

How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

Conventional Water Treatment Processes: Traditional Methods Stand the Test of Time

For many years, the combined processes of mixing, flocculation, sedimentation, filtration, and chlorine disinfection shown here have formed traditional water treatment plant design. This approach, known as conventional treatment, effectively removes practically any range of raw water turbidity, along with harmful bacteria, including *E. coli*, viruses, and protozoans, such as *Giardia lamblia* and amoebas. Next month, *How Water Works* will begin looking at these conventional treatment processes in detail.

1. Raw water basins slow the water's velocity after it passes through the intake structure, allowing heavy sediment and grit to settle to the bottom of the basins before the water enters the treatment plant.
2. Chemical coagulants are added to react with the remaining small particles in the water to form particles large enough to settle out. Rapid mixing distributes the coagulant evenly throughout the water.
3. Flocculation basins gently mix the water with large submerged paddles so smaller particles collide to form large particles called "floc."
4. Floc settles by gravity to the bottom of a sedimentation basin. Clean water spills over to the filters.
5. Filtration removes any remaining particles. The force of gravity moves the water through filter media—primarily sand, anthracite coal, granular activated carbon, garnet sand, or some combination of these materials.
6. Chlorine is added for disinfection. A chlorinator meters chlorine gas from a chlorine cylinder or other container and then delivers the set dosage.
7. Finished water basins ensure contact time is allotted for adequate disinfection.
8. A clearwell stores water before the water enters the distribution system.
9. Pumps send clean, safe water throughout the community.

Some illustration elements exaggerated for emphasis.



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