**Introduction**

Cement, concrete and grout are among the most common materials used in construction. Concrete mixers, delivery vehicles and related equipment (chutes, pump lines, drums wheel barrows etc.) need to be washed regularly. Examples of where washout waters can be created are:

* Washing down of machinery used with fresh concrete, e.g. concrete chutes, drums, pumps and mortar silo equipment
* Cutting or coring of concrete structures
* Hydrodemolition (high pressure water cutting)
* Surface water run-off from recently lime stabilised sites
* Placement of fresh concrete beneath groundwater e.g. piled foundations
* Placement of fresh concrete in a water course e.g. Bridge abutments

Concrete wash water has a highly alkaline pH (circa pH 12) which if released has the potential to pollute land and leach into the ground and contaminate groundwater. For comparison purposes, drinking water has a pH of circa 7 and bleach has a pH of circa 12 to 13. For every single unit change in pH, for example pH 6 to 7, this represents a tenfold increase in strength. Consequently it is not practical to dilute concrete washout water to reduce the pH. To dilute just 1m³ of concrete wash water at pH 12 you would need four Olympic swimming pools (over 10,000m³) of water to bring it back to neutral (pH 7).

Discharge permits typically stipulate a pH limit of between 6 and 9 for discharges into the aquatic environment and Trade Effluent consents require the pH to be 10 or below.

Even the release of relatively small volumes of concrete washwater can have devastating long lasting effects on the health of the receiving watercourse. The high alkaline wash water can increase the pH of surrounding waters and, depending where it is discharged, can harm terrestrial and/or aquatic life. The solids in concrete washout water can affect the turbidity of the water, block gills of fish, smother the bed of the water body and cause blockages of streams, drains and pipes, which may increase the risk of flooding.

**Legislation and regulation**

England and Wales **(EN) (W)**

Under the Environmental Permitting (England and Wales) Regulations 2010 (as amended) and the Water Resources Act 1991 (as amended), it is on offence to discharge polluting substances to controlled waters (surface water and groundwater) without prior approval from the relevant Regulators (Natural Resources Wales and Environment Agency).

On the 1st July 2014, new sentencing guidelines for environmental offences came into force (link to external document Environmental Sentencing Guidelines), setting out the level of fines that can be handed out by the Courts. In the most serious case, if Balfour Beatty (classed as a large organisation) was found to have caused a category 1 incident through deliberate culpability then the fine could range between £450,000 and £3,00,000 (with a likely starting point of £1,000,000). The court would have the authority to move over and above this fine range if Balfour Beatty were classed as a ‘very large’ organisation.

In February 2017, Interserve Construction Ltd was fined £54,000 plus £5,955 costs after admitting a single incident of discharging silt-laden water into a tributary of the River Rother in Burwash, East Sussex in October 2014.

Scotland **(S)**

Under the Water Environment (Controlled Activities) Regulations 2011 (as amended) and the Water Resources (Scotland) Act 2013 it is an offence to discharge polluting substances to controlled waters (surface water and groundwater) without prior approval from the relevant Regulator (Scottish Environment Protection Agency and Scottish Water).

SEPA have confirmed that that under no circumstances can concrete washout water be dispersed directly to ‘ground’.

Northern Ireland **(NI)**

Under the Water (Northern Ireland) Order 1999 (as amended) it is an offence to cause pollution of a waterway or groundwater. Effluent cannot be discharged without the prior approval from the relevant regulator (Northern Ireland Environment Agency).

**What you need to do in England, Wales, Scotland, and Northern Ireland**

**Leftover Concrete**

Following a delivery of concrete there will usually be a small amount of leftover. This CANNOT be placed in a skip as waste, instead:

* It can be deposited on site and stored in a single agreed location.
* It should be stored on an impermeable surface preferably an impermeable sheet.
* It must be stored in an area away from works and people and segregated from other materials.
* It must be stored at least 10 metres from drains, ditches and watercourses.

Once the concrete is dry it can be broken up by an excavator and used on any site on the same project or placed in the rubble skip for disposal. Uses for the broken up concrete differ depending on fragment size and could include backfill for excavations, repair material for infilling pot holes on access tracks or infill for crane pads or piling platforms

**Hierarchy of Disposal Options for Concrete Wash Water**

Wales, Scotland, Northern Ireland **(W) (S) (NI)**

England **(EN)**

**Avoid washing out on Site**

Preference should be given to avoiding the need to wash out on site by engaging with the concrete supplier to identify alternative options. For example, there are solutions for concrete wagons to contain washout water and dispose of back at the depot and to prevent concrete spillages on the highway. Two such examples are:

Spill Stopper System – contains wash water on the wagons and prevents in-transit spills.

Concretesock® or similar – a chute cover which reduces risks of concrete spills on the highway.

**When washing out on site in unavoidable**

All sites must develop a strategy for dealing with concrete washout water prior to mobilisation on site and communicate it to key stakeholders e.g. concrete suppliers, workforce etc. The following must be followed:

* Concrete washout requirements must be specified in any orders and built into terms and conditions as required.
* Plan and implement wastewater control measures prior to mobilisation on site e.g. designated washout area with suitable containment that is sited on an impermeable area at least 10 metres from any watercourse or surface water drain, rock outcrop sinkhole in soluble rock such as limestone to minimise the risk of run-off entering the water environment. The concrete washout area should be identified on site plans and on site using suitable signage.
* Engage with the local regulator to discuss concrete washout management options and apply for appropriate consents if required.
* Plan and prepare for a spill should it occur.
* Minimise water consumption and waste water generation e.g. recirculate collected washout water.
* Receptacles for wash water must be regularly monitored to ensure that overtopping does not occur and any deterioration in the waterproofness of the structure is identified and repaired as necessary.
* Surplus cement products (mortar and concrete) should be disposed on an impermeable surface, such as plastic sheeting more than 10 metres from watercourses and away from people, plant and the construction works. Once hardened it should be disposed as inert waste, preferably for beneficial re-use.
* Any washwater / slurry must be contained. Run-off must be directed to a secure waterproof sump or secure tank and the liquid fraction disposed as planned, (following treatment if required).

Concrete Wash Water Record form ([ENV-SF-0009a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/BMS%20Documents/HSES/Environment/Forms/ENV-SF-0009a%20Concrete%20Wash%20Water%20Record.docx)) should be completed by the Project Team to record the concrete wash water strategy for the site.

Site documentation should show:

* The location of the concrete washout facility.
* Copies of consents.
* Records of regulator engagement.
* How concrete wastes are going to be stored.
* How concrete wastes will be collected from these storage points.
* Where wastes will be taken to and/or how they will be treated and disposed.
* How any treatment systems to treat the liquid fraction and/or recover the solids will be operated and maintained.
* How site personnel, particularly those responsible for concrete delivery and pumping, will be made aware (via induction, toolbox talks, pre-start meetings etc.) that a wash-down area is available on-site and when and how it is to be used.

Washwater should be contained within an impermeable bund, treated to enable re-use or disposal. Alternatively the wash water should be consigned correctly for off-site disposal at a suitably licensed waste management facility, in accordance with the Duty of Care for Waste Management.

To minimise the amount of washout water generated, excess concrete should be scraped off the equipment before it is washed. These excess solids should be placed in a designated surplus cement products location until hardened. A high pressure, low volume water spray nozzle reduces water use. Where possible, washout bays / skips / containers should be covered during heavy rainfall and at night to avoid flooding.

**Treatment**

Proven methods to treat concrete washout water are:

* Treatment with mineral acid, such as sulphuric or hydrochloric are dangerous to handle and when used to reduce the pH level it is easy to overshoot the target resulting in acidic water which will need to be disposed as hazardous waste water (special waste in Scotland).
* Treatment with citric acid, like acid there is a risk of over dosing and acidifying the treated water with citric (fruit) acid. Citric acid also increases the Biochemical Oxygen Demand (BOD) of the water above the limits for safe discharge into the aquatic environment.
* Carbon dioxide is mildly acidic when dissolved in water and is the safest neutralising agent for concrete water as it is self-buffering, making it virtually impossible to acidify the water though overdosing.

A third party should be engaged to install, operate and provide instruction on using these systems.

**Monitoring**

All concrete washout areas should be monitored to ensure that they are working correctly and have adequate storage capacity. Monitoring should take place weekly during dry weather and prior to, during and after forecast rainfall events.

Set concrete and wash water should be removed as required to ensure that the facility has sufficient capacity and prevent overtopping.

**Reporting**

An environmental incident occurs if:

* Concrete is washed out in an area other than the designated concrete washout area.
* Concrete washout leads to a release of concrete washout water to land, surface water or the drainage network.
* In the event that an environmental incident occurs then this occurrence should be reported and notified as per business unit reporting requirements and as set out in [HSES-PR-0005](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8639) Incident Reporting and Investigation

**Supplementary Information**

England **(EN)**

There is provision to allow the re-use of concrete wash waters and cement fines (from storage of wash waters) at construction sites, under a low risk waste activity (LRW400), without the need for an environmental permit. Re-use covers for example subsequent washing or stockpile damping down. It would also cover storing wash waters and allowing as much water to evaporate as practicable.

Additionally, under LRW417 there is provision for the treatment by physical dewatering of cement washings at construction sites pending recovery of the water at the concrete suppliers without the need for an environmental permit.

Link to external document Environment Agency Guidance on Low Risk Waste Activities.

If operating under either of these low risk waste positions, activities must be undertaken in accordance with industry best practice. Activities must not be carried out in a manner that causes or is likely to cause pollution or harm to human health. Balfour Beatty could be prosecuted if the Environment Agency considers that pollution has or is likely to be caused, irrespective of the activity being listed as a low risk waste activity.

Regulatory Position Statement RPS107 Managing concrete wash waters on construction sites has been withdrawn by the Environment Agency and no longer applies. Concrete wash water can no longer be discharged directly to ground without an environmental permit.

Wales **(W)**

Link to external document Guidance for Pollution Prevention Works and maintenance in or near water: GPP5 provides guidance on environmental legislation in Wales. Information on concrete, cement and grout is provided in section 3.

If it is not possible to reuse wash waters then they should be collected, and where necessary discharged to the foul sewer (with permission from the sewerage undertaker and following any necessary treatment), or contained for disposal off site. Wash waters from concrete and cement works should never be discharged into the water environment as this could have serious impact on the water quality and ecology. Wash water shouldn’t be dispersed directly to ‘ground’. Washout direct to ground and risk prosecution

Scotland **(S)**

Link to external document Guidance for Pollution Prevention Works and maintenance in or near water: GPP5 provides guidance on environmental legislation in Scotland. Information on concrete, cement and grout is provided in section 3

If it is not possible to return to the batching plant to washout then washout water can be disposed into the foul water sewer. A Trade Effluent Consent from Scottish Water must be obtained before discharging and the concrete fines must have been settled out and pH reduced to <10 to prevent blocking/damaging the sewer.

If a foul sewer isn’t nearby and consent from SEPA to discharge treated washout water to ground has not been obtained, a waste water contractor should be employed to remove the concrete washout water and dispose as liquid waste.

SEPA have confirmed that that under no circumstances can concrete washout water be dispersed directly to ‘ground’. Washing out directly to ground and without consent is not an option as we risk prosecution.

* Trade Effluent is any liquid waste 'produced in the course of any trade or industry' which is discharged to the waste water system. It is the legal responsibility of a company which discharges trade effluent to public sewer to obtain a Consent from Scottish Water. Failure to apply for Consent may result in a fine, which is currently set at a maximum of £40,000.
* Project teams that will be disposing of trade effluent into the foul water system are to apply for a Trade Effluent Consent by completing Trade Effluent Notice (Form H). Smaller discharges, generally <2m3 in volume, may be controlled by issuing a Letter of Authorisation. This will be confirmed by Scottish Water once the application has been received. Temporary discharges greater than 2m3 are issued with a FULL consent which lasts 6 months before being terminated.
* Scottish Water will not issue a Consent until a Licensed Provider has been appointed.
* There is no charge to submit the Form H application. Applicants may be required to submit sample analysis results to prove the nature of the discharge at their expense. If samples have to be taken by Scottish Water to monitor discharge compliance these charges may be costed back to the applicant. Any other charges will be confirmed by the Licensed Provider.
* The Trade Effluent Consent must be in place before any waste water is disposed to the foul sewer. The statutory period for processing a Form H application is 90 days. Scottish Water aim to process each application as quickly as possible. Straightforward applications generally take 3 – 6 weeks. Complicated applications may take longer than 3 months before a decision can be made. It is recommended applications are submitted at the earliest opportunity.
* The Trade Effluent Consent lasts 6 months before being terminated. If the discharge will last for more than 6 months do not tick ‘temporary’ on the Form H; a FULL consent will be issued. When no longer required the project team must use the Trade Effluent Notice (Form H) to terminate the consent with Scottish Water.
* Concrete washout water must be treated to reduce the suspended solids to prevent blockages and reduce the pH to below 10 to prevent damage to the fabric of the waste water system. There is no formal testing regime and the project team is responsible for self-inspecting the turbidity and pH to determine it is acceptable for discharge.
* Waste water, treated if necessary, can be disposed directly into the foul sewer via the man-hole access. Ideally a discreet location will be selected. It is the project teams responsibility to manage any risks and nuisances associated with lifting the man-hole cover. It is not necessary to ‘break in’ and make a fixed connection to the sewer.

Northern Ireland **(NI)**

Link to external document Guidance for Pollution Prevention Works and maintenance in or near water: GPP5 provides guidance on environmental legislation in Northern Ireland. Information on concrete, cement and grout is provided in section 3. If it is not possible to reuse wash waters then they should be collected, and where necessary discharged to the foul sewer (with permission from the sewerage undertaker and following any necessary treatment), or contained for disposal off site. Wash waters from concrete and cement works should never be discharged into the water environment as this could have serious impact on the water quality and ecology. Wash water shouldn’t be dispersed directly to ‘ground’. Washout direct to ground and risk prosecution

Trucks, hoppers, mixers and concrete pumps that have contained concrete must be washed out in a contained area away from watercourses, surface water drains, storm water drains, grids and channels to prevent pollution. Where possible, store and reuse washout water. Concrete washout water should be contained and removed from site for treatment as liquid waste or disposed of to sewer under a trade effluent consent.

**UK Documentation**

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| **Reference** | **Type** | **Title** |
| [ENV-RM-0009b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6415) | Reference material | Concrete Washout Disposal Training (Scotland, Wales, N. Ireland, England) |
| [ENV-SF-0009a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6416) | Standard Form | Concrete Wash Water Record |
| [ENV-TB-0009a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6413) | Toolbox Talk | Concrete Washout |

**External Documentation**

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| --- | --- | --- |
| **Reference** | **Type** | **Title** |
| External Document | Sentencing Guidelines | Environmental Offences Definitive Guideline |
| External Document | EA Guidance | Environment Agency Guidance on Low Risk Waste Activities. |
| External Document | SEPA / NRW / NIEA Guidance | Guidance for Pollution Prevention Works and maintenance in or near water: GPP5 |