



# EnviroKids!

Educational Tools for Tomorrow's Environmental Heroes

Issue Created by

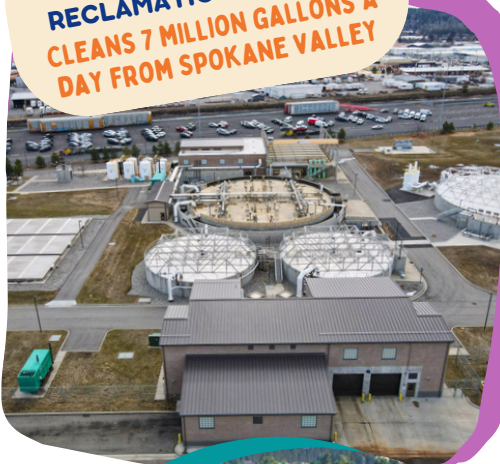
Spokane County  
Water Resource  
Center



## REDUCE, REUSE, RECLAIM

### How do we clean dirty water?

**SPOKANE COUNTY  
REGIONAL WATER  
RECLAMATION FACILITY  
CLEANS 7 MILLION GALLONS A  
DAY FROM SPOKANE VALLEY**



We love having clean water to drink, cook, wash, and play in. Clean water is not only essential for us but is crucial for all life on Earth. When we use water, we contaminate it and make it dirty. We call this dirty water **WASTEWATER**. But can we make dirty water clean again? You bet! We can **RECLAIM** the wastewater and make it safe to go back in the environment.

In the 1950s, wastewater in Spokane would go directly into the Spokane River or be processed minimally in septic tanks and eventually drain into the Spokane Valley - Rathdrum Prairie Aquifer. The Spokane River and the aquifer were becoming polluted, especially as the population of Spokane County increased. The aquifer is the source of drinking water for over 600k people, including everyone in Spokane. What could be done to stop and correct the pollution?

**All of these things  
can make water dirty!**

**TRASH**

**CLEANING  
PRODUCTS**

**FOOD SCRAPS**

**DIRT/SAND**

**TOYS**

**POOP & PEE**

**HAIR & SKIN**

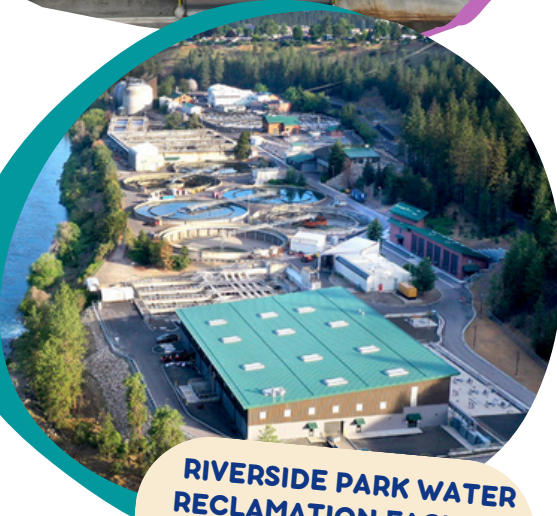
**GREASE**

**CELLS**

**SOAP**

**PAPER**

**RIVERSIDE PARK WATER  
RECLAMATION FACILITY  
CLEANS 28 MILLION GALLONS  
A DAY FROM SPOKANE CITY**



Wastewater treatment facilities are the answer! It only takes eight hours for wastewater to be treated in the Spokane County wastewater facility and get discharged into the Spokane River. That means all the water you use in the morning is cleaned and into the river by the time you sit down for dinner! But how does the water get cleaned? Flip over to learn all about how we do it!

At the water reclamation facilities, wastewater is taken (all the dirty water you send to us - yup - including poop!) and three useful products are created:

**Fertilizer  
(Biosolids)**



**Energy  
(Methane)**



**Clean  
Water**

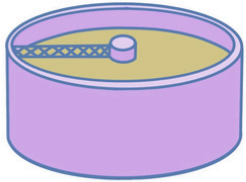
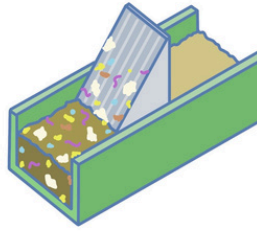


# HOW DOES IT WORK?

Every wastewater treatment facility is different, this is how the Spokane County facility cleans water!

## 1 SCREENING

Screens at the plant entrance catch large garbage like wipes. Sand, pebbles and other heavy particles settle out in the grit chamber. The trash and grit are sent to the Waste to Energy plant. These large solids need to be removed to prevent clogs and damages to equipment later in the process.

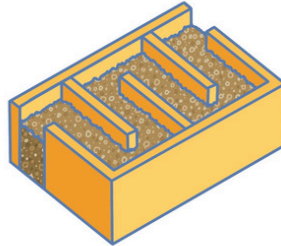


In the primary clarifiers the water is slowed down which allows particles to settle out. Chemicals are added to help the solids clump together and separate from the water. Some solids like greases, oils, and fats float and the other solids sink. Large arms sweep the top and bottom of the tank and all the gunk is removed while the water moves on to the next step.

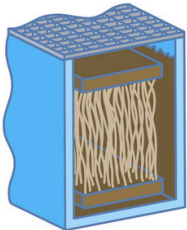
## 2 PRIMARY CLARIFIERS

## 3 AERATION BASIN

Bubblers in the aeration basin provide air for the microbes which eat the contaminants in the water. Even though it looks like bubbly, chocolate milk, the microbes are working hard to clean the water. As these microbes reach the end of their lifecycle, they are removed and sent to the solids treatment.



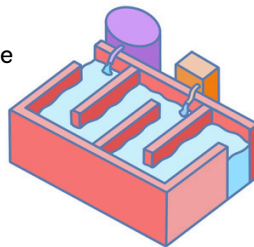
## 4 MEMBRANES



The water is now pulled through ultrafiltration membranes. These membranes are like long straws punctured by millions of tiny holes. These holes allow water to pass through and leave everything else – nutrients, chemicals bacteria, etc. – are left behind. 99% of all pollutants are removed because of the membrane technology. WOW!

## 5 CHLORINE CONTACT

Chlorine is added to the water to remove any viruses that made it through the membranes and prevent bacteria from regrowing in the water. Next, sodium bisulfite is added to remove the chlorine to make the water safe to go back into the ecosystem.



When the wastewater first entered the treatment plant, it was not safe to put back into the environment. Would you want to swim in a river with raw sewage in it? After being treated in the processes outlined above, this Class A reclaimed water meets state and federal standards to be safely released into the Spokane River!

## 6 DISCHARGE

## What can I flush?



Poop



Pee



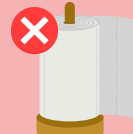
Toilet Paper



Medicine



Kleenex



Paper Towel



Baby Wipes



Toys

## WHAT ABOUT THE SOLIDS?

Solids are removed in the primary clarifiers and aeration basin. The first step for the solids treatment is to remove some of the water from the sludge. Then the sludge goes into large tanks called anaerobic digesters. These tanks are filled with microbes that process the solids for about 15 days.

One of the byproducts of these microbes is methane gas that can be burned for energy. After the digesters, more water is removed from the solids and the biosolids are sent to a composting facility. After composting, the final product is used as a fertilizer for agriculture and landscaping.

## Think About It

You've now read how water can be transformed from something polluted and dangerous into something that won't hurt people or the environment. If we have all this technology to transform our wastewater, why should we worry about what we put down the drain, like chemicals, toys, grease, car oil, etc.? Is it easier to remove these things or prevent them in the first place?



Envirokids is a collaborative effort among multiple environmentally focused agencies in the Spokane region working to provide locally relevant educational resources to teachers and families.