West Basins Planning Area

Background

The West Basins Planning Area is located in the central western portion of the State and is comprised of the Butler Valley, McMullen Valley, Ranegras Plain, Tiger Wash, and Harquahala Valley groundwater basins (the Harquahala Valley Groundwater Basin has been designated as an Irrigation Non-Expansion Area). The Planning Area is within portions of La Paz, Yuma, Yavapai, and Maricopa Counties. Communities within the Planning Area include Aguila in the northeast, Brenda in the southwest, and Vicksburg, Hope, Harcurvar, and Salome in the central portion of the Planning Area. The CAP Canal bisects the Planning Area, crossing from the northeast in the Ranegras Plain Basin and exiting in the western central portion of the Planning Area through the Harquahala Valley Basin.

The majority of the lands in this Planning Area is federally- owned and managed. The largest is the US Bureau of Land Management (BLM) for resources conservation, recreation and livestock grazing. Other federal lands are managed by the US Fish and Wildlife Service (FWS); and a small portion dedicated to the CAP right of way, owned by the US Bureau of Reclamation (*see Figure P.A. 20-1*). State Trust Lands are dominant in the Butler Valley and McMullen Valley basins. Only 10 percent of the lands across this Planning Area are in private ownership, the majority of which is in the Harquahala Valley Basin, primarily used for irrigated agriculture.

Water Supply Conditions

Groundwater

The West 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 be suitable for artificial underground storage and recovery of renewable water supplies.

Groundwater in storage in the Butler Valley Basin is estimated to be 6.4 MAF. Groundwater levels are declining at approximately 1-foot per year (*see Figure P.A. 20-2*). The groundwater in storage estimate for the McMullen Valley Basin is 15 MAF. Groundwater levels are declining by approximately 0.3 feet per year in the McMullen Valley Basin. Estimated groundwater in storage for the Ranegras Plain Basin is 9.0 MAF, with groundwater levels declining by approximately 0.9 feet per year in response to groundwater pumping. Groundwater in storage in the Tiger Wash Basin is estimated to be 7 MAF, with groundwater levels rising by approximately 0.3 feet per year. Groundwater in storage in the Harquahala Valley Basin is estimated to be 15.5 MAF, with groundwater levels rising by approximately 1.4 feet per year, largely attributable to CAP use and local recharge. Land subsidence has been documented in the McMullen Valley, Renegras Plain and Harquahala basins.

Surface Water

There are no perennial streams within the planning area (*see Figure P.A. 20-3*). There is one reach of intermittent stream on Browns Canyon Wash in the far northwest corner of the Tiger Wash Basin. CAP water is used within the Harquahala Valley basin primarily for agricultural and

industrial uses and is being artificially recharged into the local aquifer for future recovery. The anticipated beneficiaries of this storage are water users outside of the Planning Area.

Reclaimed Water

There are no large population centers and the absence of concentrated development within the Planning Area limits the existence of centralized wastewater collection and treatment works and, likewise, limits the availability of reclaimed water for reuse. Most domestic water users rely upon septic systems for wastewater treatment and disposal. One known waste water treatment plant exists within the McMullen Valley Basin although the volume and use of the reclaimed water is unknown.

Ecological Resources

The West Basins Planning Area includes significant portions of the Rawhide Mountain, Harcuvar Mountains, Harquahala Mountains, New Water Mountains, and Eagle Tail Mountains Wilderness areas and a portion of the Kofa National Wildlife Refuge (*see Figure P.A. 20-3*).

Water Demands

Table P.A. 20-1 below presents the baseline projected water demands for the West Basins Planning Area. Agricultural irrigation is the majority of the water use in the Planning Area, primarily dependent on groundwater except for agricultural uses in the Harquahala Basin, which uses a combination of CAP water and groundwater. Agricultural demands are projected to remain steady through 2060 at 250,000 acre-feet per year, unless groundwater is transported out of the Harquahala Valley Basin (see below). Municipal demand is expected to increase from 1,016 acre-feet to a little over 2,000 acre-feet per year in 2060. Industrial demand, currently dominated by the Harquahala Generating Station, is expected to increase slightly from an average of 1,500 acre-feet per year to just over 2,000 acre-feet per year in 2060.

Characteristics Affecting Future Demands and Water Supply Availability

Water Management

The Harquahala Irrigation Non-Expansion Area (INA) was established under the 1980 Groundwater Management Act. Creation of the Harquahala INA, overlying only the Harquahala Valley Groundwater Basin, prohibits the addition of new agricultural acreage using groundwater within the INA after its establishment. Additionally, all groundwater withdrawn from wells in the INA with a pumping capacity of 35 gallons per minute or greater (designated as non-exempt wells) must meter and report their annual groundwater use to ADWR.

Groundwater Transportation

Throughout most of the State, groundwater transportation in Arizona is prohibited between basins *(A.R.S. §45-544)*. However, specific exemptions are included in the State law that allow groundwater be transported away from McMullen Valley, Butler Valley, and the Harquahala Valley basins into an initial Active Management Area (AMA). Specific and unique requirements must be met to comply with State law to effectuate transfers from each of these basins (*A.R.S. §45-552, §45-553, and §45-554)*.

Table P.A. 20-1. Projected Demands (in acre feet) – West Basins Planning Area

Sector	2010	2035	2060
Agriculture	250,000	250,000	250,000
Dairy	0	0	0
Feedlot	0	0	0
Municipal	1,016	1,607	2,009
Other Industrial	0	0	0
Mining	0		
High		0	0
Low		0	0
Power Plants	1,107		
High		1,147	2,065
Low		918	1,652
Rock Production	0		
High		124	154
Low		51	65
Turf	0		
High		0	0
Low		0	0
Total (High)	**252,123**	**252,878**	**254,228**
Total (Low)	**252,123**	**252,576**	**253,726**

Strategies for Meeting Future Water Demands

Comprehensive Analysis of Groundwater Transportation

While there are certainly issues related to the transportation of water, the legislature has stated its intent, and has created a statutory mechanism that facilitates transfers from the Harquahala Valley, the McMullen Valley, and the Butler Valley basins. While projected demands within the entire Planning Area are estimated to be as high as 254,000 acre-feet per year, the estimated range of groundwater in storage in the basins identified for transportation (Harquahala Valley, McMullen Valley and Butler Valley) could theoretically support withdrawals between approximately 290,000 and 621,000 acre-feet per over a 100-year period. It should be noted that this estimate is not a guarantee of available water supplies and may not occur in areas that can be accessed due to the significant land area under federal ownership. Additionally, it is unlikely that all of the groundwater in storage could be withdrawn from wells without undesirable consequences, including water quality degradation, land subsidence, and earth fissuring. Development of a comprehensive groundwater model would help to develop more accurate estimates of sustainable groundwater development from available lands.

The statutory exceptions for the three transportation basins, while unique to each basin, require an evaluation of impacts to local water users. The statutes also allow, and generally direct that the acquisition of these water supplies can occur on a piecemeal approach. While this allows for each landowner to decide if they want to participate in such a program, changing conditions over time will increase the complexity of the required impact analysis, increasing costs and reducing regulatory certainty for applicants seeking these water supplies and their investors.

Either a change in statute or policies that allow for a comprehensive approach (within a specific basin) for analysis and/or acquisition, using basin-wide groundwater modeling, will provide protections, not only to existing landowners in making voluntary decisions for the disposition of their lands, but also to investors looking for future water supplies. Without this, the availability of water supplies, and the ability of landowners to benefit from these actions, may be limited.

Reclaimed Water Reuse

The availability of and ability to use reclaimed water is limited by the dispersed population and reliance on septic systems. However, centralization of wastewater and underground storage of all available reclaimed water should be encouraged to enhance local aquifer supplies. Alternatively, reclaimed water could be developed and used in place of transported groundwater to meet the same objective.

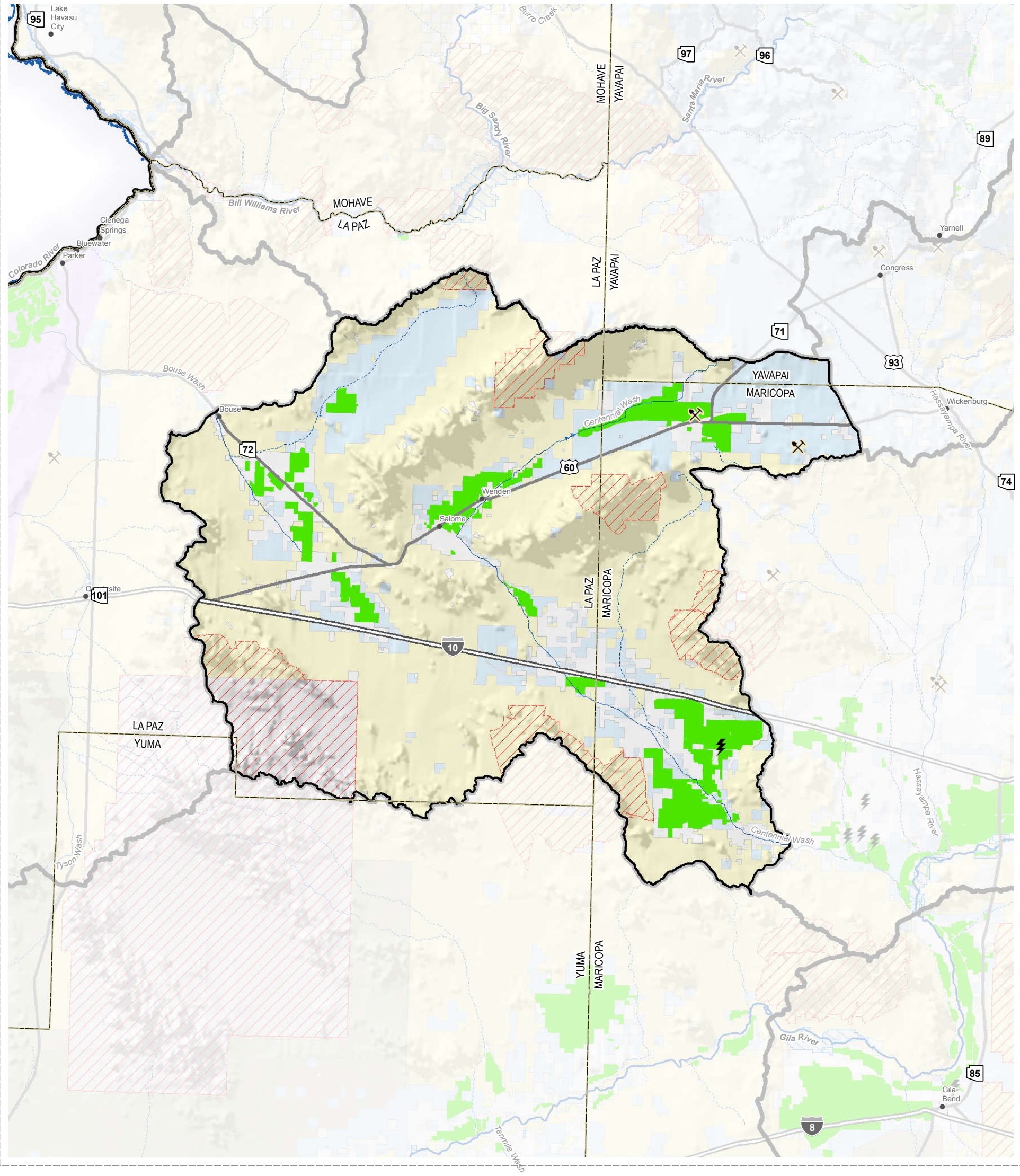
Recharge and Recovery of Excess Colorado River Water or Imported Water Supplies

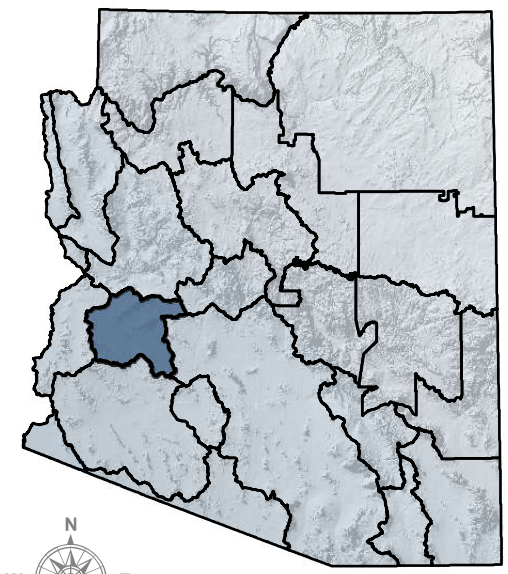
The proximity of the CAP canal to certain portions of this Planning Area may provide opportunities for the temporary storage of excess Colorado River supplies (if and when they are available). This option should also be evaluated for water supplies that are developed from projects outside of Arizona for the benefit of water users who have CAP canal access, but for which there may not be an immediate use. This temporary storage and the transmission of water supplies through the CAP canal are contingent on available capacity and must be done in a manner that does not harm existing landowners or water users dependent on CAP supplies.

Meeting Future Demands

Because of the relatively small increases in projected demands and the availability of groundwater, it would appear that there are sufficient water supplies to meet projected demands. Vulnerability to drought conditions, potential transportation and declines in water levels will need to be monitored and addressed.

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.20-1

West 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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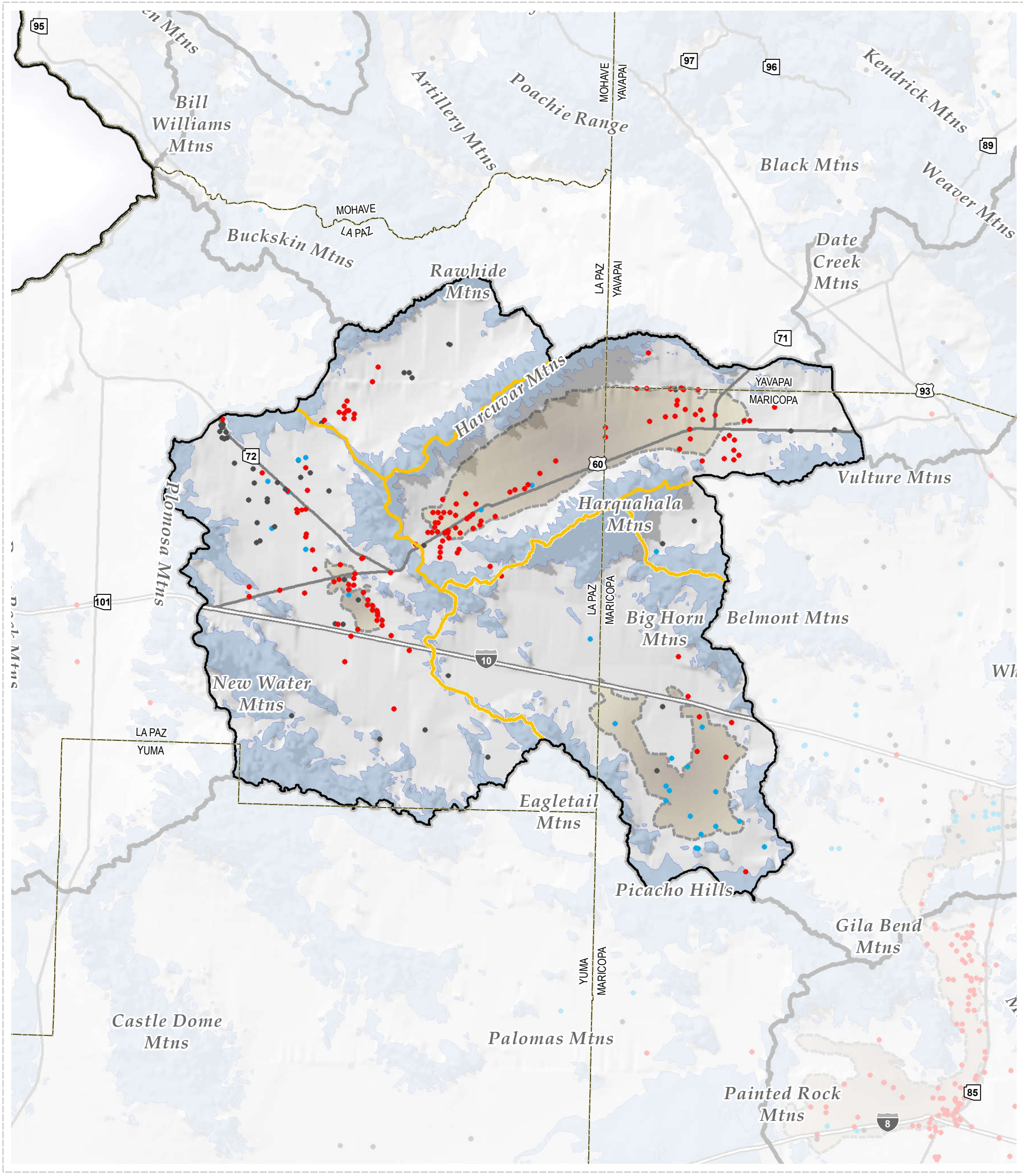
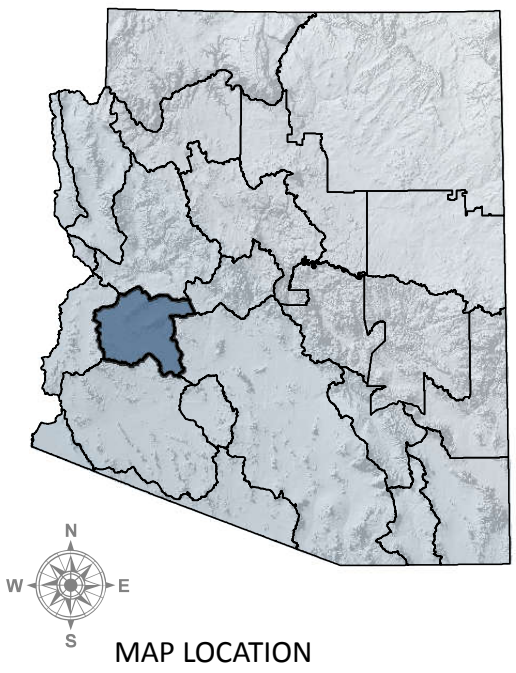




MAP LOCATION
(Planning Area Boundaries)

- 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)

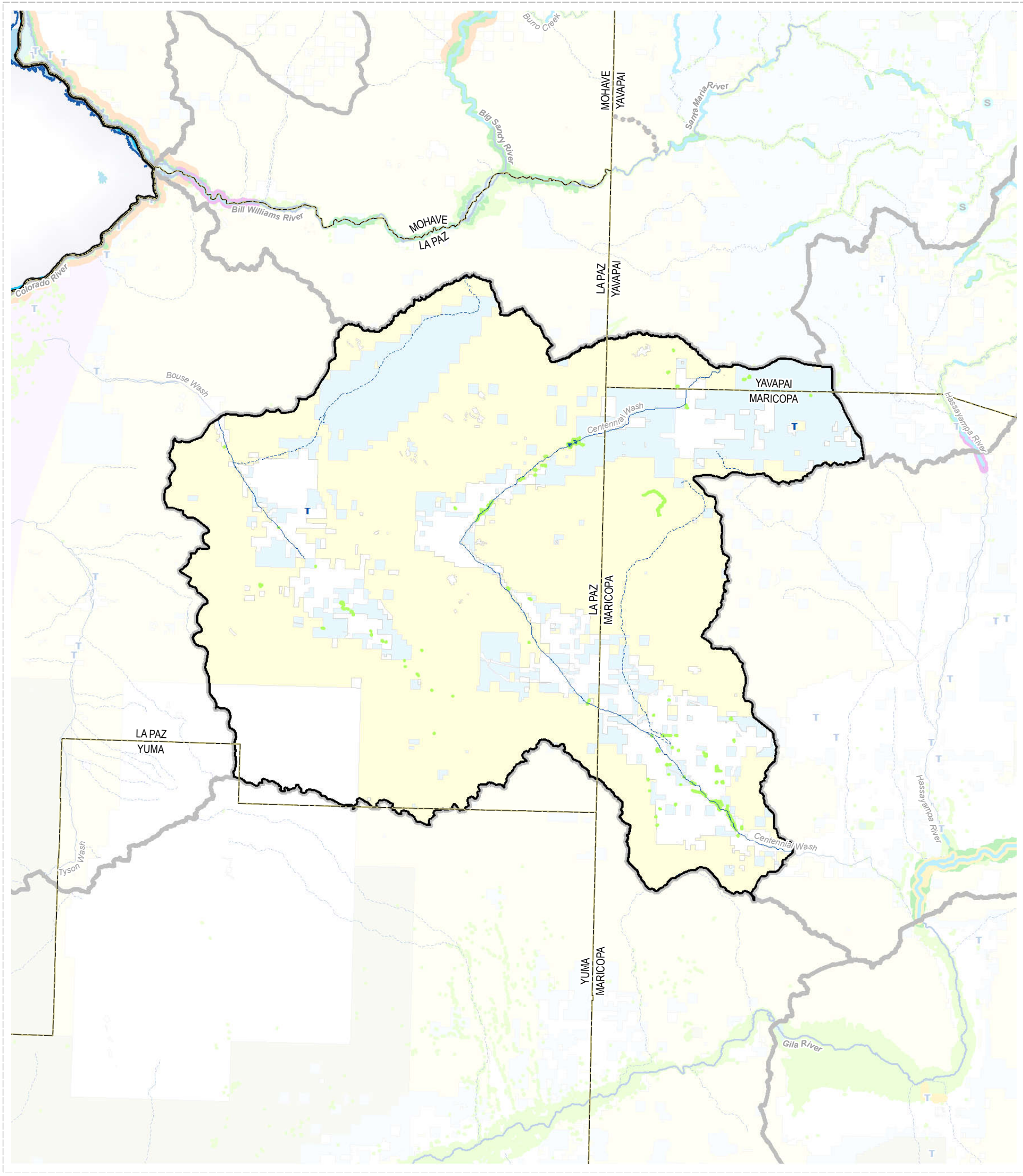
Recent Water Level Change * (1990's through 2000's)
- Minor WL Change +5' to -5'
- Negative
- Positive

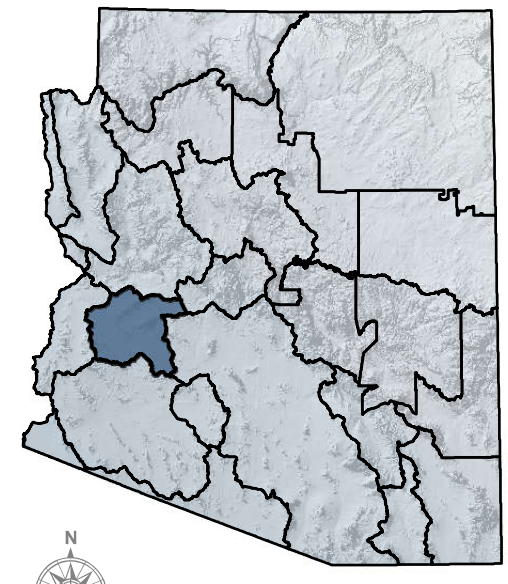
* Data provided by ADWR

Figure P.A.20-2

West Basins Groundwater Hydrology

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.





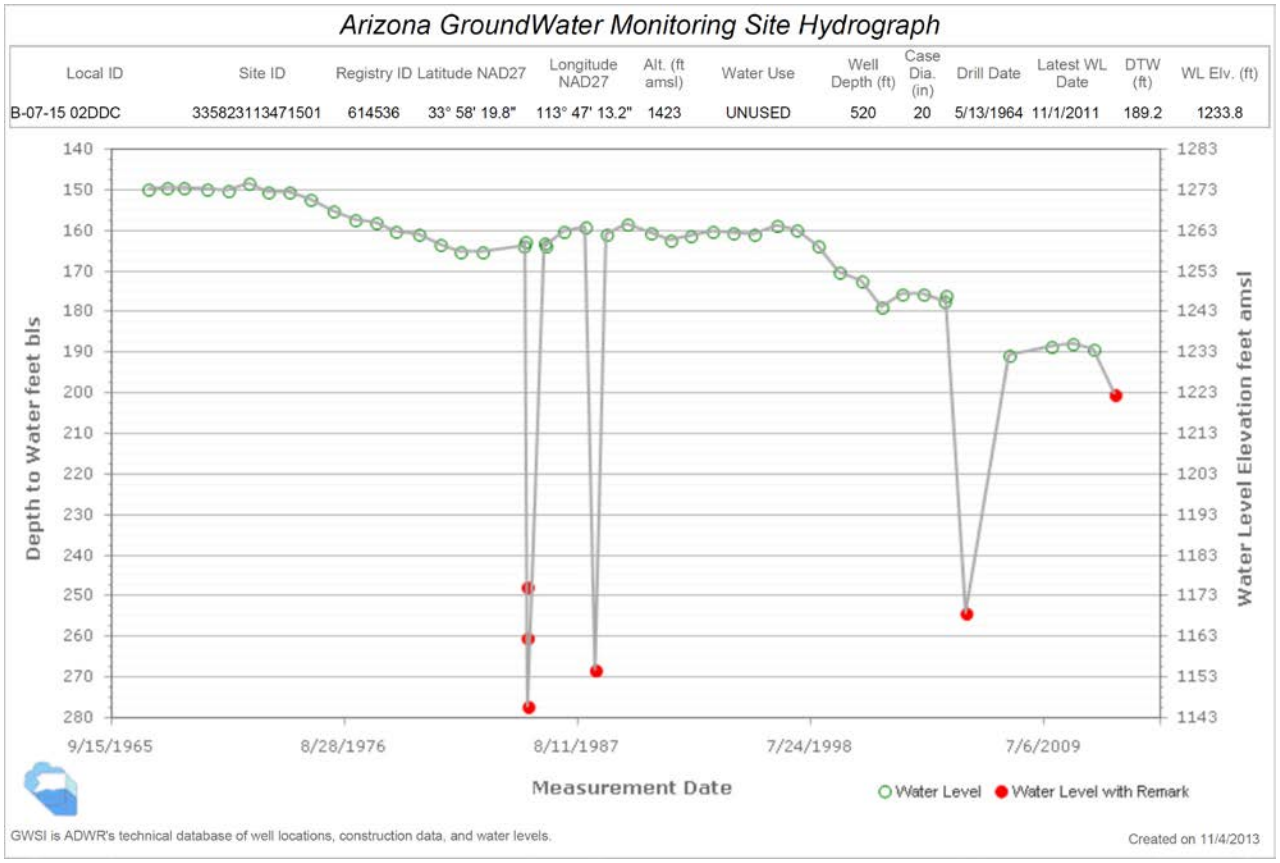
MAP LOCATION
(Planning Area Boundaries)

- Planning Area (ADWR)
- State (ALRIS)
- County (ALRIS)
- Reservoir or Lake (NHD)
- Waste Water Treatment Plant (ADEQ)
- 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

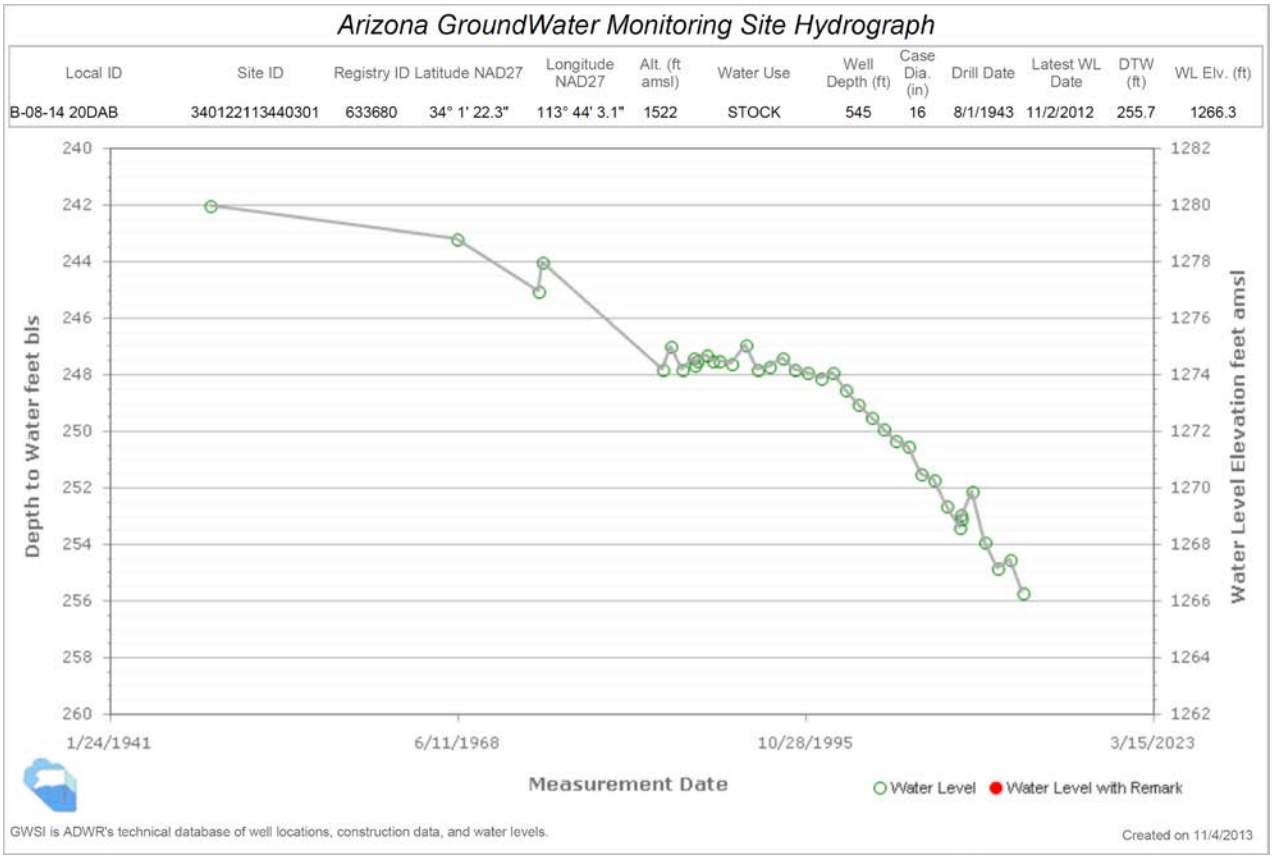
Figure P.A.20-3

West Basins
Surface Water and Natural Features

Butler Valley Basin – West Basins Planning Area

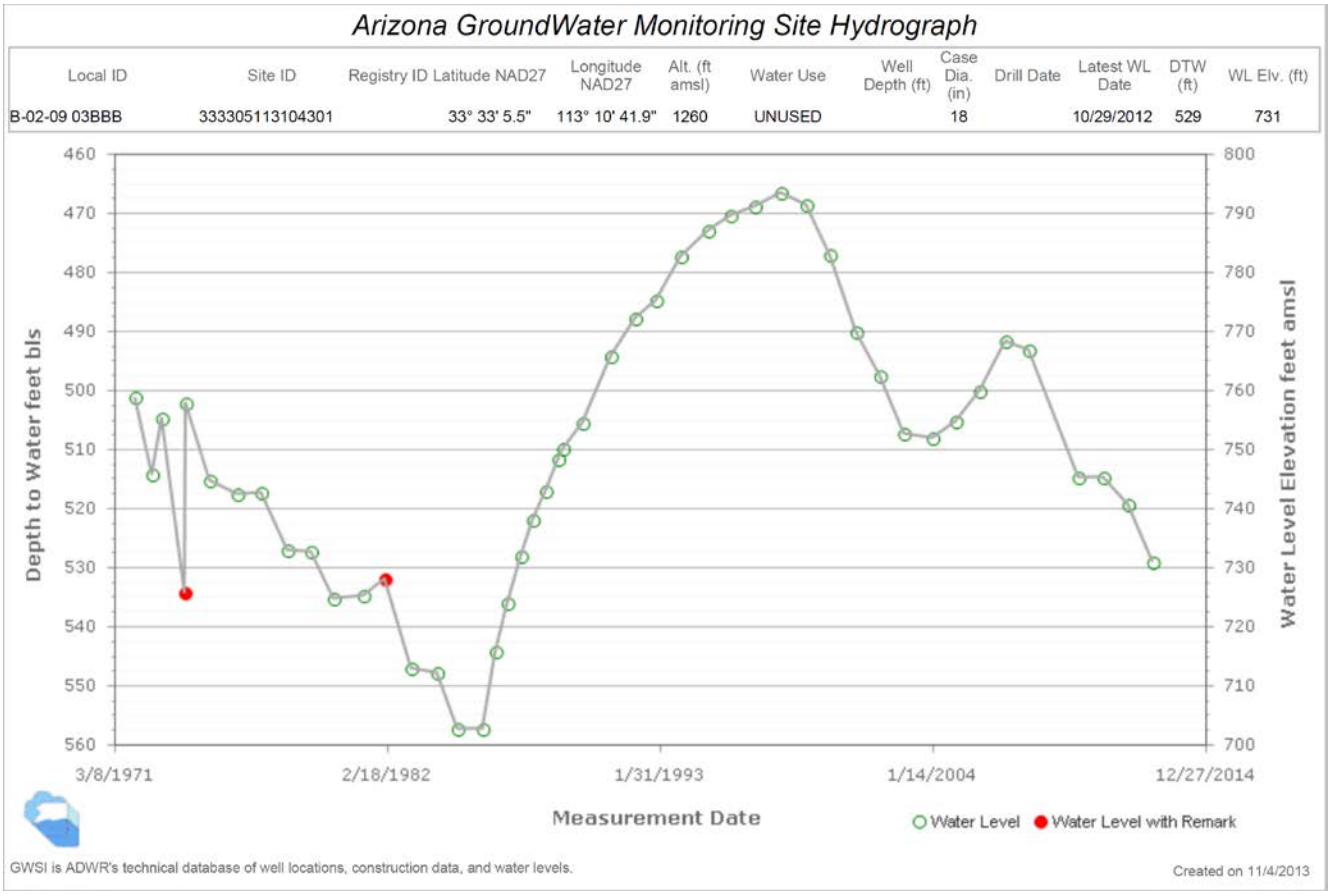


B-07-15 02DDC -- Butler Valley basin SW agricultural area of valley.



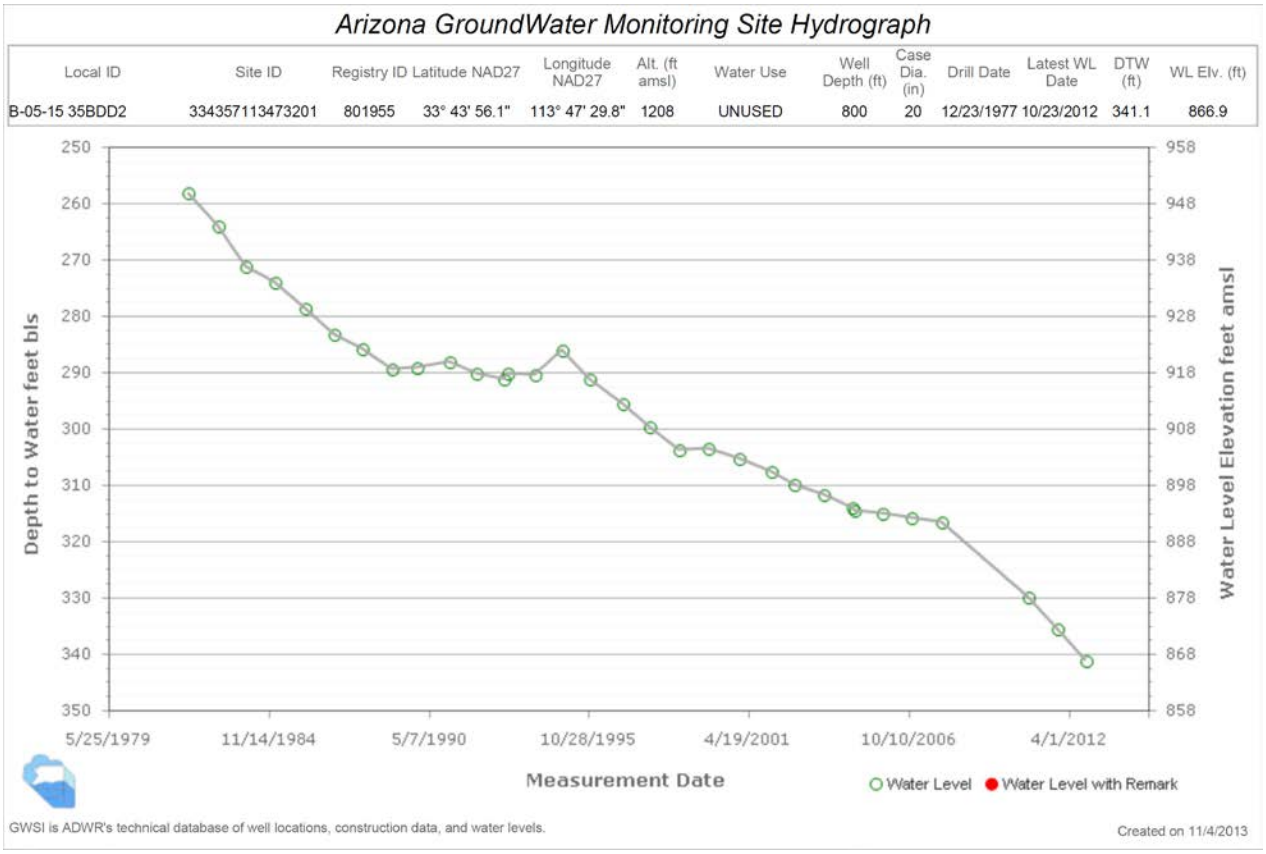
B-08-14 20DAB – Butler Valley basin central Butler Valley.

Harquahala INA – West Basins Planning Area

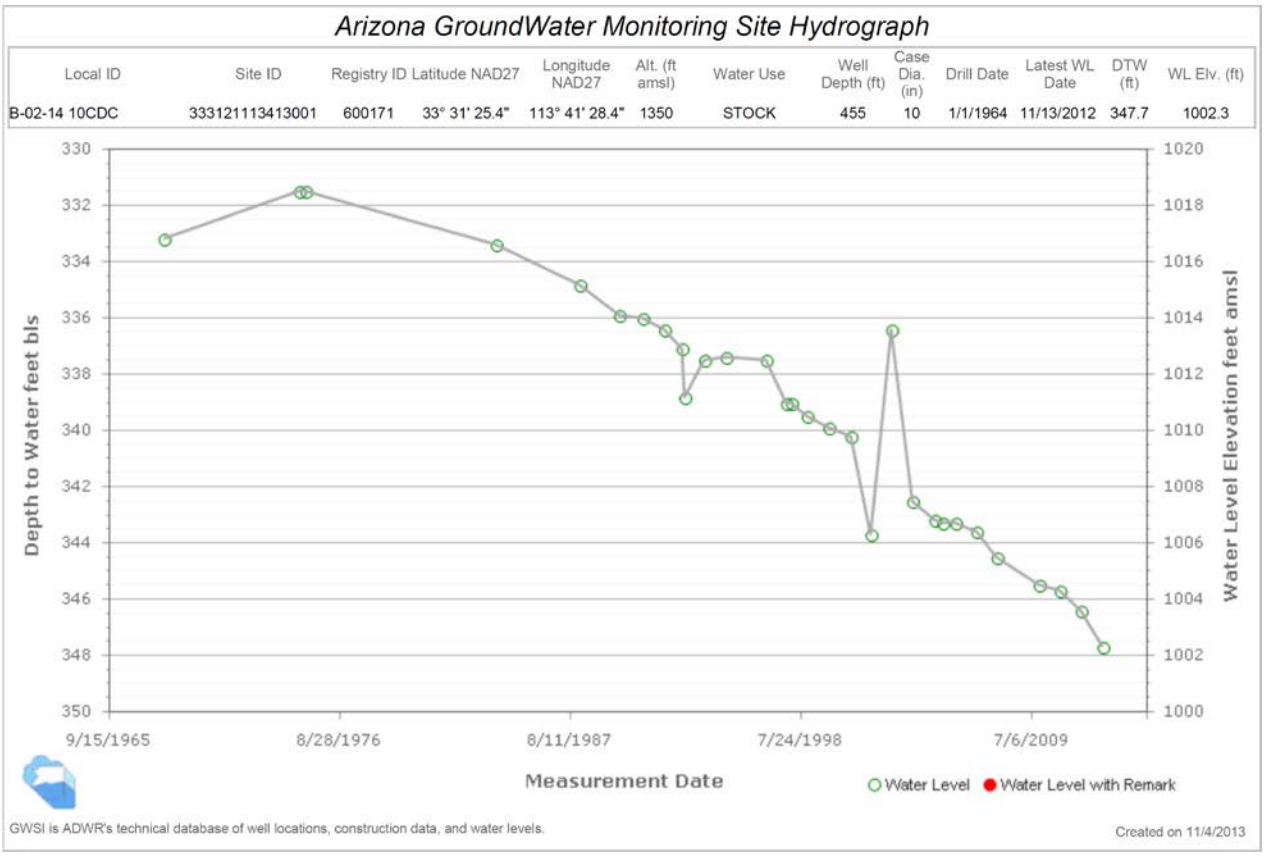


B-02-09 03BBB Harquahala INA about 10 miles east of Centennial.

Ranegras Plain Basin – West Basins Planning Area

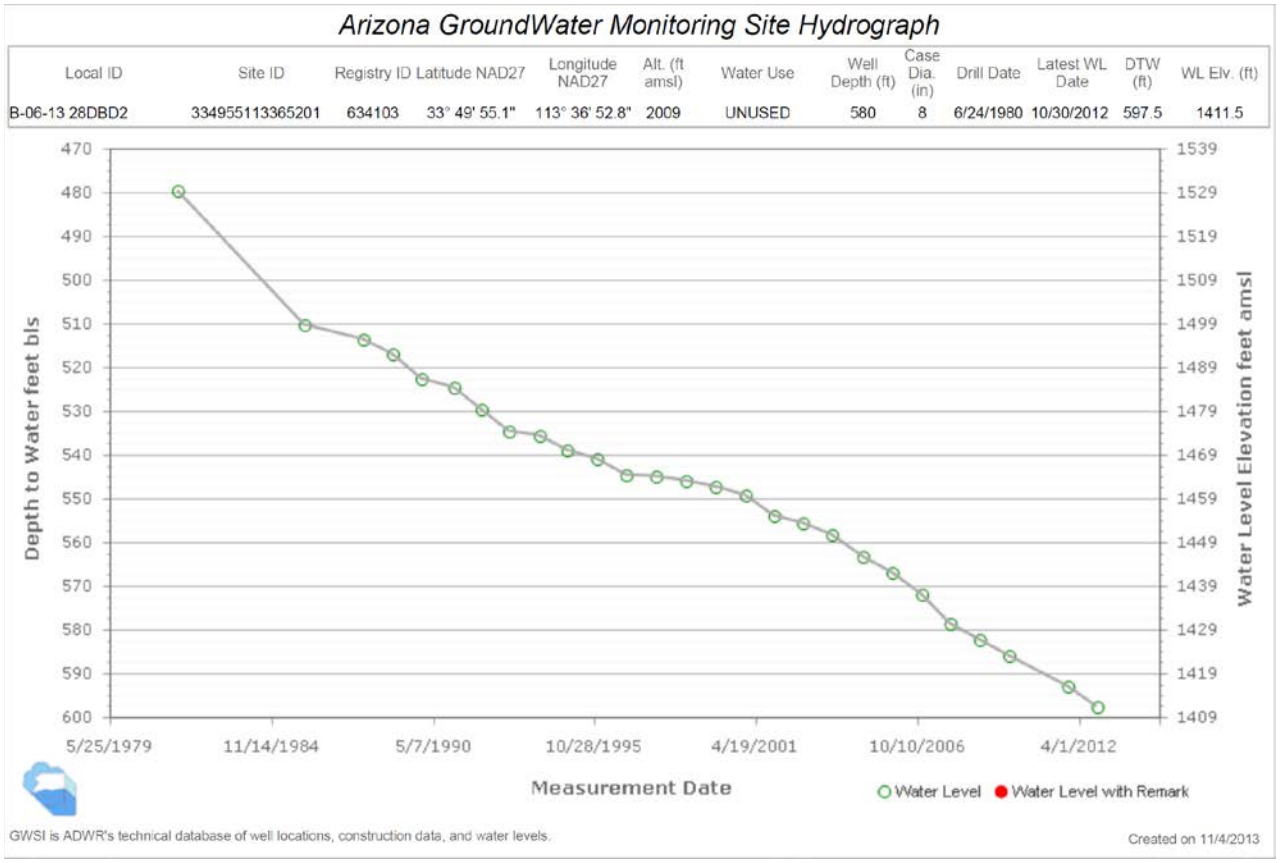


B-05-15 35BDD2 – Ranegras Plain basin about 5 miles west of Vicksberg.

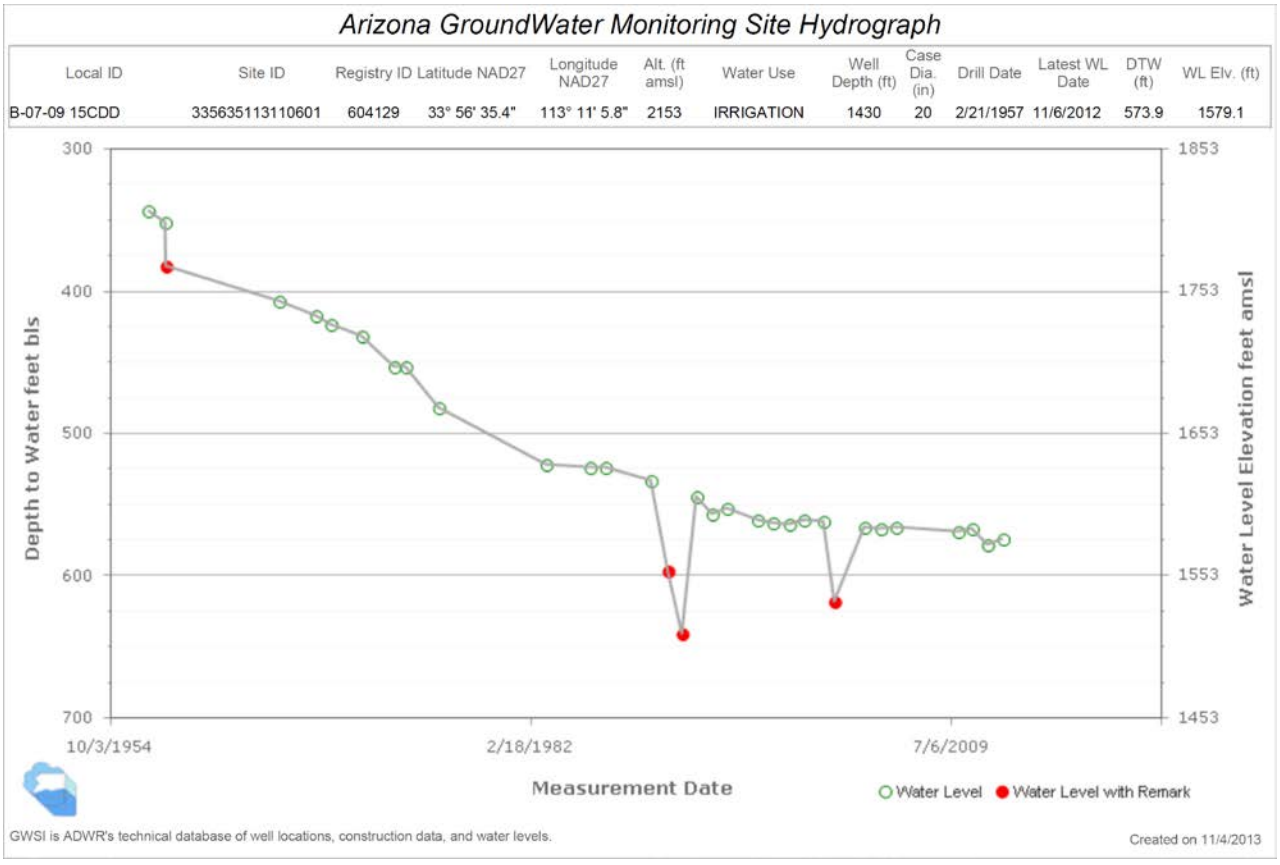


B-02-14 10CDC – Ranegras Plain basin south-central area.

McMullen Valley Basin – West Basins Planning Area



B-06-13 28DBD2 – McMullen Valley basin about 4 miles west of Wenden.



B-07-09 15CDD – McMullen Valley basin NE McMullen Valley.