Water and Liquid Waste Treatment Plant and System Operators

Significant Points

- Employment is concentrated in local government and water, sewage, and other systems utilities.
- Because of expected much faster than average employment growth and a large number of upcoming retirements, job opportunities will be excellent.
- Completion of an associate degree or a 1-year certificate program in environmental studies or a related field may help applicants to find jobs and advance more quickly.

Nature of the Work

Water is one of our society’s most important resources. While most people take it for granted, it takes a lot of work to get water from natural sources—reservoirs, streams, and groundwater—into our taps. Similarly, it is a complicated process to convert the wastewater in our drains and sewers into a form that is safe to release into the environment. Water treatment plant and system operators run the equipment, control the processes, and monitor the plants that treat water so that it is safe to drink. Liquid waste treatment plant and system operators do similar work to remove pollutants from domestic and industrial waste.

Fresh water is pumped from wells, rivers, streams, and reservoirs to water treatment plants, where it is treated and distributed to customers. Used water, also known as wastewater, travels through sewage pipes to treatment plants where it is treated and either returned to streams, rivers, and oceans, or reused for irrigation. Operators in both types of plants control equipment and monitor processes that remove or destroy harmful materials, chemicals, and microorganisms from the water. They also run tests to make sure that the processes are working correctly and keep records of water quality and other indicators.

Water and wastewater treatment plant operators operate and maintain the pumps and motors that move water and wastewater through filtration systems. They monitor the indicators at their plants and make adjustments as necessary. They read meters and gauges to make sure that plant equipment is working properly. They take samples and run tests to determine the quality of the water being produced. At times, they may adjust the amount of chemicals, such as chlorine and fluorine, being added to the water.

The specific duties of plant operators depend on the type and size of the plant. In a small plant, one operator may be responsible for maintaining all of the systems. This operator would most likely work during the day and be on call during nights and weekends. In medium-size plants, operators may work in shifts to monitor the plant at all hours of the day. In large plants, multiple operators work the same shifts and are more specialized in their duties, often relying on computerized systems to help monitor plant processes.

Occasionally, operators must work during emergencies. Weather conditions may cause large amounts of storm water and wastewater to flow into sewers, exceeding a plant’s capacity. Emergencies also may be caused by malfunctions within a plant, such as chemical leaks or oxygen deficiencies. Operators are trained in emergency management procedures and use safety equipment to protect their health, as well as that of the public.

Both tap water and wastewater are highly regulated by the U.S. Environmental Protection Agency. Plant operators must be familiar with these regulations and ensure that their high standards are met. Operators are also responsible for keeping records that document compliance and for being aware of new regulations that are enacted.

Work environment. Water and wastewater treatment plant and system operators work both indoors and outdoors and may be exposed to noise from machinery and to unpleasant odors. Operators’ work is physically demanding and often is performed in locations that are difficult to access or unclean. They must pay close attention to safety procedures because of the presence of hazardous conditions, such as slippery walkways, dangerous gases, and malfunctioning equipment. As a result, operators have a higher-than-average occupational injury rate.

Plants operate 24 hours a day, 7 days a week. In small plants, operators may work during the day and be on call in the evening, at night, and on weekends. Medium-size and large plants that require constant monitoring may employ workers in three 8-hour shifts. Because larger plants require constant monitoring, weekend and holiday work is generally required. Operators may be required to work overtime.

Training, Other Qualifications, and Advancement

Employers usually hire high school graduates who are trained on the job. Completion of a training program may enhance an applicant’s competitiveness in the job market.

Education and training. A high school diploma is usually required for an individual to become a water or wastewater treatment plant operator. Some applicants complete certificate or associate degree programs in water-quality and wastewater-treatment technology. Employers prefer to hire such candidates, because completion of a program minimizes the training needed at the plant and also shows a commitment to working in the industry. These programs are offered by community colleges,

Water and liquid waste treatment plant and system operators read meters and gauges to make sure that plant equipment is working properly.
Some experienced operators get jobs as technicians with State drinking-water-control or water-pollution-control agencies. In that capacity, they monitor and provide technical assistance to plants throughout the State. Vocational-technical school or community-college training generally is preferred for technician jobs. Experienced operators may transfer to related jobs with industrial liquid-waste treatment plants, water or liquid waste treatment equipment and chemical companies, engineering consulting firms, or vocational-technical schools.

**Employment**

Water and wastewater treatment plant and system operators held about 113,400 jobs in 2008. About 78 percent of all operators worked for local governments. Others worked primarily for water, sewage, and other systems utilities and for waste treatment and disposal and waste management services. Jobs were located throughout the country.

**Job Outlook**

Water and wastewater treatment plant and system operator jobs are expected to grow much faster than the average for all occupations. Job opportunities should be excellent for qualified workers.

**Employment change.** Employment of water and liquid waste treatment plant and system operators is expected to grow by 20 percent between 2008 and 2018, which is much faster than the average for all occupations. A growing population and the increasingly suburban geography of the United States are expected to boost demand for water and wastewater-treatment services. As new plants are constructed to meet this demand, new water and wastewater treatment plant and system operator jobs will arise.

Local governments are the largest employers of water and wastewater treatment plant and system operators. Employment in privately owned facilities will grow faster, because Federal certification requirements have increased utilities’ reliance on private firms specializing in the operation and management of water- and wastewater-treatment facilities.

**Job prospects.** Job opportunities should be excellent, both because of the expected much faster than average employment growth and because the retirement of the baby-boomer generation will require that many operators be replaced. Further, the number of applicants for these jobs is normally low, primarily because of the physically demanding and unappealing nature of some of the work. Opportunities should be best for people with mechanical aptitude and problem-solving skills.

**Earnings**

Median annual wages of water and wastewater treatment plant and system operators were $38,430 in May 2008. The middle 50 percent earned between $30,040 and $48,640. The lowest
10 percent earned less than $23,710, and the highest 10 percent earned more than $59,860. Median annual wages of water and liquid waste treatment plant and systems operators in May 2008 were $38,510 in local government and $37,620 in water, sewage, and other systems.

In addition to their annual salaries, water and wastewater treatment plant and system operators usually receive benefits that may include health and life insurance, a retirement plan, and educational reimbursement for job-related courses.

**Related Occupations**

Other workers whose main activity consists of operating a system of machinery to process or produce materials include:

- Chemical plant and system operators
- Gas plant operators
- Petroleum pump system operators, refinery
  - operators, and gaugers
- Power plant operators, distributors, and dispatchers
- Stationary engineers and boiler operators

**Sources of Additional Information**

For information on employment opportunities, contact State or local water pollution control agencies, State water and liquid waste operator associations, State environmental training centers, or local offices of the State employment service.

For information on certification, contact:


For educational information related to a career as a water or liquid waste treatment plant and system operator, contact:

- National Rural Water Association, 2915 S. 13th St., Duncan, OK 73533. Internet: [http://www.nrwa.org](http://www.nrwa.org)

The Occupational Information Network (O*NET) provides information on a wide range of occupational characteristics. Links to O*NET appear at the end of the Internet version of this occupational statement, accessible at [http://www.bls.gov/ooh/ocos229.htm](http://www.bls.gov/ooh/ocos229.htm)