

# Federal Wage System Job Grading Standard for Water Treatment Plant Operating, 5409

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## WORK COVERED

This standard covers nonsupervisory work involved in the operation of water treatment facilities and plants to treat or pump water for domestic or industrial use.

This standard cancels and supersedes the Job Grading Standard for Water Treatment Plant Operator, 5409, issued in September 1969.

## WORK NOT COVERED

This standard does not cover work which primarily involves:

- Operating wastewater treatment plants that collect, treat, and dispose of waterborne domestic or industrial waste. (See [Job Grading Standard for Wastewater Treatment Plant Operating, 5408.](#))
- Chemically treating boiler makeup or wastewater. (See [Job Grading Standard for Boiler Plant Operating, 5402.](#))

## TITLES

Jobs covered by this standard at grade 7 level and below are titled *Water Plant Operator*.

Jobs at grade 8 and above are titled *Water Treatment Plant Operator*.

## GRADE LEVELS

This standard describes three levels of nonsupervisory water treating work (grades 7, 8, and 9). The standard does not describe all possible levels at which jobs may be established. If jobs differ substantially from the skill, knowledge, and other work requirements described in the grade levels in this standard, they may be graded above or below the levels described based on sound grading methods.

## NOTE TO USERS

Because of possible adverse human health and environmental effects, many states have imposed strict certification requirements on water treatment plant operators. Certification of employees, however, does not directly affect the difficulty or other characteristics of work which are considered in grading trades and labor jobs under the Federal Wage System. Under this system, jobs are graded considering the skill and knowledge which are applied in actual work performance, as well as the factors of responsibility, physical effort, and working conditions

actually involved in accomplishing work assignments. Consequently, certification requirements have no grade level impact.

## **SPECIAL ADDITIONAL RESPONSIBILITIES**

This section provides guidance for determining the grade level of certain plant operating situations. The Water Treatment Plant Operator Standard describes normal operation. However, employees in certain water plant operations work under special circumstances. When positions clearly meet the criteria described below, one additional grade may be credited to plant operator positions at the full performance level whether they work alone or with a small group of plant operating employees. It is the intent of this provision that only one operator on each shift be credited with an additional grade for shift-level responsibility.

Most water treatment plants run on a 7-day, 3-shift plan. Operators may be assigned to a specific shift or alternate working on all three shifts, including weekends. On second and third shifts and on weekends, one operator is typically designated as the "operator in charge" of the complete plant, including ancillary and stand-alone water treatment facilities which may be geographically dispersed and is responsible for following instructions which are typically supplied in writing from a supervisor or by the "operator in charge" on the previous shift. The operator typically performs additional duties which are more responsible and require a slightly higher level of skill and knowledge than of full performance level operators who are on duty where a supervisor is available to provide specific guidance and assistance.

The "operator in charge" must have a thorough knowledge of the entire water treatment system and user requirements in order to locate problems and initiate immediate corrective action to maintain adequate water production. The operator, in the absence of written contingency procedures, must have the responsibility to decide whether to shut down a water treatment plant and, if so, whether equipment still in operation can handle the load or whether to attempt to bypass the trouble until corrective action has been completed. Typically, the "operator in charge" has responsibility to determine what work must be done and the authority to approve overtime or to call in necessary maintenance personnel. The operator is responsible for relaying instructions to the next shift operator including problems encountered and action taken.

While these and other similar situations do not describe supervisory responsibilities, they represent situations which indicate that individuals designated as "operator in charge" have more responsibility and a higher level of skill and knowledge than operators who have a supervisor who is available for technical advice and guidance.

Additional grade credit will be added only to plant operators at the journey level who are assigned shift responsibility on a regular and recurring basis. Credit will not be given to plant operators who regularly work when a supervisor is present at the facility or at a nearby facility on the same shift.

## **WATER PLANT OPERATOR, GRADE 7**

*General:* Grade 7 water plant operators work in pumping facilities or water treatment plants where the quality of the water meets acceptable standards without any treatment or where water treatment is confined to one or a few simple steps. At this level, they monitor pumping equipment and gauges according to a prescribed schedule and perform routine operator maintenance. They make adjustments to valves and pumps to control and aerate water flow and they add material to soften water.

*Skill and Knowledge:* Grade 7 water plant operators know how to regulate the amount of water which is being drawn into the system from one or more sources and how to pump it into storage tanks or distribution systems. Grade 7 level operators know how to read meters, gauges, and charts; record the readings; and consolidate the data into reports. They have skill in regulating water volume and performing simple treatment processes such as aerating and softening water.

Grade 7 water plant operators know the location of all booster stations, pumps, valves, and corresponding gauges and the purpose and capacity of each to maintain prescribed water levels. They have skill in performing routine operator maintenance such as lubricating, cleaning, changing filters, and painting water pumping equipment and pipes, and assisting higher grade operators in performing minor operational repairs.

They also know how and where to collect water samples and how to conduct and record basic water sampling tests such as fluoride or chloride content and ion concentration (pH) levels. They use basic water treatment equipment such as color wheels and pH level detection kits or meters.

*Responsibility:* Grade 7 water plant operators receive work assignments from a supervisor or a higher grade operator either orally or in writing. They check equipment operations throughout the shift according to a prescribed schedule. In some work situations at water treatment plants, operators at this level may be responsible for monitoring any part of the system. Grade 7 level operators are responsible for maintaining proper water levels in storage tanks and insuring that in-line water pressures do not exceed safety limits to prevent flooding conditions at terminal points in the systems.

They are responsible for checking equipment to determine that it is operating properly and performing minor operator maintenance as prescribed. The work is spot-checked for compliance with instructions and regulations during progress and through a review of records and reports at the completion of the shift by the supervisor. They are responsible for performing basic tests and measurements in accordance with specific and easily understood instructions in printed pamphlets and guidelines.

*Physical Effort:* Grade 7 water plant operators do considerable walking, standing on concrete floors, and climbing stairways and ladders. Light to moderate physical effort is necessary to turn valves and controls. They frequently lift and carry items weighing up to 18 kilograms (40 pounds) unassisted, and occasionally lift and carry heavier items with assistance of other workers or with lifting devices.

*Working Conditions:* Grade 7 water plant operators usually work indoors and occasionally work outside for short periods where they are subject to prevailing weather conditions. They are exposed to constant noise, rotating machinery, dirt, grease, chemicals, oil, and fumes in the work area. Water plant operators are subject to cuts and abrasions from the use of tools and equipment and burns from chemicals. In addition, they work on catwalks and ladders. Operators at this level follow prescribed safety practices and use safety equipment such as face shields, gloves, hard-toe shoes, respirators, and protective clothing. Some of these safety items may be uncomfortable to wear, and may be worn or used for long periods.

## **WATER TREATMENT PLANT OPERATOR, GRADE 8**

*General:* Grade 8 water treatment plant operators work in water treatment plants where the quality of the water is below acceptable and prescribed standards and requires nonfiltration processes to change the taste, odor, or chemical content of the water.

Grade 8 operators make scheduled equipment checks similar to the grade 7 level operators. However, the gauges, meters, electrical motors, pumps, chemical feeders, auxiliary generators, and recording and controlling devices used in nonfiltration water treatment processes are more numerous and complex than those described at the grade 7 level. Nonfiltration processes typically include carbonation, ammoniation, fluoridation, chlorination, and other processes not performed at the grade 7 level. In some work situations, grade 8 operators, in addition to the above, monitor and maintain water quality in swimming pools.

*Skill and Knowledge:* Grade 8 water treatment plant operators have a thorough knowledge of nonfiltration processes normally associated with pretreated or ground (well) water treatment processes to change the taste, odor, or chemical content of the water. Grade 8 operators know how to perform water treatment tests to check items such as pH level, turbidity, and fluoride and chloride content. They have skill in the use of instruments such as ethylometers and pH meters to take measurements. They are skilled in adding silicates and chemical agents such as chlorine, fluoride, and manganese into the water system.

Grade 8 water treatment operators are knowledgeable of State and Federal reporting requirements and Federal regulations which cover the addition of water treatment chemicals. Water treatment operators at this level know how to maintain acceptable water quality standards and record the treatments according to established methods and regulations.

In some work situations, grade 8 operators, in addition to the above, are knowledgeable of proper procedures for monitoring and maintaining the quality of swimming pool water and chlorination levels. They maintain pool water through backwash cycles, chemicals, and filtration, which includes rapid and slow sand filters, and diatomaceous earth filters.

In addition to the operator maintenance at grade 7 level, grade 8 water treatment plant operators perform minor maintenance and repairs such as adjusting packing glands, repacking valves, and replacing valves and basic gauges.

*Responsibility:* Grade 8 water treatment plant operators receive work assignments from a supervisor or a higher grade operator either orally or in writing. Similar to the grade 7 level, the grade 8 water treatment plant operators work under the general technical guidance of a higher grade employee. Grade 8 operators are responsible for adding chemical agents and compounds into the system to maintain water quality. They are responsible for conducting tests and measurements within prescribed State and Federal standards. Records are reviewed by a supervisor or higher grade employee at the completion of the shift.

*Physical Effort:* Physical effort at this grade level is the same as that described at [grade 7](#).

*Working Conditions:* In addition to the working conditions described at the [grade 7 level](#), operators at this level have a greater exposure to chemicals and compounds, some of which may be hazardous.

## **WATER TREATMENT PLANT OPERATOR, GRADE 9**

*General:* Grade 9 water treatment plant operators work in plants where the water requires both nonfiltration processes as described at the grade 8 level and, in addition, filtration processes to change the taste, odor, physical, chemical, or bacteriological content of the water. The grade 9 operators make regularly scheduled checks similar to the grade 8 operators. However, the meters, gauges, motors, pumps, feeders, and the recording and control devices are more complicated in a filtration plant.

Filtration methods include treatment which changes the physical, chemical, or bacteriological quality of the water by means such as mixed media filters, slow sand filtration, gravity rapid sand, diatomaceous earth filtration, or anthrafil filtration and pressure.

*Skill and Knowledge:* In addition to the basic and nonfiltration processes at the grade 8 level, grade 9 water treatment plant operators have a thorough knowledge of the filtration processes such as mixed media filters, slow sand filtration, gravity rapid sand, or anthrafil filtration and pressure or diatomaceous earth filtration, normally associated with surface (lakes, rivers) water treatment.

They have skill in measuring and introducing chemicals and compounds into the water system. They know the individual and combined effects of chemicals and compounds such as alum, lime, soda ash, fluorides, and polyphosphates that are used in filtration procedures.

In addition to the tests performed at the grade 8 level, and because microorganisms are not eliminated by normal disinfecting methods, the grade 9 operators perform water treatment tests and measurements that require a working knowledge of various microbiological organisms. Grade 9 operators know how to treat the incoming water and how to perform basic microbiological tests such as inoculation and incubation of outgoing water samples to verify the elimination of the treated microorganisms. [**Note:** Certified laboratories typically perform final microbiological tests for State and Federal compliance.]

Grade 9 level operators have skill in the operation of settling tanks, filter beds, surge pumps, hydrochlorinators, phosphate feeders, soda ash and dry lime feeders, lime solution tanks, and similar types of equipment. In addition to the kinds of minor maintenance performed at the lower grade levels, grade 9 water treatment plant operators check the operation of plant equipment and accomplish minor repairs and maintenance such as replacing gaskets, bearings, piping, pump motors, and replacing packing.

*Responsibility:* Grade 9 water plant operators receive work assignments from a supervisor or a higher grade worker who is in charge of the facility or work shift. These assignments may be in the form of written or oral instructions. Overall responsibility is greater than that described at the grade 8 level because grade 9 operators mix and add a wider variety of chemicals and compounds associated with filtration processes. They are responsible for tests and measurements in accordance with formulas established by State and Federal regulations. Grade 9 operators have final responsibility for the many reports that are sent to State and Federal agencies. Their work is reviewed in progress and upon completion of the shift by the supervisor for compliance with instructions and standard operating procedures.

*Physical Effort:* Physical effort at this grade level is the same as that described at [grade 7](#).

*Working Conditions:* Working conditions at this grade level are the same as that described at [grade 8](#).