

Let's explore...

Wastewater Treatment

... at the Robert O. Pickard Environmental Centre (ROPEC)

Ottawa's wastewater treatment plant:

- Cleans an average of 390 million litres of wastewater every day – enough to fill more than 6,000 backyard swimming pools
- Protects the environment. When the water is returned to the Ottawa River, its levels of bacteria, phosphorus and organics are far below all limits set by the plant's operating permit. The E. coli count, for example, reaches only 14 per cent of the allowed amount.
- Produces 39 dry tonnes of biosolids each day, which are used as agricultural fertilizer

The Robert O. Pickard Environmental Centre is located in the city's east end, right next to the Ottawa River. Using an extensive sewer system, all of the wastewater is collected from homes and businesses between Stittsville, Orleans and Manotick.

Whenever we use water, we contaminate it – whether we flush the toilet, take a shower, wash dishes or do the laundry. All of this waste can be easily treated at ROPEC. Other materials are more difficult to break down or remove, such as deodorants and some hair care products.

Substances like oil or paint are not meant to be treated by a municipal sewage plant. For information on how to properly dispose of hazardous waste, check out the Waste Explorer at ottawa.ca/recycle.

The Wastewater Treatment Process

1 Coarse Screening/Pumping

Wastewater flows to the plant through enormous pipes buried deep in the ground. Upon arrival, any object bigger than a shoe gets screened out. The sewage is then pumped to ground level. It flows through the rest of the treatment processes by gravity.

2 Fine Screening/Degrit

Screens catch smaller objects like sticks and rags. Degrit tanks separate pebbles, grit and sand from the other solids that can be further treated. Screenings and grit are trucked to a landfill and buried.

3 Primary Clarification

The plant has 15 covered settling tanks. Water is slowed down to allow heavy solids to sink to the bottom, while grease and fat float to the surface. The settled solids (sludge) and floatables (scum) are removed by skimmers and sent to digesters (step 9). The remaining water still contains very fine solids and dissolved material like sugar.

4 Aeration

In these long and deep uncovered tanks, naturally-occurring bacteria break down the small particles. Air is blown into the tanks, making bubbles. This creates ideal conditions for the bacteria and keeps the solids from settling.

5 Phosphorus Removal

A solution of iron is added to the wastewater. Iron captures the phosphorous, creating a solid that can sink and be separated from the water.

6 Secondary Clarification

16 round open tanks slow the wastewater down, allowing the remaining solids and bacteria to settle as sludge. Most of the sludge is continuously pumped back to the aeration tanks, so that the bacteria can biodegrade more waste. Excess sludge is further processed (step 9).

7 Disinfection

Leaving the secondary clarifier, the water is disinfected by adding chlorine, the equivalent of strong household bleach. This kills the majority of microorganisms that have survived the treatment process.

8 Dechlorination

A final chemical is added to remove excess chlorine. Now the treated water can be returned to the river.

9 Biosolids Processing

Excess sludge and scum is treated in six sealed tanks (anaerobic digesters), using other naturally-occurring bacteria. These bacteria convert about half of the sludge into methane gas and carbon dioxide. The rest goes through centrifuges, where water is removed. What is left is a nutrient-rich, soil-like material called biosolids. Farmers use it as a fertilizer.

10 Cogeneration

The methane gas that has been produced in the anaerobic digesters is burned in engines and boilers, producing heat and electricity that is used to run the plant.

