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## Potential Environmental Effects of the Southern Nevada Groundwater Project

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In 1989, the Las Vegas Valley Water District filed 147 applications to pump 800,000 acre-feet per year (afy) of groundwater from 30 basins in eastern and southern Nevada. Those applications were transferred to the Southern Nevada Water Authority (SNWA), and by 2003, 37 applications in 12 basins had been withdrawn, and 17 applications had been transferred to Lincoln County where they are being actively pursued through a public/private partnership with Vidler Water Company. Coyote Springs Investment and Tuffy Ranches have filed applications for large quantities of groundwater in Coyote Springs Valley and Lake Valley. Proposed capacity for the SNWA pipeline includes 36,000 afy of water to enable the Coyote Springs Development. A quick review of the Nevada State Engineers website (<http://water.nv.gov/>) on 24-29 May, 2009, revealed that SNWA and Las Vegas Valley Water District currently hold groundwater rights of 204,256.12 afy in 15 basins. Their applications for additional groundwater in several more basins remain valid, but SNWA has not yet requested hearings for them.

### *Editor's Note:*

*We have not been and are not currently involved in this research. We are, however, concerned about the effects that lowering of the water table would have on native species, ecosystems, rural communities, and sustainability of the Las Vegas community.*

In 1995, Schaeffer and Harrill used a recently developed US Geological Survey groundwater model to ask the question: What would happen to the groundwater table if SNWA pumped water in the quantities (180,800 afy) and from the locations proposed at that time, and there were no other groundwater withdrawals? Their contour map of groundwater decline (Figure 1) to a probable final steady-state suggests the effects would have extended from Death Valley to Sevier Lake, Utah. In 2009, Bredehoeft and Durbin used an even more recently developed groundwater model to ask the question: What would happen to the groundwater table in

eastern Nevada if SNWA pumped water in the quantities (170,000 afy) and from the locations proposed for the Eastern Nevada pipeline project, and there were no other groundwater withdrawals? Their answer shifts the decline eastward toward the Utah border where the major drawdown of 700 feet or more extends from Kane Springs/Delamar/Meadow valleys northward to Snake/Spring/Steptoe valleys. Both of the analyses referred to above demonstrate that groundwater withdrawal in quantities requested by SNWA would, over the long term, lower groundwater tables by hundreds of feet throughout a major fraction of Southern and/or Eastern Nevada. That's 20-30 times more than the approximately 30 foot decline of the groundwater table in Southern Nevada over the past 12-15,000 years as glaciers retreated and lakes in many of Nevada's valleys disappeared.

Of course, SNWA is not the only one dependent on southeastern Nevada's groundwater. A review of the State Engineers records in February 2006 found that in the approximately 80 basin area of probable impact, water rights already existed for 102% of the estimated perennial yield (715,268 afy). My family co-authors and I published a paper in 2007 (Deacon et al.) in which we describe the inescapable conclusions: the groundwater table will drop more than the models suggest, everyone now holding groundwater rights in the area will see an increase in pumping costs, wetland habitats and the outdoor recreation they support will decline, and biodiversity dependent on those habitats will crash.

As a means of encouraging federal agencies to drop water rights protests, SNWA and federal agencies in the Department of Interior negotiated Monitoring, Management, and Mitigation (M M and M) agreements in five Eastern

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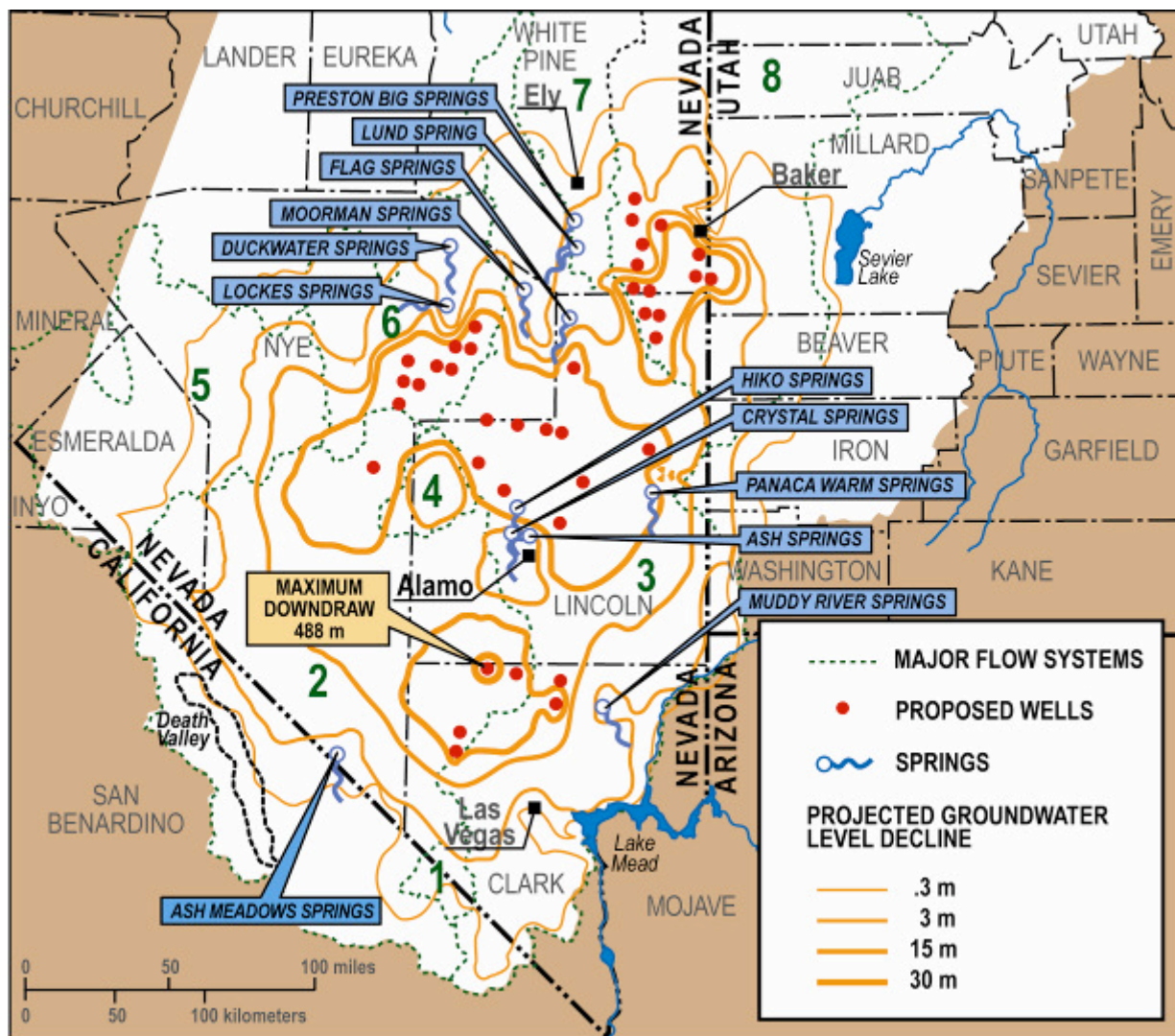


Figure 1. Estimated groundwater level decline from SNWA water project as proposed in 1995 (from Schaeffer and Harrill 1995).

Nevada basins. These agreements are often described as a means of ensuring minimal environmental damage from the pipeline project. That outcome is highly unlikely because 1) Physics dictates that in large, interconnected aquifers, monitoring programs can identify problems that will get worse, but not those that could be improved -- even if the cause (pumping) were completely stopped (Bredehoeft and Durbin 2009), and there are no commitments in the agreements to stop pumping completely. 2) M M and M agreements have been negotiated for only 5 of the 80 basins (Schaeffer and Harrill 1995), or 5 of the 31 basins (Bredehoeft and Durbin 2009) likely to be affected. 3) Many regional springs (biodiversity hotspots) are supplied by water moving through a complex interconnected sequence of cracks and crevices in the rocks. They will cease to flow very rapidly if and when distant sources of supply are interrupted.

Some hint of the threat to quality of life in Nevada is possible with the realization that within the 80 basin area of groundwater decline there are at least 3 national parks, 4 national wildlife refuges, 4 state wildlife management areas, 20 listed endangered or threatened species, 42 species that have been petitioned for listing and 347 species listed as "sensitive" on the Nevada Natural Heritage Database. Cost considerations aside, the pipeline project would make the Las Vegas Valley increasingly dependent on diminishing water resources. The US Global Climate Change Research Program estimates precipitation in southeastern Nevada over the next 90 years will decline 20-

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**A Newsletter of the UNLV  
Desert and Dryland Forest Research Group**

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## Upcoming Events

### California Invasive Plant Council

*2009 Symposium "Wildland Weed Management on the Leading Edge"*

Visalia, CA October 8-10, 2009

<http://www.cal-ipc.org/symposia/>

### Center for Plant Conservation

*"Applied Plant Conservation Workshop"*

*Covering 17 key conservation topics during one week of intensive instruction*

Phoenix, AZ November 16-21, 2009

<http://www.centerforplantconservation.org/Education/Workshops/BLM/2009blmregistration.html>

## Southern Nevada Groundwater Project *(continued from page 7)*

40%. Precipitation is the principal contributor to the aquifer. The US bet on derivatives and saw its economy crash, Las Vegas bet on high rollers and saw its economy crash, we are now proposing to bet on increasing precipitation when the science demonstrates the opposite is what we can expect!

### References

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