STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF SEPTEMBER 25-26, 2014
Prepared on September 17, 2014

ITEM NUMBER: **19**

SUBJECT: **Los Osos Groundwater Basin Management**

STAFF CONTACT: **Harvey Packard, 805/542-4639, Harvey.packard@waterboards.ca.gov**

DISCUSSION

In August 2008, the San Luis Obispo County Superior Court approved an interlocutory stipulated judgment in response to litigation filed by the Los Osos Community Services District (LOCSD) against Golden State Water Company, S&T Mutual Water Company, and San Luis Obispo County. These parties are known as the ISJ Working Group. The judgment requires the parties to work cooperatively to study and manage the Los Osos Groundwater Basin.

In August 2013, the ISJ Working Group published *Public Review Draft Basin Plan for the Los Osos Groundwater Basin*. The Los Osos Basin Plan describes the basin; challenges facing the basin, such as pollution and seawater intrusion; and proposes management measures to "provide sustainable water supplies for existing and future residential, commercial, institutional and agricultural development with Los Osos." (p. 1)

This staff report provides some background information regarding aquifer zone characterization and seawater intrusion. The information comes directly from the Los Osos Basin Plan.

Los Osos Groundwater Basin Aquifer Zone Characterization (Basin Plan section 5.4)

The Basin is made up of several sub-horizontal aquifer layers, each of which has distinct characteristics. For ease of reference, the aquifer layers are described as Zones A through E and the Alluvial Aquifer, as shown on the west-east cross-section included as Attachment 1. For most purposes in this Basin Plan, Zones A and B are also referred to as the perched aquifers, Zone C is referred to as the Upper Aquifer, and Zones D and E are referred to collectively as the Lower Aquifer. First Water refers to the shallowest groundwater zones and includes the Alluvial Aquifer, the perched aquifer, and the top portion of the Upper Aquifer (Zone C) where not overlain by the alluvial or perched aquifer.

Seawater Intrusion into the Basin (Basin Plan section 5.9)

Given that Lower Aquifer groundwater elevations inland of the coast have been below sea level or within a few feet of sea level for many years, seawater intrusion was inevitable. Upper Aquifer groundwater elevations have remained above the elevation needed to preclude intrusion. Between 1985 and 2005, the average annual rate of intrusion in Lower Aquifer Zone D was estimated at 60 feet per year for the 250 mg/l isochlor line. Zone E intrusion was estimated at 54 feet per year. Data from the 2005 study also showed the rate of intrusion for precursor trends (early-detection at lower chloride concentrations based on ion ratios) at approximately 200 feet per year between Golden State Water Company wells Pecho and Rosina, and approximately 600 feet per year between Golden State Water Company's Rosina well and LOCSD's Palisades well. A water quality monitoring survey conducted between November 2009 and January 2010

provided updated estimates concerning the rate and extent of seawater intrusion, and indicated that the rate of intrusion was accelerating at that time.

Rates of seawater intrusion are affected primarily by water levels (pressure gradients) and aquifer permeability. The rate of intrusion is typically not uniform over time, but varies seasonally according to pumping cycles, and is accelerated during drought periods. Intrusion may also not be uniform within the aquifer zones, but may follow preferential pathways along discrete sand gravel layers being tapped by pumping wells. Results of the 2009-2010 monitoring event, which followed three years of drought conditions, were interpreted to indicate that the average horizontal rate of intrusion between 2005 and 2010, based on the 250 mg/l isochlor, had accelerated to match the early precursor rates (up to approximately 700 feet per year), and had reached the LOCSD Palisades well.

Evidence of accelerated seawater intrusion since 2005 has also been confirmed with geophysics at a deep monitoring well (LA4), where there has been a vertical rise in the seawater interface of 25 feet since the 2005 survey. By comparison, the seawater interface rose 30 feet at Well LA4 between 1985 and 2005, a 20-year period. In early 2013, work at the LOCSD Palisades well confirmed that intrusion into the well was occurring in Zone E. Zone D water quality at the well is close to historical (pre-intrusion) quality. Using recent information on the flow and salt loading contributions of each Lower Aquifer zone, a back-calculation of historical water quality data shows that the intrusion front in Zone E had already reached the Palisades well by 2005. This means that the estimated historical rate of seawater intrusion in Zone E between 1977 and 2005 changes from 54 feet per year to approximately 180 feet per year, and while accelerated rates of intrusion since 2005 have occurred, they may not be as high as rates calculated in 2010. Attachments 2 and 3 show the advance of seawater intrusion though time.

Current Conditions

Central Coast Water Board staff is not aware of any new information or data regarding seawater intrusion beyond that provided in the draft Basin Plan and summarized in this staff report. Staff, in a letter dated August 28, 2014 (see Attachment 4), asked the ISJ Working Group to participate in this agenda item to update the Central Coast Water Board directly. The LOCSD and the S&T Mutual Water Company each declined to do so, citing confidentiality of the ISJ Working Group discussions (and unavailability of key staff due to previously planned vacations). Neither Golden State Water Company nor San Luis Obispo County responded to the letter.

Attachment 5 is a letter addressed to the Central Coast Water Board from the Santa Lucia Chapter of the Sierra Club, outlined the club's support and action to promote water quality in the Los Osos Groundwater Basin.

The Central Coast Water Board has been evaluating methods to incentivize or influence groundwater basin management activities given the ISJ Working Group's limited action to finalize the Los Osos Basin Plan, implement the basin management measures in a timely way, and communicate openly with the Central Coast Water Board and the public. For example, the Central Coast Water Board may request that the State Water Resources Control Board evaluate use of its authority if the ISJ Working Group members are unwilling or unable to demonstrate implementation of timely actions to stabilize and protect the groundwater basin.

ATTACHMENTS

1. Los Osos Groundwater Basin Cross Section, West-East

2. Historical Progression of Seawater Intrusion in the Lower Aquifer
3. Seawater Intrusion Wedge (2009)
4. Central Coast Water Board Letter Dated August 28, 2014
5. Sierra Club Letter Dated August 11, 2014