TODD GROUNDWATER

6 April 2015

MEMORANDUM

To: Bob Jaques, Seaside Basin Watermaster Technical Program Manager

From: Gus Yates, Senior Hydrologist, Todd Groundwater

Re: Groundwater Management Options and Recommendations for the Laguna Seca-El Toro Region

I recently completed a peer review of groundwater modeling studies of the Seaside Basin. During that process I became aware that the Watermaster Board would welcome input on groundwater management options for the Laguna Seca Subarea in light of the effect that nearby pumping outside the basin appears to have on groundwater levels and yield within the basin. The basin boundary assumed for the purpose of adjudication is not actually a physical boundary within the groundwater flow system. The Paso Robles and Santa Margarita Aquifers continue uninterrupted from the Laguna Seca Subarea into the El Toro Subarea. This memorandum describes my thoughts and recommendations regarding management of groundwater in the Laguna Seca and El Toro areas.

Unlike the Coastal Subareas, the Laguna Seca Subarea will not benefit from proposed projects that would import water to the Seaside Basin. The Seaside Basin Groundwater Replenishment Project (GWR Project) will import highly-treated recycled water from the MRWPCA and inject the water into the Seaside Basin near the eastern border of the Northern Coastal Subarea. The Monterey Peninsula Water Supply Project (MPWSP) would import water from a seawater desalination facility to be constructed near Marina. The water would be introduced directly into water distribution systems operated by California American Water Company (Cal-Am). Both projects are in active stages of design, permitting and environmental compliance. Together, the projects are expected to balance groundwater supply and demand in the coastal subbasins, but neither project would supply additional water to the eastern half of the Laguna Seca Subarea, where chronically declining water levels are a problem. Although Cal-Am plans to discontinue producing groundwater from the Laguna Seca Subarea, simulations by HMWRI (2014b) indicate that pumping by the remaining users ("alternative producers") would still exceed the operational yield.

Possible solutions to groundwater overdraft in the Laguna Seca Subarea are described below at a conceptual level, along with potential obstacles to their implementation.

2490 Mariner Square Loop, Suite 215 | Alameda, CA 94501 | 510 747 6920 | toddgroundwater.com

Management Measures within Laguna Seca

Management Option: Redistribute Pumping

Because of head-dependent boundary responses, decreased groundwater pumping by Cal-Am and/or other users will increase the rates of groundwater outflow to the Southern Coastal, Northern Inland and El Toro Subareas. Given that the adjudication and now the Watermaster are managing the Seaside Basin on a subarea basis, the Laguna Seca Subarea could retain some of its local yield by installing recovery wells near the three outflow boundaries to intercept any increases in outflow. Pipelines would need to be installed to convey that water back to the locations where pumping was decreased.

This concept would involve installing new municipal wells in up to three locations and constructing pipelines several miles in length from each location back to the east-central part of the subarea. It might be possible to use the Ryan Ranch water system to convey water from the Southern Coastal outflow boundary part of the way toward the eastern half of the Laguna Seca Subarea.

This approach would not eliminate the problem of water-level declines at the eastern end of the Laguna Seca Subarea caused by pumping in the El Toro Subarea. Without recovery wells, outflow to El Toro would increase. Outflow would remain the same if the water-level gradient across the boundary remained the same. If El Toro water levels decline in the future, then Laguna Seca water levels near the boundary would have to decline at the same rate to maintain a constant gradient. However, this would require pumping at a recovery well on the Laguna Seca side of the boundary, which would increase the total rate of water-level decline in the eastern part of the Laguna Seca Subarea.

Management Option: Continue Pumping from Ryan Ranch Wells

Cal-Am reportedly plans to discontinue pumping from its wells in the Ryan Ranch development in the western half of the Laguna Seca Subarea. Groundwater levels are stable in that area, and groundwater flow is toward the Southern Coastal Subarea. Eliminating production from the Ryan Ranch wells would simply increase the rate of outflow while doing little to alleviate overdraft in the eastern half of the Laguna Seca Subarea. Therefore, it would be desirable to continue using the Ryan Ranch wells and to convey the produced water to the eastern part of the subarea. Depending on how Cal-Am plans to deliver water from other sources to Ryan Ranch customers, this management option might require additional pipelines from the Ryan Ranch wells to the eastern part of Laguna Seca.

Management Option: Reduce Water Demand

Given the high cost of conveying water within Laguna Seca—much less obtaining it from external sources—reducing water demand in the eastern part of the subarea is worth a hard look. Much of the consumptive use is for golf course irrigation. A treatment plant reportedly converts nearly all locally-produced wastewater into recycled water that is used on the golf courses. However, the recycled water supply is less than the golf course irrigation demand.

Therefore, the principal variable that can easily be managed is the irrigation requirement of the golf courses. This might be accomplished by decreasing the total irrigated area or the type of irrigated ground cover.

Management Measures Beyond the Basin

Management Option: Change the Laguna Seca-El Toro Boundary Location

The problem of trans-boundary pumping effects could be solved by shifting the boundary location inward or outward to fully exclude or include the effects of the external pumpers, which in this case are primarily the Toro and Corral de Tierra municipal wells. If the boundary were moved outward to include those wells, they would fall under the jurisdiction of the adjudication and Watermaster and would be subject to the same phased pumping reductions as other Seaside Basin users. This would theoretically halt long-term water-level declines near the current boundary location.

From a practical standpoint, there appear to be at least two major issues associated with this approach:

- It would require reopening the adjudication and having El Toro pumpers join the Seaside Basin and its management program. This could prove to be a difficult and lengthy process.

- It would not permanently eliminate the fundamental problem of basin boundaries defined by flow divides, rather than physical geological boundaries. Future changes in pumping near the new basin boundaries could lead to similar problems of trans-boundary flow.

Management Option: Import Water to the Laguna Seca Subarea

Cal-Am reportedly intends to size the combined capacities of the GWR Project and the MPWSP such that they provide sufficient additional supply to enable Cal-Am to reduce its Seaside Basin pumping to comply with the Seaside Basin Adjudication Decision. The capacity of either project could conceivably be increased to obtain a new increment of supply for Laguna Seca. Additional pipelines would also be needed to convey the water from the Cal-Am system to the eastern part of Laguna Seca.

The GWR Project and the MPWSP are both already at advanced stages of environmental analysis. Changing the size of the project could delay the schedule for completion.

Management Option: Use SGMA as a Means of Managing Areas outside the Basin

The Sustainable Groundwater Management Act (SGMA) was adopted by the California Legislature and Governor in late 2014 and became effective on January 1, 2015. It profoundly changes statewide groundwater management and requires that all medium- and high-priority groundwater basins be sustainably managed, which means that overdraft is

eliminated. SGMA represents a new vehicle for managing groundwater in adjacent parts of the Salinas Valley Groundwater Basin (including the El Toro Subarea), or more specifically, to prevent external pumpers from adversely affecting groundwater levels within the Seaside Basin. Application of the SGMA to the Laguna Seca Subarea groundwater depletion problem is complicated by two factors: the existing Seaside Basin Adjudication Decision and basin boundaries.

Adjudication. Seaside Basin is adjudicated, and SGMA defers to existing management programs in basins or parts of basins that have already been adjudicated, including the Seaside Basin (Water Code Section 10720.8(a)). The Watermaster is thus equivalent to the Sustainable Groundwater Agency that in other basins must be selected from among local agencies or created by a group of agencies acting under a memorandum of agreement or as a joint powers authority. Collaboration with external agencies to manage groundwater close to its borders is obviously desirable for the Watermaster, but it might not be legally feasible for the Watermaster to join a regional joint powers authority. That would bring the Seaside Basin under the authority of the Sustainable Groundwater Agency, which could conflict with current legal authority of the court.

SGMA does allow parts of basins to be managed by separate Groundwater Sustainability Agencies under separate Groundwater Sustainability Plans, but it requires the agencies to develop "coordination agreements" that ensure consistency among the plans (Water Code Sections 10727(b)(3), 10727.6 and 10723.4). Coordination agreements must demonstrate that all of the Groundwater Sustainability Plans within a basin together achieve the objective of sustainability throughout the basin. The coordination agreement is a means by which the Watermaster could engage in managing adjacent parts of the basin without subverting or reopening the adjudication. The adjudication implementation issues are legal in nature and would require legal counsel analysis before conclusions on this could be reached.

Basin Boundaries. SGMA requires that basin and subbasin boundaries be consistent with the boundaries in California Department of Water Resources (DWR) Bulletin 118 unless revised through a formal process that includes DWR approval. The boundaries of the Seaside Basin used by the court for the purpose of adjudication do not conform at all to the Bulletin 118 boundaries, as shown in **Figure 17**. The adjudicated area straddles two Bulletin 118 subbasins of the Salinas Valley Groundwater Basin: the Seaside Area Subbasin and the Corral de Tierra Area Subbasin. The boundary between these Bulletin 118 subbasins is the inland extent of windblown dune deposits, which are unsaturated and have no bearing on the underlying groundwater flow system. However, the adjudication boundaries are equally problematic because the northern and eastern boundaries are the approximate locations of groundwater flow divides that could easily shift in response to future changes in pumping.

SGMA includes a provision for requesting changes in basin or subbasin boundaries. By January 1, 2016, DWR must adopt regulations stating the procedures for requesting boundary revisions. Several general criteria are listed in SGMA (Water Code Section 10722). The triennial update of Bulletin 118 is due to be completed by January 1, 2017, and that version is to be the basis for creating Groundwater Sustainability Agencies and Plans (Water

Code Section 10720.7). This would appear to create a one-year window—calendar year 2017—to apply for basin boundary adjustments.

Option A: Do Nothing
If the Watermaster takes no proactive steps to accelerate management of groundwater in adjacent parts of the Salinas Valley Basin, management will still occur pursuant to SGMA. Whichever entity becomes the Sustainable Groundwater Agency will need to submit a Groundwater Sustainability Plan by January 31, 2022 and to achieve sustainability by January 31, 2042.

The drawbacks to this sub-option are that the Watermaster would have no input into strategies and programs developed for managing groundwater in adjoining areas, and Seaside Basin interests might not be fully taken into account. Also, it might take 27 years to achieve sustainability.

Option B: Actively Participate in External Groundwater Management
Monterey County Water Resources Agency (MCWRA) appears to be the logical candidate to become the Groundwater Sustainability Agency for areas adjoining the Seaside Basin. At a minimum, it could certainly be a member and key player in a multi-party Groundwater Sustainability Agency. The Watermaster could approach MCWRA in the near future to initiate a collaborative effort to manage the Seaside part of the Salinas Valley Basin under SGMA. The problems with conflicts between the Bulletin 118 boundaries and adjudication boundaries would impact the external Groundwater Sustainability Agency as much as they would impact the Watermaster. A joint petition to DWR for subbasin boundary adjustments could be a useful near-term objective.

RECOMMENDATIONS

Several of the possible management options listed above seem promising in terms of feasibility and cost-effectiveness. Recommended next steps to further explore those options are as follows:

- **Quantify the costs and benefits of continued operation of Ryan Ranch wells.** The groundwater model should be used to simulate Laguna Seca water balances with and without Ryan Ranch pumping by Cal-Am, with particular attention paid to changes in outflow to the Southern Coastal Subarea. Continued operation of the Ryan Ranch wells would presumably require an agreement with Cal-Am and probably also construction of pipelines to convey the water toward the eastern part of the Laguna Seca Subarea to offset pumping reductions in that area. The feasibility and approximate cost of these measures should be estimated. The impacts of any changes in outflow from the Laguna Seca subarea to the Southern Coastal Subarea should also be evaluated for potential negative impacts.

- **Quantify the costs and benefits of recovery wells to intercept increased subsurface outflow from the Laguna Seca Subarea resulting from decreased Laguna Seca**

Subarea pumping. The groundwater model should be used to simulate the increases in outflow at the Southern Coastal, Northern Inland and El Toro boundaries and the ability of hypothetical recovery wells to capture any increases in outflow resulting from decreased pumping in the eastern part of the Laguna Seca Subarea. The cost of the wells and of pipelines needed to return the captured outflow to the central part of the Subarea could be estimated and integrated into a feasibility and cost-benefit analysis of outflow recovery wells.

- **Initiate sustainable groundwater management in areas adjacent to the Seaside Basin.** The Watermaster should meet soon with MCWRA to discuss implementation of SGMA in areas adjacent to the Seaside Basin. Issues to be discussed include:

    - whether to petition DWR for subbasin boundary revisions, and if so, what the alternative boundaries should be for the purposes of implementing SGMA (DWR will publish revision procedures by January 1, 2016);

    - which agency or agencies should become the Sustainable Groundwater Agency for the adjacent areas;

    - the elements of a coordination agreement linking water management in the Seaside Basin with the Sustainable Groundwater Plan for adjacent areas.