Sebastopol Water Well Monitoring Program

The Sebastopol Water Information Group (SWIG) is a non-profit community-oriented citizen group that has worked for many years to provide technical support and information to all water users in the Sebastopol area. One important SWIG project has been to measure water levels in domestic water wells near Sebastopol, to obtain seasonal hydrologic information of area-wide water levels.

Since 2005, SWiG's well monitoring program has been supported by grants from the Northern California Environmental Grassroots Fund, which allowed us to purchase 2 sonic well meters and a tape well meter, a computer for reducing the monitoring data, and a digital projector for public presentations on local water issues.

In 1999 SWIG members began measuring water levels south of Sebastopol, following landowner's complaints of failing domestic water supply wells. Most of these wells were located on or in the area surrounding Cooper Road, where more than 20 wells were documented to have gone dry after installation of a new municipal water supply well (Well #7) owned and operated by the City of Sebastopol and located at the corner of Gravenstein Highway and Cooper Road.

Information from the City of Sebastopol indicated that in 1999 it was pumping over 450 million gallons of water annually from four active municipal wells within the incorporated area of Sebastopol. At that time, Well #7 and nearby Well #6, located on Cotter Court, supplied over 60 percent of the City's water. Both wells are located on the south side of Sebastopol, close to Cooper Road.

Sebastopol is one of the few cities in Sonoma County that supplies water from groundwater sources and is not connected to the larger Sonoma County Water Agency (SCWA) network, which draws water supplies from collectors in the Russian River. Sebastopol has historically operated four or five municipal wells within the City boundaries, to supply municipal water to residents and businesses within the city limits. Currently Sebastopol has four active municipal wells.

By the 1960s, contamination from a former dry cleaner and leaking underground storage tanks had impacted water supply Well #5, located on Fannen Avenue, making the well unusable. Contamination from leaking underground fuel storage tanks also impacted water supply well #4 in Spooner Park, but a large scale treatment system, using carbon and sand filtration, now renders that well water drinkable. In the past several years, Sebastopol replaced collapsed Well #2, located on Jewell Avenue, by drilling Well #8 at the same Site.

City records from 2008 to 2011 indicate that Sebastopol pumped approximately 380 to 340 million gallons of groundwater for municipal and residential uses. SWIG members and City leaders are engaged in a collaborative process with

other Santa Rosa Plain water users to create a program for managing local groundwater resources.

The water level measurement efforts described here are part of the ongoing efforts to obtain general information about water supply withdrawals, and corresponding groundwater levels in the greater Sebastopol area. The aim is to understand the water supply and meet the needs of all users.

The SCWA also extracts groundwater from the Sebastopol area. In response to the 1976 drought, SCWA drilled three large municipal wells in the Laguna de Santa Rosa for emergency backup supplies. Each well is approximately one mile from the City of Sebastopol, to the northeast, east, and southeast.

Between 2000 and 2009, SCWA pumped the wells to supply water to SCWA municipal contractors. Data obtained by SWIG indicate that between 2004 and 2009, some 4,000 to nearly 6,000 acre-feet of water were pumped annually from the three wells and fed into the SCWA aqueduct for municipal use.

The combined pumping from Sebastopol, SCWA, and Rohnert Park wells created a broad lowering of groundwater levels across the southern Santa Rosa Plain.

Results of SWiG well monitoring (see below) indicate that groundwater levels generally have been rising since 2004.

CASGEM

In November 2009 the California State Legislature amended the State Water Code to mandate a statewide groundwater elevation monitoring program, which tracks seasonal and long-term groundwater elevation trends in California's groundwater basins. To achieve that goal, the amendment requires collaboration between local monitoring entities and the State Department of Water Resources (DWR) to collect groundwater elevation data. Accordingly, DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program, to establish a permanent, locally-managed program of regular and systematic monitoring in all of California's alluvial groundwater basins.

The CASGEM program relies upon the many established local long-term groundwater monitoring and management programs in California. SWIG's well monitoring program has been recognized as a valid Sonoma County program, and DWR invited SWiG to contribute our data to CASGEM.

Water Level Measurements

SWIG has performed water level measurements for wells located on Cooper Road since 1997. Starting in May 2009, SWIG formalized a broader water level measurement program that includes 12 domestic water supply wells located north and south of Sebastopol, and west of the Laguna de Santa Rosa (see map). The wells draw water from portions of both the Wilson Grove Highlands and the Laguna de Santa Rosa hydrologic areas. The selected wells represent a broad variety of well types in the Sebastopol area, and include several wells that were installed since 2001, to replace failed wells. Although well driller logs are not always available in public records, we have attempted to obtain this information on participating wells.

SWiG measures participating wells on a semi-annual basis to coincide with the expected seasonal high and low water levels in May and October. Water levels are measured when the well has not been used for a minimum of two hours prior to measurement, allowing recovery of the water level to the static level. Measurements are obtained using either a sonic water meter or a standard electrical water level tape. The sonic meter is the preferred device, because it is easier to use and does not require any instruments or equipment to enter the well, so minimizes the chance of well contamination.

Well water levels are measured from the top of the well casing, and then standardized to an elevation referred to mean sea level. This is accomplished by estimating the top of well casing elevation from both US Geological Survey quadrangle maps and Google Earth, to establish ground elevation at the well location. Water level elevations can then be calculated. We enter this information into Surfer®, a computer program, to construct the accompanying diagram showing the maximum groundwater levels (potentiometric water elevations) — the yellow lines on the map for the sampling area, and to calculate groundwater flow directions (north of east, from highest to lowest elevation line) and anomalies (circular elevation lines).

Results

Water levels in Sebastopol vary from artesian conditions (groundwater is present at the top of the well casing), to water depths greater than 140 feet below the ground surface. Seasonal variations are one to 25 feet, depending upon seasonal rainfall and water usage. SWiG does not measure water usage for private wells participating in the well survey.

From the data collected to date, the following conclusions can be made about groundwater conditions in and near Sebastopol:

- Groundwater generally flows easterly from the upland of Pleasant Hill Road, which separates the Atascadero & Green Valley Creek drainage from the part of the Wilson Grove Highlands beneath Sebastopol, and from the Laguna de Santa Rosa.

- Depth to groundwater varies seasonally, sometimes as much as a 25 foot difference in a six-month period.

- Groundwater levels in the area of Cooper Road indicate localized anomalies in elevations that may be associated with either variations in subsurface materials, or the presence of discontinuities such as fault zones (not known as active earthquake faults, however).

- Local municipal well pumping can have a long-term effect on water levels of domestic water supply wells. Shallow and deeper groundwater bearing zones appears to be hydraulically connected.

- Additional long-term monitoring is needed to establish how groundwater levels change over time, and to establish baseline conditions during long-term climatic changes including drought and climate change.

- Education, and sharing of water source information with both well owners and established municipalities have proven beneficial for raising resource awareness and to provide opportunities for coordinated resource management.

- Management of groundwater demand, and protection of water quality and recharge areas, are needed to protect this valuable public resource.