

Concrete Wash Water

Concrete Show 2024



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Best Practice

Concrete Wash Water

What is it?

Concrete washout water (wash water) is a mixture of solids (slurry) and water.

It is created by the washing of any equipment that comes into contact with fresh concrete.



Concrete Wash Water

What is pH?

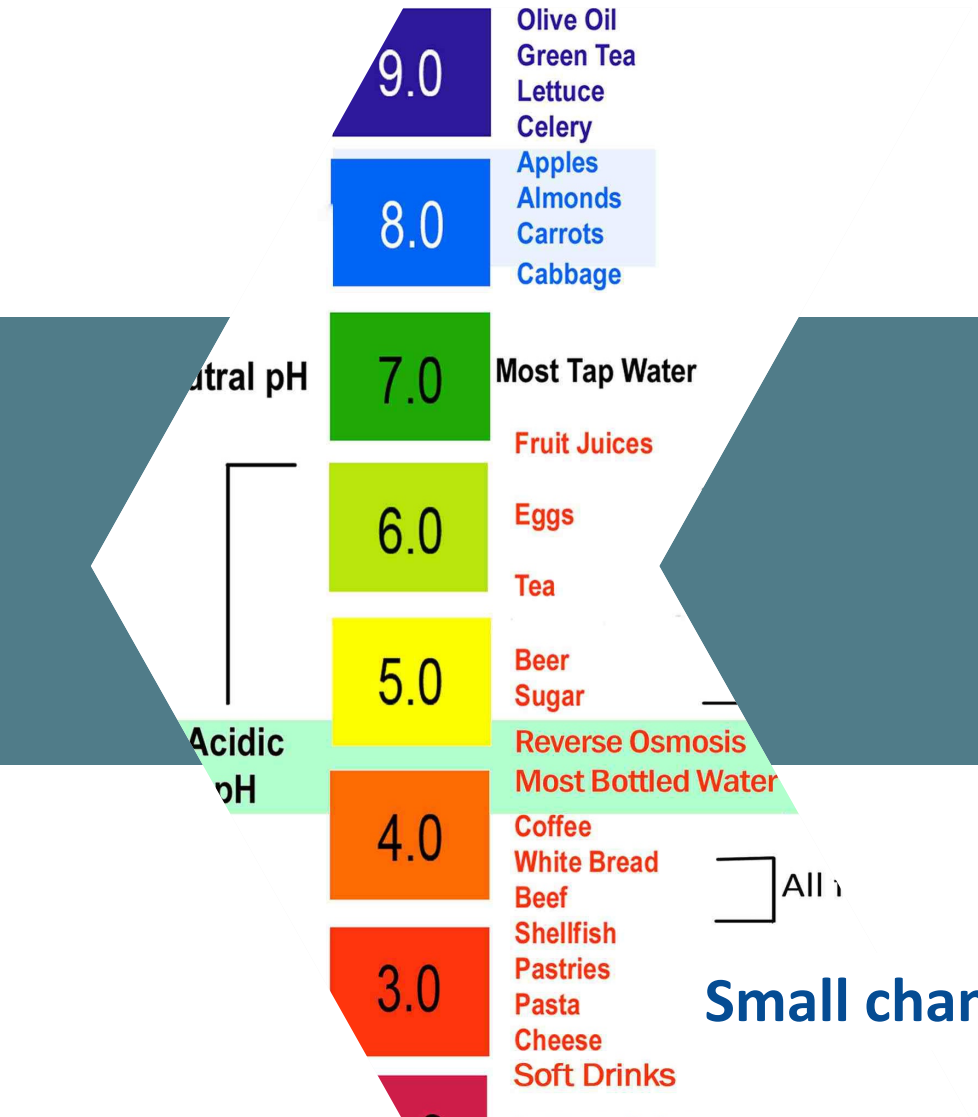
An expression of how acidic or alkaline a water is.

The pH scale goes from 0-14, with 0 being the most acidic and 14 the most alkaline.

The **pH is a logarithmic scale**, that is,

- When a solution becomes **10 times** more acidic, its pH decreases by **one pH Unit**.
- If a solution becomes **100 times** more alkaline, its pH will increase by **two pH Units**.

Small changes in pH = large changes in the chemistry of the water



Concrete Wash Water

Why is it important ?

Untreated concrete wash water is **hazardous** to the environment and may **kill** fish and other aquatic plants and animals.

It is also caustic and corrosive, having a highly alkaline pH (**greater than pH 12**), similar to the pH of concentrated caustic soda (sodium hydroxide).

The safe pH for ponds, rivers, streams, ditches and canals is **pH 6.5 to 9**. High pH water **can harm** fish gills and eyes and interfere with reproduction.

The solids can **smother** the bed of a watercourse, **killing** benthic plants and animals.



Concrete Wash Water

What are the H&S risks ?



Environment: Discharge to ground will kill vegetation. If allowed to enter a water course **even small volumes** will **cause the death** of aquatic life (**Fish Kills**).

Operators: highly alkaline substances such as concrete wash water are corrosive, and if left untreated can cause chemical burns to the skin.

Contact between liquids/mist and eyes can cause severe irritation and/or eye damage.

It's the water that causes the burns



Concrete Wash Water

Why you should be concerned ?

- The project you are working on will be managing the site in accordance with **environmental and H&S legislation as well as best practice**
- An incident may result in:
 - Site works being stopped
 - Harm to site operators
 - Pollution of the environment
 - Commencement of legal proceedings
 - Issue of financial penalties (fines)
- Affect a companies ability to win further work and employ staff



- Remember there is a legal principle that the polluter pays

That could be you if you ignore site rules and cause a pollution incident

Concrete Wash Water

What do you need to do ?

Ensure that

- You have been inducted and understand the site controls for concrete washout.
- You ask to see the CoSHH assessment for the highly alkaline water, if available.
- You fully understand how to operate the sites washdown equipment.
- You fully comply with site rules and method statements.
- If using a recycling washout system that it is powered, managed and ready for use **Don't use your onboard water** as this may overwhelm the equipment and spill onto the ground.
- The Safe Working Load (SWL) is not exceeded for any sack or lifting equipment .
- Ensure that washing down does don't causes splashes of the highly alkaline wash water. **Contact between skin and the wash water may cause skin burns.**

Promptly report to site management any spillages, leakages or damage to washdown equipment. Remember an incident or risk of environmental damage may stop the pour.

Concrete Wash Water Treatment Hierarchy

Elimination physical removal of the hazard

- On-site treatment of the concrete wash water to neutralise the highly alkaline pH
- Containment of the solids, separation from the liquid and treatment to make solid.

Substitution

- Use of concrete mixes which do not create alkaline pH wash water. Not currently practical

Engineering Controls

- Design and implementation of suitable concrete wash water storage facilities that allow for the safe storage of the alkaline pH waters and settled solids.

Administrative Controls

- Use of a suitably licenced waste carrier and waste management facility to fully treat the concrete wash water (liquids and solids)



Concrete Wash Water Off-Site Disposal

Responsibility of the Waste Producer

- To provide an accurate description of the waste and associated environmental or health and safety hazards.
- Ensure that wastes are suitably contained (stored) to allow transportation with spillage or leakage.
- Ensure that all wastes are transported by a suitably licenced waste carrier.
- Ensure that all wastes are disposed of properly at a suitably licensed waste management facility.
- Ensure that all necessary waste transfer documentation is completed and stored for future reference.

EWC Codes

- What is the correct waste code?
 - 16 10 01* Aqueous liquid wastes containing hazardous substances
 - 16 10 02 Aqueous liquid wastes other than those mentioned in 16 10 01

Different waste codes needed for treated and untreated concrete wash water



Concrete Wash Water On-Site Treatment

Treatment Aims

- Containment of wash water and solids
- Minimise the volume of waste materials produced
- Enable recycling (reuse) of wash water following treatment
- Neutralise the highly alkaline pH of the liquid phase
- Dewater (solidify) the concrete solids



Concrete Wash Water Containment

Secure water tight structure needs to be constructed.

Appropriate signage including explanation of the Health and Safety risk of highly alkaline pH wash water and slurry needed.

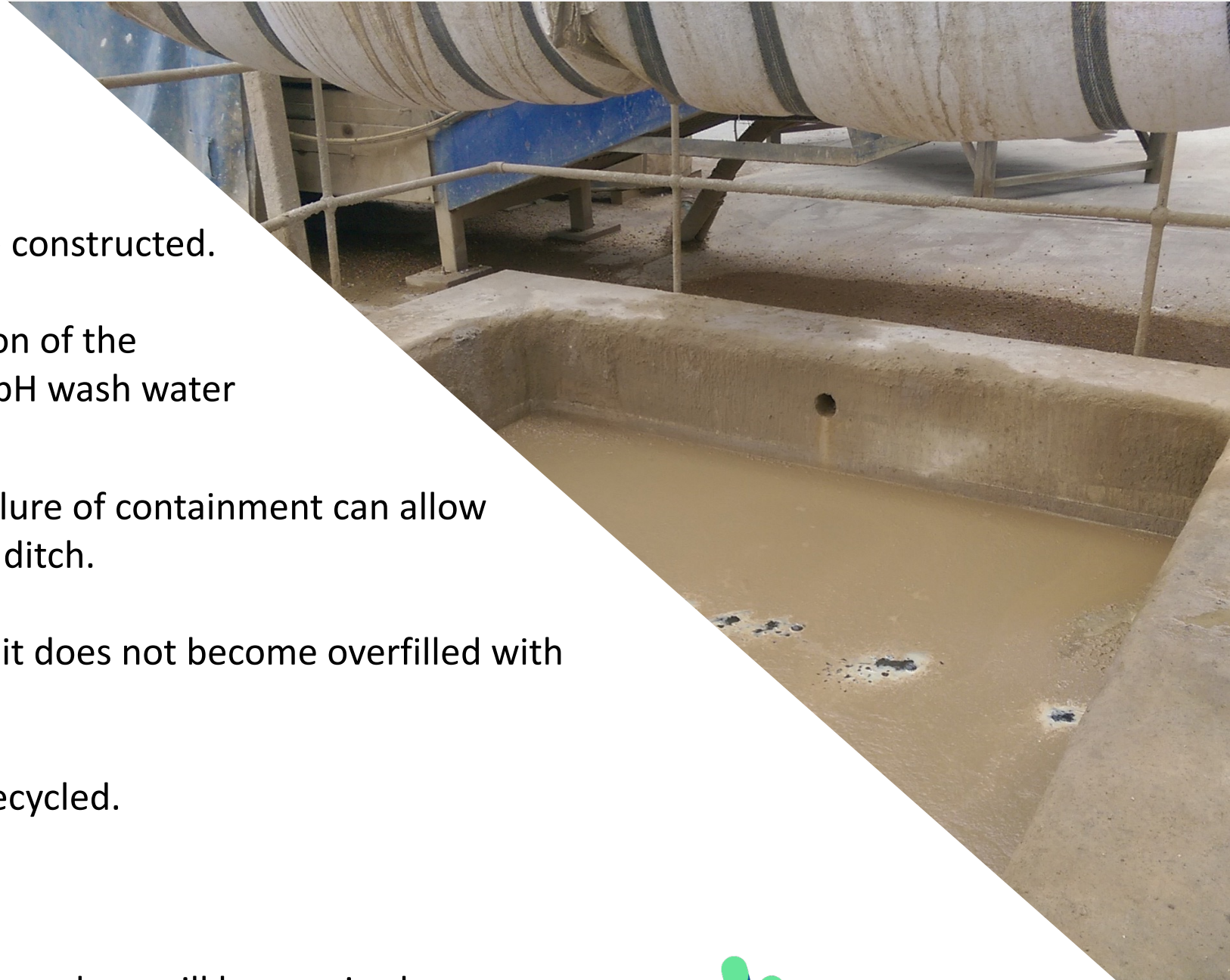
Should not be located in areas where failure of containment can allow contents to enter water course, drain or ditch.

Regular inspection to ensure that the unit does not become overfilled with washout water and/or rainwater.

Does not enable solids or liquids to be recycled.

May be difficult to empty

Off-site disposal of collected liquids as hazardous will be required.



Concrete Wash Water Solids Recovery and pH Adjustment

On-site Treatment

- Containment
- Mineral Acid
- Carbon Dioxide
- pH Blue
- BlueRinse
- Self dosing Geotextile Products



Concrete Wash Water

Mineral Acid

Typically either hydrochloric acid or sulphuric acid.

Highly dangerous, corrosive, the greater the strength the greater the hazard. **COSHH regulations** place on employers the responsibility to **use the least hazardous chemical** that gives satisfactory performance.

Can cause skin burns and eye damage on contact; ingestion can burn the mouth, throat and stomach.

Dosing of mineral acid should be undertaken only using an automatic device (**precise control of dosing needed**) to prevent overdosing and the **creation of a low pH** (highly acidic) water.

Small spillages can be **neutralised** by containing the spill and using either a spill kit or sodium bicarbonate to neutralise the acid. **Larger spillages** should be dealt with by **calling the Fire and Rescue Service**.

Formal training in the use of the acid and required PPE needed to reduce risk to operatives.



Concrete Wash Water

Carbon Dioxide

Carbon dioxide is a **safer alternative** than **mineral acids** and an effective chemical for lowering the pH of alkaline waters.

When used to adjust the pH of concrete wash water additional concentrations of solids may be precipitated.

Overdosing will **not lower the pH of the water to a low pH** (<pH 5.6).

Reduced Health and Safety concerns for operators (relative to use of mineral acid)

Reduced pollution risk to the environment as storage of strong acid is avoided.

Slow to react, may need time to reach final pH



Concrete Wash Water pH Blue

pH adjustment chemical

Available as solid blocks or liquid.

Safer than acid and more convenient than carbon dioxide

Treatment for alkaline/grout waste. Lowers the pH to circa pH 8.4

Non-Hazardous

Simple to use

Can be used within dosing treatment system eg Blue Rinse or can be mixed into storage tanks to batch treat pH waste or to treat discharge water from the Blue Rinse Nappy sack frames



Concrete Wash Water BlueRinse

Self buffering, overdosing will not create low pH (acidic water).

Non hazardous chemical. Safe and easy to use. Enhanced operator safety.

Captures wash water at source preventing discharge to the environment.

Closed loop operation, wash water is recycled around the washing circuit. reduced consumption of water, **no need for discharge** of treated water **to the environment**.



Concrete Wash Water Self Dosing Geotextile

Non-Hazardous chemical, low operator health and safety risk.

Easy to deploy, no power needed to operate.

Driver uses their wagons on-board water supply for chute washdown.

No need to provide secure storage for treatment chemicals.

Easy to operate.

Ideal for low volume/infrequent wash out activities. Typically, 50 washout per sack.

The contents of sack will be safe to dispose of or reuse on site; the used sack will be non-hazardous and can enter your usual site waste stream.



Concrete Wash Water Summary

Thank you
for
listening



Contain



Treat



Protect

Only washout into the sites designated washout facility.

Never allow untreated wash out to be discharged to ground, surface water course or site drains.

Report any spillages to ground, water or drains which occur to site management.