

# treatment process

## Wastewater Treatment Process

Treating wastewater to the tertiary level takes approximately 24 hours. Computers monitor and control the treatment process, flow levels and water quality, and log data. The water recycling facility staff analyze the data and make adjustments daily to assure that the equipment is working properly.

### STEP 1: Primary Treatment



1.

Untreated sewage is 99% water and 1% waste. The first step in the treatment process is to grind large debris such as branches, rags, and plastics into smaller pieces so that they can be pumped to the recycling plant for removal.

2.

When the wastewater flows into the primary clarifier, heavy solids settle to the bottom of the tank and lighter oils, greases, and floatable debris rise to the surface. Revolving arms scrape the bottom and skim the top to remove solids.

### STEP 2: Secondary Treatment



3.

The water then enters the **Bardenpho Process**, a series of zones filled with natural micro-organisms that feed on the pollutants while reducing the nitrogen and phosphorous in the water. **(See Below)**

4.

In the secondary clarifiers, the micro-organisms clump together and settle to the bottom of the tank where they are collected and a portion are returned back to the Bardenpho process.

### STEP 3: Tertiary Treatment



5.

Tertiary treatment removes the smallest particles still in the water. The first step is the flocculation and sedimentation clarifier, where a coagulant gathers suspended particles and precipitates out remaining phosphorous. The particles sink to the bottom of the tank and are removed.

6.

Next, the water seeps through a specialized sand filtration process where micro-organisms remove any remaining nitrogen and reduce turbidity.

7.

The final step is to disinfect the water in the chlorine contact basin. The water is chlorinated for a minimum of 90 minutes to insure thorough disinfection. At the end of this process, the water meets Title 22 standards and is safe for full body contact recreation.

## Bardenpho Process

### 1. Anaerobic Zone

Water from the primary clarifier is mixed with activated sludge, a soup containing micro-organisms, to facilitate the removal of phosphorous in later stages.

### 2. 1st Anoxic Zone

Recycled nitrates from stage 3 are added to the inflow from stage 1. Micro-organisms reduce the nitrates to gaseous nitrogen.

### 3. Oxidic Zone

Aeration provides oxygen for the micro-organisms, which consume excess phosphorous. A portion of the micro-organisms are re-used in the previous stage.

### 4. 2nd Anoxic Zone

Nitrate not consumed in the first anoxic stage is reduced by micro-organisms to nitrogen gas, to provide oxygen for the micro-organisms.

### 5. Reaeration Zone

A second aeration stage ensures that the micro-organisms will remain aerobic and remove phosphorous.