State Wat Resources Control Board

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Linda S. Adams
Acting Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

APPLICATION NO. T032564
(Leave blank)

UNDERGROUND STORAGE SUPPLEMENT TO APPLICATION TO APPROPRIATE WATER BY PERMIT

1. State amount of water to be diverted to underground storage from each point of diversion in item 3b of form APP.

   a. Maximum Rate of diversions (1) *30* (2)_____(3)_____cfs
   b. Maximum Annual Amount (1) *5,400* (2)____(3)_____acre-feet

2. Describe any works used to divert to offstream spreading grounds or injection wells not identified in item 7 of form APP.

Existing diversion dam at RM 46.7 diverts into SVID ditch along eastside of Scott Valley within ½ to 2 miles from the Scott River, south of Fort Jones. Delivery will be down the 13.2 mile ditch to existing irrigated fields, which have "turnouts" to deliver water through lateral ditches to each field for flood irrigation. Fields are used to grow alfalfa, pasture and grain. The ditch allows for flood irrigation of these fields during irrigation season (4/1-10/1). This proposal is to allow flooding of the fields during the winter months (1/1/-3/31) to intentionally infiltrate for groundwater recharge, which will also provide accretion flows to the Scott River during the low flow season.

See Attachment 1 – Map Scott River and SVID Service Area

3. Describe spreading grounds and identify its location and number of acres or location of upstream and downstream limits if onstream.

See Attachment 1 SVID Maps. Seepage will occur along the length of the ditch and flooding will occur on existing fields. Maximum irrigated acreage within SVID is 3,475 acres, though the UCD model estimates that land area of flooding benefit will most likely be 2,200 acres during the winter.

For instream fish & wildlife benefits for the return accretion flows, the upper most benefit will be in the Scott River at RM 46.7 while the downstream benefit will be to the mouth of the Scott River in the low flow season the point of verification will be USGS gage at River Mile (21).

4. Focused Study Area: State depth of groundwater table in spreading grounds or immediate vicinity:
   33.82 feet below ground surface on *9/27/2015* measured at a point located within *the SW¼ of SW¼ of Section 12, T 42N, R 9W, MD B&M*

General Area Description: 3,475 acres within the district. UCD Model priority area including approximately 2,200 acres is identified in Attachment 1.

5. Give any historic maximum and or minimum depths to the groundwater table in the area.

Focused Study Area: Location – *same as above* Maximum *41.2* feet below ground surface on *9/22/14* Location – *same as above* Minimum *15.1* feet below ground surface on *5/3/06*

6. Describe proposed spreading operation.

See #3 above and attached description of UCD Groundwater Study Plan and Recharge Experiment (Attachment 5). Flooding of dormant agricultural fields below the SVID ditch between 1/1 and 3/31 when surplus flows are available. Users may spread equally among the ditch member properties. Some seepage will also occur from the unlined, earthen ditch along its 13.2 mile length. Much of the proposed reach of the Scott River is perched and/or has a levee preventing tail water re-entry. Fields that may have a potential for tail water return will not be flooded and therefore no tail water return flow is anticipated. Contributions to the Scott River will only be by seepage via groundwater flow. UCD groundwater recharge research on one field (near RM 41) can monitor rate of movement toward the river, but to date the instream benefits can't be quantified. Other wells in the Scott Valley Community Well Measuring network can measure groundwater level changes.

7. Describe location, capacity and features of proposed pretreatment facilities and/or injected wells.

Not applicable

8. Reference any available engineering reports, studies, or data on the aquifer involved.

Mack, S. 1958. Geology and Ground Water Features of Scott Valley, CA. USGS Water Supply Paper 1462, p. 110.
Harter, T. 2008. Scott Valley Groundwater Study Plan. UC Davis.
Foglia, L. et al. 2013. Scott Valley Integrated Hydrologic Model: Data Collection, Analysis, and Water Budget. UC Davis. p. 101
UC Davis Groundwater website on Scott Valley: //groundwater.ucdavis.edu/Research
Dahlke, H. 2015. Preliminary Results on Groundwater Recharge Experiment – Scott Valley. UC Davis, 2 p.

9. Describe underground reservoir and attach a map or sketch of its location.

Aquifer is an unconsolidated, highly heterogeneous mix of fluvial and alluvial sediments that is approximately 51% silt and clay, 37% gravel, and 12% sand. Maximum aquifer thickness is about 200-250 feet in the deepest part of the valley, decreasing toward the valley margins. Specific yield from modeling results and pumping tests in the valley range from 0.06 near the stream to 0.20 near the valley margins. See attached Map of groundwater basin in Attachment 1.

10. State estimated storage capacity of underground reservoir.

Total storage capacity in the entire Scott Valley aquifer was estimated to be 400,000 acre-ft (Mack 1958). For the area in question, it is approximately 5,500 acre-feet, assuming an average depth to water of 25 ft, on 2,200 acres, and a specific yield of 10%.

11. Describe existing use of the underground storage reservoir and any proposed change in its use.

The aquifer is currently used to supply irrigation water during the growing season and a small amount of domestic and stockwater use year around. The aquifer also is interconnected with the Scott River and delivers water to help sustain surface flow. No change in irrigation, domestic, or stockwater pumping is proposed. However, an anticipated increase in base flow of the Scott River for fish and wildlife benefit is proposed through this effort.

12. Describe the proposed method and location of measurement of water placed into and withdrawn from underground storage.

Water

Water diverted from the Scott River would be measured at the SVID diversion gage using a pressure transducer that measures depth to water, which can then be converted into a flow rate given a flow rating table. Another pressure transducer will be placed at the end of the ditch to measure the flow rate there, although no excess surface flow (tailwater) is anticipated to return to the Scott River. Devices will be a doppler flow meter (Grey Line DFM 5.1 model), the same that UCD is using on their experimental field study.

UCD's groundwater recharge experiment on 15 acres below SVID also has a network of pressure transducers and flow meters to track the rate of groundwater movement toward the river.

Groundwater levels are measured monthly at 9 wells below the SVID ditch through the Scott Valley Community Well Measuring Program, with data going back to April 2006. No change is groundwater use for irrigation is proposed.

Surface flows in the Scott River will be measured at 2 seasonal gages by the Siskiyou RCD, located at RM 46 and RM 35, and by the permanent USGS gage at RM 21.

Comparisons can be made with previous years' data to assess changes in seasonal groundwater levels and surface flows.

Additional copies of this form and water right information can be obtained at www.waterrights.ca.gov.