COUNTY OF LAKE **WATER RESOURCES DEPARTMENT**

M E M O R A N D U M

TO: Board of Supervisors

FROM: Will Evans, Deputy Director – Water Resources
by Tom Smythe, Water Resources Engineer

SUBJECT: Groundwater Conditions
Spring 2016

DATE: April 20, 2016

Staff has been measuring groundwater levels in the major groundwater basins in the county since the early 1960's. Due to statewide drought conditions, for the last three years, we have provided periodic updates on our groundwater levels. These updates are also posted on our website at http://www.co.lake.ca.us/Government/Directory/Water_Resources/Department_Programs/Groundwater_Data.htm.

Staff measured 80 water wells in the major groundwater basins between April 11 and April 13, 2016. Following is a summary of groundwater levels. Spring groundwater levels in Lake County were near normal, with some areas above average and some below average spring levels. Compared to other areas of California, especially those areas south of the Delta, Lake County's groundwater impacts in the major aquifers from the drought appear to be limited.

These summaries are general statements and due to varying aquifer conditions do not cover all conditions. Individual well owners may experience conditions substantially different than the general condition (some of our wells show markedly different conditions than other nearby wells) and problems are more likely with shallow wells. This does not include other smaller aquifers and water bearing formations, such as the Clear Lake Volcanics, within Lake County. Approximately 70% of the groundwater use in the County is extracted from the measured groundwater basins.

Attached are maps of each major groundwater basin showing the wells measured. Each well is labeled as follows:

- Well Number: This is a number assigned by the State, for instance 14N-09W-32M1. The well number identifies the well by Township, Range, Section number and by lot within the section (there are 16 lots).
- S Avg: This is the average spring (April) water level, typically the highest of the year. Most wells were measured since the early or mid-1960's, however, some wells have data going back to the late 1940's and new wells have been added to the network. The long record can document changes in the physical groundwater condition (i.e. down cut stream channels lower the maximum possible groundwater level), changes in irrigation practices (i.e. changes in crop types and irrigation demands), and seasonal impacts (i.e. droughts).
- F Avg: This is the average fall (October) water level, typically the lowest of the year.

- Spring 2016: This is the water level measured during the period of April 11 and April 13, 2016. If no number is provided, this indicates we were unable to measure the well for some reason (i.e., the pump house was locked).

These maps only tell part of the story of each groundwater basin, as long term groundwater conditions due to changing water use and aquifer conditions can have a substantial effect the average spring and fall levels. Conditions are also different within different areas within a basin. We evaluated numerous hydrographs (plots of groundwater levels over time) within each basin to prepare the following summary. Well hydrographs are available on the Lake County Water Resources website under Department Programs – Groundwater Data.

Big Valley

Big Valley is the largest groundwater basin and the most complicated due to its geology (there are numerous major aquifers, some of which have limited connection to adjacent aquifers), recharge characteristics (there are multiple sources of recharge) and differing land use and groundwater use patterns. From the maps, it looked like most of the basin has good groundwater levels.

Wight Way: We have measurements on three wells along Wight Way. Each of the three wells measured had groundwater levels substantially above the spring average.

Kelseyville Bench/Gold Dust Drive: This area is served by a deep aquifer of volcanic ash. Groundwater is showing a several year decline. Recharge of this aquifer is from runoff over the exposed ash layer, which is very limited in extent and has limited recharge. Groundwater levels have begun to recover, however, with all wells remain below average spring levels. This area will probably require several normal runoff years to fully recover from the drought.

Western Valley Floor: This is the main portion of the valley floor to the west of McGaugh Slough, including areas along Adobe Creek and Manning Creek. Most of the wells were above the average spring level.

Eastern and Northeastern Valley Floor: This is the area east of McGaugh Slough. Most of the wells were above the average spring level.

Collayomi Valley

Conditions look good, with most of the wells above average. We stil.l have 3 wells that are inaccessible due to damage from the Valley Fire. We will work with property owners to re-establish measurements in the damaged wells.

Coyote Valley

Coyote Valley has several sub basins, including the main basin (includes Hidden Valley Lake), Crazy Creek basin and the east basin (Comstock and Luchetti).

Most of the water intensive development, including HVLCSD's water wells, is within the main basin. Groundwater levels have recovered some, however, they remain below average.

Groundwater pumping has increased substantially in the Crazy Creek basin in the last 15 years, so it is difficult to determine potential impacts (11N-06W-25P1). There has been little recovery of the well over the past winter.

We were unable to measure the one well we have in this area due to a locked gate.

High Valley

The two wells measured are slightly lower than average, however, water levels appear to be higher than were common during the 1960's. Historically, High Valley groundwater levels have been slow to recover from droughts, probably due to a limited recharge area. With increased irrigation of wine grapes over the last 10-20 years, it is not clear whether this type of recovery will continue to occur.

Scotts Valley

The main groundwater storage in in Scotts Valley is at the south end of the valley. Wells at the south end of the valley are near average levels, with the northern wells near mid-valley being above average. The reduction of agricultural irrigation in Scotts Valley has resulted in increased water levels over the last 10 years, however, they have not recovered to 1960's levels due channel downcutting reducing overall storage in the early 1970's..

Upper Lake Valley

All three wells in Bachelor Valley are near average spring levels.

Groundwater levels in the Upper Lake area have recovered to normal full levels. These are below full levels prior to the 1980's, probably due to storage losses in the aquifer due to downcutting of the Middle Creek channel. The one exception to this is the well we measured in Clover Valley, which remains substantially below normal full levels.

Conclusion

Groundwater levels in Lake County are near normal, with the deviation from average conditions generally small. Compared to other areas of California, especially those areas south of the Delta, the impacts of the drought on Lake County's groundwater appear to be limited. No significant groundwater shortages are anticipated in the major aquifers.

Our measurements only occurred in the seven largest groundwater basins in the County. Approximately 70% of the groundwater extracted in the County is from these basins. Our analysis does not include other smaller aquifers and other water bearing formations, such as the Clear Lake Volcanics, within Lake County.

Lake County has small aquifers which are able to refill quickly with slightly below to normal precipitation. This permits much of Lake County to recover from drought conditions quickly. However, our smaller aquifers do not have much carryover into subsequent years, therefore, droughts that extend over several years, such as occurred in 1987-1992 can have greater impact on groundwater levels than one or two extremely dry years, such as 1976-77 and 2013-2015.

We encourage all water users to use water wisely and conserve our precious supplies for future use and generations, and to protect our limited water supplies if the drought persists.

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