



THE POOP CYCLE

- When you flush, a valve is raised and the water from your toilet tank is emptied into the bowl; water, with help from pressure and gravity, pushes any waste in the bowl down into the toilet trap. Once you're no longer able to see the flushed wastewater, it then moves to the toilet trap.
- The trap is a curving channel inside the base of the toilet that leads from the hole directly to the drainpipe, carrying wastewater towards the main drain. With the wastewater now moving through your home's pipes, it travels through a series of stack pipes and branch lines, continuing to rely on gravity and pressure to move forward. These stacks and branches are a collection of pipes that connect your house with the sewer main where your unit's wastewater is traveling. The main drain is the singular highway to and from your home. The wastewater from your toilet joins other wastewater from your house, maybe even from other households, and moves through underground sewer pipes.
- Everyone's wastewater must be both treated and converted to clean water before being released into the soil or reused in different ways. If you have a septic tank, your wastewater flows into the tank where biological filters take over before it's leached into the soil.
- One of the major characteristics with wastewater is the smell. In many cases, at municipal centers, bio-towers scrub all of the foul air that comes in off of the sewers. Deodorizing misting systems are another way to help control the smell of the sewage. The sewage itself is sent to a wastewater treatment facility.
- At this point, the wastewater is passed through a number of screens for filtration. Larger solids are separated from the sewage. Solids have the potential to clog pipes sewer lines and the facility's equipment. With large solids out, the wastewater is moved into massive circular settlement tanks, where the leftover, smaller, solids can settle at the base over a period of time. This material, which is made up of human waste, is referred to as sludge. Scrapers are installed at the base and push the sludge into the center, where it can be removed for later treatment. With no sludge, it can be moved to a secondary treatment tank.
- Now placed in rectangular tanks, the water is stirred so the gasses can release into the air. Air is also pumped into the tank to create a proper environment for bacteria to decompose small organic material that might have made it through the primary treatment. Any leftover materials that have settled at the bottom at this point are removed. There's little, if any, sludge, chemicals and dangerous substances left at this point.
- Another filtration is done to partially treated sewage and it is filtered through sand beds to remove any smells as well as iron, bacteria and other solid materials that might still be lingering.
- All of the previously collected sludge, from the last several phases, will now undergo heating in order to break them down into methane gas and biosolids that are rich in nutrients. The last part is to add chlorine to the water to kill any bacteria and make it reusable. It's typically required that effluents – the water that will be discharged into a body of water – be used in irrigation or on agricultural land. Your toilet water has now made it through the entire treatment process and is slowly released back into a local water source.



Sources:

1. EPA's overview of post-flush activities:
https://www3.epa.gov/npdes/pubs/what_happens_after_the_flush.pdf
2. Similarly, the EPA's overview of the wastewater cycle:
https://www3.epa.gov/npdes/pubs/centralized_brochure.pdf
3. Third party plumbing service overview of wastewater cycle:
<https://www.therooterworks.com/blog/2020/may/what-happens-to-what-you-flush/>
4. Overview of wastewater cycle: <https://www.livescience.com/where-does-poop-go.html>
5. Third party plumbing service on waste cycle:
<https://www.ezflowplumbingaz.com/blog/2020/june/what-happens-to-what-you-flush-down-the-toilet/>
6. Wastewater cycle study: <https://thepoopproject.org/flush-deeper-2>

