

4720.5520 PUMPING TEST STANDARDS FOR LARGER SIZED WATER SUPPLY SYSTEMS.

Subpart 1. **Applicability.** A pumping test must be conducted as specified in this part if:

- A. the public water supply system consists of two or more wells;
- B. a well is accessible for measuring the water level in the aquifer used by the public water supply system;
- C. the pump or the water distribution system can maintain a ten percent or less variation in the discharge rate;
- D. the water storage facility of the public water supply system can hold enough water to meet the water needs for the length of the pumping test specified in subpart 5; or
- E. the water storage facility of the public water supply system can hold the discharge water or the water disposal method is not a public safety hazard.

Subp. 2. **Pumping capacity.** When a pumping test is conducted, the public water supply well must be pumped at its maximum obtainable capacity.

Subp. 3. **Water level measurement.** The water level measurements must be recorded in units of one-hundredths of a foot.

Subp. 4. **Total volume of water measurement.** The total volume of water pumped during the pumping phase of the test must be recorded as the total gallons pumped.

Subp. 5. **Pumping test length.** The length of the pumping test for a public water supply well must be no less than:

- A. 24-continuous hours pumping, followed by a 24-continuous hour recovery period, in a confined aquifer; or
- B. 72-continuous hours pumping, followed by a 72-continuous hour recovery period, in an unconfined aquifer.

Subp. 6. **Recording; start and finish.** The date and time of the start and the finish of the pumping test must be recorded to the second.

Subp. 7. **Groundwater level monitoring.** For a public water supply well completed in geological materials specified in part 4720.5550, subpart 2, item D, subitem (2), at least one well or environmental bore hole must be used to monitor groundwater levels before, during, and after the pumping test.

A. The well or environmental bore hole used to monitor groundwater levels must be located where it is influenced by the pumping well.

B. The public water supplier is responsible for the construction of one well or environmental bore hole to monitor groundwater levels if an existing well or environmental bore hole cannot be used for the test requirements specified in this subpart.

Subp. 8. **Frequency of readings; confined aquifer.** During the pumping phase and recovery phase of the test for a confined aquifer, water levels in the pumping well and any well or environmental bore hole used to monitor groundwater levels must be measured with sufficient frequency to characterize the drawdown versus time response in each of the following time intervals:

- A. prepumping condition;
- B. 0 to 5 minutes;
- C. 5 to 10 minutes;
- D. 10 to 20 minutes;
- E. 20 to 60 minutes;
- F. 60 to 120 minutes;
- G. 120 to 180 minutes;
- H. 180 to 360 minutes;
- I. 360 to 720 minutes; and
- J. 720 to 1,440 minutes.

Subp. 9. **Frequency of readings; unconfined aquifer.** During the pumping phase and recovery phase of the test for an unconfined aquifer, water levels in the pumping well and any well or environmental bore hole used to monitor groundwater levels must be measured with sufficient frequency to characterize the drawdown versus time response in each of the following time intervals:

- A. prepumping condition;
- B. 0 to 5 minutes;
- C. 5 to 10 minutes;
- D. 10 to 20 minutes;
- E. 20 to 60 minutes;
- F. 60 to 120 minutes;
- G. 120 to 180 minutes;
- H. 180 to 360 minutes;
- I. 360 to 720 minutes;

- J. 720 to 1,440 minutes;
- K. 1,440 to 2,880 minutes; and
- L. 2,880 to 4,320 minutes.

Subp. 10. **Readings; discontinuation.** The readings during the recovery phase of the test may be discontinued when the water levels in the pumping well and the well or environmental bore hole used to monitor groundwater level reach 95 percent recovery of the prepumping condition.

Subp. 11. **Recording; pumping rate.** The pumping rate for a public water supply well must be recorded during the pumping phase of the test:

- A. every five minutes during the first hour of the pumping phase of the test;
- B. at hours 2, 3, 6, and 12 for a confined aquifer; and
- C. at hours 2, 3, 6, 12, 24, and daily following the 24-hour reading for an unconfined aquifer.

Subp. 12. **Final recording.** The final recording of the pumping rate for a public water supply well must be recorded five minutes before shutting off the pump.

Subp. 13. **Pumping rate variation.** When the pumping rate of a public water supply well varies by ten percent or greater from the previous reading, except for the final recording specified in subpart 12, new readings must be recorded at five-minute intervals for either the next hour or until a variation of less than ten percent is observed, whichever is the greater length of time.

Subp. 14. **Failure to record pumping rate.** Failure to record the pumping rate for a public water supply well at the times specified in subparts 11 and 12 requires the pump test to be redone.

Subp. 15. **Pumping rate measurement.** The pumping rate must be expressed in gallons per minute.

Subp. 16. **Recording and submittal requirements.** Pumping test data must be recorded and submitted to the department on forms or electronic data file templates provided by the department.

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