

## **Alpine County Guideline – Well Capacity California Health and Safety Code Section 64554**

A water system shall determine the total capacity of its groundwater sources by summing the capacity of its individual sources; if capacity varies seasonally, it shall be determined at the time of maximum daily demand.

- (a) The capacity of a well shall be determined from existing pumping data, or from a pump test conducted pursuant to Subsection (b), (c), or (d). Prior to conducting a pump test, a system shall submit the following information to this Department:
  - (1) The name and qualifications of the person who will be conducting the test;
  - (2) The proposed pump test production rate;
  - (3) A site sketch showing, and the text justifying, the discharge locations;
  - (4) A site sketch showing the location of any surface water staff gauges and a description of their construction;
  - (5) Specifications for the pump that will be used for the pump test and the depth at which it will be placed in the well;
  - (6) A description of the method and equipment that will be used to ensure the maintaining of a constant pumping rate for alluvial wells or constant water level for hard rock wells;
  - (7) A description of the discharge and water level measurement method and schedule, and;
  - (8) A description of how any of the system's other wells will be operated while the new well is being tested and their anticipated operating schedule during normal operations after the new well is online.
- (b) To determine capacity for a well drilled in alluvial soils when there is no existing data, a water system shall conduct a constant discharge (pumping rate) pump test as follows:
  - (1) Pump the well continually using a constant rate of water discharge;
  - (2) Take measurements of the water level drawdown at least one hour apart;
  - (3) Plot the drawdown measurements against the logarithm of time elapsed since the beginning of the pump test; and
  - (4) Pump until at least four consecutive drawdown measurements and the elapsed time yield a straight line in the plot developed pursuant to Subsection (b)(3).
- (c) To determine capacity for a well drilled in hard rock when pumping and drawdown data covering a period of at least ten years do not exist, a water system shall conduct a constant head (water level) pump test that is initiated during August, September or October and demonstrate recovery of the well water level pursuant to Subsection (c)(3):
  - (1) For a 72-hour test,
    - (A) A day before the test, pump the well for two to three hours and allow it to sit overnight; measure and record the static water level prior to beginning the test;
    - (B) Pump the well continuously for a minimum of 72 hours;
    - (C) Measure and record water drawdown levels and pumping rate:
      - 1. Every thirty minutes during the first four hours of pumping,
      - 2. Every hour for the next four hours, and

- 3. Every four hours thereafter; and
  - (D) Pump until the water drawdown level is constant for at least four measurements collected at four-hour intervals; and
  - (E) Plot pumping rate versus time on semi-logarithm graph paper with the time intervals on the horizontal axis and the pumping rates on the vertical axis;
- (2) For a 10-day test,
- (A) A day before the test, pump the well for two to three hours and allow it to sit overnight; measure the static water level prior to beginning the test;
  - (B) Pump the well continuously for a minimum of 10 days;
  - (C) Measure and record water drawdown levels and pumping rate:
    - 1. Every thirty minutes during the first four hours of pumping,
    - 2. Every hour for the next four hours,
    - 3. Every eight hours for the remainder of the first four days,
    - 4. Every 24 hours for the next five days, and
    - 5. Every four hours thereafter;
  - (D) Pump until the water drawdown level is constant for at least four measurements collected at four-hour intervals;
  - (E) Plot pumping rate versus time on semi-logarithm graph paper with the time intervals on the horizontal axis and the pumping rates on the vertical axis;
- (3) To complete either the 72-hour or 10-day test, the well shall recover within a length of time equivalent to the duration of the pumping time of the pump test. Recovery means that the water level has returned to within two feet of the static water level measured at the beginning of the pump test or to a minimum of ninety-five percent of the total drawdown measured during the test, whichever is most stringent. If the well does not recover pursuant to this criteria, capacity cannot be determined pursuant to Subsection (c)(4). To demonstrate the recovery, measure and record the water level in the pumped well:
- (A) Every 30 minutes during the first four hours after pumping stops,
  - (B) Hourly for the next eight hours,
  - (C) Every 12 hours until either the water level in the well recovers to the static level measured prior to the test, or for the length of time the well was pumped for the test, whichever occurs first; and
  - (D) Plot water level versus time on semi-logarithm graph paper with the time intervals on the horizontal axis and the water levels on the vertical axis.
- (4) Capacity shall be calculated as:
- (A) For a 72-hour test, 25% of the last of the four measurements taken pursuant to Subsection (c)(1)(D); or
  - (B) For a ten-day test, 50% of the last of the four measurements taken pursuant to Subsection (c)(2)(D).
- (d) The capacity of a well may be assigned on the basis of an alternative pump test, providing that:
- (1) Prior to conducting the test, the water system submits a proposal prepared by a licensed hydrogeologist with at least three years experience in the conduct of well capacity tests to the Department for review and approval; in addition to the information in Subsection (d), the proposal shall include:

- (A) The methods, locations, and schedule for water level measurements during the pumping and recovery phases of the test; and
- (B) The anticipated pump test duration and criteria for pump shut down.
- (2) The pump test is performed in accordance with the approved proposal, unless prior approval is obtained from the Department to alter the pump test protocol;
- (3) The Department is notified of the anticipated start date of the pump test at least one week prior to the start of the testing; and
- (4) On-site precipitation data is collected for the period beginning one week preceding pumping through the recovery period, and on-site weather condition observations recorded at least twice daily during pumping and recovery.
- (e) The water system shall submit a report to the Department that includes all data and observations associated with the pump test conducted pursuant to Subsections (b), (c) or (d), as well as the estimated capacity determination methods and calculations. The data collected during pumping and recovery phases of the testing shall be submitted in electronic format in both tabular and graphic Excel files.
- (f) Well capacity assigned on the basis of a pump test may be revised if subsequent pumping data collected during normal operations indicates that the pump test results were not representative of the actual well capacity.