

Washing 101 Guide: Where the Water Goes

A Deep Dive into Water Management & Recycling

Washing 101: Full-Length Guide

Where the Water Goes: Demystifying Water Use & Recovery in Aggregate Washing

Water is a big deal in aggregate washing. Not only do you need a reliable source of clean water, but you need to know where it goes, how to get it back, and how to design a system that saves money, protects the environment, and keeps the operation running efficiently.

When water first enters a wash plant, it does several jobs: rinsing coarse material on a screen deck, helping separate sand in a screw or cyclone, transporting silt and sludge to a thickener or settling pond, and ultimately leaving the plant with either clean material or waste.

The goal is to recover as much of that water as possible and reuse it.

Let's break it down.

Wash water gets sprayed onto the raw feed at the beginning of the circuit to knock off loose fines. It runs through screens and washing systems, where it carries away silt, clay, and very fine sand particles (collectively called "fines" or "slimes").

That dirty water is often called slurry. It's usually sent to a sump, where it's pumped either into a cyclone, a thickener, or a settling pond. A cyclone uses centrifugal force to separate fine sand from silts and slimes. That sand can be recovered and reused or sold.

The rest of the dirty water (ultra-fines and sludge) goes to a thickener, filter press, or pond. The goal is to separate solids from water - ideally producing a dry cake or manageable sludge you can haul

away - and return as much clear water as possible back to the start of the wash process.

****Settling ponds:****

These are the old-school, gravity-based option. Water slows down and solids settle out over time. Pros: cheap to build, low tech. Cons: require a lot of space, can be slow and messy, and eventually need to be cleaned out - which is costly and time-consuming.

****Cyclones:****

Great for separating coarse silt and fine sand. They're fast, compact, and don't use chemicals or moving parts. But they can't handle slimes or remove suspended ultra-fines.

****Thickeners:****

These tanks use flocculants (chemicals that clump fine particles together) to help solids settle out. The clear water overflows the top and is sent back to the start. The settled sludge is pumped out the bottom.

****Filter Presses:****

These machines press sludge into dry "cakes," making it easy to haul away. They recover the most water and create the least mess - but they're expensive and operate in batches, so you have to size them correctly and maintain them well.

The most advanced systems combine all of these: cyclones to recover sand, thickeners to clarify slurry, and filter presses to squeeze the last bit of water from the waste.

Ultimately, every wash plant is different. What works for one site might not work for another. But every site can benefit from understanding the water flow and making smart decisions about reuse and recycling.

Need help designing a system that works for your operation? Foreman Equipment can help.

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