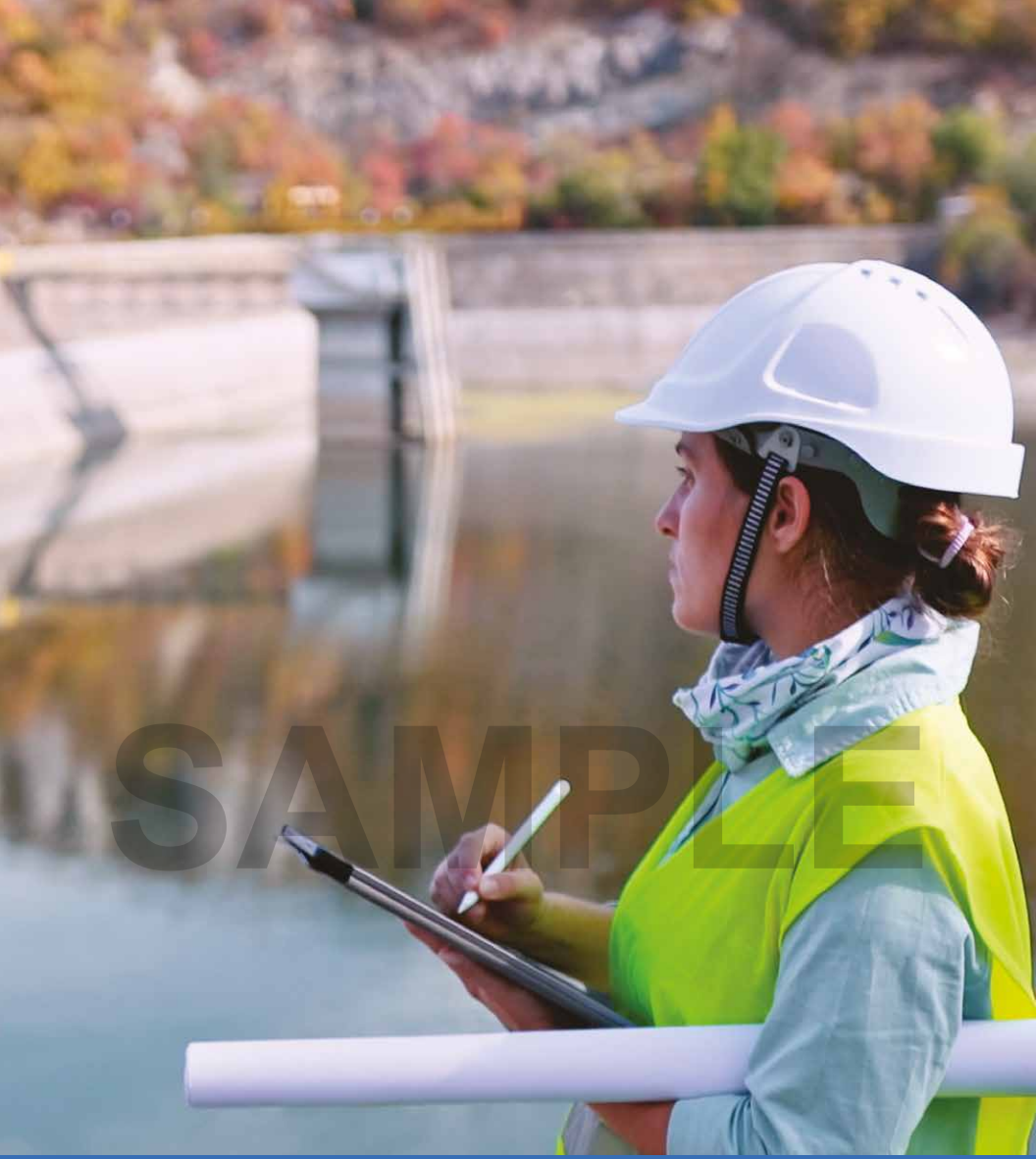
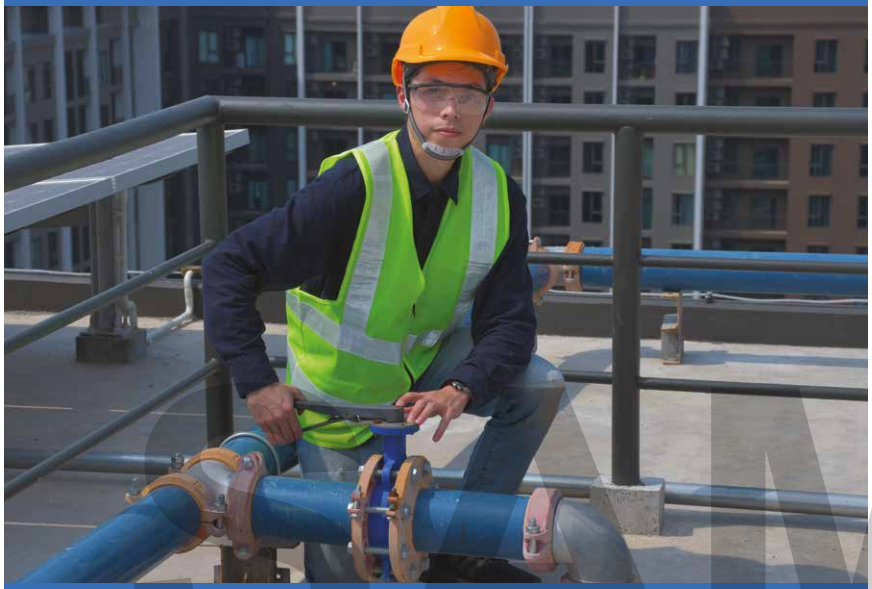

SAMPLE

CAREERS IN WATER

INTRODUCTION



When we turn on the faucet to fill up a glass of water, we don't usually stop to think about the professionals within the water industry who keep us and our environment safe. Without the technicians, operators, scientists, engineers, pipefitters, and other specialists, there would be no one to ensure our water was clean, distributed properly, or handled safely once it went back down the drain. This field is extremely crucial to not only our society, but the ecosystem as well. For example, the professionals who work within this industry help ensure that the water systems don't pollute our waterways. It's because of these dedicated workers that we are able to swim in a lake or fish in a river. It's because of them that we have clean water to drink at home and at work. If you are looking for a career path that is stable, in demand, and recession proof, the water industry might be for you! This booklet is your guide to the countless water-related career options available. From hydrologists who study how water moves to plant operators who ensure there's enough clean water flowing through the pipes, there are job opportunities at every education level.

For employment, salary estimates & training administration please visit the O*Net database: www.onetonline.org.

Remember to check with your local state guidelines, as certification requirements may vary state to state.



WATER TREATMENT PLANT OPERATOR

Water treatment plant operators work with freshwater sources such as wells, rivers, streams, and reservoirs, and are responsible for testing, treating, and monitoring the water. Before water travels to homes, schools, and businesses it must first pass through a water treatment plant to ensure that it's safe to drink. Operators add chemicals as necessary to disinfect the water and to both clean and maintain equipment to ensure safety. In addition, these operators use computers and other machinery to control and operate the processes of our drinking water.



CAREER REQUIREMENTS

- High school diploma or equivalent

Preferred qualifications

- A certificate or associate's degree in water quality or wastewater treatment technology

Certification/Licensing

- A license must generally be obtained by the jurisdiction in which the operator works, however, requirements may vary by state. There are 4 levels of licenses, which vary depending on how much training and experience the operator has.
- Certification requirements are developed and maintained by taking a set of exams.
- On-the-job training is also required, but operators typically gain experience while training or working in lower-level positions throughout the plant.

SAMPLE

WATER DISTRIBUTION OPERATOR



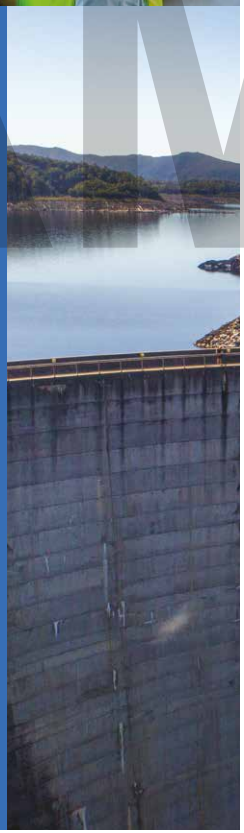
Water distribution operators control, monitor, and regulate water distribution system facilities and equipment. They redirect the raw water supply from freshwater sources to the plant and distribute the treated drinking water to consumers throughout the service territory. Other duties include monitoring water quality, operational data, as well as repairing and calibrating equipment. Systems like Supervisory Control and Data Acquisition (SCADA) are used in operating equipment, such as automatic control devices and distribution systems.

CAREER REQUIREMENTS

- A high school diploma or equivalent (Education and training may vary by state.)

Certification/Licensing:

- Operators must pass an exam demonstrating appropriate knowledge & skills, which could be obtained either on the job or via higher education. Visit Association of Boards of Certification (www.abccert.org) to find certification contact information. A minimum score of 70% is required in order to pass. There are multiple certification levels that can be achieved through proven on-the-job experience.
- Each state has continuing education and certification based on the operator's level of certification.



LABORATORY TECHNICIAN



Laboratory technicians help ensure that our water is safe to drink. In order to do this, they have to run tests and analyze the results to determine whether the water is safe enough to drink or to release into the environment. Compliance testing is used to determine whether or not treatment processes meet their regulations and to ensure the water is free of contaminants. This position is primarily lab-based; they support governments, water treatment plants, hydrologists, and other environmental scientists/agencies.

CAREER REQUIREMENTS

- An undergraduate degree in a STEM field (biology, chemistry, environmental science, toxicology)
- Lab requirements may vary in different laboratories. If interested in becoming a supervisor, more experience and/or education may be needed.

Preferred Qualifications:

- Certifications from organizations like the Association of Boards of Certification, American Water Works Association, and the American Academy of Environmental Engineers & Scientists are recommended.



SAMPLE

PIPELAYER AND STEAMFITTER



Pipelayers and steamfitters install the pipes needed to transfer water from one place to another. Pipelayers use various materials such as concrete, plastic, clay, or cast-iron pipe to set up drains, sewers, water mains, and oil or gas lines. Before laying the pipe, pipelayers must construct and grade the trenches either by hand or with the help of machinery. After the pipe is laid, they either weld, cement, or use glue in order to connect the pieces together. Steamfitters are specialists who install pipe systems that are capable of moving liquids or gases held under high pressure. This is a specialized position because pressure can have extreme effects on a system.



CAREER REQUIREMENTS

- A high school diploma or equivalent
- Completion of an apprenticeship or vocational school program (Apprenticeships, both union and nonunion, usually consist of 4 or 5 years of paid on-the-job training with a classroom component.)

Certification/Licensing:

- Many states require a special license in order to work on gas lines, which involves experience, taking an exam, or both. Pipelayers usually receive their training on the job.



PLUMBER

Plumbers install, maintain, and repair the pipes that supply water and gas to our homes and businesses. In addition, these pipes are responsible for drainage, irrigation, sewage, and various other functions as well. Plumbers can install and repair plumbing fixtures such as bathtubs, showers, sinks, and toilets as well as some appliances. On top of that, they can also help clear obstructions from sink drains and toilets. Some plumbers may work in a design capacity, which involves drafting blueprints in order to help increase the efficiency of the installation process. Other times, plumbers may work in dangerous conditions involving welding electrical equipment and natural gas lines.

CAREER REQUIREMENTS

- A high school diploma or equivalent
- Completion of an apprenticeship program or training at a vocational-technical school. Most apprenticeships are 4 years, but can vary by state.

Certification/Licensing:

- A plumber's license is required in most states, but standards may vary by state. Typical requirements include 2-5 years of experience and passing an exam focused on plumbing trades and local codes.
- In order to become a master plumber, you must work as a journeyman plumber for 2 years and take another exam.



SAMPLE

WATER RESOURCE RECOVERY PLANT OPERATOR



Water resource recovery plant operators, also known as wastewater treatment operators, are in charge of removing pollutants from the water used for domestic and industrial purposes. Their goal is to sanitize water sourced from sewers and drains before releasing it or allowing it to be used for irrigation. Operators split their time indoors & outdoors, working with chemicals, computers, and machinery. Wastewater treatment is vital to public health, especially in order for us to safely use our streams and rivers for swimming, fishing, and drinking water.

CAREER REQUIREMENTS

- A high school diploma or equivalent
- Water Resource Recovery is a complex process and operators must acquire long-term on-the-job training.

Preferred Qualifications:

- A certificate or degree program in a related field (environmental science or wastewater treatment technology) is recommended.

Certification/Licensing:

- A license must generally be obtained. Licenses can have up to 4 different levels, which vary depending on how much training and experience the operator has.
- Certification requirements are developed and maintained by taking a set of exams.

WASTEWATER COLLECTIONS OPERATOR



Wastewater collections operators ensure that wastewater flows safely to the plant for treatment. Operators also help ensure public health by preventing sewage blockages and overflows. They are in charge of repairing, cleaning, inspecting, constructing, and maintaining all wastewater collection systems. These systems include—but are not limited to—pipes, sanitary sewers, pump stations, and manholes. Their work may require skilled construction, repair, and maintenance of wastewater system facilities as well. Wastewater collections operators usually work outdoors, operating power equipment and heavy machinery, even in challenging weather conditions.

CAREER REQUIREMENTS

- A high school diploma or equivalent
- Relevant work experience of 1-2 years in either construction, maintenance, or other related field is needed.

Certification/Licensing:

- Certification requirements like education and training may vary by state.

SAMPLE

WATER RESOURCE PLANNER



Water resource planners, commonly referred to as water resource specialists, design strategies and programs in order to help solve water resource issues. These issues consist of water quality, supply, and other regulatory compliance problems. They analyze stormwater systems in order to find better ways to improve water resources as well as perform hydraulic, hydrologic, or water quality modeling. Water resource planners work in a variety of locations as a result of their varied duties. They may also manage investigations related to water storage, wastewater discharge, permits, pollutants, or other compliance and regulatory problems.

CAREER REQUIREMENTS

- A bachelor's degree in engineering, geology, hydrology, or related field
- 33% of water resource planners obtain a bachelor's degree, but about 51% pursue advanced degrees such as a master's.

Preferred Qualifications:

- At least 2 years of work-related experience as either a hydrologist, geologist, or engineer is highly recommended.





ENVIRONMENTAL ENGINEER

Environmental engineers research, design, plan, and implement their extensive knowledge of the sciences and engineering to help with the prevention, control, and remediation of environmental hazards. They aim to control issues related to waste treatment, pollution control technology, and site remediation. These engineers also study the existing or potential environmental impact of land use projects on air, land, or water. Depending on what kind of project they are working on, engineers may find themselves in a variety of locations such as out in the field, or in an office.

CAREER REQUIREMENTS

- A bachelor's degree in environmental engineering from a school accredited by the Accreditation Board of Engineering and Technology

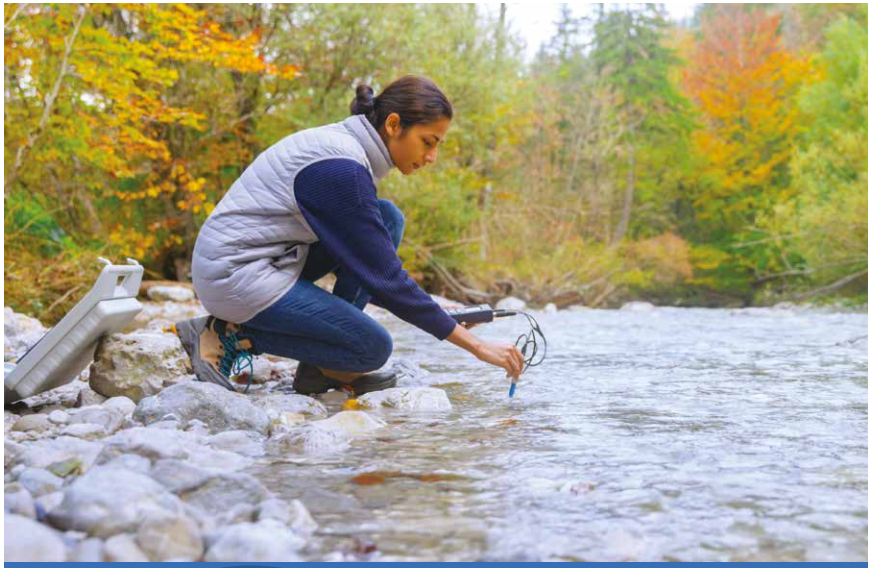
Preferred Qualifications:

- A master's degree is recommended.

Certification/Licensing:

- For those who are interested in offering their services to the public, a Professional Engineer license (PE) is needed.
- In order to become licensed, completion of an ABET accredited program is required. In addition, 4 years of experience will be needed.

SAMPLE



HYDROLOGIST

Hydrologists study the movement of water through and along the earth's crust. They research the distribution, circulation, and physical properties of surface and underground waters. Hydrologists analyze the intensity and form of precipitation, including the rate at which it infiltrates the soil, moves through the earth, and finally returns back to the ocean and atmosphere. They are the experts when it comes to solving problems related to water quality and availability. Hydrologists often measure and graph phenomena such as stream flows, lake levels, and other changes in water volumes. This job is split between the field and the office—but the office itself can vary from government to private consulting services. The demand for hydrologists is expected to grow. As time goes on, finding new ways to properly manage water resources will become more critical as challenges with population and climate change increase.

CAREER REQUIREMENTS

- A bachelor's degree in physical science or a related field like natural resources

Preferred Qualifications:

- A master's degree is highly recommended.

Certification/Licensing:

- Licensing requirements vary by state.
- Certifications are optional, but can help you achieve a competitive advantage over your competition.
- Some hydrologists may even pursue a Ph.D., which allows them to be able to work in a classroom setting as well as receive a higher salary.

ENVIRONMENTAL PROTECTION TECHNICIAN



Environmental protection technicians perform both field and laboratory tests in order to monitor the environment and analyze pollution sources. This can occur in both urban and rural settings. These technicians may also collect samples of soil, water, gases, and various other materials needed for testing. Their jobs may range from discussing test results with customers to developing programs towards monitoring the environment for radiation or pollution. Environmental protection technicians need to be able to process & analyze their recorded data, while also communicating their findings clearly to clients, including the general public. They are equal parts hard science and public service in this way, working for locations like testing laboratories, local governments, and consulting firms. New job opportunities are very likely in the future for this occupation.

CAREER REQUIREMENTS

- An associate's degree or 2 years of postsecondary education. The degree must be in either environmental science, public health, environmental health, or a related field.

Preferred Qualifications:

- A bachelor's degree is recommended; some employers may require one.

Certification/Licensing:

- Some states may require a license in order to perform certain tasks.
- Certifications are recommended and available voluntarily.

SAMPLE



UTILITY MANAGEMENT

Utility managers & supervisors are the captains of the ship—metaphorically speaking, of course. These leaders ensure that what needs to get done is done through demonstrating effective leadership skills. These workers provide their fellow employees with a clear idea as to what their organization's strategic goals and operational priorities are. Upper management is also responsible for upholding a healthy company culture; they are responsible for coaching and developing their employees through regularly scheduled trainings, feedback sessions, and more.

CAREER REQUIREMENTS

Supervisor:

A high school diploma or equivalent. Multiple years of relevant job experience or combination of work & education is also required.

Manager:

Usually requires a bachelor's degree and numerous years of relevant job experience or a combination of some job experience & education.

WATER/ WASTEWATER ENGINEER



Water/Wastewater engineers oversee and design various projects involving provision of potable water, prevention of flood-related damage, or disposal of wastewater and sewage. They prepare environmental documentation for water resources, data management and analysis, regulatory program compliance & field work. Water/Wastewater engineers also perform hydraulic modeling and pipeline design. On the job, water/wastewater engineers review & critique plans, proposals, or designs related to water & wastewater treatment systems. New job opportunities are likely in the future for this occupation.

(Also called consulting engineer, county engineer, engineer, product development engineer)

CAREER REQUIREMENTS

- A bachelor's degree in either mechanical, civil, environmental, or chemical engineering or related field

Preferred Qualifications:

- A master's degree may be preferred. A considerable amount of work-related skill, knowledge, or experience is needed for these occupations.

Certification/Licensing:

- Must be licensed as a Professional Engineer with your state association, which is required to work in all public engineering jobs. Water and Sewer operation licenses are highly desirable.

SAMPLE

GREEN INFRASTRUCTURE WORKER



Green Infrastructure (GI) workers use stormwater management practices in order to protect, mimic, and/or restore the natural water cycle. A few examples of GI are bioretention (stormwater planters, rain gardens, etc.), permeable pavements, rainwater harvesting, rooftop detention practices (green roofs), dry wells, stormwater wetlands, and more. An essential part of their job is to care for plantings and ensure GI technology is functioning properly, which requires a diverse set of skills. A GI worker may perform a variety of job roles such as an installer, maintenance inspector, construction inspector, or maintainer.

CAREER REQUIREMENTS

A high school diploma or equivalent is typically required.

Preferred Qualifications:

Completion of a GI training or certificate program and prior GI experience is recommended. In order to become fully qualified, GI workers will have to acquire long-term on-the-job training.



STORMWATER ENGINEER/ COORDINATOR

Stormwater engineers are responsible for designing solutions to complex stormwater management issues. The engineer will review, manage & ensure the quality of project designs for stormwater management, which includes designing green & gray infrastructures, surface water runoff, & reviewing proposed contracts. Engineers may support other programs within the Watershed Management Division. Stormwater coordinators monitor and enforce stormwater regulations. They perform specialized technical work by developing & managing the area's efforts to improve the quality of water resources with a focus on complying with the area's requirements per Municipal Separate Storm Sewer System (MS4) permit, as it relates to stormwater, best management practices, education & outreach.

CAREER REQUIREMENTS

Stormwater Engineer:

A degree in civil, environmental, biosystems, or biological & agricultural engineering or a related field. Relevant work experience of at least 2 years is needed. Preferred qualifications like certification/licensing may vary by state.

Stormwater Coordinator:

A degree with major course work in an environmental studies area or a related field. Multiple years of relevant training & work experience is needed. Preferred qualifications may vary by state.

SAMPLE

OTHER WATER JOBS



Biologists test for pathogens, nutrients, total suspended solids, PH levels, and biological oxygen demand.

Chemists ensure that the water processed at filtration plants is safe. They evaluate ecosystems by collecting samples; monitoring the condition of streams, lakes, and other bodies of water over time while analyzing data to review trends and make projections.

Communications professionals help communicate information that goes beyond sharing the science to include understanding the public's situation.

Conservation scientists advise local governments and others on water quality issues; they assist in coming up with the best possible protocols regarding conserving water and preventing groundwater contamination.

Drinking water treatment operators maintain, repair & operate a wide variety of complex machinery and equipment in a water treatment plant and/or pumping station or related facility.

Electricians are responsible for wiring, installing, maintaining, and managing the electrical equipment found at water plants.

Engineers design the processes that make water treatment & resource recovery possible, playing a critical role in providing clean, safe water to sustain life & our economy.

Environmental scientists are the specialists who aim to protect the environment by using their extensive knowledge of the natural sciences.

General maintenance & repair workers fix and repair machines, mechanical equipment, and buildings; they learn a variety of skills on the job.

Instrument technicians are in charge of installing and maintaining electronic monitoring and communication equipment (like pressure and level recorders as well as computers). They are responsible for maintaining the communication systems at water plants, pump stations, etc.



Lawyers who studied water rights are experts in the laws that govern the allocation and use of water. They help clients get water rights, defend water rights, transfer water rights, or challenge water rights. Lawyers also determine the validity of rights as well as impose and enforce conditions on their use.

Mechanics are responsible for performing maintenance on a wide variety of light and heavy equipment as well as their related systems and components.

Plumbers assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, or other liquids or gases. They may install heating and cooling equipment and mechanical control systems.

Pretreatment/industrial coordinators oversee the entire pretreatment program for a municipality, but may oversee multiple facilities. They primarily deal with compliance to regulations.

Septic tank service technician repair and clean sewer lines, septic tanks, and or drains. On the job they may need to replace damaged tile for drains, repair breaks in underground pipes, or patch up walls and other parts of the tank.

Watershed managers are responsible for creating, developing, and implementing plans for the management of water systems. This includes effective works for water supply & sewage, as well as decision making for implementing programs and projects related to floodwater management.

Water well drillers operate a variety of drills to tap subsurface water & salt deposits, as well as remove core samples during mineral exploration or soil testing. They utilize controls to stabilize machines and to position & align drills.

Welders can work in a variety of locations—from working on planes and bridges to your local water treatment plant. They use techniques such as arc welding (which uses electrical currents to generate heat) in order to create or disassemble huge objects (buildings, ships, cars, pipes, etc.).

SAMPLE

CONTINUE LEARNING

American Water Works Association (AWWA)
www.awwa.org

Water Environment Federation (WEF)
www.wef.org

Work for Water
www.workforwater.org

Environmental Protection Agency (EPA) WaterSense
www.epa.gov

United States Department of Agriculture (USDA)
www.rd.usda.gov/programs-services/water-environmental-programs

United States Geological Survey (USGS)
www.usgs.gov/mission-areas/water-resources

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