Hassayampa/Agua Fria Planning Area

Background

The Hassayampa/Agua Fria Planning Area is located in the central portion of the State, immediately adjacent to the northern boundary of the Phoenix AMA. Lands within the Planning Area are located primarily within Yavapai County. A very small portion at the southern extent of the Planning Area is located within Maricopa County. The Hassayampa/Agua Fria Planning Area is contained within the northern portion of the Agua Fria-Lower Gila River Watershed. The Planning Area encompasses entirely both the Upper Hassayampa and Agua Fria groundwater basins. Notable communities within the Planning Area are Wickenburg, Congress, Black Canyon City, and Mayer.

The majority of the land within this Planning Area is federally owned and managed by two agencies, the USDA Forest Service (Forest Service) and the US Bureau of Land Management (BLM) (*see Figure P.A. 11-1*). The Forest Service manages land as part of the Prescott National Forest. Land uses are recreation, livestock grazing and timber production. Castle Creek and a portion of Pine Mountain Wilderness Areas are located within Forest Service lands. BLM lands include the Agua Fria National Monument and the Hassayampa River Canyon and Hells Canyon Wilderness Areas. Land uses are recreation and livestock grazing. State Trust Lands are located throughout the Planning Area. Livestock grazing is the primary land use on the State Trust Lands. Private land is located throughout the Planning Area interspersed with State, BLM, and Forest Service lands. There are also numerous small private land in-holdings in the Prescott National Forest. Private land uses include domestic, commercial, and livestock grazing.

Water Supply Conditions

Groundwater

The northern portion of the Hassayampa/Agua Fria Planning Area is located in the Transition Zone Physiographic Province. The mountainous terrain of this region have aquifers that consist of relatively thin alluvial aquifers, and in fractured crystalline, sedimentary, and volcanic rock. The southern portion of the 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.

Overall, minor water level fluctuations have been observed in wells within both the Agua Fria and Upper Hassayampa basins (*see Figure P.A. 11-2*). In much of the northern half of the Planning Area, groundwater occurs in volcanic rocks that yield small volumes of water. One water level hydrograph in this region near Mayer has shown steady water levels over the last several years.

In the southern portion of the Planning Area, basin-fill deposits that have relatively high water yields are typically encountered. Hydrographs of water level measurements in wells near Wickenburg and Black Canyon City have also remained relatively constant over the past 30 years.

No State or federal water quality remediation sites have been identified within the Planning Area. Groundwater quality issues related to naturally occurring arsenic and fluoride have been encountered in multiple locations in the Planning Area.

Surface Water

The two primary surface water features in the Agua Fria-Hassayampa Watershed are the Agua Fria and Hassayampa Rivers (*see Figure P.A. 11-3*). Both rivers generally flow north to south in the Planning Area. Lake Pleasant, which is impounded by New Waddell Dam, is located at the southern boundary of the Agua Fria Basin and stores water flows from the Agua Fria River (the reservoir is also used to store CAP water for the operations of the project). The Agua Fria River is perennial along several reaches within the Planning Area.

There are three active streamgage stations along the Agua Fria River. The minimum and maximum annual flow in the Agua Fria River near Rock Springs (upstream of Lake Pleasant) was 1,528 acre-feet (1975) and 360,541 acre-feet (1992), respectively. There are currently no operating streamflow gages along the Hassayampa River.

Reclaimed Water

There is limited reclaimed water production within the Planning Area. The largest volume of reclaimed water is produced at the Wickenburg WWTP. Reclaimed water from this facility is discharged to unlined impoundments for aquifer recharge. Reclaimed water disposal methods from the other small wastewater treatment facilities within the Planning Area either discharge to watercourses or are unknown.

Ecological Resources

The Agua Fria River and its tributaries support riparian systems, and drain into Lake Pleasant—a popular recreation area for boating and fishing (*see Figure P.A. 11-3*). Many important aquatic and riparian wildlife species occur within the riparian forests and along the shores of Lake Pleasant. Critical habitat is designated for the Gila Chub and Mexican Spotted Owl. The Nature Conservancy Hassayampa River Preserve and several federally-managed Wilderness Areas are located within the Planning Area. Much of the southern portion of the Upper Hassayampa Basin is identified as an important wildlife linkage for the Bighorn Sheep, Badger, Mountain Lion, Mule Deer, Black-tailed Jackrabbit, Desert Tortoise, Gila Monster, hawks and several fish species.

Water Budget

Table P.A. 11-1, below, presents the baseline and projected water demands for the Hassayampa/Agua Fria Planning Area. Municipal use is the largest water demand sector and the volume is projected to double by 2060. Population growth in the northern section of the Phoenix metropolitan area will likely expand into the Planning Area as current communities such as Wickenburg grow and State Trust Lands are sold and developed. Although this demand sector is projected to double, the overall demand estimate is anticipated to be approximately 9,200 acre-feet per year by 2060. Other demand sectors have minimal current or projected water use. In 2060, municipal use is anticipated to represent approximately 75% of the total water use in the Planning Area.

TABLE P.A 11-1. Projected Water Demands (in acre feet) - Hassayampa/Agua Fria Planning Area

Sector	2010	2035	2060
Agriculture	1,800	1,800	1,800
Dairy	786	786	786
Feedlot	0	0	0
Municipal	4,595	7,547	9,239
Other Industrial	0	0	0
Mining	0		
High		0	0
Low		0	0
Power Plants	0		
High		0	0
Low		0	0
Rock Production	2		
High		455	555
Low		189	231
Turf	0		
High		0	0
Low		0	0
Total (High)	**7,183**	**10,588**	**12,380**
Total (Low)	**7,183**	**10,322**	**12,056**

Characteristics Affecting Future Demands and Water Supply Availability

Reclaimed Water

The storage of reclaimed water from the Wickenburg WWTP helps to recharge the aquifer which provides water management benefits to this community.

CAP Water

The Mayer Domestic Water Improvement District (DWID) originally contracted for a 332 acre-feet of CAP entitlement to be used via an exchange with entities in the CAP service area (Maricopa, Pinal and Pima counties) for rights to local surface water supplies. The Mayer DWID instead chose to sell and transfer their subcontract to the City of Scottsdale in the Phoenix AMA Basin. Monies resulting from the sale of this entitlement were placed in a trust fund account, with oversight by ADWR, to ensure that trust fund monies are used to defray expenses associated with "designing, constructing, acquiring and/or developing an alternative water supply in an amount which may include, but is not limited to, a combined net increase" in the subcontractor's "water system capacity to replace the CAP allocation" transferred to Scottsdale. Mayer has been exploring utilizing its funds for the development of local groundwater supplies.

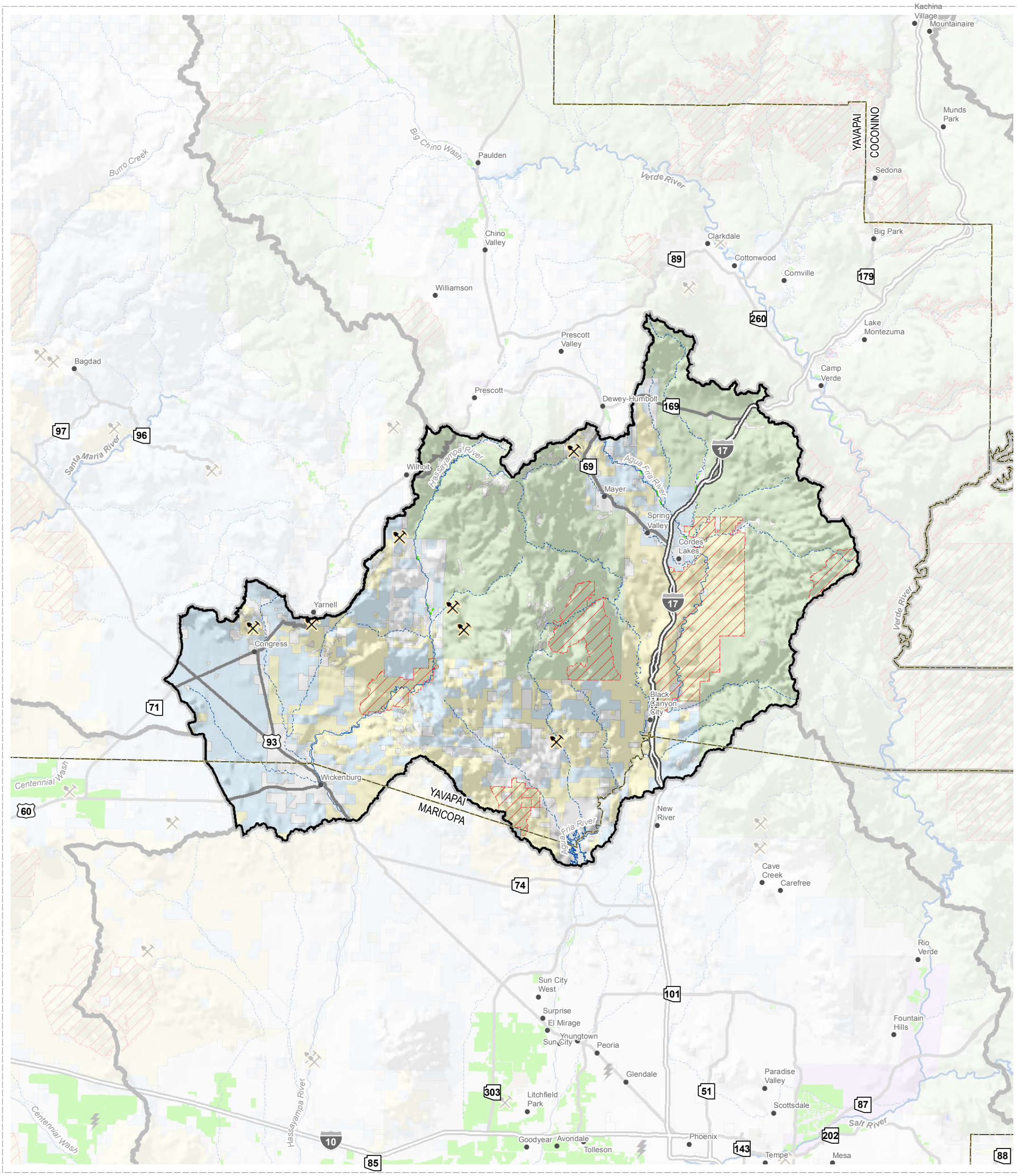
Groundwater Availability

Compared to the deep alluvial basins found in the southern part of Arizona, high elevations, steep topography and extensive areas of bedrock in the northern portion of the Hassayampa/Agua Fria Planning Area translate into relatively minimal groundwater storage capabilities and high runoff. These conditions result in limited, drought-sensitive water supplies for some communities, such as Mayer. The geologic formations near Black Canyon City yield relatively small volumes of water to wells. Additionally, arsenic and fluoride concentrations at levels that equal or exceed drinking water standards have been detected in springs and wells near Black Canyon City and at Castle Hot Springs. Areas of relatively high water yield include basin-fill deposits near Wickenburg in the Upper Hassayampa Basin.

Strategies for Meeting Future Water Demands

Because projected water demand increases are still relatively small for this Planning Area, no strategies are being developed at this time. However, because of the potential increases in municipal water demands, increased monitoring of aquifer conditions would support development of a comprehensive hydrologic model to better understand the long-term sustainability of the groundwater supplies in this area. Opportunities to partner with communities in the neighboring AMAs for augmenting local water supplies and wellhead treatment for water quality issues should be explored as well.

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.



Miles
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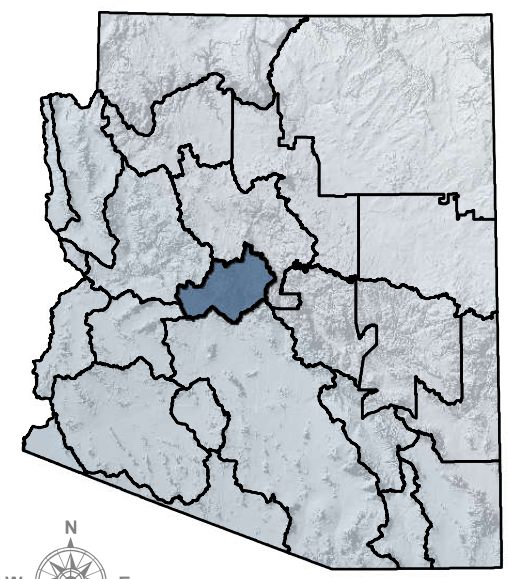

MAP LOCATION
(Planning Area Boundaries)

- 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.11-1

Hassayampa/Agua Fria Land Ownership

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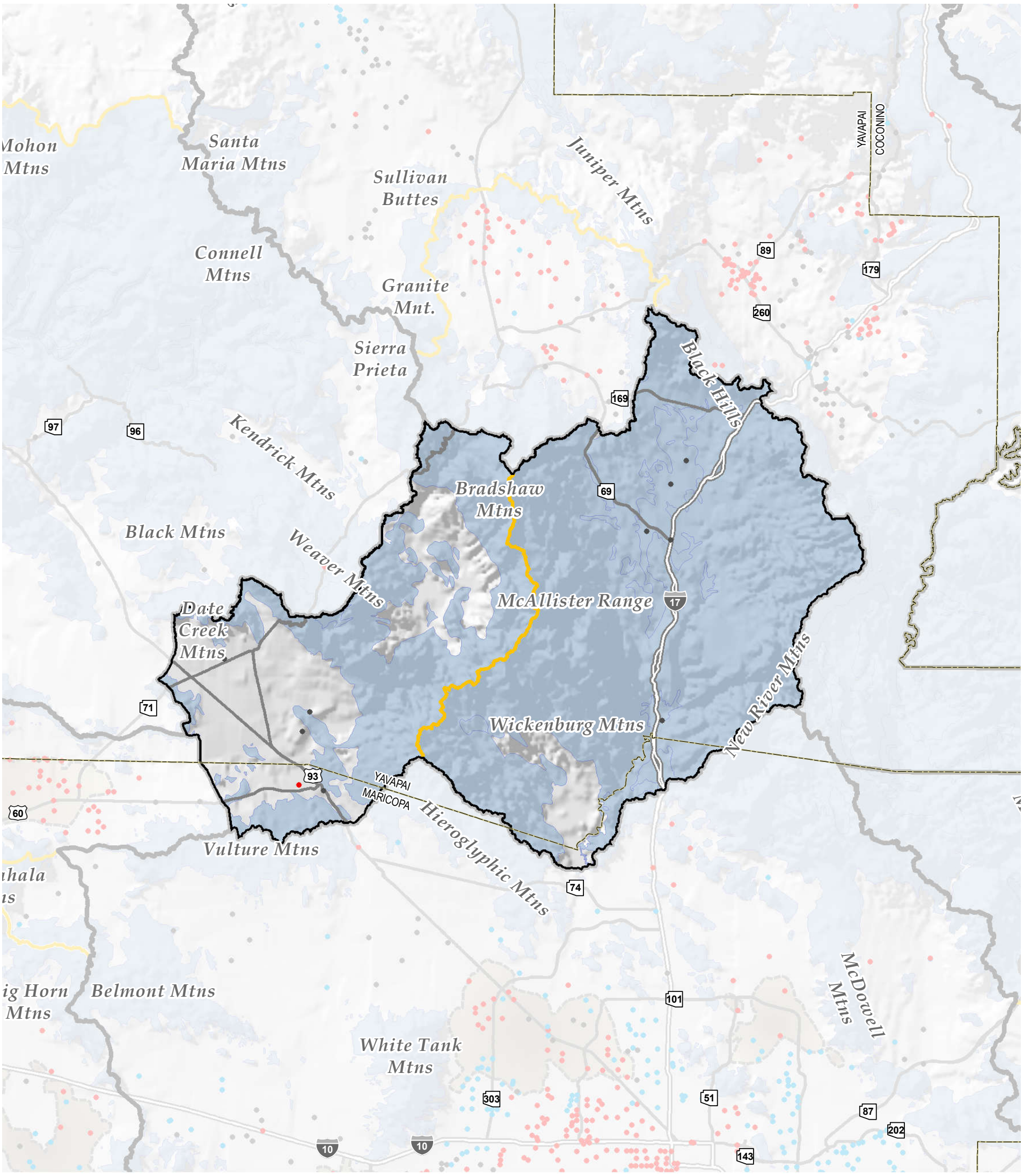

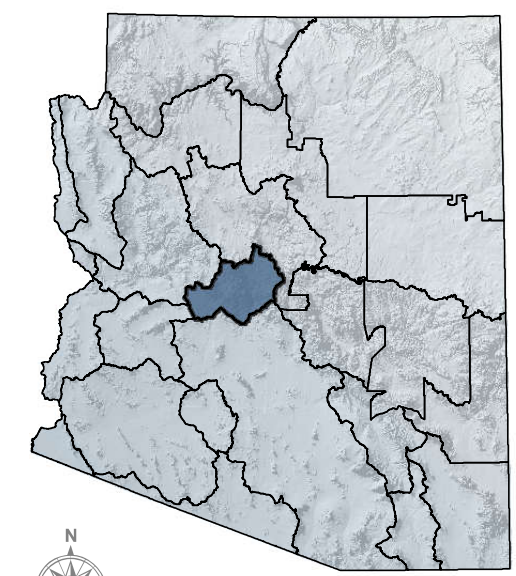

MAP LOCATION
(Planning Area Boundaries)

- 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.11-2

Hassayampa/Agua Fria 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.
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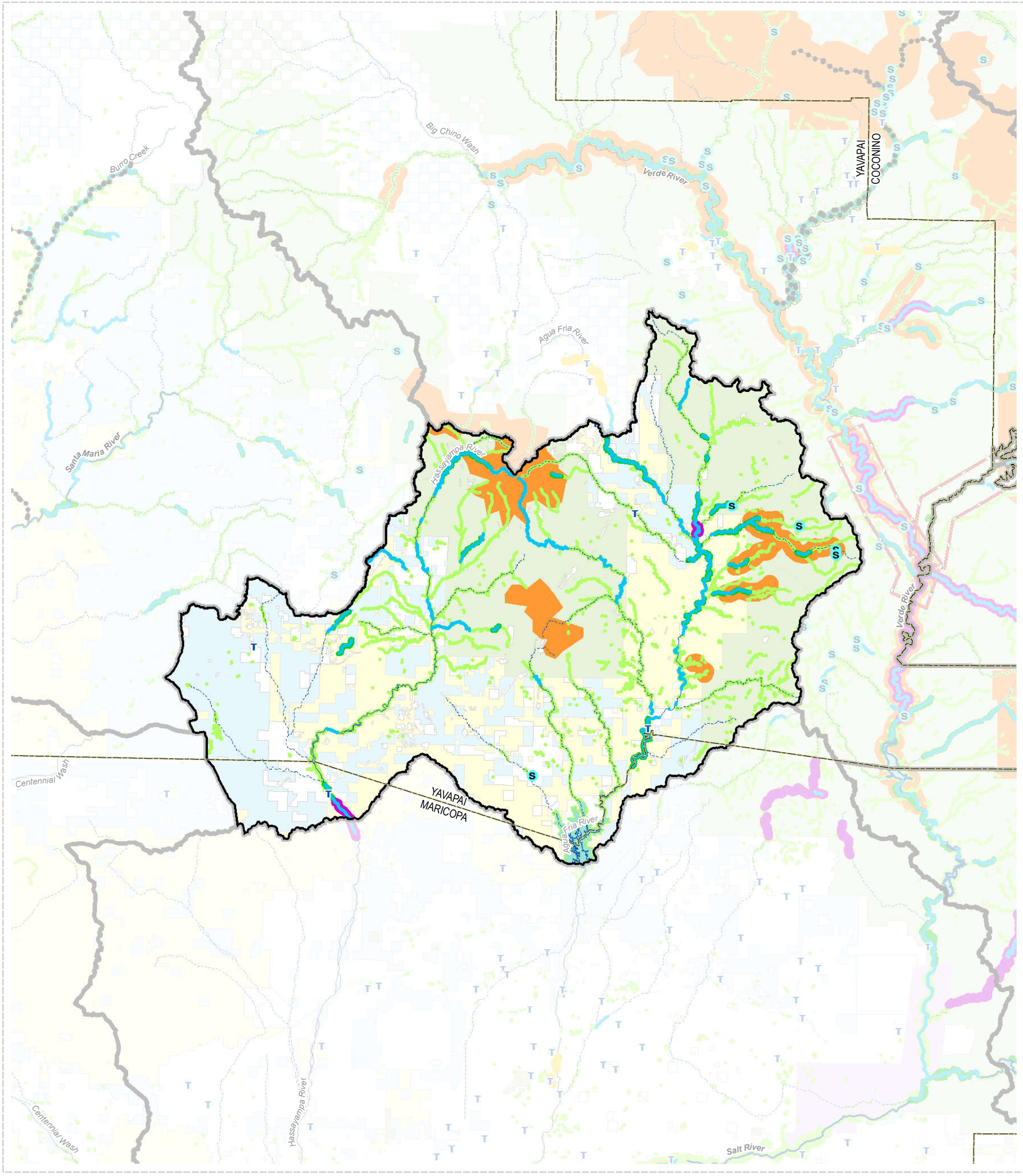
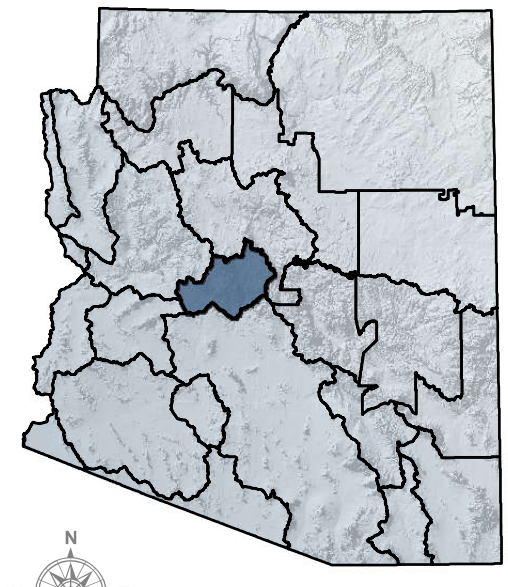




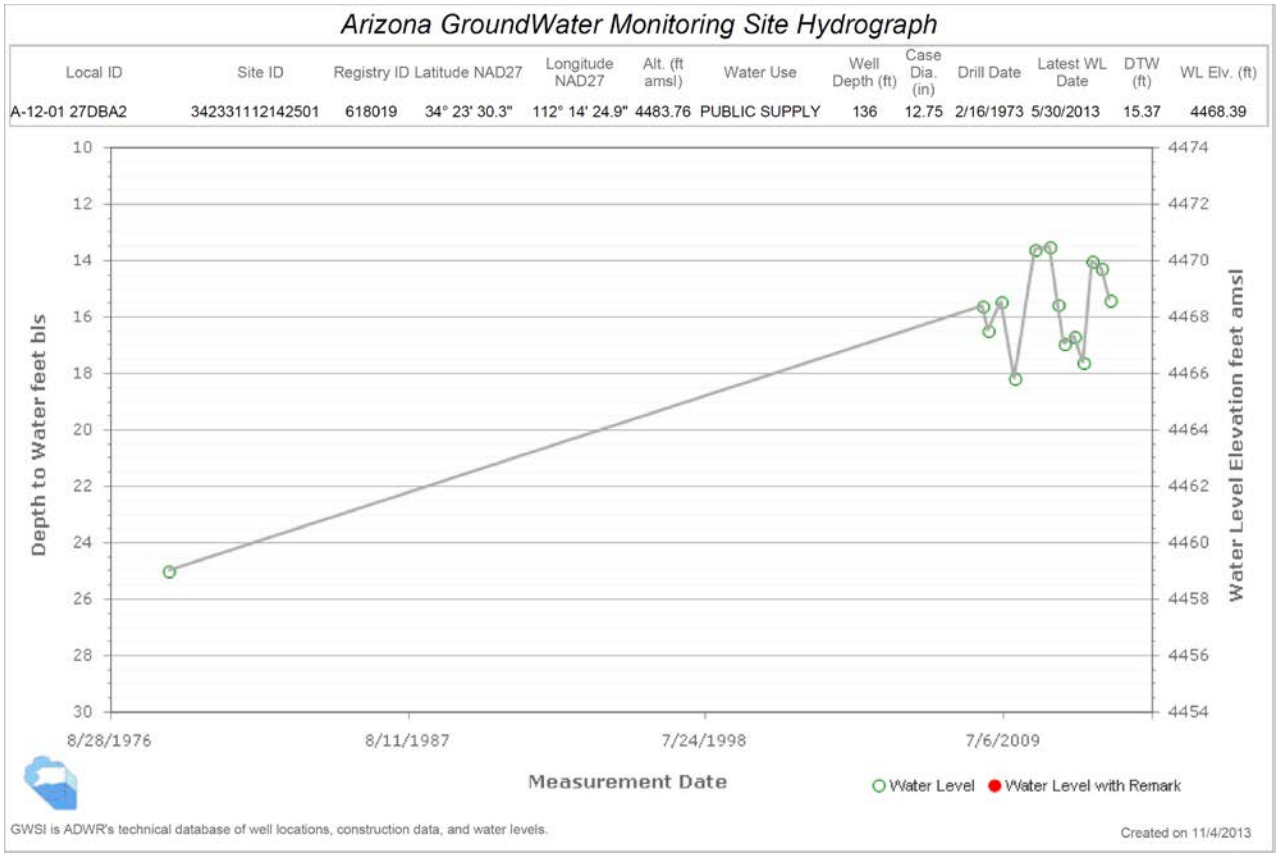
MAP LOCATION
(Planning Area Boundaries)

- 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

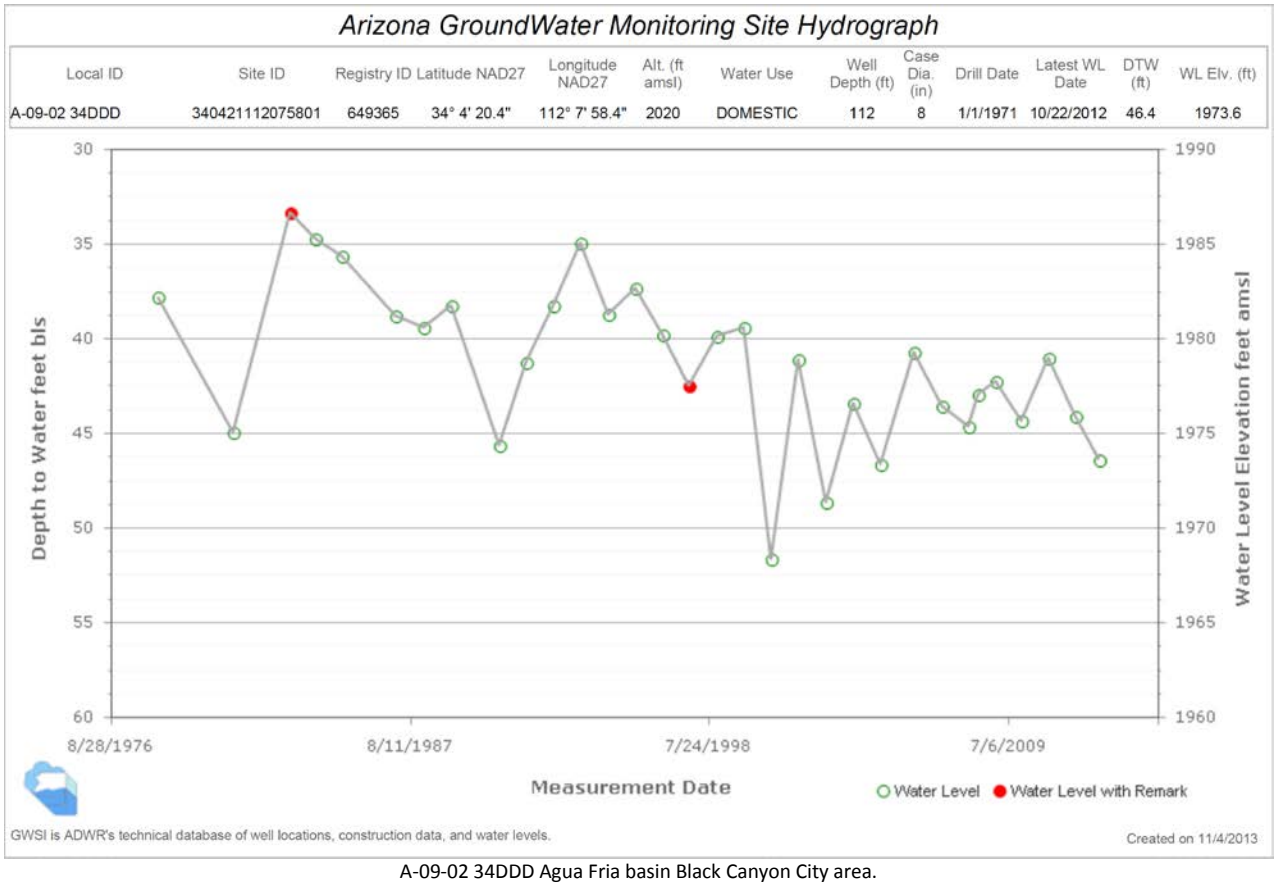
Figure P.A.11-3

Hassayampa/Agua Fria
Surface Water and Natural Features

Agua Fria Basin – Hassayampa and Agua Fria Planning Area

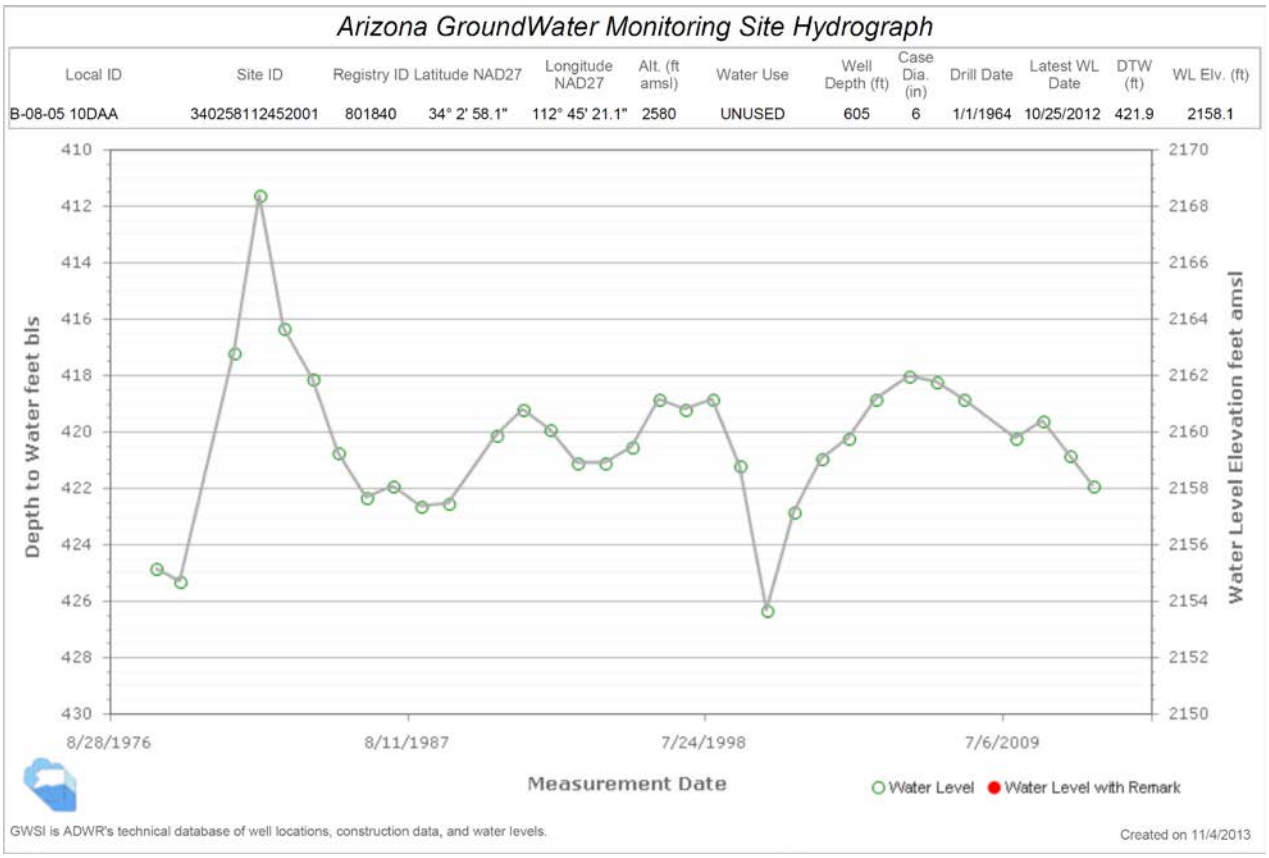


A-12-01 27DBA2 Agua Fria basin Mayer area.

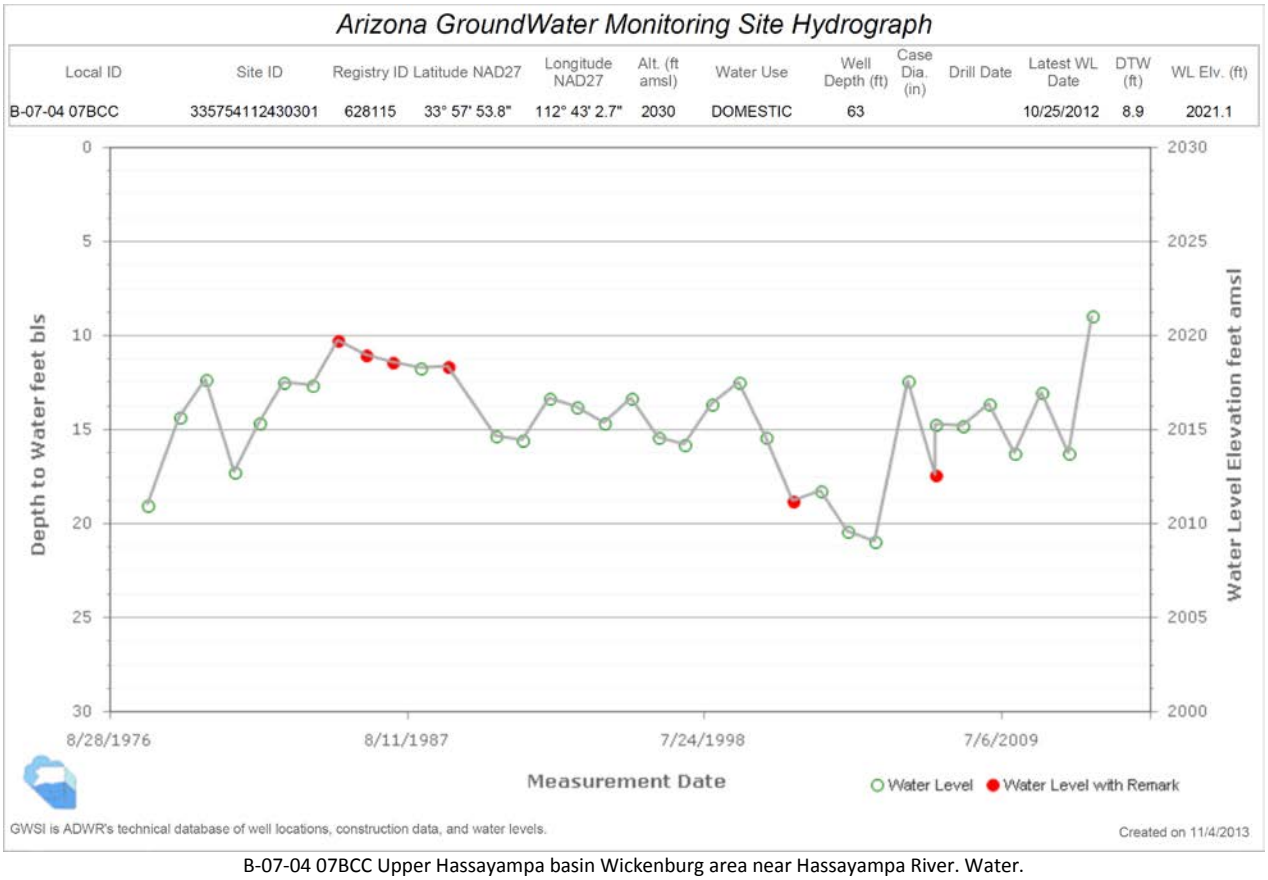


A-09-02 34DDD Agua Fria basin Black Canyon City area.

Upper Hassayampa Basin – Hassayampa and Agua Fria Planning Area



B-08-05 10DAA Upper Hassayampa basin 1 mile west of Hassayampa River and about 5.5 miles north of Wickenburg.



B-07-04 07BCC Upper Hassayampa basin Wickenburg area near Hassayampa River. Water.