

# Sierra Valley Groundwater Management District Well Evaluation Technical Guidelines & Procedures for

**New Wells being pumped at  $\geq 20$  gpm or with annual water use  $> 2$  acre-feet per year (652,000 gallons per year, 1,800 gallons per day)**

## Definition of New Well

For the purpose of this document, a new well includes a well that is being drilled for a new proposed groundwater use (replacement wells exempted), or an existing well that is being equipped, reequipped, reconditioned, deepened to provide increased water supply, or placed back into production (registered inactive wells included) to provide water supply that is greater than has occurred within the past 5 years.

## Required Evaluation and Information

### A. Well Information

1. Owner Name and contact information
2. Operator Name and contact information (if different from owner)
3. Well Name or ID Number
4. Coordinates and well location description
5. Description of Well Use (Existing and Planned)
6. Depth Drilled
7. Lithology noted during drilling (depths of sands, silts, clays, gravels, bedrock)
8. Screened Depth Interval
9. Seal Depth Interval
10. Equipped Yield / Flow Rate
  - a. How Flow Rate Determined
11. Flow Meter Information:
  - a. Make / Model
  - b. Serial Number
  - c. Measurement Units
12. Annual Water to be Pumped from the Well
  - a. Include Total to be Pumped for Project or Site, if from more than one well to be used (note: provide description of other wells, using above outline)
  - b. If pumping is anticipated to vary over time, explain the initial and full-buildout expected water use and the expected time-frame over which use will increase.
13. Return of pumped water back to the aquifer
  - a. If a portion of pumped water will be returned back to the aquifer, explain how much and identify to which aquifer the return will be made to (for example, shallow water table aquifer)

## B. Pumping Test of Well (for existing wells)

1. Minimum 8-hour constant-rate well pumping test, recording:
  - a. Flow rate using an instantaneous and total volume flow meter.
  - b. Static water level measurement prior to pumping.
  - c. Water level measurements when pumping (hourly minimum).
  - d. Static and pumping water level measurements from nearby wells, if access is available and the well is not being pumped.
  - e. Computation of aquifer transmissivity using Cooper-Jacob (1945) solution, or applicable similar method.
  - f. If nearby well drawdown recorded, computation of aquifer storage coefficient.
  - g. Note any nearby pumped wells during the test that may be causing drawdown interference during the test.

## C. Pumping Drawdown Analysis

1. Identify hydrologic resources within a 2500 ft radius of the proposed well, including irrigation wells, commercial and municipal wells, stockwatering wells, domestic wells, streams, wetlands, irrigation ditches, and springs.
2. Distance-Drawdown Analysis shall be used to predict drawdown from pumping of the new well using the Theis (1935) equation, or similar analytical method, and the following variables.
  - 2a. Pumping durations shall be analyzed at:
    - a. 1 year
    - b. 5 years
    - c. 10 years
    - d. 20 years
  - 2b. The following storage coefficients shall be used, unless determined during the pumping test.
    - a. Well depth <100 ft = 0.1
    - b. Well depth 100-300 ft = 0.001
    - c. Well depth >300 ft = 0.0001
  - 2c. The transmissivity shall be used as derived from the pumping test. For wells not yet drilled, the transmissivity shall be estimated based on expected conditions for the new well and nearby well yields. Assumptions shall be documented.
  - 2d. The pumping rate shall be equal to the full buildout pumping water demand, pumped at an equivalent continuous pumping rate.
3. Drawdown reporting shall be in ft of predicted drawdown at distances of 200, 1000, and 2500 ft from the pumping well. Drawdown results may be tabular or in contoured map format, and reported to the nearest 0.1 ft unit.
4. If desired, the applicant can discuss use of the Sierra Valley numerical groundwater flow model to make drawdown predictions, rather the Theis method. The applicant shall bear the expense of SVGMD to run the model and extract the drawdown results.

### **C1. Special Analysis Required (new wells >200 gpm or 100 AFA)**

*For proposed wells that will pump in excess of 200 gpm, or  $\geq 100$  acre-feet annually, additional drawdown analysis will be required as outlined below.*

1. The applicant shall have the proposed pumping run in the SVGMD numerical flow model, and the cost to run the model and provide drawdown results shall be reimbursed to SVGMD by the applicant. The model predicted results shall be in addition to the Theis analytical solution. Drawdown results shall be plotted on a basemap identifying all water resources under Item 1.
2. If predicted drawdown exceeds 10 ft at the 2500 ft radial distance after 20 years of simulated new well pumping, the predicted drawdown shall be mapped to the geographic extent necessary to incorporate the outer edge of the 10-ft drawdown threshold. Hydrologic resources under Item 1 shall be identified within the entire 10-ft drawdown threshold area.

### **D. Reporting of Results**

Results of the well pumping evaluation shall be provided in writing to the SVGMD. The evaluation shall be signed and stamped by a qualified individual, defined as a licensed geologist, certified hydrogeologist, or licensed professional engineer in the state of California.

For wells that have not yet been drilled at the time of the new well drawdown analysis, a pumping test and well completion log with as-built information shall be filed with the SVGMD. If the actual transmissivity of the well is greater than or less than 50% of the estimated value in the submitted drawdown analysis to SVGMD, then the new well owner shall provide an updated drawdown evaluation to SVGMD for record keeping purposes. The pumping test, and if necessary, the update to the drawdown analysis shall be submitted to SVGMD within 60 days of new well drilling completion.