River In A Concrete Box

THE WASTEWATER TREATMENT PROCESS

Nature has been purifying and recycling water since the beginning of time. All water on earth is recycled through the hydrologic cycle, which is the movement of water through the earth's surface and atmosphere (condensation, infiltration, runoff, evaporation and precipitation). One part of the hydrologic cycle is the purification of water. Lakes, streams and rivers serve as the earth's natural purification system. Of all the water on the planet, less than 3% is fresh water, 2% of it is trapped in ice glaciers in unusable condition, and only 1% is available for people to use. Therefore, always conserve water and be water-wise.

As our population grew and urban areas built up, nature no longer was able to purify our wastewater by itself. Wastewater treatment plants use technology to mimic natural processes in a concrete box. Instead of the months or years that nature takes to purify waste, the wastewater treatment plant does the cleaning in about half a day.

For more information, contact Los Angeles County Sanitation Districts at (562) 908-4288 Ext. 2301 or visit us at www.lacsd.org.

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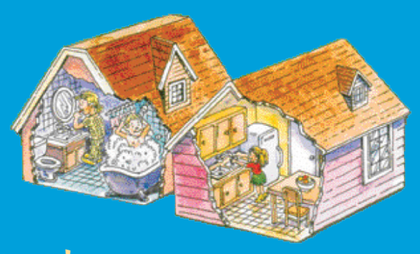
The Source

In nature - Where does it go, after bears and animals go in the woods? Where did all that dinosaur poop go? Rain runoff forces everything to flow into a nearby stream or river. Everything, even bear poop, can end up in the river.

At the treatment plant – Wastewater, the used water from homes, businesses and industries, travels through miles of underground sewer pipes to a wastewater treatment plant. There, wastewater is pumped from the relatively deep sewers up near ground surface to begin the treatment process.



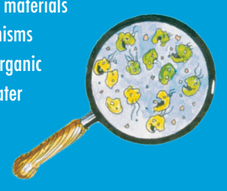
1 Primary Treatment

In nature – Heavier, solid particles settle to the bottom of the river while lighter materials float to the top and are carried away by the current.

At the treatment plant – Long concrete tanks act the same as the river. The solid materials settle to the bottom and are removed along with the floating materials for additional treatment. The wastes remaining after this step are dissolved and suspended materials (mostly organic).

2 Secondary Treatment

In nature – The remaining dissolved and suspended materials flow downstream where naturally occurring microorganisms (tiny organisms like bacteria and protozoa) in the river use this organic material as food! This food and oxygen that is dissolved in the water enable the microorganisms to multiply.



At the treatment plant – Wastewater from primary treatment, containing mostly dissolved organic materials, flows into tanks filled with microorganisms, the same kind as in the river, but a lot more dense. Air is bubbled into the tanks to provide oxygen for the organisms to breathe. The bacteria and protozoa then eat the remaining dissolved and suspended materials and multiply. Some of the bacteria and protozoa are recycled in the treatment plant to treat more wastewater.

3 Tertiary Treatment

In nature – Water filters through the ground beneath the river and joins the underground water supply. Some of this filtered water flows to nearby lakes or the ocean.

At the treatment plant – Filters, some using sand, some using other materials with small openings, remove any remaining solid material.

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4 The Final Product

In nature –The ultraviolet rays of the sun kill the harmful bacteria, viruses and protozoa. The river water is cleaned through natural processes and can support healthy fish and animals.

At the treatment plant – Treated water is mixed with a disinfectant to kill any harmful bacteria, viruses and protozoa remaining in the water. The disinfectant is removed before the water leaves the plant so that the cleaned water released to the environment will not harm animals or vegetation. The cleaned water is now ready for many uses as described below.

Uses of Recycled Water

When does recycled water stop becoming recycled water?

All water is recycled, either by nature or at a treatment plant.
Recycled water from a treatment plant can replace the use of drinking water in many ways, including groundwater replenishment, landscape irrigation, growing crops, industrial processes and artificial snowmaking. Recycled water distribution systems can be identified by their purple pipes and pumps. The Sanitation Districts have been recycling water since 1962 and, along with our water agency partners, have beneficially reused over 1 trillion gallons of water. This recycling reduces our need to import drinking water hundreds of miles from the Colorado River and Northern California, which provides environmental benefits, economic benefits and helps protect us from drought.

Nature's Way

So where does all the bear and dinosaur poop go?

Nature recycles it. By mimicking the natural processes in a river, we are able to clean water in a concrete box that we call a wastewater treatment plant.

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