Managing Concrete Plant Water and Wash Water

Introduction

This BRMCA guidance is to help member Companies adopt best practice with respect to managing concrete plant water and wash water, and prevent pollution of surface waters. Operating in accordance with this guidance does not remove your responsibility to comply with the law and prevent pollution. It is a duty of care not to cause or allow pollution and if you do cause or allow pollution you may be committing a criminal offence.

The MPA, including BRMCA, Water Policy has three primary aims:

- Minimising water consumption
- Prioritising use of the most sustainable water sources
- Protecting the water environment

The water environment includes both surface water and groundwater. Surface waters include rivers, streams/burns, dry ditches, lakes/lochs, loughs, reservoirs, ponds, canals, estuaries and coastal waters. Groundwater is all water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

These guidelines should be implemented on a site by site basis

Minimising water consumption

The aim is to establish a benchmark of current water use and set targets for reduction in water consumed in the ready-mixed concrete manufacturing processes. Measurement or other determination of the water used and recycled through a concrete plant is an essential part of minimising water consumption. Ideally each concrete plant should be supplied from a metered water supply where usage is read and recorded at regular intervals no greater than one month or in accordance with the abstraction licence. Annex A contains guidance on the measurement or other determination of water usage.

Most sustainable water

For making concrete general suitability is established for water conforming to BS EN 1008 *Mixing water for concrete — Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete.* MPA and BRMCA considers the following as a realistic ranking of water sources with respect to sustainability for most operations in the United Kingdom.

Sustainability ranking	Source of water	Explanatory notes
Most sustainable	Harvested rainwater	Rainwater falling on the land surface and onto buildings that is collected and stored for use.
	Recycled water	Water from manufacturing processes, generally wash water is collected for reuse.
	Water supplied with aggregates or from a quarry	Water supplied with aggregates or water that has been moved from an adjacent quarry floor as part of the dewatering process to allow dry extraction of aggregates or other minerals.
	Primary abstracted water	Water that is taken from ground or surface water sources for use in site processes.
Least sustainable	Mains water	Water that is taken directly from the public water supply

Abstraction from rivers and boreholes
Where a site abstracts more than 20 cubic metres of water per day (10 cubic metres in Scotland) from a borehole or stream a copy of the abstraction licence must be held on the site.

A record of the volume of water abstracted should be kept on site and submitted to the regulator as required. Water abstraction record intervals are normally specified in either or both the licence or abstraction return forms. As unexplained significant changes in water usage must be investigated and details of the outcome recorded it may be useful to record usage at more frequent intervals, and at intervals not greater than a calendar month.

Surface water management
Each site should have a Surface Water management Plan to include a drainage plan identifying: foul drains, surface water drains and any interceptor traps, silt traps and discharge points. The site should also have a schedule for inspections and measurements, as well as a record of regular maintenance and any repair or refurbishment. The frequency of inspection, measurements and maintenance is to be determined on a site by site basis

Only clean surface run-off should be allowed to enter the surface drains. Surface water drains discharge to surface waters where pollution is against the law. Substances, even those not hazardous to humans, can cause significant pollution. These include fine aggregates, pigments and admixtures. Areas that discharge to a surface water body drain must be kept free of all of contaminants such as dust, cement containing slurry, oil, pigment and admixture.

Where necessary a record of surface water discharge quality shall be maintained. Visual inspection of surface water discharges should be carried out regularly to confirm that the discharge is substantially free of suspended solids or other potentially polluting materials. Where refurbishment or maintenance is required then this should be carried out as soon as practicable. Where practicable an interceptor or silt trap should be incorporated into the surface water drainage system.

Where surface water cannot be kept free of contaminant it must be regarded as trade effluent and discharged in accordance with the appropriate consent.

In the event of an accidental spillage of potentially contaminating substances action should be taken to protect drains. Where there is a potentially contaminating discharge to a surface water drain then the regulator will need to be informed. Each devolved Nation has its own regulator as listed at the end of this guidance.

Drum washout and truck cleaning
To reduce the pollution risk ensure that all washing is carried out in a designated area of impermeable hardstanding where the wash water drains to a sump where any overflow is collected for use as recycled water. Where there is no practical alternative to using an unlined wash pits then a groundwater risk assessment may be required and consideration given to providing a remedial lining. Wash out water must be prevented from draining to surface water drains and sewers without necessary consents.

Settlement systems should be managed to ensure effective removal of solids from effluent. In particular wedge pits should be regularly cleaned to prevent carry over of solids into the sewer or surface water drains. The system should also be free of any debris

that may block the outlet. Dirty water should be prevented from short circuiting the settlement system and entering the sewer or surface water drains untreated and without the necessary consents.

Trade effluent
Water discharged from settlement pits or reclaimed water tanks is trade effluent and must only be discharged in accordance with the appropriate consent, normally to a foul sewer. A copy of the consent should be held on site and staff should be aware of its content.

Monitoring of the discharge should be undertaken by internal sampling or by the regulator where there is an identified increased environmental risk. Where monitoring is carried out a record of pH and visual assessments should be kept. Where required a record of volume discharge rate should also be kept. Where pH correction systems are fitted these should be checked every production day. The sewer inlet should be checked and cleaned regularly to minimise the risk of blockage.

Where fitted trade effluent meters should be checked regularly maintained and calibrated to ensure they are working properly.

Where water in excess of the discharge parameters accumulates, then it should be treated or sent off-site to a registered liquid waste disposal contractor.

Water Regulators
Water regulators in the United Kingdom are:
- Environment Agency, for England
- Northern Ireland Environment Agency, NIEA
- Scottish Environment Protection Agency, SEPA
- Natural Resources Wales, NRW

For further information from BRMCA please contact Chris A Clear at chris.clear@mineralproducts.org or telephone 07976 546941.

Chris A Clear, 28 June 2016

Safety - Fresh wet concrete, mortar and screed burns
Where skin is in contact with fresh concrete, skin irritations are likely to occur owing to the alkaline nature of cement. The abrasive effects of sand and aggregate in the concrete can aggravate the condition. Potential effects range from dry skin, irritant contact dermatitis, to – in cases of prolonged exposure – severe burns. Take precautions to avoid dry cement entering the eyes, mouth and nose when mixing mortar or concrete by wearing suitable protective clothing. Take care to prevent fresh concrete from entering boots and use working methods that do not require personnel to kneel in fresh concrete. Barrier creams can be used to supplement protective clothing but are not an alternative means of protection.

Unlike heat burns, cement burns might not be felt until some time after contact with fresh concrete, so there might be no warning of damage occurring. If cement or concrete enters the eye, immediately wash it out thoroughly with clean water and seek medical treatment without delay. Wash wet concrete off the skin immediately. It is important that when it comes to washing cement and concrete from your skin then use plenty of clean water as the risk of cement burns outweighs concerns over preserving water. On no occasion is recycled water suitable for washing skin.

Annex A. Notes on the measurement or determination of water usage at a ready-mixed concrete plants.

Sustainability ranking	Source of water	Notes on measurement or determination of water usage.
Most sustainable	Harvested rainwater	Estimate from area of roofing and pavement that drains to recycling sump or wash out pit and either assume MET Office data for UK average rainfall, or average rainfall per month for a local climate station. http://www.metoffice.gov.uk/public/weather/climate Assume no harvesting from any area of soil or vegetation.
	Recycled water	Water from manufacturing processes, generally wash water collected for reuse. Measure where possible otherwise assume a BRMCA default figure of x% of total consumption.
	Water supplied with aggregates or from a quarry	Water supplied with aggregates or water that has been moved from an adjacent quarry floor to allow extraction of aggregates or other minerals. Where water is supplied from an adjacent quarry record usage from meter readings or estimate if other operations are supplied through the same metered supply. Use moisture content measurements or established values of total moisture content to determine volume of water supplied with aggregates.
	Primary abstracted water	Record usage from meter readings or established distribution if other operations are supplied through the same metered supply.
Least sustainable	Mains water	Record usage from meter readings or established distribution if other operations are supplied through the same metered supply.