air extraction and filtration system, should be installed to suppress dust generated during mixer truck loading. Weigh bins and hoppers should be enclosed on three sides and roofed where a front-end loader is used. The roof should extend 2 metres in front of the bin.

Any raw material spills should be removed promptly by dry sweeping. Water should not be used in the process of cleaning up spills except where the area drains to a wastewater collection point where washing down would be preferable to generating dust by sweeping.

### **Fabric filters**

An approved fabric filter incorporating a fabric-cleaning device should be installed on each cement storage silo. The quality of the filter media and the design characteristics of the filter system must be capable of ensuring that the maximum concentration of solid particles in residual gases does not exceed 100 mg/m<sup>3</sup>.

Fabric filters should be serviced and maintained in accordance with the manufacturer's recommendations. Adequate access to the filters should be provided to allow for regular inspection and maintenance. A pollution control equipment register (PCER) should be used to record, on a weekly basis, the following:

- pressure drop
- visual conditions of exhaust material
- incidents of filter media failure/replacement.

The PCER must be accessible at all times to EPA Authorised Officers.

To prevent overflow and subsequent filter damage, storage silos should be fitted with high-level audible and visual alarms in addition to an automatic delivery shut-down. These alarms must have a test circuit and be tested regularly and documented in the PCER. Every alarm apparatus must be maintained in working order at all times.

## **Water management**

### ***Environment Protection (Water Quality) Policy 2003***

*The Environment Protection (Water Quality) Policy 2003* (Water Quality Policy) applies to all inland surface and ground waters, and marine waters. The Water Quality Policy covers:

- water quality objectives
- management and control of point and diffuse sources of pollution
- obligations relating to particular activities
- criteria, discharge limits and listed pollutants.

Section 25 of the Water Quality Policy lists the additional obligations relating to concrete batching plants. This section requires an operator to ensure that the premises incorporate an effective operating wastewater management system.

## **Water considerations**

Potential pollutants in batching plant wastewater and stormwater include cement, sand, aggregates, chemical admixtures, fuels and lubricants. The site should be designed and constructed such that clean stormwater, including roof runoff, is diverted away from contaminated areas and directed to the stormwater discharge system. Any liquids stored on site, including admixtures, fuels and lubricants, should be stored in accordance with EPA Guideline, *Bunding and spill management* (2007). Underground storage tanks should be tested annually for integrity.

### **Wastewater collection system**

Contaminated stormwater and process wastewater should be captured and recycled. Concrete agitator bowls and chutes must never be washed out to the stormwater system or roadways. A wastewater collection and recycling system should be designed to collect contaminated water from:

- agitator washout
- truck washing
- yard washdown
- contaminated stormwater
- concrete batching area
- slump stand
- any other wastewater from the batching plant operation.

Process wastewater and contaminated stormwater collected from the entire site should be diverted to a settling pond, or series of ponds, such that the water can be reused in the concrete batching process. The settling pond or series of ponds should be lined with an impervious liner capable of containing all contaminants found within the water they are designed to collect.

In general a high standard of yard and equipment maintenance will considerably reduce the potential for discharge of sediment to the wastewater collection and recycling system.

### **Stormwater management**

Uncontaminated stormwater from building roofs, roads and other paved areas, etc, may be separated from the wastewater collection system and directed through a suitable interceptor or sediment collection system. This system should be designed and installed to ensure that only clean stormwater is discharged from the site. Regular inspection and maintenance of the system is necessary to avoid discharges of contaminated water from the site. These inspections and maintenance should be recorded in the PCER.

Areas where spills of oils and chemicals may occur should be equipped with easily accessible spill control kits to assist in prompt and effective spill control, according to the EPA Guidelines, *Bunding and spill management*. Staff should be familiar with spill response and notification procedures.

## **Noise management**

### ***Environment Protection (Noise) Policy 2007***

The *Environment Protection (Noise) Policy 2007* (Noise Policy) provides guidance on noise levels that may be deemed excessive under the EP Act. It should be noted that the Act requires site-specific issues be taken into account when determining noise levels that may be excessive.

It is important to ensure that all practicable steps are taken to minimise the adverse effect that noise emissions may have on the amenity value of an area. This responsibility includes not only the noise emitted from the plant and equipment but also associated noise sources, such as radios, loudspeakers and alarms.

## Noise considerations

Commercial and industrial premises must not allow excessive noise to be emitted from the premises. The EPA may issue an Environment Protection Order (EPO) requiring that the excessive noise be curtailed within a specified period.

## Waste management

The main solid waste generated by batching plants is waste concrete. Waste minimisation is the preferred approach to dealing with this material. Where possible, waste concrete should be used for construction purposes at the batching plant or project site (eg bunker blocks or paving unsealed areas). Alternatively, waste concrete can be directed to a suitable washout pit where it becomes gravel, sand and sludge, which can subsequently be collected and reused.

## Environmental audits

An environmental audit should be conducted annually to ensure that the plant is operating according to its environmental objectives and within legislative requirements. Implementing environmental complaint procedures and training staff to recognise and minimise environmental hazards are also good ways of achieving high standards of environmental compliance through continuous improvement. There may be benefits in providing integrated quality, safety and environmental management systems for the site, plant operation and delivery process.

## Currency of these guidelines

These guidelines offer advice to assist with compliance with the general environmental duty and specific environmental policies. They are subject to amendment and persons relying on the information should check with the EPA to ensure that it is current at any given time.

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## Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

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## Further information

### **Legislation**

Legislation may be viewed on the Internet at: <[www.legislation.gov.au](http://www.legislation.gov.au)>

Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet	Telephone:	13 23 24
Adelaide Service SA Centre	Fax:	(08) 8204 1909
108 North Terrace	Internet:	< <a href="mailto:shop.service.sa.gov.au">shop.service.sa.gov.au</a> >
Adelaide SA 5000		

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