LOCAL GROUNDWATER ASSISTANCE PROGRAM

PROJECT DESCRIPTION

According to the annual Deep Groundwater Survey conducted by District staff in December 2011, Westlands Water District has 94% of operating groundwater wells metered. The 2012 Well Metering Project will consist of installing the remaining 6% of the groundwater meters within the District and with the remaining funds repair or replace existing meters that are no longer functional and install devices to improve accuracy.

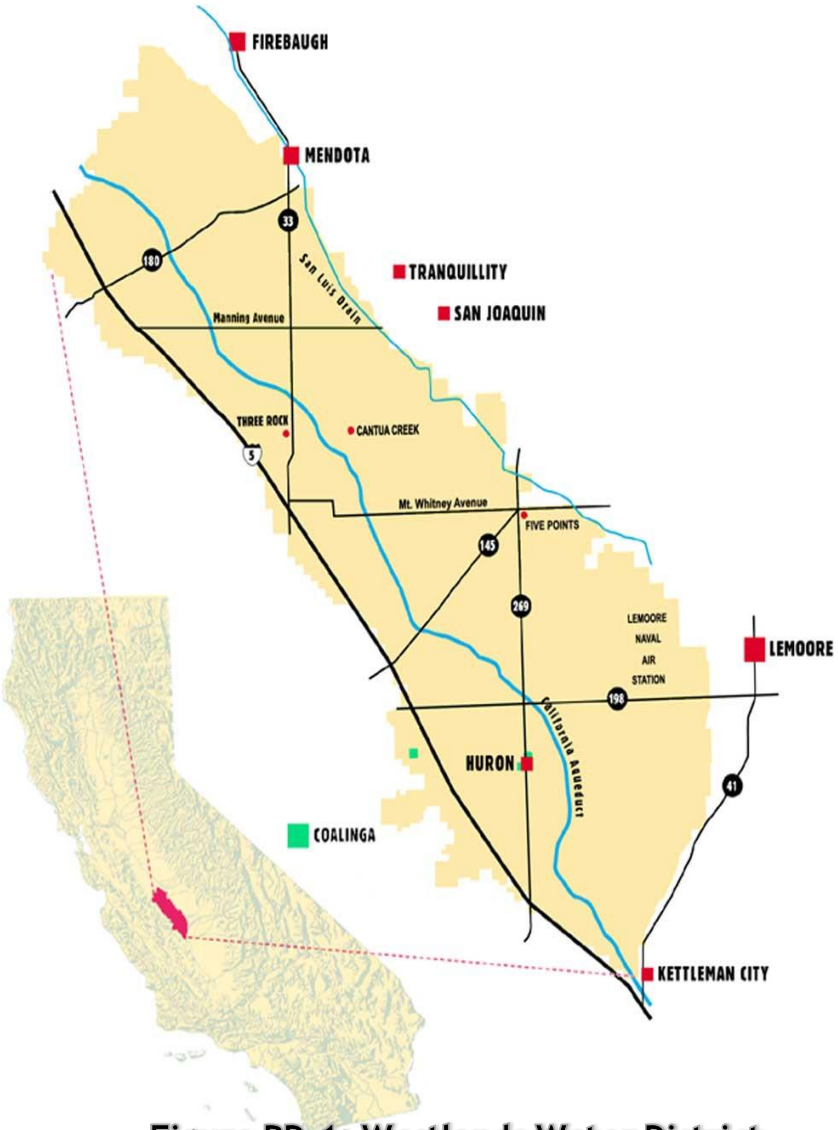

Figure PD-1: Westlands Water District

Westlands consists of nearly 1,000 square miles of prime farmland between the Diablo Range of the California Coast Range Mountains and the lowest point of the San Joaquin Valley in western Fresno and Kings Counties. Westlands averages 15 miles in width and stretches 70 miles from Mendota on the north to Kettleman City on the south. Westlands is located in both Fresno and Kings Counties with Huron and Lemoore Naval Air Station the only communities within the District. Figure PD-1 shows the general location of Westlands in the western portion of the San Joaquin Valley and shows locations of cities and roads within and adjacent to the District.

Westlands formed under California Water District Law in 1952 upon petition of landowners located within the District proposed boundaries. Nearly all land within the current Westlands' boundaries was at one time farmed using groundwater. The permanent distribution system was built between 1965 and 1979 which consists of a closed, buried pipeline network designed to convey irrigation water to 160- or 320-acre land units from the San Luis Canal (SLC), the Coalinga Canal (CC), and a 7.4-mile unlined canal from the Mendota Pool. The area served by the completed system serves approximately 88 percent of the irrigable land in the District, including all land lying east of the SLC. Water is distributed through 1,034 miles of buried pipe, varying in diameter from 10 to 96 inches. Gravity and pumps feed 38 lateral pipelines from the east bank of the SLC, while water is pumped into 27 laterals on the west bank. Six partially completed laterals are served from the CC. Farmers control individual deliveries at each of the more than 3,200 metered outlet valves.

Westlands' farmers work some of the most fertile and productive land in the world, producing vital food and fiber products as well as from renewable natural resources. Westlands' farmers have combined generations of family tradition with state-of-the-art advances in modern agricultural practices which produce more than 60 different crops and have the potential for numerous other crops. Westlands agricultural productivity, unlike many other major growing areas in California, is not directly threatened by urbanization. Westlands farmers produce the three-way benefit of (1) superior crop yields, (2) high crop values, and (3) low water use, which is an irreplaceable asset to California and the United States now and for many years to come.

Westlands Water District's primary source is surface water obtained from the CVP allocation the District receives, which is supplemented by pumped groundwater. The reduction of CVP water and other surface water supplies has resulted in the construction of many new wells, to obtain additional supplement water to make up for the shortfall in surface irrigation water. During 1990-1999, two hundred eighty-two wells were constructed within the District and from 2000-2009 an additional 186 wells were constructed, with 140 of these wells constructed in the later three years. In accordance with the GWMP, Westlands Water District performs annual groundwater monitoring and collaborates with the California Statewide Groundwater Elevation Monitoring Program (CASGEM). Westlands Water District is registered with CASGEM as agency number 5646. The District will continue to supply CASGEM with annual data retrieved by the Districts technicians. Monitoring is done by sounding each well while in a static condition and measuring the electrical conductivity of the water while the well is operating. The result is the Deep Groundwater

Conditions Report, which allows the District to estimate District-wide pumped groundwater quantities as well as calculate seasonal application efficiency.

The groundwater basin underlying the District is comprised generally of two water-bearing zones: (1) an upper zone above a nearly impervious Corcoran Clay layer containing the Coastal and Sierran aquifers and (2) a lower zone below the Corcoran Clay containing the Sub-Corcoran aquifer. A generalized cross section of the District showing the Corcoran Clay and these water-bearing zones is shown in Figure PD-2. The Corcoran Clay separates the upper and lower water bearing zones in the majority of the District; however, it is not continuous and diminishes near the San Luis Canal. Except for the western portion of the district, Westlands is generally considered to be sitting above a saline salt sink, which describes the upper unconfined aquifer or otherwise called shallow groundwater. Salinization, or salt build-up in the soil, is one of the oldest problems faced by irrigated agriculture. Complicating Westlands' salinity problems is its soil structure in some areas where dense clay layers of varying depth and thickness restrict natural drainage. This causes an accumulation of unused irrigation water above the clay layers, resulting in a near-surface saline water table. Because of the high salinity, water users within the District generally build groundwater wells to access the lower water bearing zone.

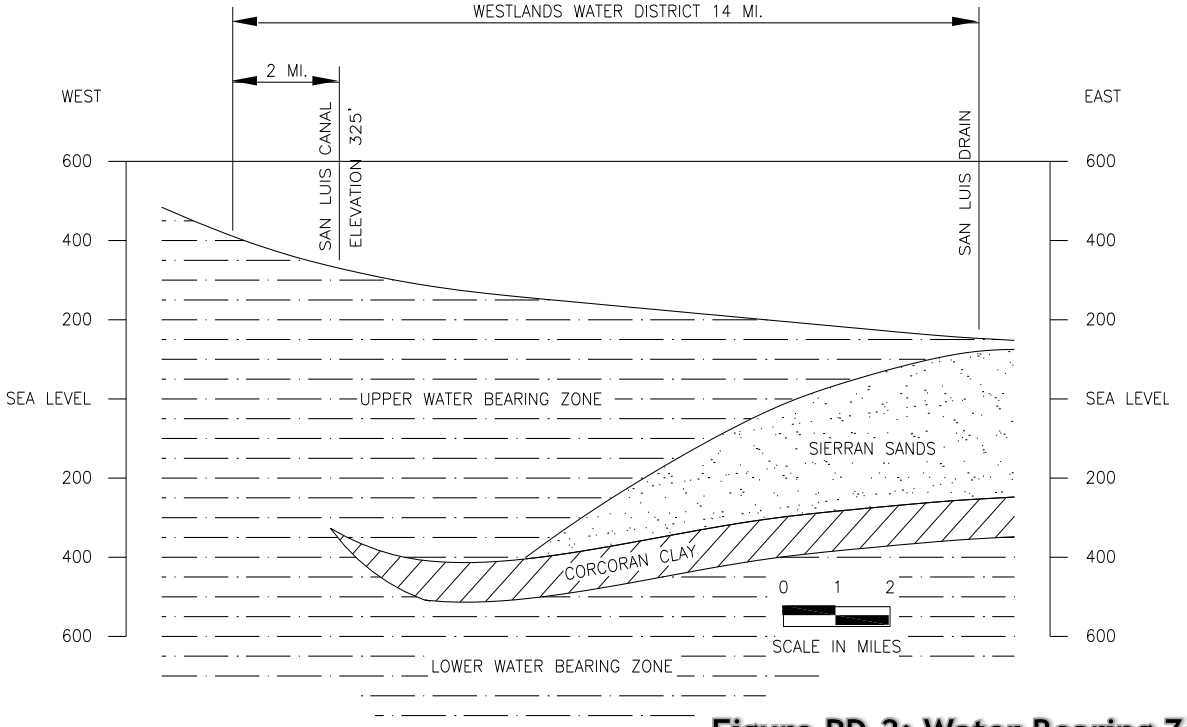

Figure PD-2: Water Bearing Zones

Westlands Water District's use of groundwater as a supplement to the CVP allocations warranted a development of a Groundwater Management Plan. The District's GWMP was approved in 1996. This plan states in section 7 of *Proposed Programs*:

> "Groundwater Meters: The District will recommend to landowners and water users that all groundwater wells extracting groundwater within the District boundaries be equipped with a water meter. The District may develop and implement a program to maintain groundwater meters similar to the program which already exists for the District's surface water meters."

Currently, Westlands Water District is working to improve and update the GWMP. The proposed edit to section 7 of *Proposed Programs* reads:

> "Groundwater Well Meters: The District will require that all landowner and water user groundwater wells extracting groundwater within the District boundaries be equipped with a meter. The District will develop and implement a program to install and maintain groundwater meters similar to the program, which already exists for the District's surface water meters."

The use of meters to measure water delivery is a cornerstone of any water conservation program and management plan. Meters enable water managers to accurately allocate limited supplies and groundwater meters help determine accurate supplemental amounts. Groundwater measurement has proven a useful tool to individual farmers to help them better manage water supplies, facilitate accurate irrigation scheduling, monitor pump efficiency, and participate in District groundwater programs. Such measurement also enables the District to better monitor groundwater supplies, calculate drought effects and determine water needs.

Water meters are required at each well participating in any of the District's conjunctive use programs. The Distribution Integration Program (DIP) allows a water user to pump groundwater into the District's Distribution System which conveys groundwater to other points of use within the District. In times of drought and restricted pumping, DWR has allowed the District's water users to participate in the Canal Integration Program (CIP) in which groundwater is pumped and conveyed through the SLC. The DIP program is used annually except when the District receives full water supply. Water users participating in the program received surface water credits for the volume of groundwater pumped into the Districts distribution system. Thus, groundwater monitoring is an essential part of managing any conjunctive use program.

2012 Well Metering Project

All water users participating in the conjunctive use programs are required to have meters. Since this is a highly used program, 94% of the wells in the District have meters. The Districts goal is to assume responsibility for the maintenance, monitoring and operations of all groundwater meters within the District; information obtained can be supplied to all water users via the established Westlands Water District website (westlandswater.org) and levels can be monitored accurately and efficiently. In addition to the annual Deep Groundwater Survey, in May and June of 2012 a survey was conducted to determine the condition of the wells within the District. 86% of the wells within the District were found and evaluated. Each well was checked to determine if a meter is currently equipped and if so, the condition of the meter, the functionality of the setup and its accuracy.

Funding from the LGA Grant will provide for all of the new meters and any parts required to repair or to improve functionality of existing meters. Westlands Water District will provide all costs involved with administration and labor. Westlands Water District will also provide all of the operation, maintenance and meter reading costs once the meters are fully operational.