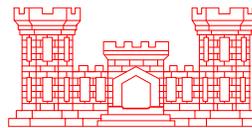


# Farmington



## Groundwater Recharge and Wetlands Feasibility Study Newsletter

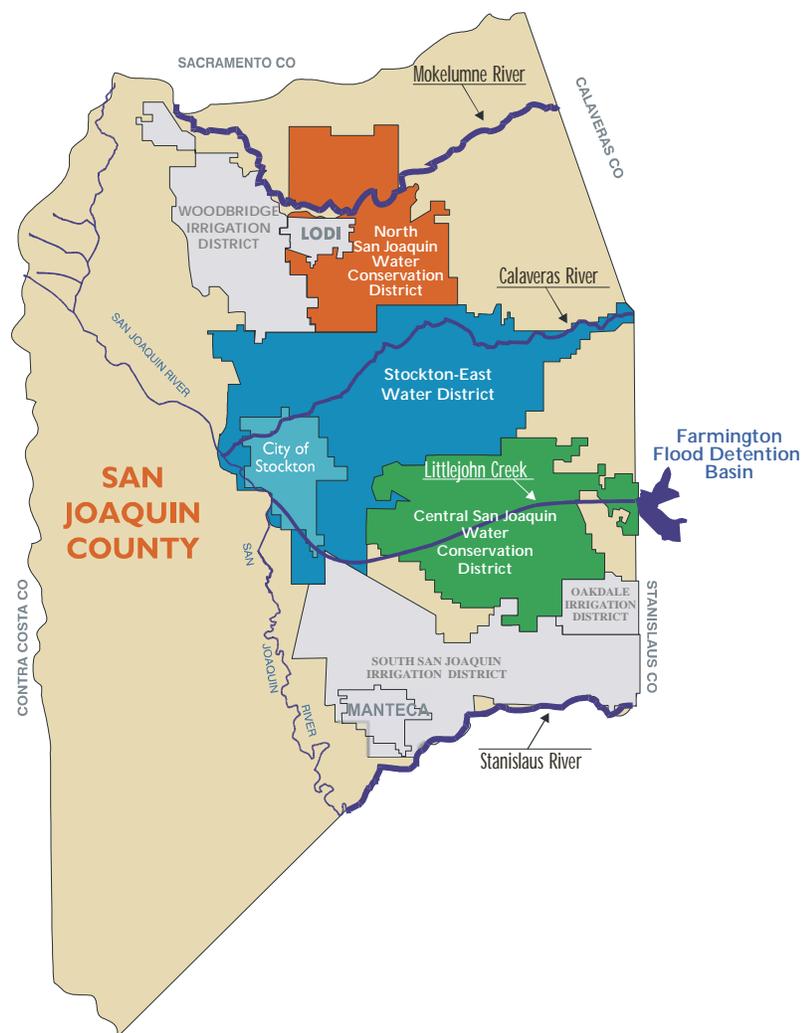
Issue 1 - Winter/Spring 2000

### Recharge Feasibility Study Begins

The Sacramento District of the U.S. Army Corps of Engineers, in partnership with several local agencies including the Stockton East Water District, is completing a feasibility study to evaluate groundwater recharge in Eastern San Joaquin County, California. The study area encompasses three water districts that overlie an area of severe groundwater overdraft.

Groundwater overdraft has been a long-term problem in Eastern San Joaquin County. Several previous studies looked at water supply management options to help restore the overdrafted aquifer. One such study, completed by the Corps in December 1997, considered operational and structural changes to the Farmington Flood Detention Dam in conjunction with groundwater recharge. That report recommended the development of a groundwater recharge project in Eastern San Joaquin County.

The Farmington Groundwater Recharge and Wetlands Feasibility Study will assess the effectiveness of different recharge techniques in Eastern San Joaquin County. The study will also consider opportunities to integrate wetland development with groundwater recharge facilities thereby providing ecosystem benefits.



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## Background

### Groundwater is Overdrafted

For nearly a century, agricultural and urban water demands in most of Eastern San Joaquin County have been met with groundwater. Over the past several decades, the amount of groundwater pumped exceeded natural recharge, lowering groundwater levels as much as 150 feet. As groundwater levels dropped, saline water migrated eastward from below the Delta, rendering groundwater unsuitable for domestic use in some areas.

“The eastern San Joaquin County aquifer is in a state of severe overdraft. If we don’t do something soon, the day will come when we will regret our inaction.”  
- Kevin Kauffman,  
General Manager SEWD

### Some Surface Water Projects are in Place

Surface water projects on major rivers provide supplemental water to the region. While these supplies have helped reduce groundwater pumping in some areas, they are not adequate to overcome the regional groundwater overdraft problem. Surface water deliveries are severely reduced during dry years, causing agricultural and urban users to increase their reliance on groundwater during drought periods.

### Groundwater Recharge Can Help

Recent studies found that the construction and operation groundwater recharge facilities can be a cost-effective way to increase available water supplies. Plentiful surface water is available during winter months in some wet years but cannot be stored. Recharging wet year supplies would increase aquifer storage and reduce the effects of continued pumping. Because existing groundwater use is widespread throughout the study area, few new facilities would be required to withdraw recharged water for existing uses in Eastern San Joaquin County.

## How Much Water is Needed?

About 200,000 acre-feet of additional water supply is needed annually in the study area to overcome groundwater overdraft and control saline water migration. Recent studies by the Corps, local sponsors, and others have shown that no single project would provide that supply, but that multiple projects would be needed. The Farmington Groundwater Recharge and Wetlands Feasibility Study will identify opportunities to meet some of these needs through groundwater recharge.

## A Regional Approach to Groundwater Recharge

The feasibility study will focus on regional groundwater recharge opportunities. As an initial step, the study team reviewed existing soil, geology, land use, water use, and groundwater information and identified conditions that influence recharge effectiveness. Shallow soils in Eastern San Joaquin County range from high permeability on the Stanislaus River fan to low permeability in the central portion of the study area.

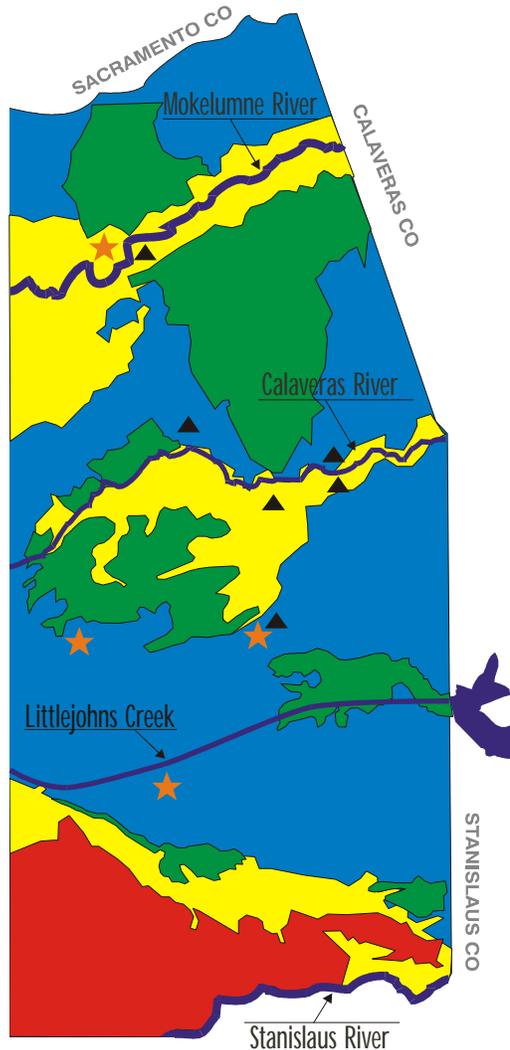
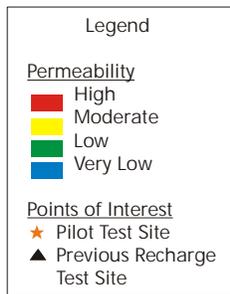
The presence of a shallow “hardpan” layer also reduces recharge rates. In areas where hardpan is encountered, recharge facilities may need to be excavated below this layer or soil modification may be needed to increase permeability through the hardpan.

The study team reviewed this information and identified candidate sites for recharge testing. Candidate test sites were assessed based on their ability to provide representative information that could be applied regionally. Four sites were selected for pilot-scale recharge testing from an initial list of 15 candidate sites.

In addition to the pilot-tested percolation

## Pilot Recharge Test Are Under Way

In December, 1999 recharge testing began at four sites in Eastern San Joaquin County. At each site, at least two test facilities were constructed to provide comparative information about percolation recharge effectiveness. Recharge techniques being tested include field flooding, shallow spreading basins, and pits to depths of 15 feet.



### Shallow Soils in Eastern San Joaquin County

Recharge effectiveness is being measured in two ways. First, the volume of applied water is being monitored, and adjusted for climatic conditions, to determine how quickly water percolates into the ground. Then, groundwater levels are being monitored to determine when the recharged water reaches the groundwater table.

Information collected during these tests will be used to estimate long-term recharge effectiveness for use in the study.

## Initial Results Are Encouraging

Initial recharge rates at the test sites have been very encouraging. After approximately one month of operation, sustained rates of one to four feet per day have been recorded. These responses are consistent with initial rates of other successful recharge facilities in the Central Valley.

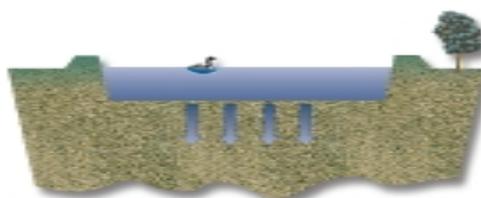
Long term rates, however, are expected to be lower as seen at other groundwater recharge projects throughout California. Factors that can affect long-term recharge rates include accumulation of fine sediment on the bottom of spreading basins, algae growth, and the saturation of soils near the recharge facility. As the tests continue, the study team will monitor changes in recharge rates closely and identify groundwater level responses.

## Feasibility Report is the Next Milestone

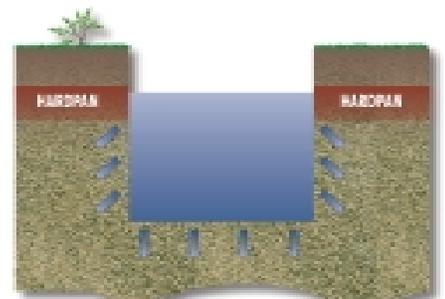
The Feasibility Report will compare the cost-effectiveness of groundwater recharge facilities at various locations in the study area. Factors to be considered include anticipated recharge effectiveness, costs of conveyance and recharge facilities, and ecosystem benefits could be derived from the integration of wetlands development.



Flooded Field



Spreading Basin



Excavated Pit

In addition to the pilot-tested percolation techniques, the Feasibility Report will consider the costs and potential benefits of enhanced recharge through streams, groundwater injection, and the development of systems to increase surface water usage in lieu of groundwater pumping.

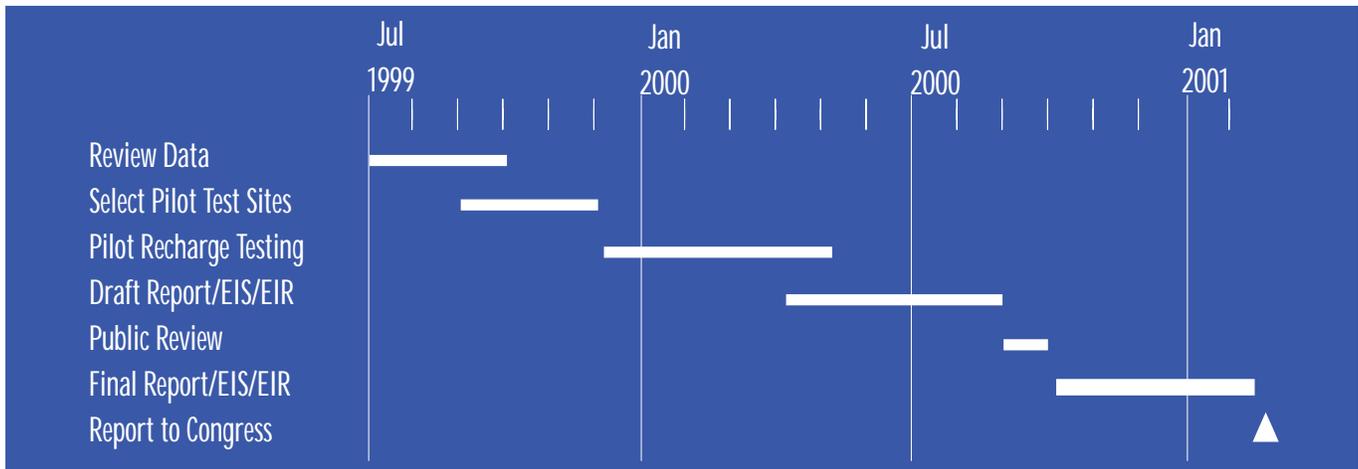
The Feasibility Report will describe a base project that would use existing water supplies. Optional increments will also be identified that could be developed as new water supplies are secured. A programmatic environmental impact statement and environmental impact report (EIS/EIR) will accompany the Feasibility Report.

## Study Management

The Farmington Groundwater Recharge and Wetlands Feasibility Study is a joint effort by the Corps of Engineers and a group of local sponsors. A Study Management Team and Executive Coordinating Committee provide guidance and oversight for the study.

- Stockton East Water District
- Central San Joaquin Water Conservation District
- North San Joaquin Water Conservation District
- City of Stockton
- San Joaquin County
- U.S. Army Corps of Engineers

## Study Schedule



## For More Information

For additional information on the Farmington Groundwater Recharge and Wetlands Feasibility Study, please contact the study management team.

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