SUSTAINABLE GROUNDWATER MANAGEMENT (SGM)

GRANT PROGRAM

Vina GSA

Butte County CALIFORNIA

Project Newsletter

Groundwater Recharge Project Identification and Feasibility Analysis

April 2026

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1. Component 5 – Vina GSA SGM Grant

As described in November 2025 Newsletter for this project, Butte County is administering a Sustainable Management Groundwater Grant awarded to the Vina Groundwater Sustainability Agency (GSA) by the California Department of Water Resources (DWR) that includes identification and assessment of potential groundwater recharge sites throughout the Vina Groundwater Subbasin (VGS). Figure 1 shows the outline of the VGS.

The November 2025 issue discussed how recharge projects were identified, field investigations completed to assess the recharge potential of specific sites, and design of groundwater recharge pilot tests. This issue discusses the performance and results of groundwater recharge pilot tests.

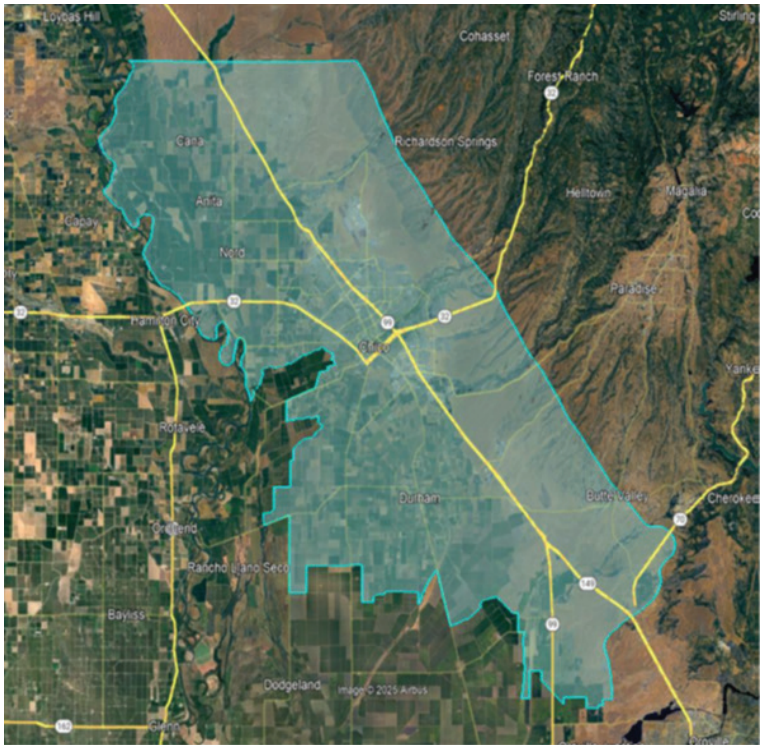


Figure 1. Outline of the Vina Groundwater Subbasin

2. Reverse Tile Drain Pilot Test

As discussed in the November 2025 Newsletter, a small (140 feet in length) reverse tile drain system was installed at a site along Comanche Creek to allow pilot testing of this groundwater recharge method. A reverse tile drain system for groundwater recharge is an underground water management system designed to capture excess surface or stormwater and intentionally send it back into the ground to replenish underground water supplies. Figure 2 shows a cross section of the reverse tile drain installed for the pilot test. The tile drain itself consists of 8-inch plastic pipe perforated to allow water to flow into the subsurface. The observation wells were installed to allow water level measurements along the system during the test. A monitoring well was also installed adjacent to the tile drain to assess if recharge water was entering the groundwater system.

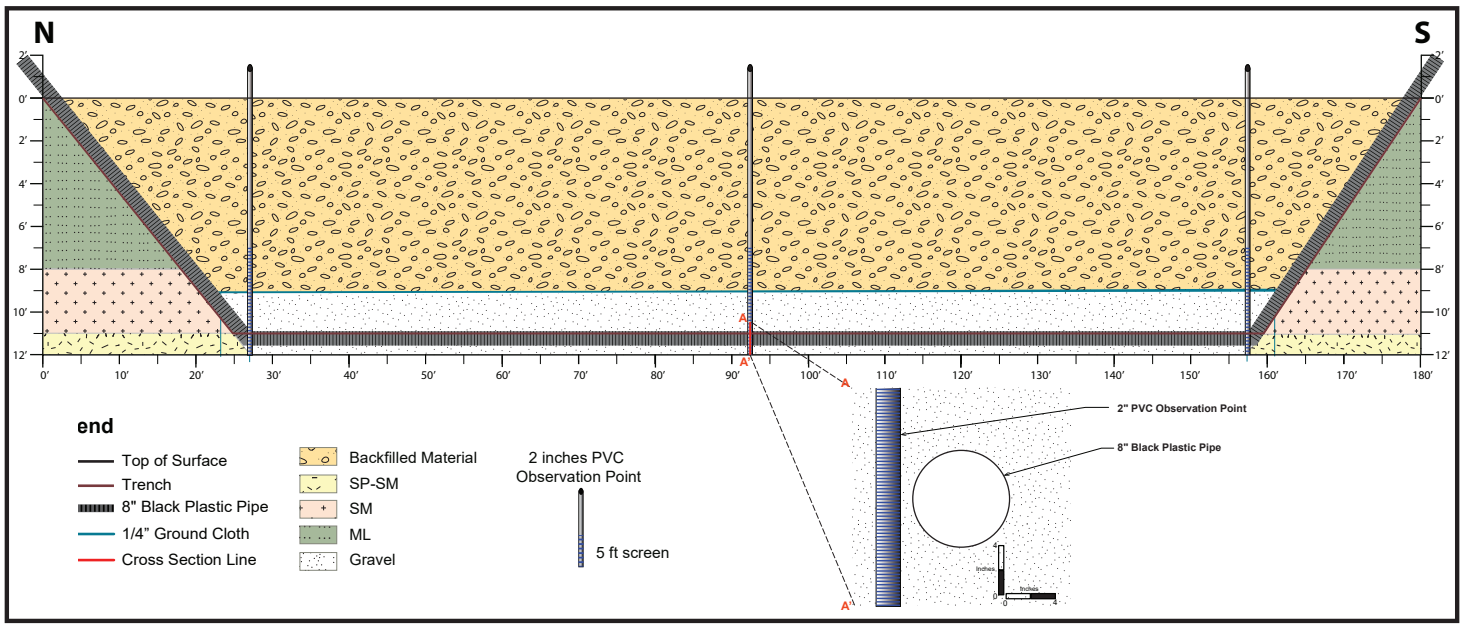


Figure 2. Location of infiltration testing

An initial pilot test of this system was conducted between December 2, 2025, to December 4, 2025, using an onsite irrigation well for the source of the groundwater recharge water. Photograph 1 shows the discharge line from the irrigation well going into the tile drain.

The average pumping rate for this test was about 76 gallons per minute (gpm) with a total of over 225,000 gallons (0.69 acre-feet) flowing into the system. These results indicate that the small system can sustain at least about 0.34 acre-feet per day, but results suggest the system could handle greater than 100 gpm. Although more assessments need to be conducted and assuming linear scaling, using these data, a full-scale system designed with 4,000 feet of tile drain might be able to support up to 3,000 gpm or more than 13 acre-feet per day. Additional testing of this system was conducted in February 2026 as discussed in the next section.

Photograph 1. Discharge line from irrigation well going into tile drain.

3. Pilot Tests Using Water Code 1242.1

After completion of the tile drain system discussed above, a second pilot test was conducted using flood waters from Comanche Creek following California's Water Code 1242.1. A small infiltration basin (about 0.2-acres in size; Photograph 2) constructed near the tile drain system was also pilot tested using this Water Code. Water Code 1242.1, added by Senate Bill (SB) 122 in 2023, creates a legal mechanism to divert flood flows during extreme storm or flood conditions for managed aquifer recharge (MAR) without needing an appropriate water right, which normally takes years to obtain. The statute's core purpose is dual: Reduce flood risk and accelerate groundwater recharge to address overdraft and SGMA groundwater sustainability needs.

Photograph 2. Infiltration basin. White pipes are stilling wells that contain pressure transducers to record water levels.

Two storm events that occurred during the weeks of February 20, 2026, and February 25, 2026, met the criteria for Water Code 1242.1 diversions to occur and two pilot tests were conducted. The first test was conducted between February 20, 2026, and February 21, 2026, and the second test was conducted between February 25, 2026, and February 27, 2026. Water was pumped directly out of Comanche Creek as shown in Photograph 3. Another pump was placed within the infiltration basin at the south end near the tile drain to pump water into this system. A gravel perm were placed within the basin to reduce sediment going into the tile drain.

Photograph 3. Pump intake into Comanche Creek.

During the February 20, 2026, pilot test, a total of 998,735 (3 acre-feet) gallons of water was pumped from Comanche Creek with approximately 3,000 gallons going into the tile drain system. During the February 25, 2025, pilot test, a total of 1,018,286 gallons (3.13 acre-feet) of water was pumped from Comanche Creek with approximately 3,000 gallons going into the tile drain system. The pumping rate from Comanche Creek ranged between 500 gpm to 1,000 gpm with an average pumping rate into the tile drain of 90 gpm.

The results for the tile drain system were consistent with those from the pilot test conducted using the irrigation well. Figure 3 shows the hydrographs of both tests for water levels collected at the north end of the infiltration basin, south end of the infiltration basin, and from the monitoring well as well. It also shows the pumping rates during the

test. This figure clearly shows that water discharged to the basin is recharging the shallow groundwater system. Infiltration rates calculated from the hydrographs from the pond stilling wells is about 14 feet per day that for the 0.22-acre pond equates to infiltrating 3.1 acre-feet per day consistent with values calculated from the average pumping rate of 700 gpm (3.09 acre-feet per day). These values suggest that a full-scale basin within this property could accept significant portions of flood water. For example, at these values a 20-acre pond could accept a pumping rate of about 11,700 gpm or 62 acre-feet per day. Other data currently being assessed from this property includes water quality data from Comanche Creek and the groundwater monitoring well, and sediment load data from the flood waters. This project demonstrates that Water Code 1242.1 can be applied practically and legally, not just at this pilot test site, but throughout the basin. In addition, this approach is not just about recharging groundwater but provides the multi-benefit of a flood risk management tool.

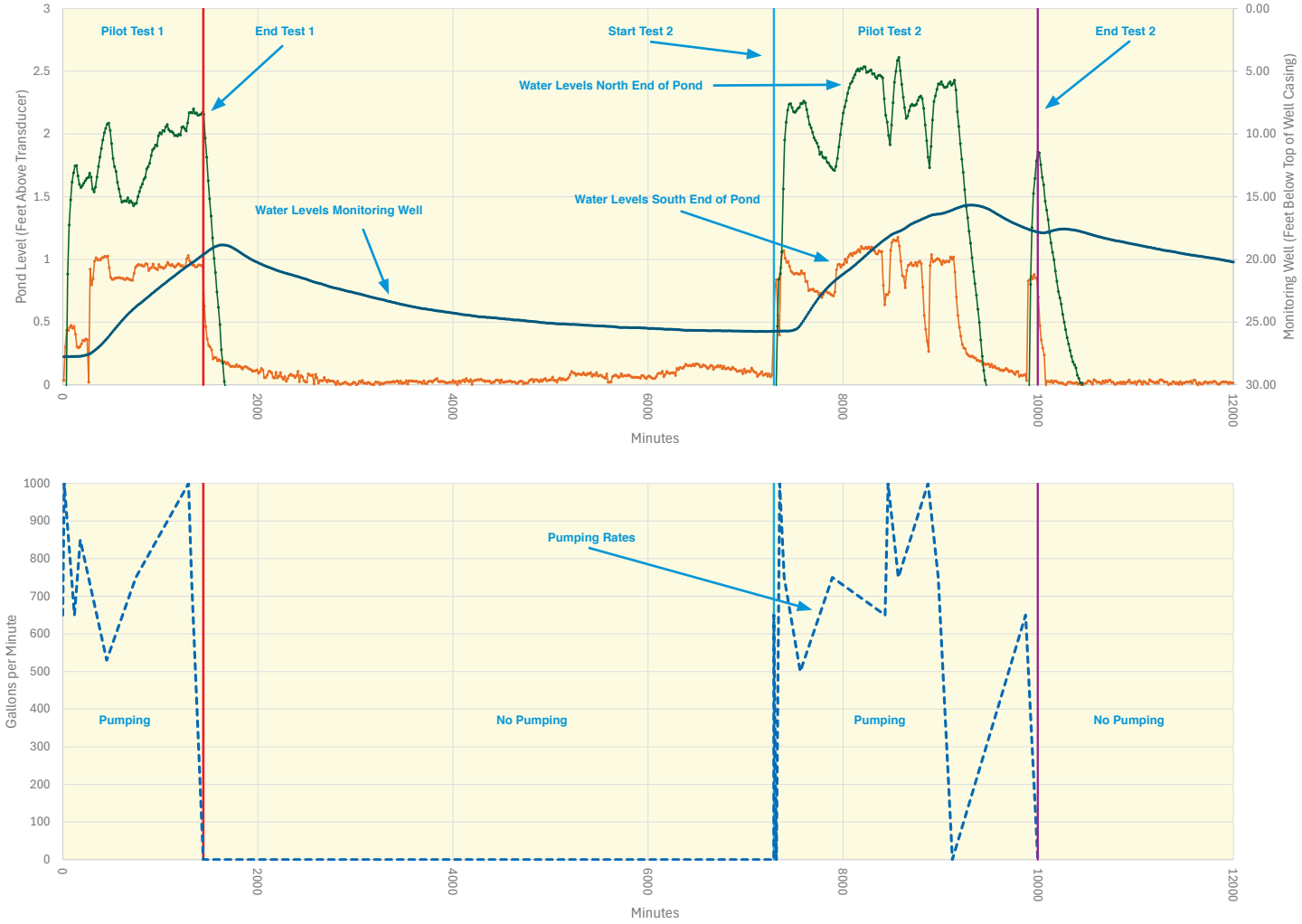


Figure 3. Hydrographs for stilling wells in infiltration basin and monitoring well (upper graph) and pumping rates of diversion from Comanche Creek (lower graph). The north stilling well is closest to Comanche Creek and where water was discharged.

4. Other Infiltration Basin Pilot Tests and Investigations

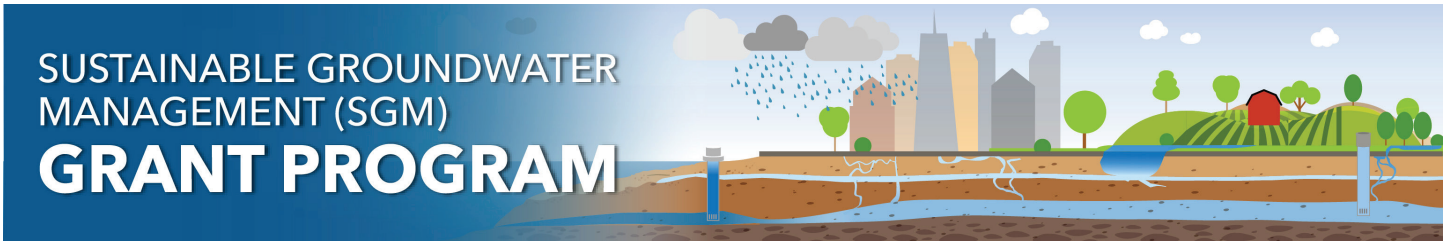
Other small infiltration basin pilot tests (Photograph 4) currently being evaluated were conducted adjacent to Rock Creek and Pine Creek. Field investigations that included infiltration testing, installation of monitoring wells, soil borings, water quality testing, and stream gauging were also conducted at these sites as well as sites located along Keefer Slough and Dry Creek are also currently being evaluated. Additional tTEM surveys were conducted at sites that bound both Rock Creek and Keefer Slough, a site along Mud Creek, and the site adjacent to Dry Creek.

Photograph 4. Infiltration basin pilot test near Pine Creek. White pipe is stilling well with transducer to record water levels

Groundwater Recharge Project Identification and Feasibility Analysis

NEXT STEPS

- Data Analysis
  - Full analysis of pilot test data to confirm initial results
  - Layout of proposed projects
  - Permitting requirements
  - Estimates of probable design and construction costs
  - Funding Options
- Prepare Field Investigation/Feasibility Report – Complete before June 30, 2026
  - Document used for project description's for future grants
- Public Outreach and Project Recap Presentations
  - May 6, 2026 - Water Commission Meeting
  - June 10, 2026 – Vina Groundwater Sustainability Agency Board Meeting
  - June 24, 2026 – Vina Stakeholder Advisory Committee Meeting



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VINA GROUNDWATER SUSTAINABILITY AGENCY

THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT

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