

Ground Water Recharge: A Pathway Toward Regional
Environmental Improvement and Water Supply Security
September 25, 2018 at 6 PM
Valley Vision Conference Room
3400 3rd Avenue, Sacramento, CA 95818

The current and future water supply security for residential, commercial, industrial, agricultural, and conservation landowner customers in the Sacramento Region (Region) appears to be satisfactory when one reviews the water supply assessments contained in each of the Region's water purveyors' Urban Water Management Plans. However, some of these plans do not fully address the implications of climate change on the future availability of water supplies. The recent drought has shown limitations in some of the Region's water supply systems, and climate scientists predict the frequency and severity of droughts will increase. The State Legislature has moved to ensure the increased frequency and severity of droughts along with other weather changes due to climate change, are planned for in future Urban Water Management Planning cycles. A more comprehensive understanding of the reliability of the Region's water supplies will be known, once the impact of the Region's changing climate is fully understood and planned for by all Regional water purveyors.

In addition, parts of the Region face groundwater elevation depressions and serious environmental issues. Even after two successive wet years both the Sacramento Central and South sub basins have significant groundwater depressions. The Cosumnes River basin is experiencing disconnect between surface water and ground water with resulting loss of valley oak woodlands and riparian habitat. Actions funded and planned by the Omochumne-Hartnell Water District and the Regional Sanitation District (discussed below), should work to partially restore some of the Cosumnes' disconnect, and eliminate some of the groundwater depression on the north side of the river. The deep ground water cone of depression south of the Cosumnes River needs to receive more restoration priority.

The past five year drought and the specter of more frequent droughts like it, coupled with the need to optimally manage the Region's water resources and purveyor systems, have been driving forces for several Regional agencies and authorities. Some of their actions are outlined below. It is time that ECOS join with these entities and endorse the following policy and action steps: 1. Improve the interconnectivity and reliability of the region's water supply systems; 2. Improve the management of the region's reservoir and surface water system; 3. Implement and expand environmentally responsible groundwater recharge programs including storm water recharge; and, 4. Develop and implement one or more Water Banks that provide the framework to enable large scale storm water recharge and retrieval.

1. The Regional Water Authority (RWA) has completed a conjunctive use analysis as part of development of an ongoing Regional Water Reliability Plan (RWRP) to improve the supply reliability of all of the Region's water purveyors. The RWRP addresses the regional supply system's vulnerabilities as well as those of each purveyor, and establishes the goal of maintaining each purveyor's level of service while expanding conjunctive use and establishing a groundwater bank. RWRP identifies current system-wide recharge potential to be 63,221 acre feet in wet years with recovery potential calculated to be 57,835 acre feet in dry years. Additional near term recharge of 27,443 acre feet with corresponding recovery of 36,736 acre feet could be accomplished with an investment of \$140-\$240 million.

RWA would like to see the establishment of a local reservoir in the regional groundwater basin with an appropriate loss factor to ensure a net benefit to the basin. The basin storage potential is estimated

at nearly 2 million acre feet. Operating the basin in a more conjunctive fashion with an associated water bank, would allow for the creation of additional supply yield for local water needs (including environmental needs), and provide possible supply yield for water needs outside the basin. This latter possibility could generate additional capital for banking/facility operations costs.

The RWRP calls out the following steps for plan implementation. During 2018, explore regional interest in the formation of a groundwater bank. By the end of 2019, complete the technical analysis to define the yield and associated impacts from expanded conjunctive use. By the end of 2021, evaluate and engage potential markets for water banking, establish the bank's governance structure (as part of RWA, another existing JPA, or a new JPA), and complete an environmental analysis of the project.

2. During the next five to ten years, Sacramento Area Flood Control Agency (SAFCA) and its Federal and State partners will complete the flood control system improvements that are needed to provide the Sacramento area with the 200-year urban level of flood protection mandated by the State Legislature. These projects are fully funded at \$1.78 billion under the emergency supplemental funding as appropriated in Public Law 115-123. Nevertheless, the risk of catastrophic flooding, amplified by climate change and by the continued growth of the area's low lying urban core, will remain unacceptably high, warranting a continued focus on flood risk reduction. SAFCA believes that additional risk reduction can be achieved by using advances in weather forecasting to take advantage of the new operational capacities created by improvements to Folsom Dam and the downstream levee system, and by adding to this mix, additional reservoir storage space for flood control in the three largest non-federal reservoirs in the American River watershed. In 2017, SAFCA evaluated the potential for providing the combined storage of an additional 300,000 acre feet by evacuating stored water effectively through new or modified lower level outlets at the three reservoirs, activated based on real-time forecasts. The initial study was conducted in collaboration with facility owners, Placer County Water Agency (PCWA) and Sacramento Municipal Utility District (SMUD). Based on the preliminary evaluation, several alternatives were identified as feasible.

Since then, SAFCA has had furthered discussions with PCWA and SMUD for potential next steps, and related regional coordination efforts. SAFCA, in cooperation with PCWA and SMUD, propose to conduct a reconnaissance level analysis aimed at identifying the most cost-effective approach to increasing the low level outlet capacity of the three upstream reservoirs. The analysis will assume that the operations of these reservoirs are incorporated into a new water control manual for Folsom Dam that allows up to a seven-day advance release of flood waters based on a forecast of extreme precipitation and run-off in the watershed. SAFCA along with SMUD and PCWA are initiating a reconnaissance level engineering study for exploring options of upstream reservoir facility modifications. The information produced by this evaluation will be used to flesh out the elements of the proposed multi-objective project, identify an appropriate array of quantifiable public benefits, and develop a methodology for leveraging multiple funding sources. Such a project could 1) improve dam safety of the upstream reservoirs, 2) provide 500-year flood protection for the City of Sacramento, and 3) provide for improved flows and aquatic habitat conditions along the Cosumnes and American Rivers and in the Sacramento-San Joaquin Delta and potentially facilitate ongoing efforts to achieve sustainable groundwater levels in the South American and Cosumnes Basins. It is estimated that the project would likely be somewhere between \$200 to \$500 million of which \$150 to 300 million would be allocable to upstream reservoir modifications with the remainder being associated with downstream storm water capture and infiltration infrastructure including acquisition of the rights necessary for use of the Folsom South Canal. The project may deliver between 25,000 to 75,000 acre feet in wet and above normal water years.

3. Regional efforts to implement groundwater recharge projects are being led by the Sacramento Regional County Sanitation District's (SRCSD) South Sacramento County Agriculture and Habitat Lands Recycled Water Program (Program). This in-lieu recharge Program provides high quality recycled water to agricultural lands in the south County to substitute for the use of pumped groundwater. The Program, when fully implemented in 2023-25, has the potential to deliver up to 50,000 acre feet of recycled water for agricultural and habitat lands use. An EIR and hydro-geologic analysis show that the Program provides significant groundwater benefits to the south County and Cosumnes region, and, in particular, stream flow benefits to the Cosumnes River itself. The Program is motivated to provide multiple environmental benefits associated with higher groundwater elevations, providing drought resistant recycled water supplies to agriculture and habitat lands, and with a healthy and full groundwater table, provide an alternative potable water source when drought conditions impact surface water supplies.

The Omochumne-Hartnell Water District (OH) is moving forward to implement a vineyard flooding recharge project close to the Cosumnes River in south Sacramento County. The project has received funding from the State Department of Water Resources under Proposition 84, and will take place over ten years. The project will divert excess storm water from the Cosumnes River using two existing diversion points on the river. The diverted water will be used to flood three dormant agricultural fields in the off irrigation season between November and March. Approximately 4,000 acre feet of excess storm water will be diverted for recharge each year. The system will be capable of 6,000 acre feet during wet years. Two existing pump houses and pipe lines will be utilized for the project, and two additional pump houses are anticipated to be constructed when funding becomes available. OH has performed an Initial Study and is proposing to adopt a Mitigated Negative Declaration for the project on September 18, 2018. The CEQA documents are available on OH's web site.

Finally, scientists from UC Davis have studied the Region as part of a larger Sacramento Valley groundwater recharge potential assessment and determined that at least 100,000 acre feet of excess storm water can be recharged into the Region annually. This study has narrowed the recharge area to approximately 1,400 acres located in South Sacramento County. More research, planning, and institutional agreements are needed before this resource can be developed in an environmentally beneficial way. The identified recharge potential demonstrates the important linkage between agriculture and urban water supply/recharge opportunities, and the importance of land use planning, identification, and purchase of flood easements on prime recharge lands. Regional government bodies, water agencies and environmental groups need to collaborate to ensure recharge projects can proceed and be funded through upcoming State grants.

4. There currently are ten+ water banks established in the San Joaquin Valley of California. The Central Valley Project (CVP) Improvement Act of 1992 established the framework under which participating CVP customers can establish a water bank. CVP does not own any interest nor does it operate water banks. Once a water bank is established, a participating CVP customer can bank its own CVP water outside its contract area. The water bank can accept and recharge other CVP customer's CVP water. The bank can also make long term (ten years or more) banking contracts. The bank constitutes the organizational and legal framework for this water management scheme, and includes an agreement between water rights holders who become depositors (water suppliers who make surface water deposits by allowing the water to recharge into the soil) and water suppliers who withdraw water from the recharged groundwater basin. Water must be banked before it can be withdrawn and bank operations have to demonstrate that no harm will be done to other groundwater users.

A conservative estimate for the size of the bank's annual deposit is nearly 200,000 acre feet of water per year during dry years. This amount can be larger during normal and wet precipitation years. RWA is committed to fully investigating the development of a regional water bank and to assisting in establishing one if enough regional interest exists. A bank is one of the primary means that help fully take advantage of the Region's recharge opportunities. The bank can accept and manage, in an environmentally acceptable way, the additional groundwater that is the result of regional recharge projects including the excess storm water recharge resource. The fully integrated water supply system envisioned in RWRP, coupled with the South Canal, Cosumnes, American and Sacramento Rivers, can convey the bank's deposits to points where they can effectively be recharged into the groundwater basin. Extraction systems, monitored and/or controlled by the bank, can be constructed and operated so that they do not negatively impact the aquifer, its users, and the environment.

Water supply and reliability for the Region is in a major state of flux. ECOS has an important role to participate in the decisions made and coalitions formed to assure future water supply and distribution systems are efficient, effective, and environmentally sound. The significant number of agency projects, some of which are outlined above, necessitate active engagement by ECOS and its member organizations. There is a risk that the Region's growth may cause water agencies and public officials to minimize the "protected purposes" of recharge projects such as the Regional Sanitation District's in-lieu recharge project. A current example of the potential to minimize this project's environmental benefits is the City of Elk Grove's SOI approval by LAFCO which includes a reference to relying on the Regional Sanitation District's recharge, if needed, as a supply resource for the new development area's growth. This reliance is potentially counter to one of the recharge project's stated commitments to provide ecosystem benefits that rely on a higher groundwater table. Near term oversight to assure the environmental benefits occur is the responsibility of the California Department of Fish and Wildlife. However, the temptation to tap into this water to fuel local growth will continue. A natural home for long term oversight could well be the Sacramento Central Groundwater Authority and a Regional water bank. Groundwater banking can provide an excellent conjunctive use tool that allows the Region to meet both water supply and ecosystems needs. ECOS should participate in the bank's formation to assure that robust monitoring and active management of water withdrawals occurs. The location of withdrawals from the water bank plays a critical role in their impacts on the associated ecosystems. ECOS should work to ensure an environmental voice is included on any Regional water bank that is formed.

Agenda

1. Opening Remarks and Introductions (2 min) – Moderator Ted Rauh ECOS

2. What is the groundwater recharge potential for the Region? How can surface water be moved around the Region to facilitate effective groundwater recharge? Where are the optimum locations for groundwater recharge? Where should the groundwater extraction system(s) be placed to maximize recovery while protecting and enhancing the region's environmental resources? What are the environmental concerns faced by the Region with regard to groundwater recharge and extraction facilities and activities? (20 min) – Dr. Graham Fogg, UC Davis Water Program.

3. What are the functions of a Water Bank? How are Water Banks established, and what is their form of governance? What environmental issues must be overcome during a water bank's formation and operation? Are there examples of successful Water Banks? Who within the Sacramento Region should participate in a Water Bank? How should it be funded and enabled to construct and manage any water recharge, conveyance and extraction systems under its purview? What other agency involvement, including structures and facilities, is needed to make a regional Water Bank operable? What are the environmental impacts or consequences the Region must plan for and guard against when a Water Bank is being planned, constructed and operated? What are the steps to establish a water bank? (20 min) – Dr. Robert Gailey, UC Davis Water Program.

4. Question and Answer period (15 min)

5. Next steps (3 min)

There are many agencies and NGOs working towards ensuring adequate water supply and preserving ecosystems; thanks to the members of Habitat 2020's Water Committee, Melinda Frost-Hurzel, Erick Ringelberg, Robert Swartz, Gary Bardini, Dave Ocenosak and Michael Wackman for their assistance in preparing this water issues paper. The following individuals have been invited to the meeting to provide ECOS with their perspectives during the Question and Answer session.

Erik Ringelberg, California Director, The Freshwater Trust

Robert J. Swartz PG, CHG Regional Water Authority, Sacramento Groundwater Authority

Gary B. Bardini, P.E. Director of Planning, Sacramento Area Flood Control Agency

Dave Ocenosak, Principal Engineer, Sacramento Area Sewer District, Sacramento Regional County Sanitation District

Lilly Allen, Scientist, Ecosystem Restoration, Water Forum

Michael Wackman, General Manager, Omochumne-Hartnell Water District, Wackman Consulting,

