

Enhanced Aquifer Management: Alternative Cut to the Aquifer

Over the last few months ADWR has received a number of comments regarding the Fourth Management Plans and issues that need to be addressed in the AMAs to achieve the Safe Yield goals. While the Management Plans authorities are generally limited to conservation, ADWR has been looking outside the present authorities to identify additional approaches to reaching Safe Yield.

For decades, more groundwater has been pumped from Arizona's aquifers than has naturally recharged back into the aquifers. This imbalance between pumping and recharge has left some aquifers significantly depleted. Using renewable supplies and recharging water underground can serve to reduce this imbalance. Artificial recharge is a means of storing excess water supplies so that they may be used in the future. Artificial recharge is an increasingly important tool in the management of Arizona's water supplies, particularly in meeting the goals of the Groundwater Management Act. Storing water underground to ensure an adequate supply for the purpose of satisfying current and future needs has proven to be both a practical and cost-effective alternative to direct use of renewable supplies.

Arizona's Underground Water Storage ("UWS") Program provides regulations under which water may be stored and rights to recover that water may be accrued or acquired. The statutes and policies of the UWS or "recharge" program, when read together, can be seen to establish a number of objectives. These objectives include:

- Protecting the general economy and welfare of the state by encouraging the use of renewable water supplies, especially Colorado River water, instead of groundwater, through a flexible and effective regulatory program for the underground storage, savings, and replenishment of water;
- Allowing for the efficient and cost-effective management of water supplies by allowing the use of storage facilities for filtration and distribution of surface water instead of constructing surface water treatment plants and pipeline distribution systems;
- Furthering the conjunctive management of the water resources of this state to reduce the overdraft and achieve the management goals of the AMAs;
- Storing water underground for seasonal peak demand and for use during years of shortage; and
- Augmenting the water supply for future growth and development.

Since its inception in 1986, the Recharge Program has become increasingly flexible over time with regard to storage and recovery locations and the number and types of programs available. With the increased flexibility has come an increased complexity and the potential for recharge projects to aggravate, as well as mitigate, local water problems. High water tables, low water tables, water quality, physical availability, and third party impacts are all conditions that can be affected positively or negatively by the siting and operation of recharge facilities. In addition, there is no requirement that a storer recharge and recover in the same sub-basin, which has created a spatial and hydrologic disconnect between where water is recharged and where it is

recovered. In some cases, it has led to water being recovered or used in different sub-basins far from where it was recharged. While some areas have experienced aquifer rebound and stabilization from these practices, other areas have declined. Additionally, given the significant number of credits in storage, there is a great potential for future groundwater level impacts depending on where stored water is recovered. This imbalance in areas with significant historic pumping and resulting cones of depression may pose an impediment to continued economic development and raises questions about Arizona's long term groundwater supply.

Certain permitted artificial recharge activities conducted under the UWS Program require that a percentage of the recharged volume be made non-recoverable as a general benefit to the aquifer. These required non-recoverable volumes are called "cuts" to the aquifer. The cuts apply to the storage of water for long-term storage credits. They do not apply to water that is stored and recovered annually. Currently, the cuts to the aquifer equal five percent.

ADWR has been analyzing how the cut to the aquifer provision could be used and modified to support comprehensive aquifer management in the AMA through recharge and recovery incentives and disincentives. One possible approach to address groundwater level imbalances in the AMAs, while allowing flexibility for those recharging and recovering for drought protection, is to encourage recharge and recovery in certain areas by modifying the cut to the aquifer percentages. The proposal applies to all future recharge and replenishment occurring within Active Management Areas and Irrigation Non-Expansion Areas. As envisioned, all existing credits will be grandfathered in and not subject to the changes. Essentially the concept is as follows:

- 0% cut to the aquifer for those who recharge and recover that water within 1 mile of the recharge facility or inside the boundaries of a Groundwater Savings Facility.
- 10% cut to the aquifer for those who recharge and recover that water outside 1 mile of the recharge facility or outside the boundaries of a Groundwater Savings Facility but do so within the same sub basin.
- 20% cut to the aquifer for those who recharge and recover that water outside 1 mile of the recharge facility or outside the boundaries of a Groundwater Savings Facility but do so within a different sub basin.
- ADWR may consider granting greater than 100% credit for water recharged in areas that will uniquely benefit by that recharge.

The use of recharge and recovery incentives to manage aquifer water levels will require regular water-level monitoring. It will be necessary to take existing hydrologic tools available to ADWR and refine them for use in this context, starting with ADWR's Groundwater Models. On-going monitoring of water levels and potential impacts will ensure that incentivized recharge and recovery supports water management goals and doesn't exacerbate existing issues or create new ones.

This program is intended to be a dynamic tool for managing water levels. To ensure that incentives and disincentives act together to improve the long-term health of the aquifer and aren't causing unintended consequences, the program should be evaluated regularly to determine its impact and redefine desirable areas for recharge and recovery. Such an evaluation should be performed at established intervals, such as every 5-10 years, and triggered by specific, observed groundwater levels.