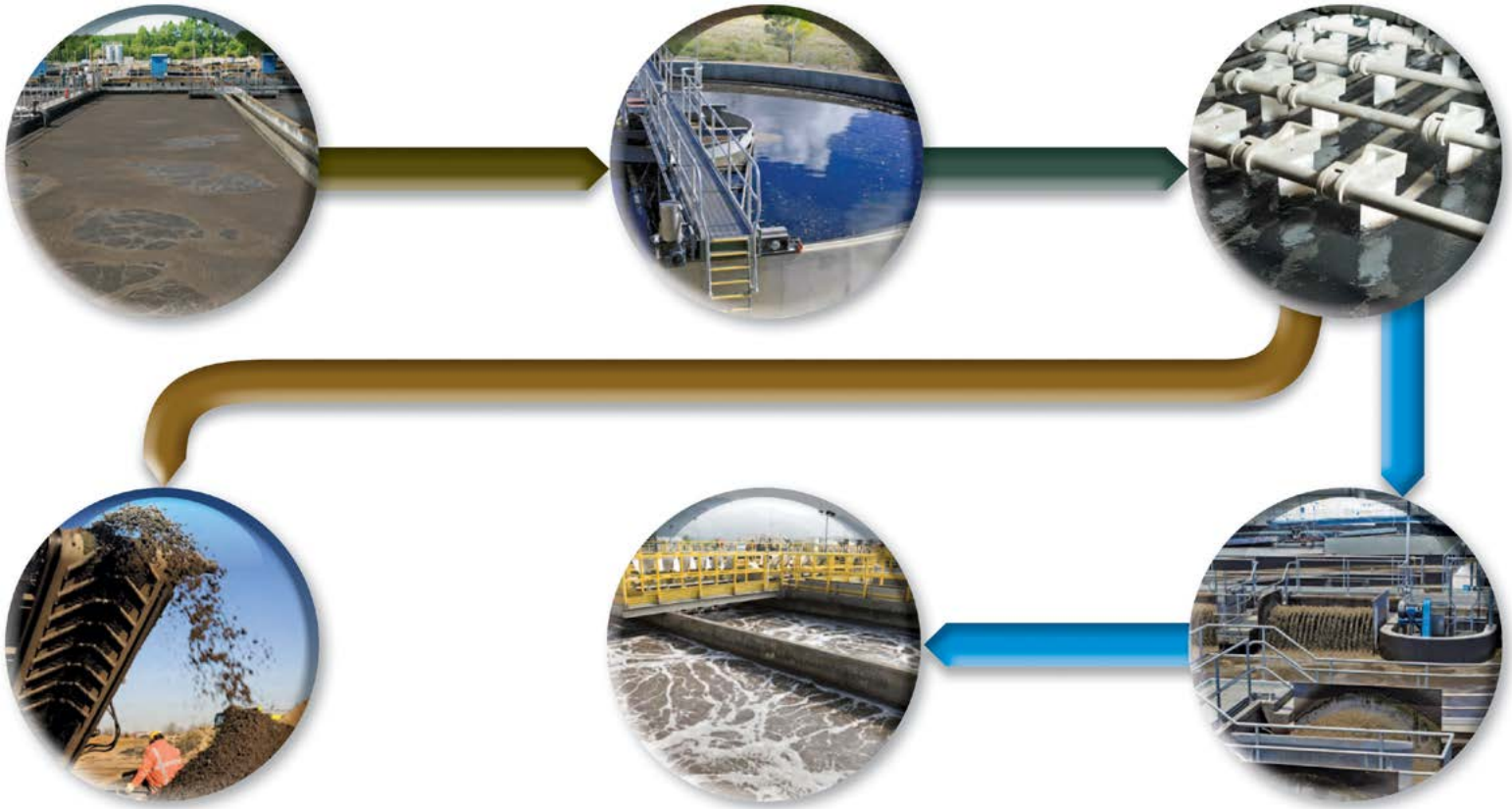
Wastewater Treatment



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Headworks

Description

Wastewater treatment removes physical, chemical and biological contaminants. It produces two waste streams: environmentally safe fluid waste (effluent) and solid waste (sludge) that is disposed of or, in some cases, reused.

In the first stage, wastewater flows through pre-settling basins or primary clarifiers, which screen out solids and collect the sand and grit.

Bearing Applications

Ball bearings are used in the bar screens that catch bottles, sticks and other large objects. In the grit collector, screw conveyors that move the waste typically have sleeve bearings, while the flight chain conveyors that scrape the sludge have sleeve bearings or housed bearing units..

Items to Consider

Bearings in the flight chain conveyors are submerged, so must be moisture- resistant.

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Clarification

Description

Clarification is the removal of particles and color from the water. In a clarifier tank, solids settle to the bottom and are scraped to the middle, where the thickened water can drain away. The remaining wastewater exits through the middle and moves on to a dewatering station.

Bearing Applications

Slewing ring bearings rotate the blades that scrape the waste.

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Dewatering

Description

The wastewater is separated into two streams — water and sludge — usually by a belt press or centrifuge. The sludge is removed to be thickened to the proper consistency for disposal (e.g. cake-like for easy stacking).

Bearing Applications

Belt presses use roller bearings, while centrifuges use ball bearings. The rake screens that separate the sludge use housed bearing units (e.g. split-to-the-shaft).

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Rotating Biological Contactor (RBC)

Description

A rotating biological contactor has packs of parallel discs, closely spaced and mounted on a rotating shaft supported just above the water's surface. The microorganisms that grow on these discs — about 40% of a disc's surface is immersed in the water — biologically degrade pollutants.

The shaft is aligned with the wastewater flow, so the discs rotate at right angles to the flow. The packs of discs, called media, are typically polyethylene, PVC or expanded polystyrene.

Bearing Applications

RBC shafts are supported with housed bearing units (e.g. split-to-the-shaft).

Items to Consider

RBC discs are subject to build-up, which increases the load on the bearings.

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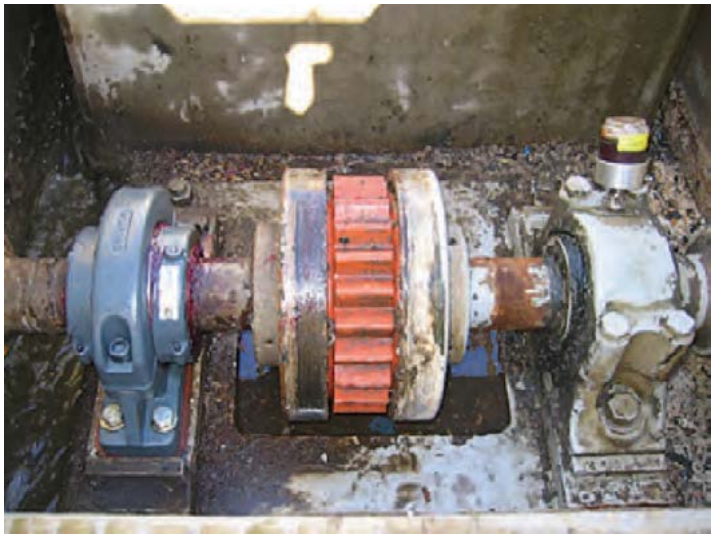

Aeration

Description

Aeration is a treatment step with two benefits. First, pumping in air agitates the wastewater and exposes it to air, which releases foul-smelling gases and replenishes the oxygen used up when organic matter decays. Second, bubbling oxygen through the water keeps any organic material suspended and forces grit (e.g., sand, coffee grounds) to settle out so it can be pumped out and taken to a landfill.

The two primary aerating techniques are rotary and cascade. The latter has no bearings, instead using gravity to make the water flow over a series of baffles.

Bearing Applications

Rotary aerators with blades have shafts supported by housed bearing units (e.g., split-to-the-shaft). Mixers use roller bearings. The pumps moving the water in and out use ball bearings.

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Sludge Removal

Description

Sludge that has been properly thickened after the dewatering process is removed via conveyor. It usually passes through a sluice gate and then into a dump truck (to go to a landfill) or a storage container.

Bearing Applications

Screw conveyors use hard iron sleeve bearings and side-mounted housed units (e.g., split-to-the-shaft bearings), while belt conveyors have roller bearings or ball bearings.

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Wastewater Treatment Applications

	Ball Bearings	Roller Bearings	Sleeve Bearings	Housed Units	Slewing Ring Bearings
Headworks	X		X	X	
Clarification					X
Dewatering	X	X		X	
Rotating Biological Contactor (RBC)				X	
Aeration	X	X		X	
Sludge Removal		X	X	X	

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