Update on Vina Subbasin Grant Funded Recharge Project

Butte County Water Commission
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Grant Funded Projects

Funding End Date:
March 2026

- Data Gap Identification and Data Improvement
- Demand Reduction Strategies
- Lindo Channel Recharge Feasibility
- Long-Term Fee Study
- Water Supply and Recharge Feasibility ★
- Inter-basin Coordination Analysis and Modeling
- Outreach Program
- Grant Administration

https://www.vinagsa.org/sustainable-groundwater-management-grant-funded-projects

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Water Supply & Recharge Feasibility Project

1. Identify two most promising water supply projects and complete feasibility analysis
2. Identify potential recharge pilot projects
   - Collect site-specific data
   - Conduct recharge tests (where viable)
   - Advance successful concepts to preliminary design and funding ready packages

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Recharge Method Spotlight: Reverse Tile Drains

A traditional tile drain system operated in reverse – **delivering water instead of draining or removing it.**

Water is routed into 10- to 15-foot-deep subsurface perforated pipes via surface inlets or standpipes.

From there, it **percolates below the root zone** and recharges the underlying aquifer.

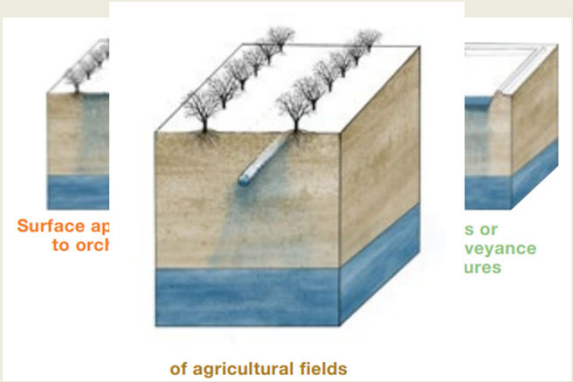

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Image credit: Almond Board of California: Introduction to Recharge report

Recharge Method Spotlight: Reverse Tile Drain Projects

Dunnigan Example – Under Development (2025)

How the System Works

- Subsurface reverse tile drains will be **installed 9-12 feet below ground** on gravelly loam soils.
- Dunnigan Water District Central Valley Project (CVP) Contract Water or high flows from the Sacramento River (e.g. 3F Water) will be used.

Recharge Benefit for 40-acre site

- Approximately 6.5 acre-feet (AF) per day
- **~1,600 AF annual recharge** when operated for 8 months/year

Costs

- Installation Cost: Around $3,400 per acre (or $4,600/acre with prevailing wage)
- **Install Cost for 40 Acres: ~$135,000 (~$185,000 w/ prevailing wage – required for grant funded projects)**
- Water Cost: Approximately **$50-$100 per acre-foot**.

➡ **Over 25 Years: $10,500/year→ $6.60 per AF**

Kern County Example (2018)

How the System Works

- Subsurface reverse tile drains were **installed 9 feet below ground** on sandy loam soils.
- California's State Water Project (Article 21) water was pumped into the system.

Recharge Benefit for 40-acre site

- Approximately 5 acre-feet (AF) per day
- **~1,825 AF annual recharge** when operated continuously

Costs

- Installation Cost: Around $2,000 per acre
- Install **Cost for 40 Acres: ~$80,000**
- Water Cost: Approximately $30 per acre-foot.

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Recharge Project Identification and Field Investigation

1. **Project Identification and Assessment**
2. **Groundwater Recharge Investigation Report**
3. **Pilot Project Implementation Report**

We have one or more recharge goals for any given recharge site or concept:

1. Flood mitigation

2. Groundwater well supply

3. Habitat support or rehabilitation (Groundwater Dependent Ecosystems)

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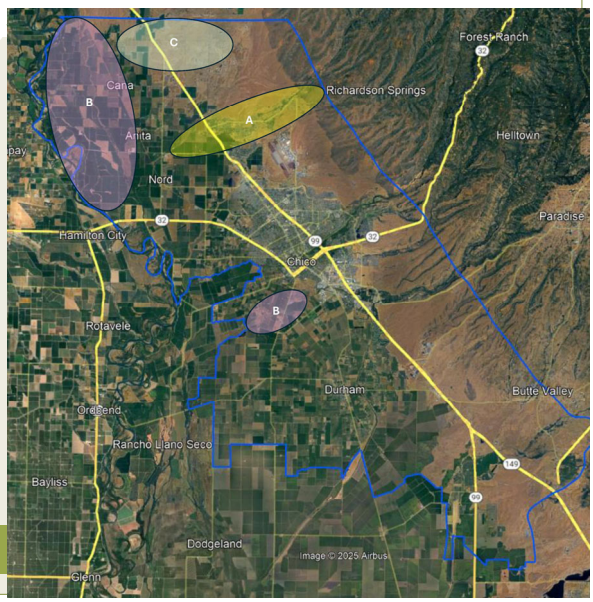
Current Status: Potential Areas and Concepts

A. Rock Creek Corridor
B. Recharge on/under Ag Land
C. Eastside Recharge

- Concept: Capture flood flows from creeks (Rock Creek, Pine Creek, Comanche Creek) into off-stream storage ponds, route them through a reverse tile drain network, and/or recharge flood flows via existing ponds and ditches.



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What will we learn?

- How recharge can work on or below orchards
- How much recharge can occur in areas with relatively shallow groundwater – where is there potential for managed recharge given depth to water conditions?
- What methods can be used to retain flood flows and move them to areas water can recharge
- Better understand natural recharge that occurs in areas east of HWY 99 and how to enhance recharge in those areas (and areas w/ cemented units)

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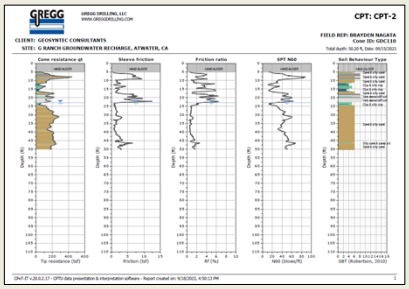
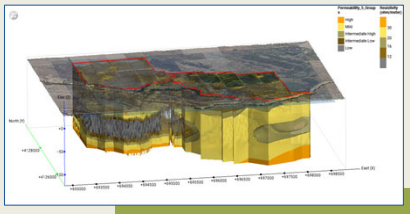
Next Steps this Summer: Field Investigations





Key Data Collection Tools

- **Infiltration rates** – Cone penetrometer tests, soil permeability from borings
- **Vertical movement** – tTEM surveys
- **Site monitoring** – Stilling wells, shallow monitoring wells, soil moisture sensors

Questions?

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