Northwest Basins Planning Area

Background

The Northwest Basins Planning Area is located in the far northwest portion of the State and comprised of the Detrital, Hualapai, Meadview, and Sacramento Valley Groundwater Basins. The Planning Area lies within Mohave County. The City of Kingman is the largest community in the Planning Area.

The majority of the land in this Planning Area is owned and managed by federal agencies (*see Figure P.A. 15-1*). The exception is in the Hualapai Valley Basin, where a significant portion of the land (43 percent) is privately held. Federal land uses include a portion of the Lake Mead National Recreation Area, spanning portions of the Meadview, Hualapai Valley and Detrital Basins, portions of the Hualapai Indian Reservation in the Meadview Basin, and the Mount Tipton and Mount Wilson Wilderness Areas located in the Detrital Basin. The largest landowner in the Planning Area is the US Bureau of Land Management (BLM). Ownership is also often fragmented, with federal, State, and private land holdings assembled in a "checkerboard" fashion that often complicates the development and implementation of comprehensive land management strategies.

Water Supply Conditions

Groundwater

The Northwest Basins Planning Area is located in the Basin and Range Physiographic Province. This province is characterized by long broad alluvial valleys separated by mountain ranges, with thick productive regional alluvial aquifers, which may provide opportunities for artificial storage and recovery. Groundwater conditions within the Planning Area are variable (*see Figure P.A. 15-2*). Groundwater in storage in the Meadview Basin is estimated to be 1 MAF with groundwater levels generally declining at approximately 1 foot per year. Groundwater in storage in the Hualapai Valley Basin is estimated to be 5 MAF with groundwater levels generally declining at 0.9 foot per year. Groundwater in storage in the Detrital Valley Basin is estimated to be 1 MAF with groundwater levels declining at 0.8 foot per year. Groundwater in storage in the Sacramento Valley basin is estimated to be 7 MAF. Groundwater levels in the Sacramento Valley Basin are rising at less than 1 foot per year.

Surface Water

Other than the Colorado River, in the northernmost portion of the Planning Area, there are no perennial streams in the Planning Area (*see Figure P.A. 15-3*). One intermittent stream, Sawmill Canyon, is located in the northeastern portion of the Sacramento Valley Basin. Lake Mead also borders the northern portion of the Hualapai Valley and Detrital Valley basins and a small portion of Lake Havasu borders the western tip of the Sacramento Valley Basin.

Reclaimed Water

Centralized wastewater collection to treatment systems is limited to the larger population centers in the Planning Area. In many areas water users rely upon exempt wells (those wells with a pump capacity of 35 gallons per minute or less) for their water supplies and septic systems for wastewater treatment and disposal. Currently, the City of Kingman operates the Hilltop and Downtown wastewater treatment

plants (WWTP) that together produce over 2,000 acre-feet of reclaimed water per year, the majority of this is produced from the Hilltop WWTP. At present, reclaimed water is not reused and is discharged into a watercourse, evaporations ponds and an artificial wetlands area[1].

Ecological Resources

The Northwest Basins Planning Area includes a portion of the Lake Mead National Recreation Area, to the north and all or portions of five wilderness areas including, Mt. Tipton, Mt. Wilson, Warm Springs, Wabayuma Peak, and Aubrey Peak Wilderness areas. These areas are designated under the 1964 Wilderness Act to preserve and protect the designated area in its natural condition.

Water Demands

Table P.A. 15-1 illustrates the projected demands in the Northwest Basins Planning Area. Agricultural land uses within the Planning Area are very limited. Livestock grazing, dependent upon precipitation for forage, occurs on public lands and dominates agricultural uses in the Planning Area.

The largest potential for growth is in the municipal, mining and electrical power generation sectors. Several large master planned developments have been proposed in the northern portions of the Detrital and Hualapai Valleys. These master planned communities were envisioned to serve the greater Las Vegas metropolitan area as transportation connections were improved and affordable housing needs were sought for the Las Vegas area. Recent economic downturns in the real estate sector have placed these development plans on hold.

Because of the extensive availability of BLM lands, it is anticipated that this area may be a focus for expansion of renewable energy development in the future. BP Wind is pursuing development of a wind farm within the Planning Area northwest of Kingman. Following construction, this facility will not use water beyond the domestic and sanitary needs of the small maintenance workforce.

Characteristics Affecting Projected Water Demands and Supply Availability

Expanded Urbanization

Limited concentrated urbanization has occurred in the Planning Area, centered primarily in and nearby the City of Kingman. Dispersed development, or low density "wild cat" development is generally scattered through the privately held lands in the Planning Area. Current and planned municipal demands are anticipated to remain dependent upon groundwater.

Water Management

The Planning Area is not within any AMA or INA that requires additional water management. No reporting requirements, other than the Community Water System reporting requirement exist within the Planning Area. The Mohave County Water Authority (MCWA) is a water management entity of note that operates in the Planning Area, and which acquired Kingman's entitlement of Colorado River water, for use by on-river communities outside the Planning Area, in exchange for providing funds to Kingman to develop its groundwater resources.

[1] http://www.cityofkingman.gov/pages/depts/publicworks/wastewater.asp

Table P.A. 15-1 Projected Demands (in acre feet) – Northwest Basins Planning Area

Sector	2010	2035	2060
Agriculture	0	0	0
Dairy	76	76	76
Feedlot	0	0	0
Municipal	12,782	22,638	28,260
Other Industrial	0	0	0
Mining	90		
High		12,000	12,000
Low		8,000	8,000
Power Plants	1,300		
High		5,944	7,623
Low		4,346	5,351
Rock Production	9		
High		1,263	1,577
Low		526	657
Turf	0		
High		422	422
Low		0	0
Total (High)	**14,257**	**42,343**	**49,958**
Total (Low)	**14,257**	**35,586**	**42,344**

Strategies for Meeting Future Water Demands

Groundwater

In response to concerns about the impacts of groundwater development by local governments, water providers and citizens groups, ADWR in collaboration with the US Geological Survey (USGS), with funding assistance from Mohave County, began conducting hydrogeologic investigations in 2005 to improve the understanding of water resources in three basins within the Planning Area; the Detrital, Hualapai and Sacramento valley basins. These investigations are focused on: (1) assessing existing data collection networks and examining the current state of knowledge of the groundwater system; (2) improving understanding of geologic units and their relationship to groundwater storage and movement; (3) improving knowledge of groundwater budget factors including recharge and storage; (4) evaluating groundwater quality; (5) establishing a hydrologic monitoring network for on-going assessment of the aquifer; and (6) informing the hydrologic community and area residents about hydrologic conditions. To date, several reports have been completed including preliminary estimates of groundwater in storage for the Detrital Valley Basin[2] and the Sacramento Valley Basin[3]. In addition, the

[2] Mason and others, 2007
[3] Conway and Ivanich, 2008

USGS released a report in 2007 on groundwater occurrence, movement and water level changes in all three basins[4].

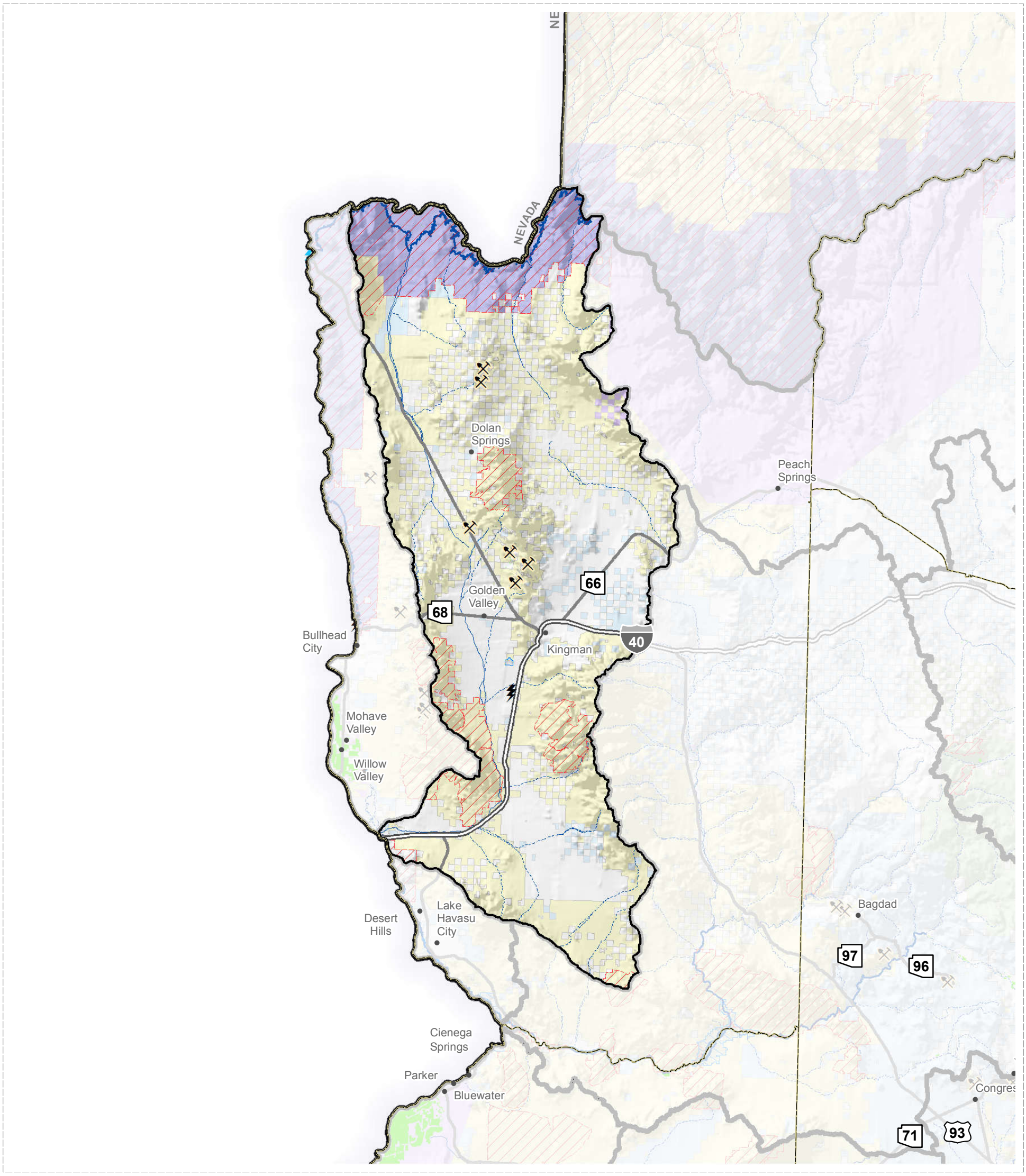
Continuation of this effort (both technically and financially) is essential for this region to achieve its water demand projections, and will be especially important for future renewable energy development. Funds could be established to ensure the completion of this effort through ADWR's Rural Water Study Program.

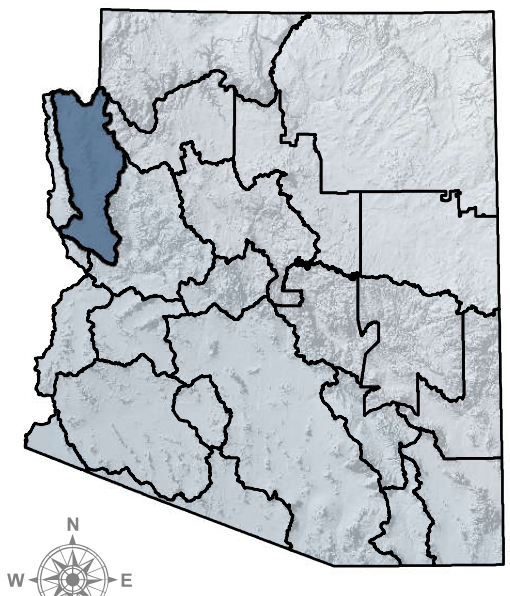
Reclaimed Water Reuse

The majority of the low-density, wild-cat style development scattered through the Planning Area relies primarily on exempt wells and septic systems for water and wastewater treatment, limiting the development of reclaimed water. Additionally, the City of Kingman currently has two WWTP's producing approximately 2,000 acre-feet annually. The permitted capacity of these facilities is nearly 5.7 MGD (6,407 acre-feet per year). The plants are currently operating at about half of their treatment capacity. Potential exists to meet the expanded needs of this community and to provide opportunities for permitted recharge to augment aquifer water supplies, as well as direct uses for landscape watering, golf course irrigation and industrial process and cooling. Several large master planned communities in the north end of the Hualapai and Detrital valleys offer the option of central wastewater collection and reuse either directly through landscape watering, golf course watering, and industrial cooling, or aquifer management through recharge and recovery.

[4] Anning and others, 2007

NOTE: Because GIS data for this project were acquired from multiple sources employing different land base grids and varying accuracy standards, some inconsistencies were encountered.
The user is responsible for understanding the accuracy limitations of GIS data layers and is responsible for the results of any application of the data for other than their intended purpose.





MAP LOCATION
(Planning Area Boundaries)

- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- River or Stream (ASLD)
- Interstate (ADOT)
- Population Center (GNIS)
- Mine (ADMMR, ADWR)
- Hydroelectric Power Plant (ADEQ, ADWR)
- Thermoelectric Power Plant (ADEQ, ADWR)
- Agriculture (SWReGAP, 2004)
- Federal Conservation Land (USFS, BLM, NPS)
- State Managed Conservation Land (AZGFD, AZSP)
- BLM Land
- National Forest
- National Park
- Military Reserve
- Private and Other Land
- State Trust Land
- Tribal Land

Figure P.A.15-1

Northwest Basins Land Ownership

NOTE: Because GIS data for this project were acquired from multiple sources employing different land base grids and varying accuracy standards, some inconsistencies were encountered.
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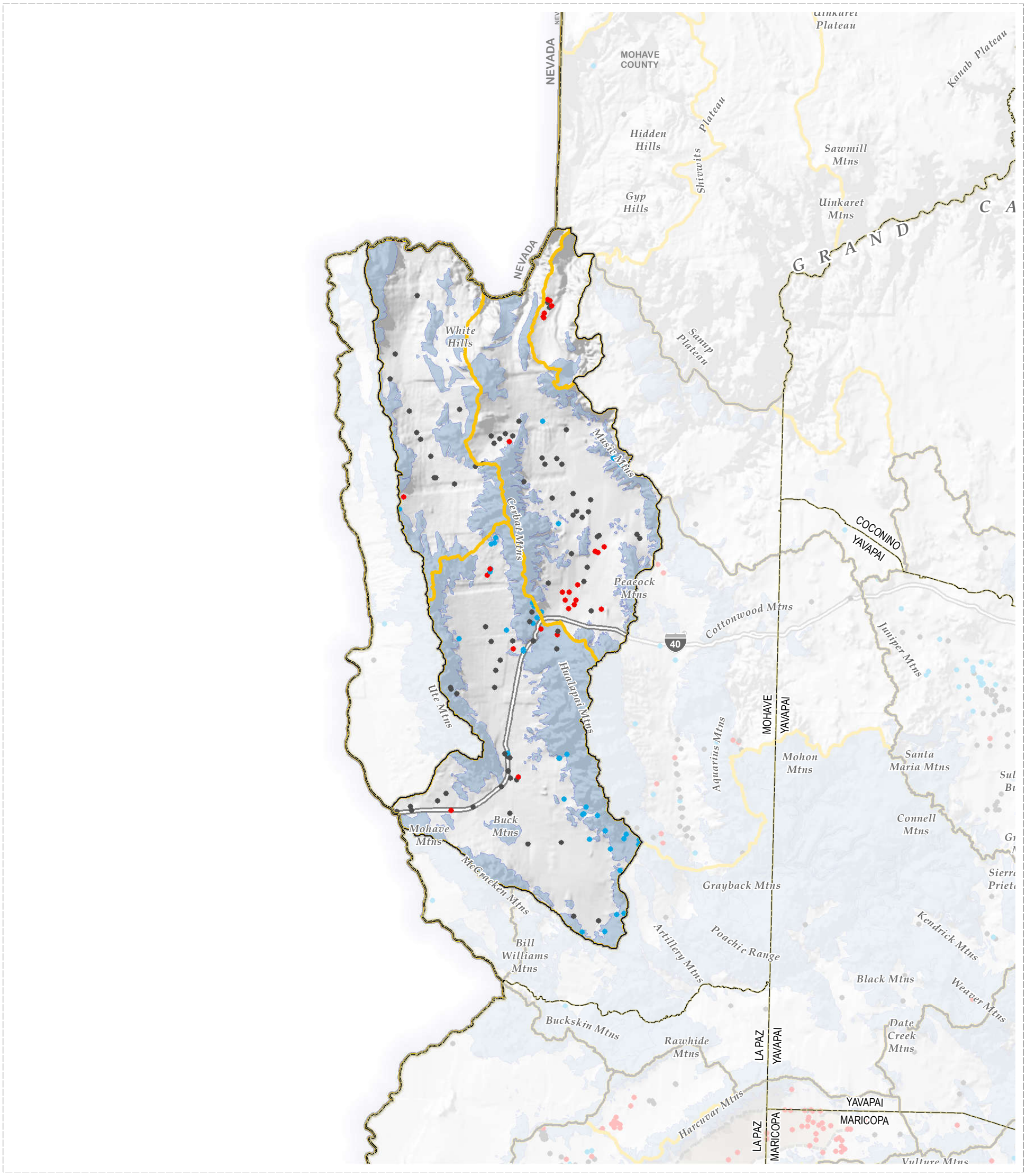

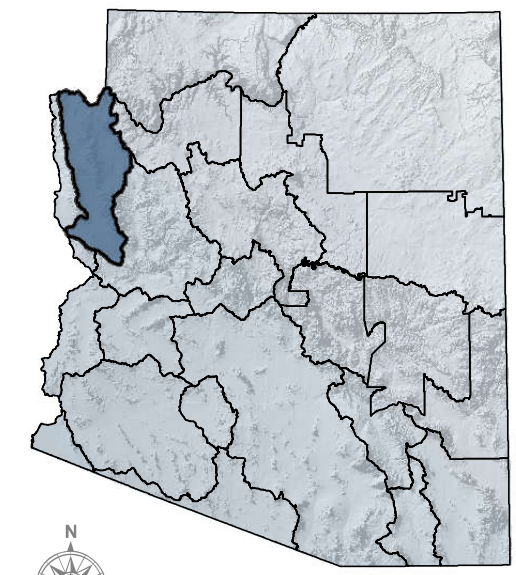

MAP LOCATION
(Planning Area Boundaries)

- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- Groundwater Basin (ADWR)
- Area of Active Land Subsidence (ADWR)
- Hard Rock Geology (AZ Bureau of Mines, UofA)
- Interstate (ADOT)

Recent Water Level Change * (1990's through 2000's)

- Minor WL Change +5' to -5'
- Negative
- Positive

* Data provided by ADWR

Figure P.A.15-2

Northwest Basins Groundwater Hydrology

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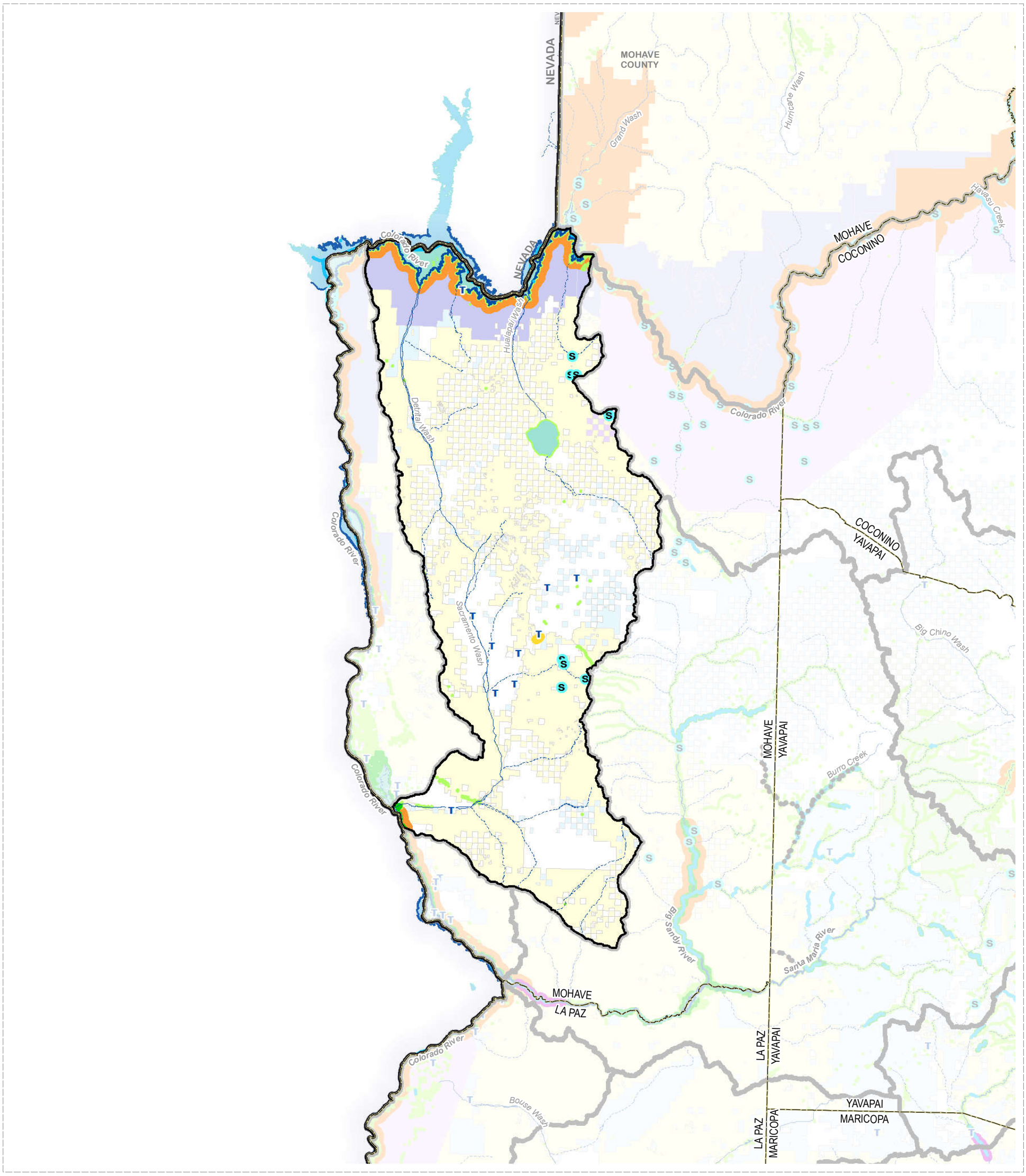
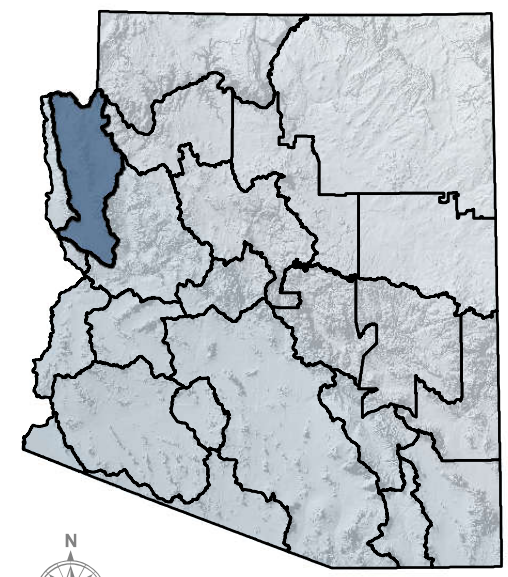




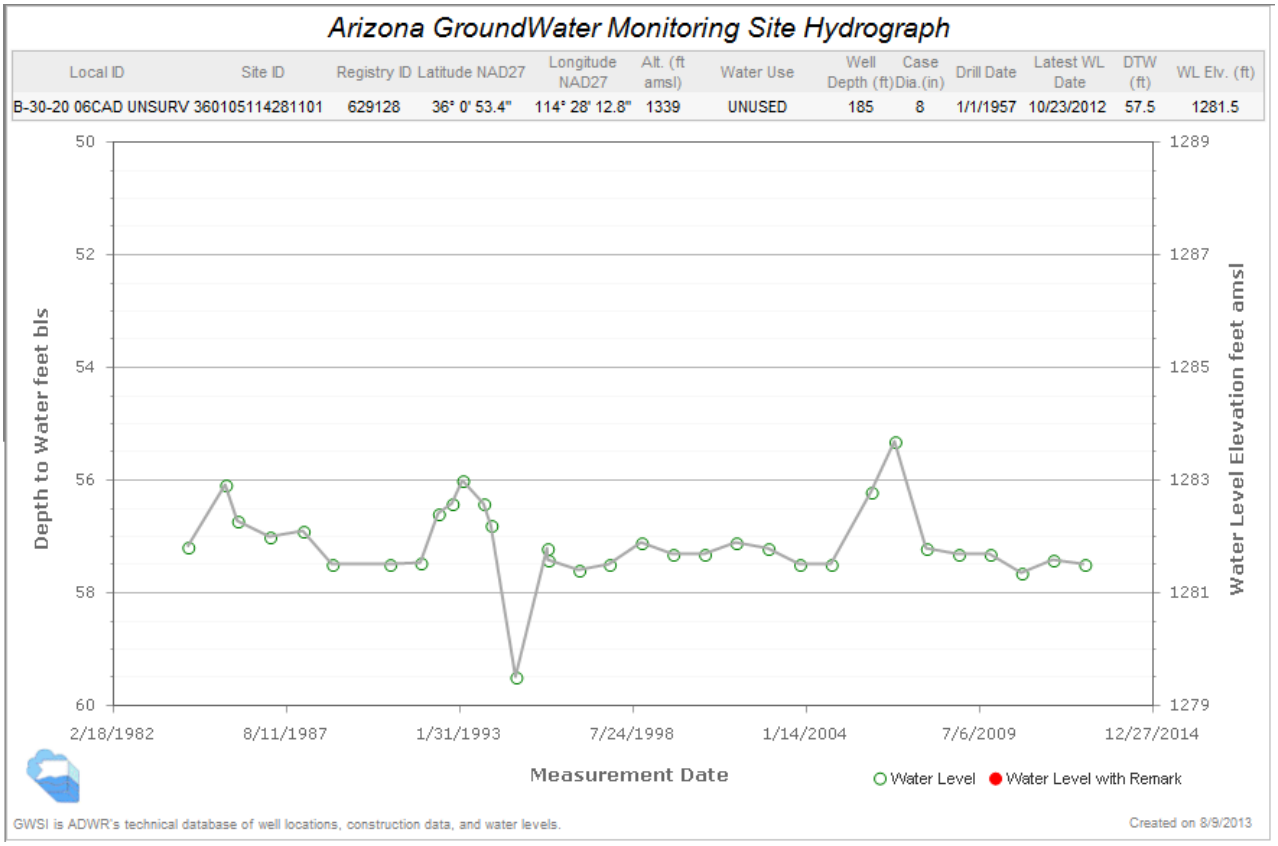
MAP LOCATION
(Planning Area Boundaries)

- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- Reservoir or Lake (NHD)
- T Waste Water Treatment Plant (ADEQ)
- S Major Spring (ADWR, Pima County)
- Perennial Flow (ADEQ, USGS)
- River or Stream (ASLD)
- Outstanding Arizona Water (ADEQ)
- Effluent Dependent Stream (ADWR, NEMO)
- Instream Flow Certificate (ADWR)
- 1993 Riparian Inventory (AZGFD)
- Modeled Riparian Habitat (AZGFD)
- Designated ESA Critical Habitat (USFWS)
- Proposed ESA Critical Habitat (USFWS)
- Federally Designated Wild and Scenic River (USFS)
- BLM Land
- National Forest
- National Park
- Military Reserve
- Private and Other Land
- State Trust Land
- Tribal Land

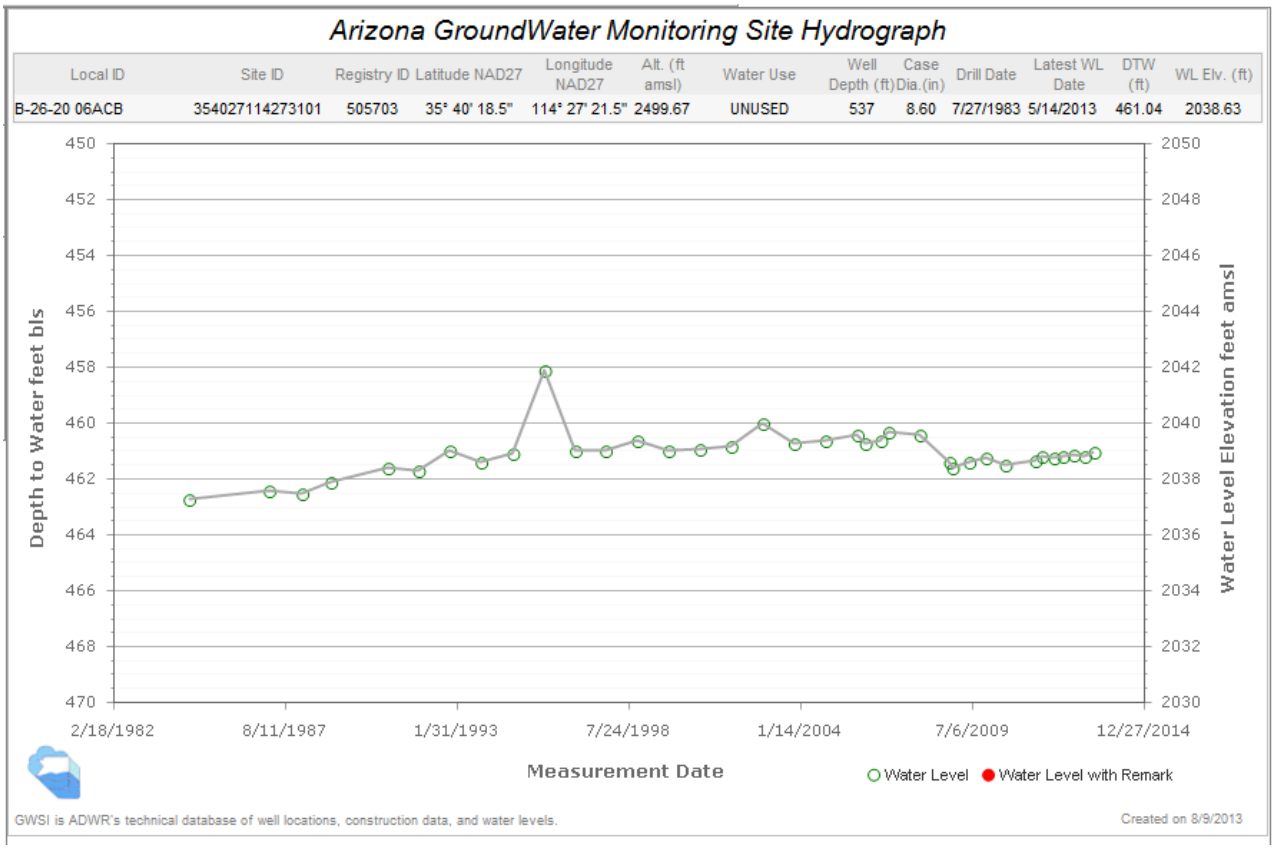
Figure P.A.15-3

Northwest Basins
Surface Water and Natural Features

Detrital Valley Basin – Northwest Basins Planning Area

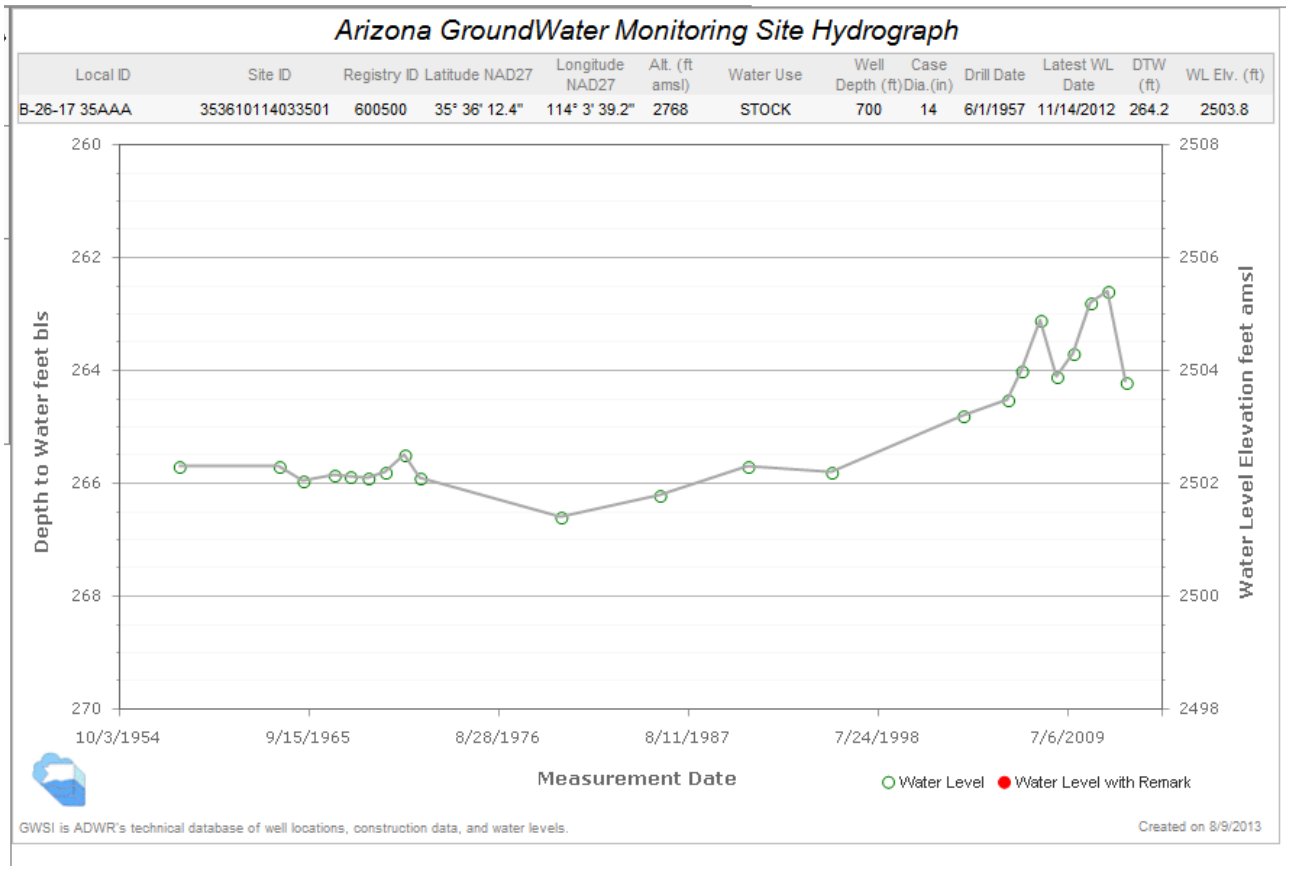


B-30-20 06CAD UNSURV Detrital Valley basin northern portion of basin along Detrital Wash at AZ268.



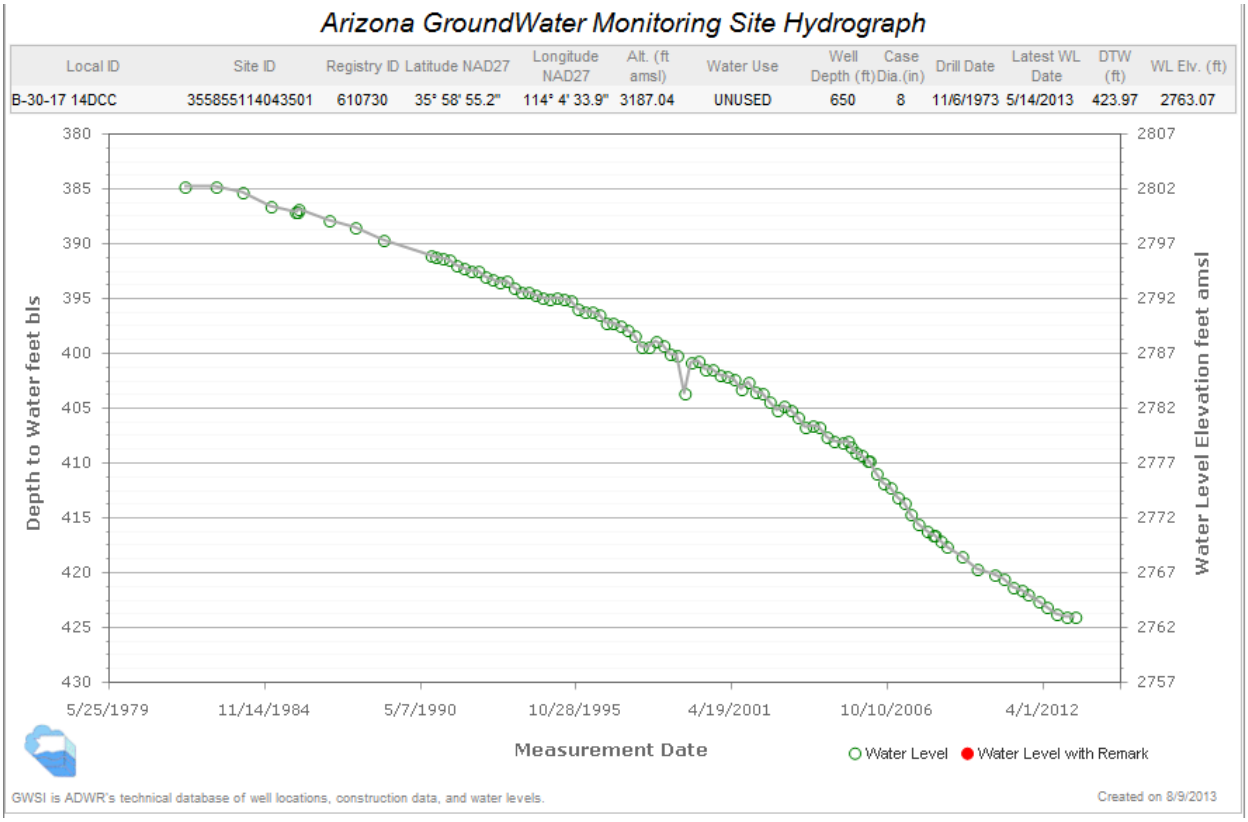
B-26-20 06ACB Detrital Valley basin central part of basin near Detrital Wash.

Hualapai Valley Basin – Northwest Basins Planning Area



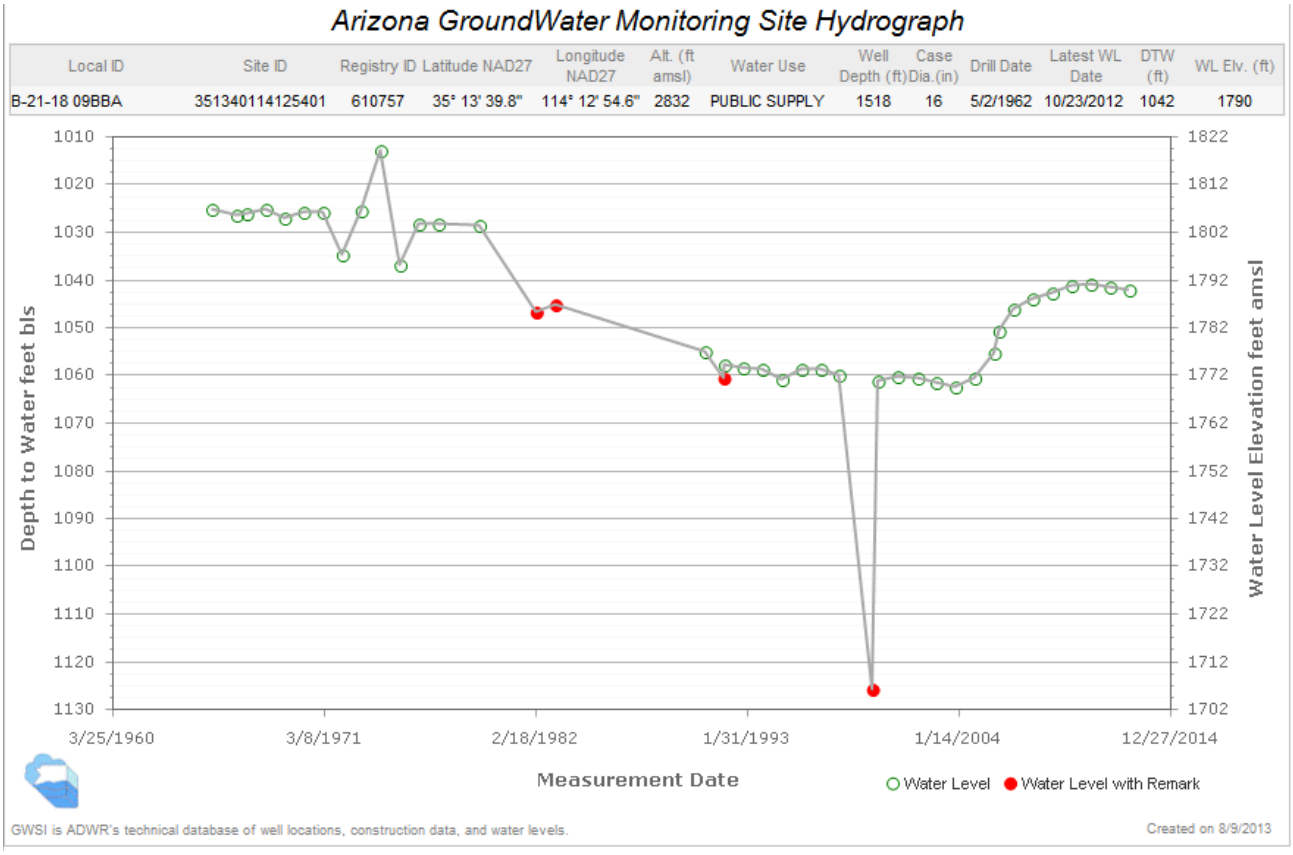
B-26-17 35AAA Hualapai Valley basin, central portion of basin about 2 miles south of Red Lake.

Meadview Basin – Northwest Basins Planning Area

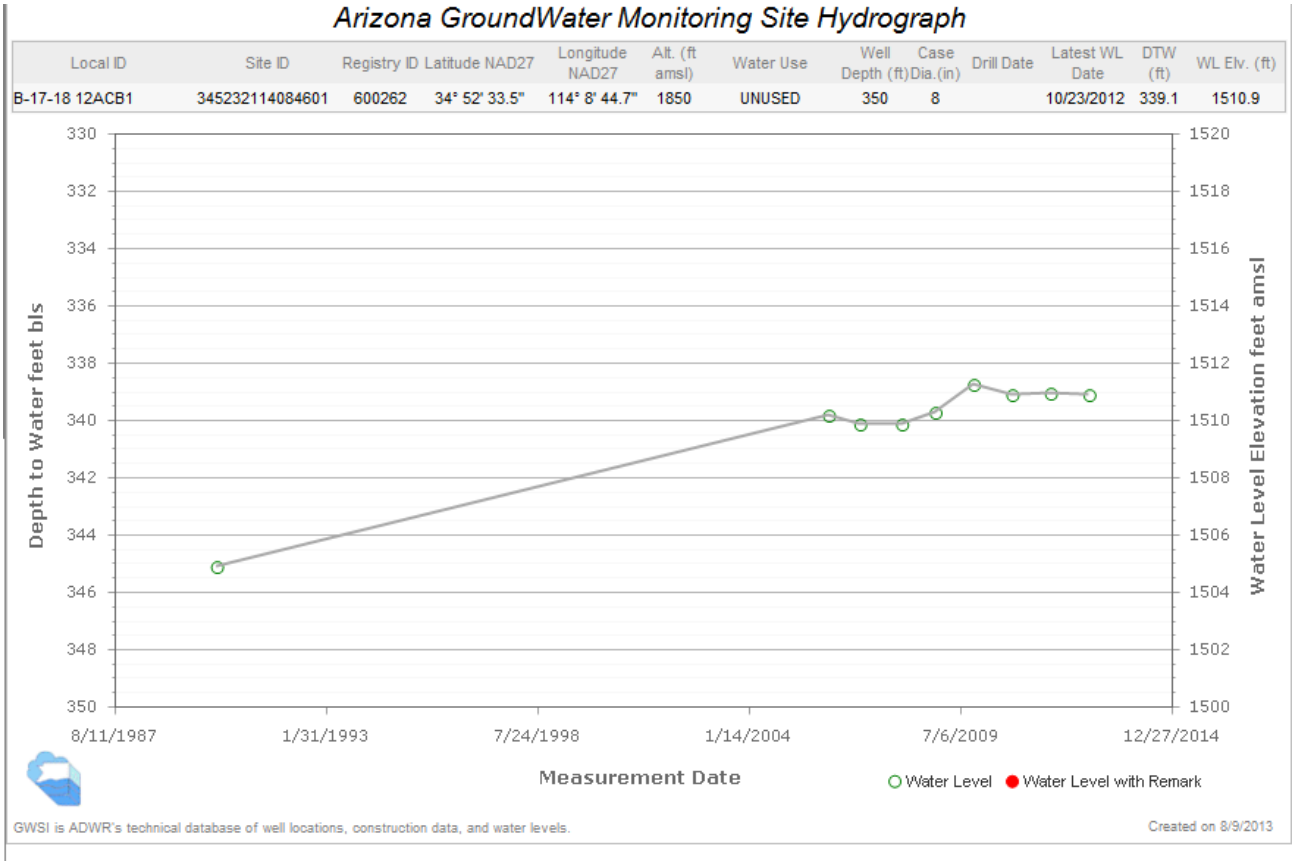


B-30-17 14DCC Meadview basin at Meadview. Overall water level decline due to local pumping.

Sacramento Valley Basin – Northwest Basins Planning Area



B-21-18 09BBA Sacramento Valley basin northern part of basin in Golden Valley area.



B-17-18 12ACB1 Sacramento Valley basin at Yucca.