

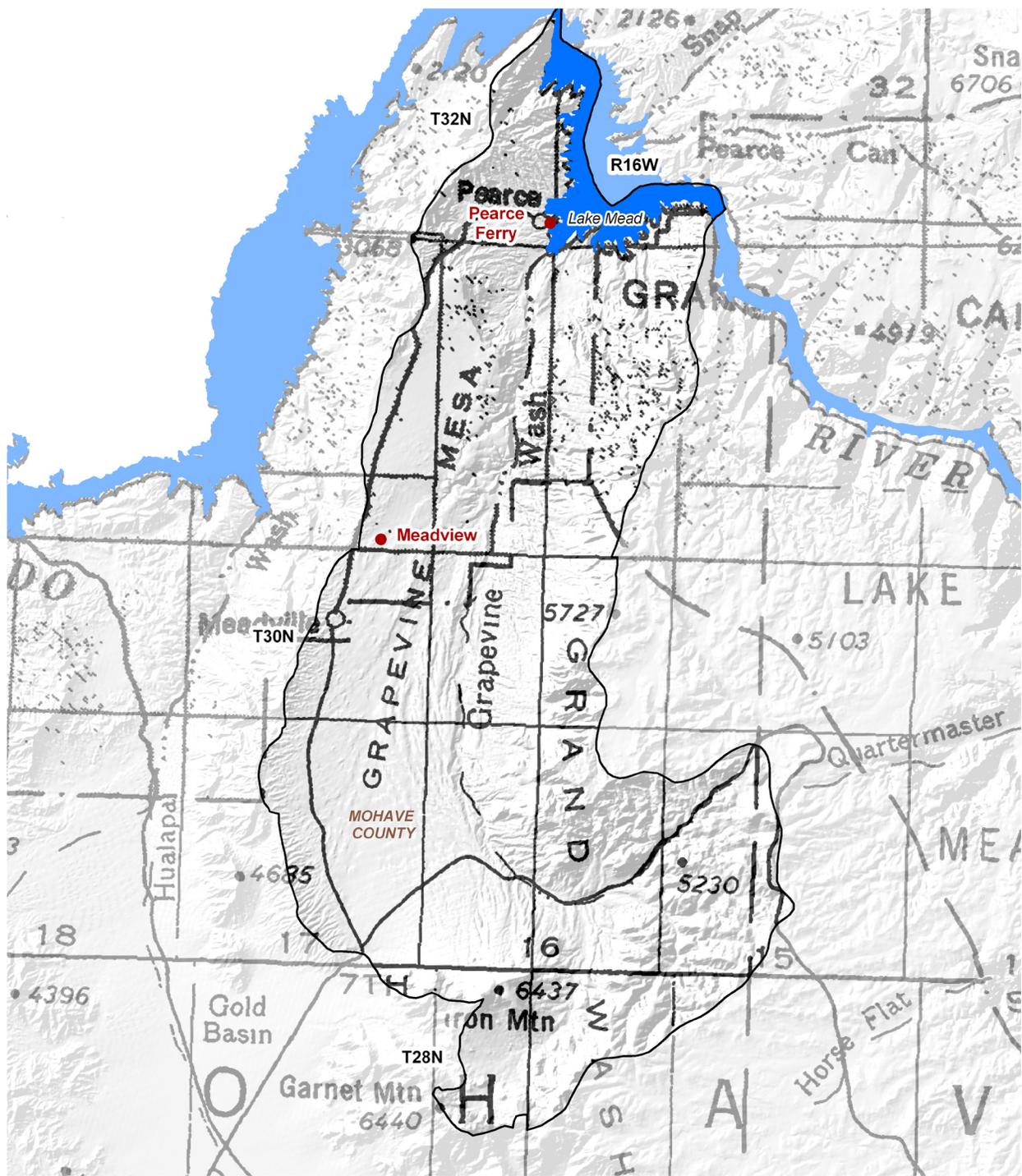
Section 4.7 Meadview Basin



4.7.1 Geography of Meadview Basin

The Meadview Basin is the smallest basin at 190 square miles, located in the north central part of the planning area. Geographic features and principal communities are shown on Figure 4.7-1. The basin is characterized by a south to north trending wash, a mesa in the western portion of the basin, cliffs along the eastern basin boundary and Lake Mead on the north. Vegetation includes Mohave desertscrub and Great Basin conifer woodland. (see Figure 4.0-9)

- Principal geographic features shown on Figure 4.7-1 are:
 - Grapevine Wash running south to north in the center of the basin
 - Grapevine Mesa west of Grapevine Wash
 - The Grand Wash Cliffs in the eastern portion of the basin
 - The highest point in the basin, Iron Mountain at 6,437 feet near the southern basin boundary
 - The lowest point is about 1,100 feet at Pearce Ferry



Base Map: USGS 1:500,000, 1981

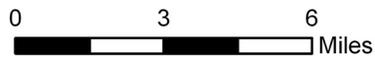


Figure 4.7-1
Meadview Basin
Geographic Features

City, Town or Place ●

4.7.2 Land Ownership in the Meadview Basin

Land ownership, including the percentage of ownership by category, for the Meadview Basin is shown in Figure 4.7-2. Principal features of land ownership in this basin are the large percentage of U.S. Bureau of Land Management and National Park Service lands. A description of land ownership data sources and methods is found in Volume 1, Appendix A. More detailed information on protected areas is found in Section 4.0.4. Land ownership categories are discussed below in the order from largest to smallest percentage in the basin.

U.S. Bureau of Land Management (BLM)

- 46.9% of the land is federally owned and managed by the Kingman Field Office of the BLM.
- All BLM lands are in the southern half of the basin.
- Primary land use is grazing.

National Park Service (NPS)

- 36.2% of the land is federally owned and managed by the National Park Service (NPS) as Lake Mead National Recreation Area and Grand Canyon National Park.
- All NPS lands are in the northern half of the basin.
- Primary land use is resource conservation and recreation.

Private

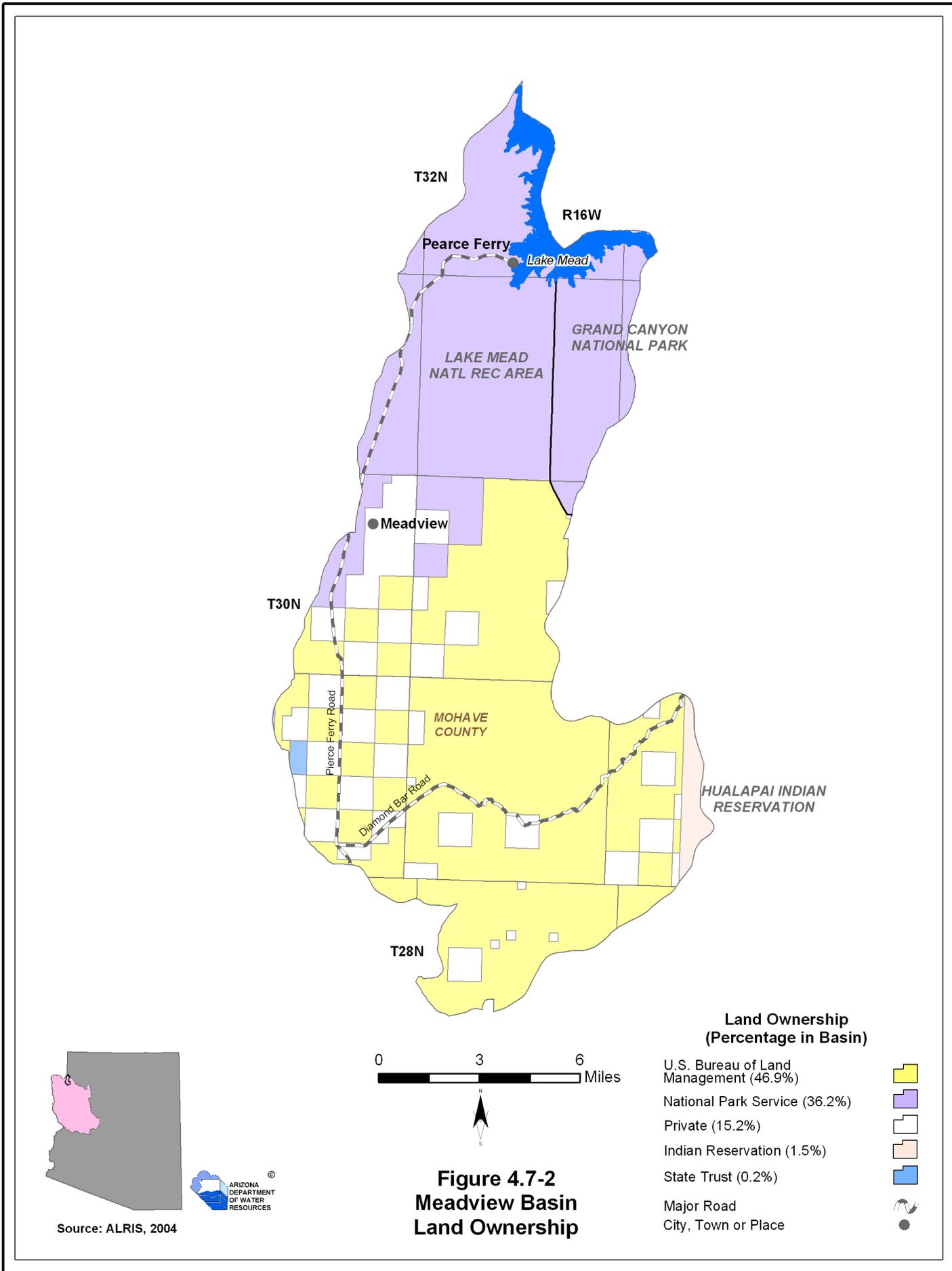
- 15.2% of the land is private.
- Private land in the southern portion of the basin is interspersed with BLM lands.
- Primary land uses are domestic and grazing.

Indian Reservation

- 1.5% of the land is under ownership of the Hualapai Tribe, in T29N, R15W.
- Primary land use is grazing.

State Trust Land

- 0.2% of the land in this basin is held in trust for the public schools under the State Trust Land system.
- Primary land use is grazing.



Source: ALRIS, 2004



Figure 4.7-2
Meadview Basin
Land Ownership

4.7.3 Climate of the Meadview Basin

Climate data from a NOAA/NWS Co-op Network station are compiled in Table 4.7-1 and the location is shown on Figure 4.7-3. Figure 4.7-3 also shows precipitation data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Meadview Basin does not contain Evaporation Pan, AZMET and SNOTEL/Snowcourse stations. More detailed information on climate in the planning area is found in Section 4.0.3. A description of the climate data sources and methods is found in Volume 1, Appendix A.

NOAA/NWS Co-op Network

- Refer to Table 4.7-1A
- There is one NOAA/NWS Co-op network climate station in the basin at Pierce Ferry 17 SSW. The average monthly maximum temperature occurs in July and is 83.1°F and average minimum temperature occurs in January and is 40.0°F.
- Highest average seasonal rainfall occurs in the winter (January - March). For the period of record used, the highest annual rainfall is 10.87 inches.

SCAS Precipitation Data

- See Figure 4.7-3
- Other precipitation data shows rainfall as high as 12 inches in the southern portion of the basin and as low as four inches in the northern portion of the basin.
- This basin is one of three basins in the planning area with a range of eight inches between areas of highest and lowest average annual precipitation, the lowest in the planning area.

Table 4.7-1 Climate Data for the Meadview Basin

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Temperature Range (in F)		Average Total Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Pierce Ferry 17 SSW	3,860	1963-1984 ¹	83.1/Jul	40.0/Jan	3.52	1.53	3.41	2.42	10.87

Source: WRCC, 2005

Notes:

¹Average temperature for period of record shown; average precipitation from 1971-2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
None			

C. AZMET:

Station Name	Elevation (in feet)	Period of Record	Average Annual Reference Evapotranspiration, in inches (Number of years to calculate averages)
None			

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record	Average Snowpack, at Beginning of the Month, as Inches Snow Water Content (Number of measurements to calculate average)					
			Jan	Feb	March	April	May	June
None								

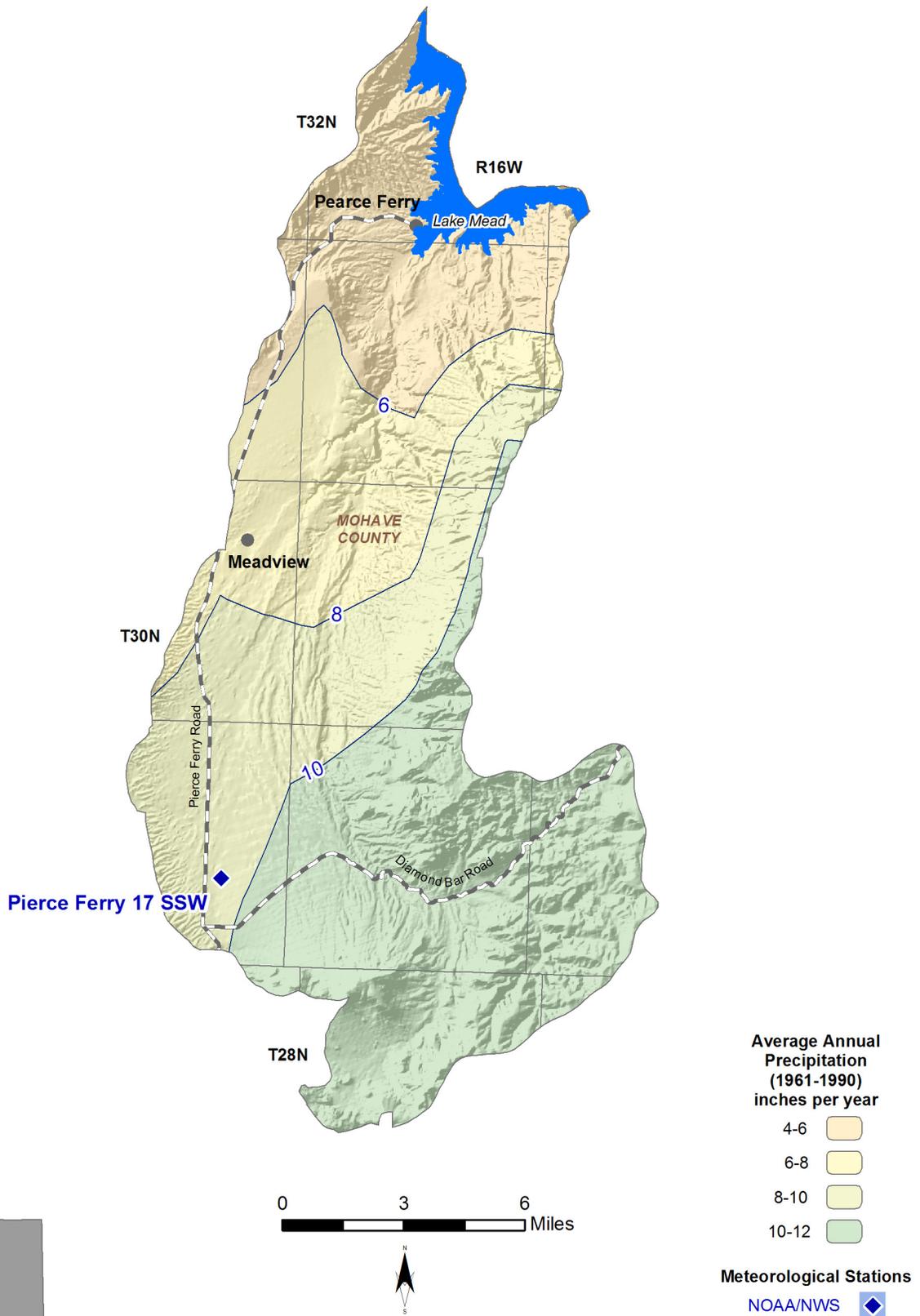


Figure 4.7-3
Meadview Basin
Meteorological Stations
and Annual Precipitation



Precipitation Data Source: Oregon State University, 1998



4.7.4 Surface Water Conditions in the Meadview Basin

This basin does not contain streamflow data. Flood ALERT equipment in the basin is shown in Table 4.7-2. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 4.7-3. The location of flood ALERT gages is shown on Figure 4.7-4. There are no runoff data available for this basin. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

Flood ALERT Equipment

- Refer to Table 4.7-2.
- As of October 2005 there were two stations in the basin.

Reservoirs and Stockponds

- Refer to Table 4.7-3.
- The basin borders one large reservoir, Lake Mead, with a maximum capacity of 29,755,000 acre-feet. The dam that creates Lake Mead, Hoover Dam, is in the Lake Mohave Basin.
- There are no small reservoirs in the basin.
- There are 14 registered stockponds in the basin.

Table 4.7-2 Flood ALERT Equipment in the Meadview Basin

Station ID	Station Name	Station Type	Install Date	Responsibility
1690	Grapevine Mesa	Precipitation	5/1/2005	Mohave County FCD
7410	Lake Mead City	Precipitation/Stage	NA	Mohave County FCD

Source: ADWR 2005b

Notes:

FCD = Flood Control District
NA = Not available

Table 4.7-3 Reservoirs and Stockponds in the Meadview Basin

A. Large Reservoirs (500 acre-feet capacity and greater)

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM STORAGE (AF)	USE ¹	JURISDICTION
None	Mead (Hoover Dam) ²	Bureau of Reclamation	29,755,000 ³	C,H,I,RR,S,R	Federal

B. Other Large Reservoirs (50 acre surface area or greater)

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE	JURISDICTION
None identified by ADWR at this time					

Source: Compilation of databases from ADWR & others

C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)

Total number: 0

Total maximum storage: 0 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)

Total number: 0

Total surface area: 0 acres

E. Stockponds (up to 15 acre-feet capacity)

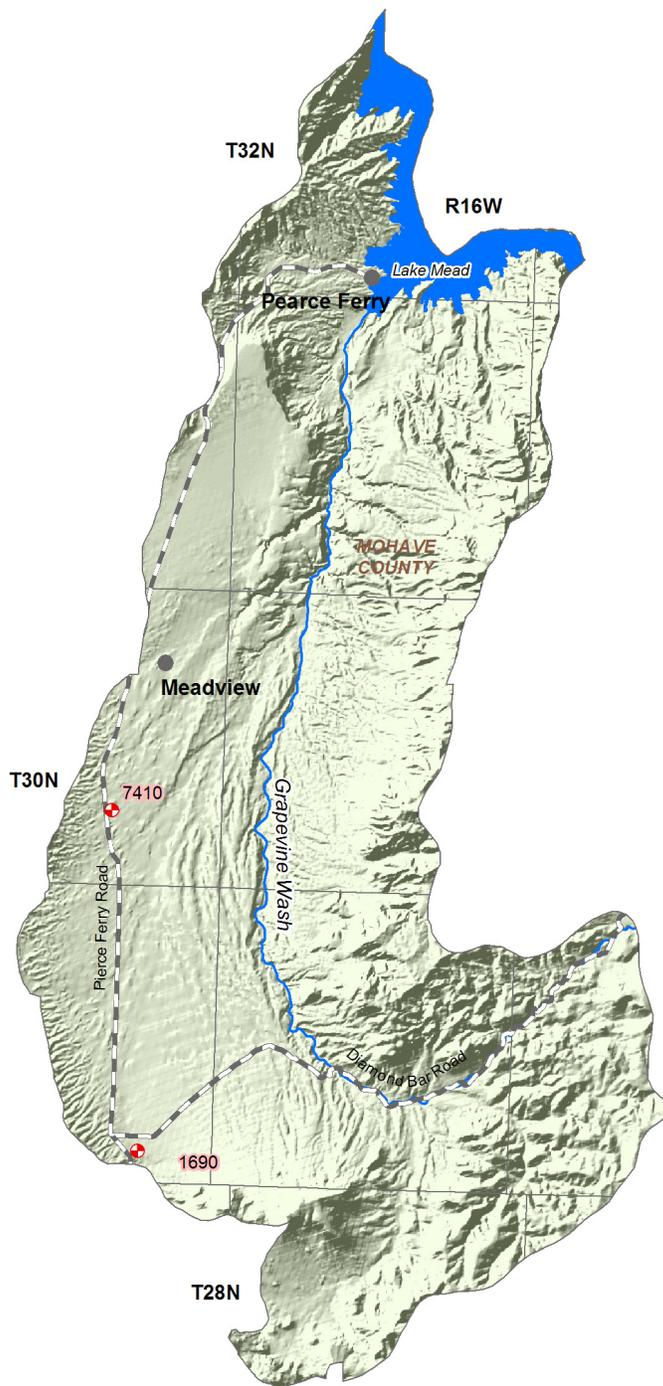
Total number: 14 (from water right filings)

Notes:

¹C=flood control; H=hydroelectric; I=irrigation; RR=river regulation; S=water supply

²Dam is located in Lake Mohave Basin and lake storage is located in Lake Mohave, Detrital Valley, Hualapai Valley and Meadview Basins.

³Includes 2,378,000 acre-feet of dead storage.



Stream Data Source: ALRIS, 2005 b

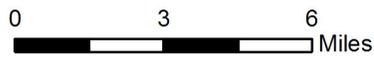


Figure 4.7-4
Meadview Basin
Surface Water Conditions

Stream Channel (width of line reflects stream order) 

Stream Gages
Flood ALERT Equip. and Station ID 

Major Road 
City, Town or Place 

4.7.5 Perennial/Intermittent Streams and Major Springs in the Meadview Basin

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the basin are shown in Table 4.7-4. The locations of major springs as well as perennial and intermittent streams are shown on Figure 4.7-5. Descriptions of data sources and methods for intermittent and perennial reaches and springs are found in Volume 1, Appendix A.

- There is one perennial stream, the Colorado River, located along the northern basin boundary.
- There are six major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time. The largest discharge rate is 108 gpm at Iron spring.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 4.7-4B. There are two minor springs identified in this basin.
- Listed discharge rates may not be indicative of current conditions. All of the measurements were taken prior to 1995.
- The total number of springs identified by the USGS varies from 8 to 10, depending on the database reference.

Table 4.7-4 Springs in the Meadview Basin

A. Major Springs (10 gpm or greater):

Map Key	Name	Location		Discharge (in gpm) ¹	Date Discharge Measured
		Latitude	Longitude		
1	Iron	354944	1135923	108	6/29/1994
2	Hillside	354942	1135815	69	6/9/1993
3	Grapevine	360240	1140130	43	5/1/1975
4	Adobe ²	355229	1135911	25	9/25/1980
5	Ray's Place-left fork	354924	1140012	18	6/29/1994
6	Ray's Place-right fork	354923	1140010	16	6/29/1994

B. Minor Springs (1 to 10 gpm):

Name	Location		Discharge (in gpm) ¹	Date Discharge Measured
	Latitude	Longitude		
Mud	355052	1135919	7	6/30/1994
Unnamed	360323	1140058	1	5/1975

Source: Compilation of databases from ADWR & others

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005a and USGS, 2006a): 8 to 10

Notes:

¹Most recent measurement identified by ADWR

²Spring is not displayed on current USGS topo maps

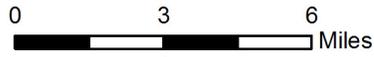
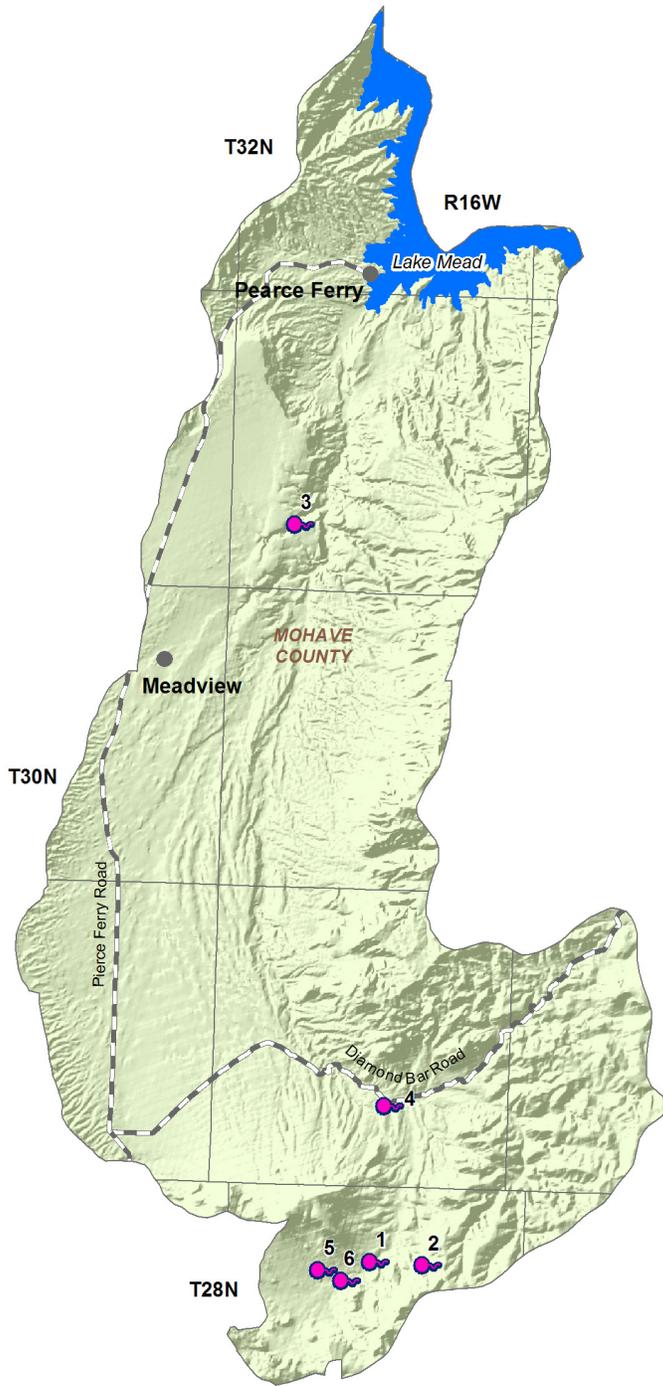


Figure 4.7-5
Meadview Basin
Perennial/Intermittent Streams
and Major (>10 gpm Springs)

- Springs 
- Perennial Streams 
- Major Road 
- City, Town or Place 



Stream Data Source: AGFD, 1993 & 1997

4.7.6 Groundwater Conditions of the Meadview Basin

Major aquifers, well yields, estimated natural recharge, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 4.7-5. Figure 4.7-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 4.7-7 contains a hydrograph for a selected well shown on Figure 4.7-6. Figure 4.7-8 shows well yields in one yield category. A description of aquifer data sources and methods as well as well data sources and methods, including water-level changes and well yields are found in Volume 1, Appendix A.

Major Aquifers

- Refer to Table 4.7-5 and Figure 4.7-6.
- The major aquifer in this basin is sedimentary rock, Muddy Creek Formation.
- Flow direction is from the south to the north in this basin.

Well Yields

- Refer to Table 4.7-5 and Figure 4.7-8.
- As shown on Figure 4.7-8 well yields in this basin are less than 100 gpm.
- One source of well yield information, based on five reported wells, indicates that the median well yield in this basin is 33 gpm.

Natural Recharge

- Refer to Table 4.7-5.
- The estimate of natural recharge for this basin is 4,000 acre-feet per year (AFA).
- Recharge in this basin is minimal because of high evaporation rates and low rainfall. Most of the basin's recharge comes from infiltration of runoff at higher elevations surrounding the basin.

Water in Storage

- Refer to Table 4.7-5.
- Storage estimates for this basin range from 62,440 acre-feet to a depth of 700 feet to 1.0 million acre-feet to a depth of 1,200 feet.

Water Level

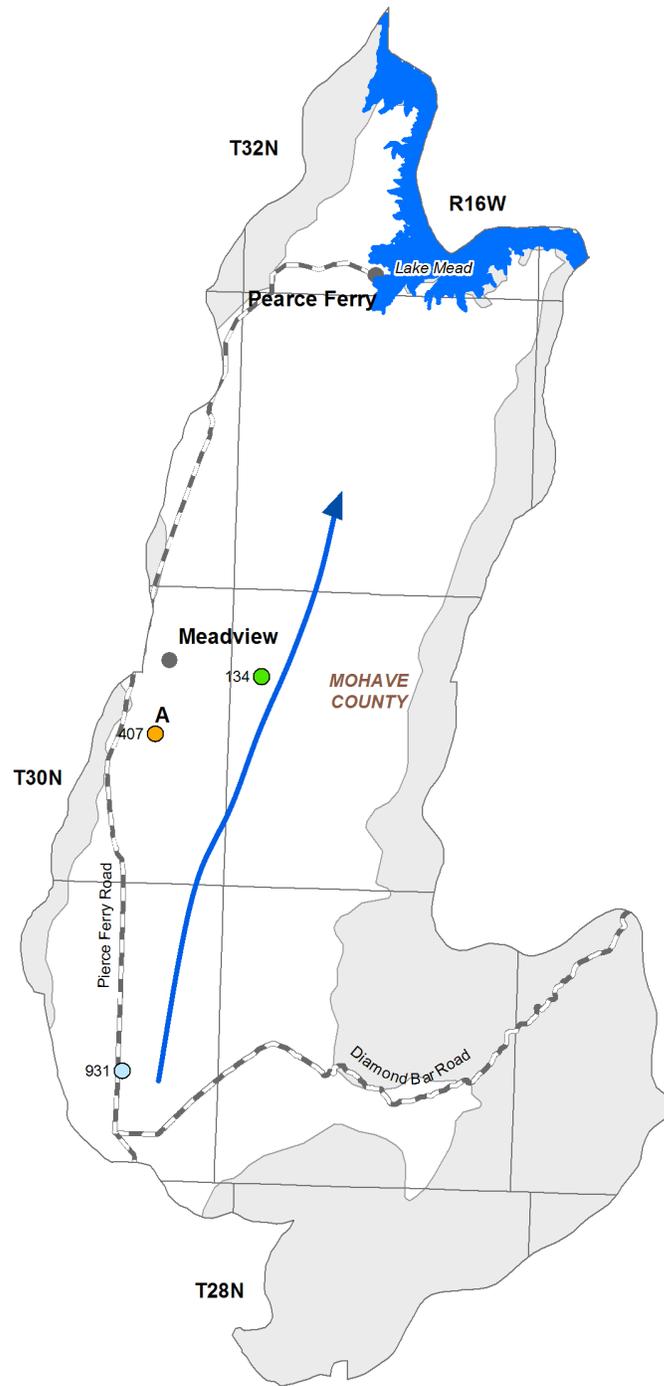
- Refer to Figure 4.7-6. Water level is shown for wells measured in 2003-2004.
- The Department annually measures one index well in this basin. A hydrograph for this well is shown in Figure 4.7-7.
- The Department measures water levels four times daily at one automated ground water monitoring site in the west-central portion of the basin.
- There are only three water depths recorded in this basin in 2003-2004. In these wells, the deepest is 931 feet in the southern portion of the basin along Pierce Ferry Road and the shallowest is 134 northeast of Meadview.

Table 4.7-5 Groundwater Data for the Meadview Basin

Basin Area, in square miles:	190	
Major Aquifer(s):	Name and/or Geologic Units	
	Sedimentary Rock (Muddy Creek Formation)	
Well Yields, in gal/min:	Range 24-80 Median 33 (5 wells measured)	Measured by ADWR (GWSI) and/or USGS
	35 (1 well reported)	Reported on registration forms for large (>10-inch) diameter wells (Wells55)
	Range 30-100	ADWR (1990)
	Range 0-500	Anning and Duet (1994)
Estimated Natural Recharge, in acre-feet/year:	4,000	Freethy and Anderson (1986)
Estimated Water Currently in Storage, in acre-feet:	62,440 (to 700 ft)	ADWR (1994b)
	1,000,000 ¹ (to 1,200 ft)	Freethy and Anderson (1986)
	<1,000,000 (to 1,200 ft)	Arizona Water Commission (1975)
Current Number of Index Wells:	1	
Date of Last Water-level Sweep:	2006 (16 wells measured)	

Notes:

¹ Predevelopment Estimate



Water-level change in feet between 1990-1991 and 2003-2004

H
375 O = number is depth to water in feet during 2003-2004; letter is hydrograph

- Between -30 and -15 ●
- Between -1 and +1 ●
- Between +1 and +15 ●

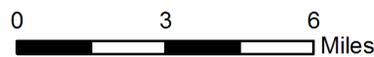
Generalized Flow Direction ➔

Consolidated Crystalline & Sedimentary Rocks

Unconsolidated Sediments

Major Road

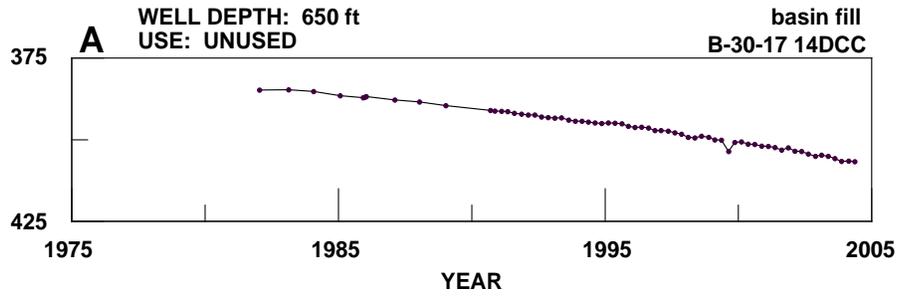
City, Town or Place

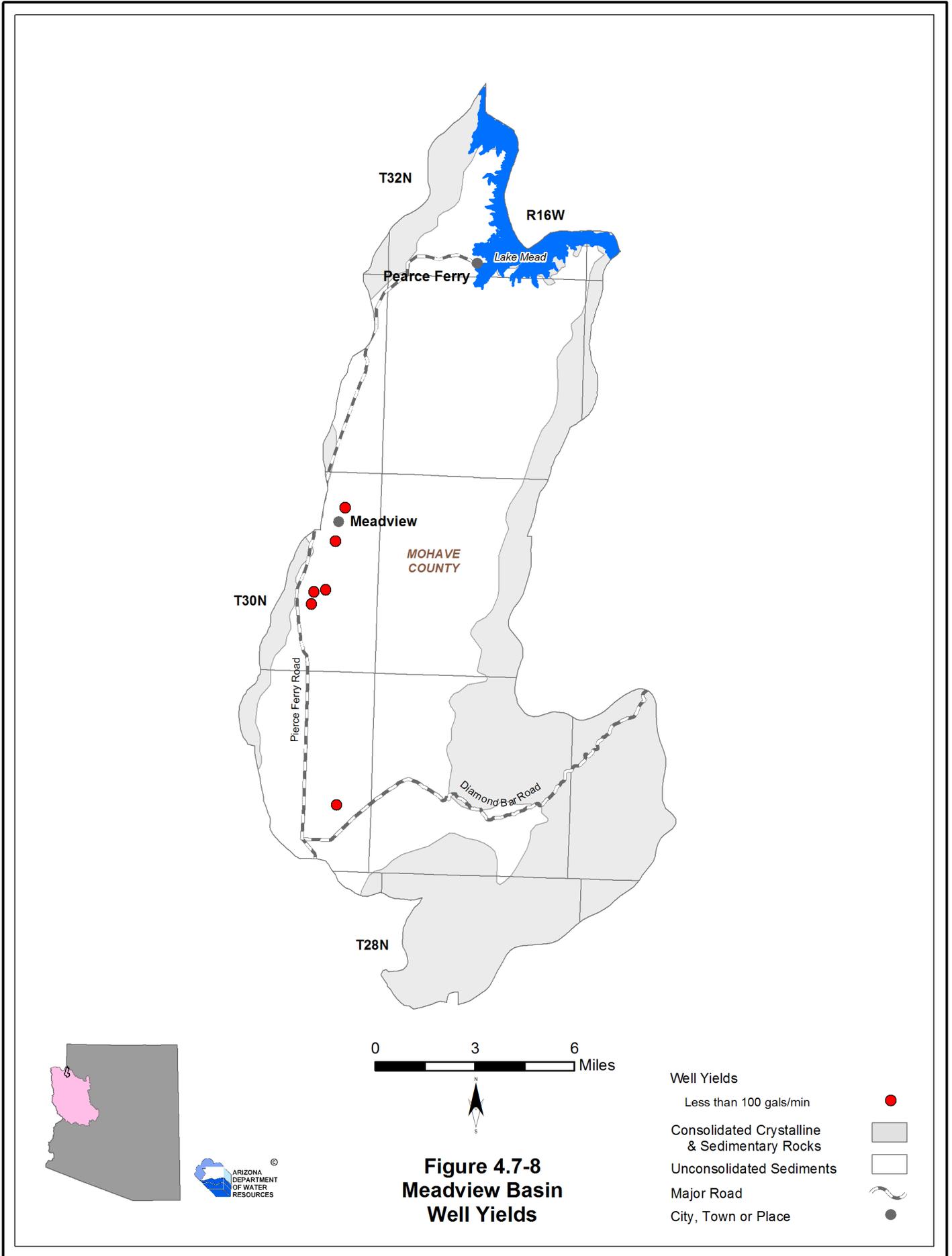


**Figure 4.7-6
Meadview Basin
Groundwater Conditions**

Figure 4.7-7
Meadview Basin
Hydrographs Showing Depth to Water in Selected Wells

Depth To Water In Feet Below Land Surface





4.7.7 Water Quality of the Meadview Basin

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 4.7-6A. There are no impaired lakes or streams in this basin. Figure 4.7-9 shows the location of exceedences keyed to Table 4.7-6A. Not all parameters were measured at all sites; selective sampling for particular constituents is common. A description of water quality data sources and methods is found in Volume 1, Appendix A.

Well, Mine or Spring sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 4.7-6A.
- Eight measured springs have parameter concentrations that have equaled or exceeded drinking water standards.
- The parameter most frequently equaled or exceeded in the sites measured was radionuclides. Other parameters equaled or exceeded included arsenic, nitrates and fluoride.

Table 4.7-6 Water Quality Exceedences in the Meadview Basin¹

A. Wells, Springs and Mines

Map Key	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard ²
		Township	Range	Section	
1	Spring	31 North	16 West	29	NO3, Rad
2	Spring	30 North	16 West	7	NO3
3	Spring	30 North	17 West	33	Rad
4	Spring	29 North	16 West	27	NO3, Rad
5	Spring	28 North	16 West	9	F
6	Spring	28 North	16 West	10	Rad
7	Spring	28 North	16 West	16	As
8	Spring	28 North	17 West	1	As

Source: Compilation of databases from ADWR & others

B. Lakes and Streams

Map Key	Site Type	Site Name	Length of Impaired Stream Reach (in miles)	Area of Impaired Lake (in acres)	Designated Use Standard	Parameter(s) Exceeding Use Standard
None identified by ADWR at this time						

Notes:

¹ Water quality samples collected between 1973 and 2000.

² As = Arsenic

F = Fluoride

NO3 = Nitrate

Rad = One or more of the following radionuclides - Gross Alpha, Gross Beta, Radium, and Uranium

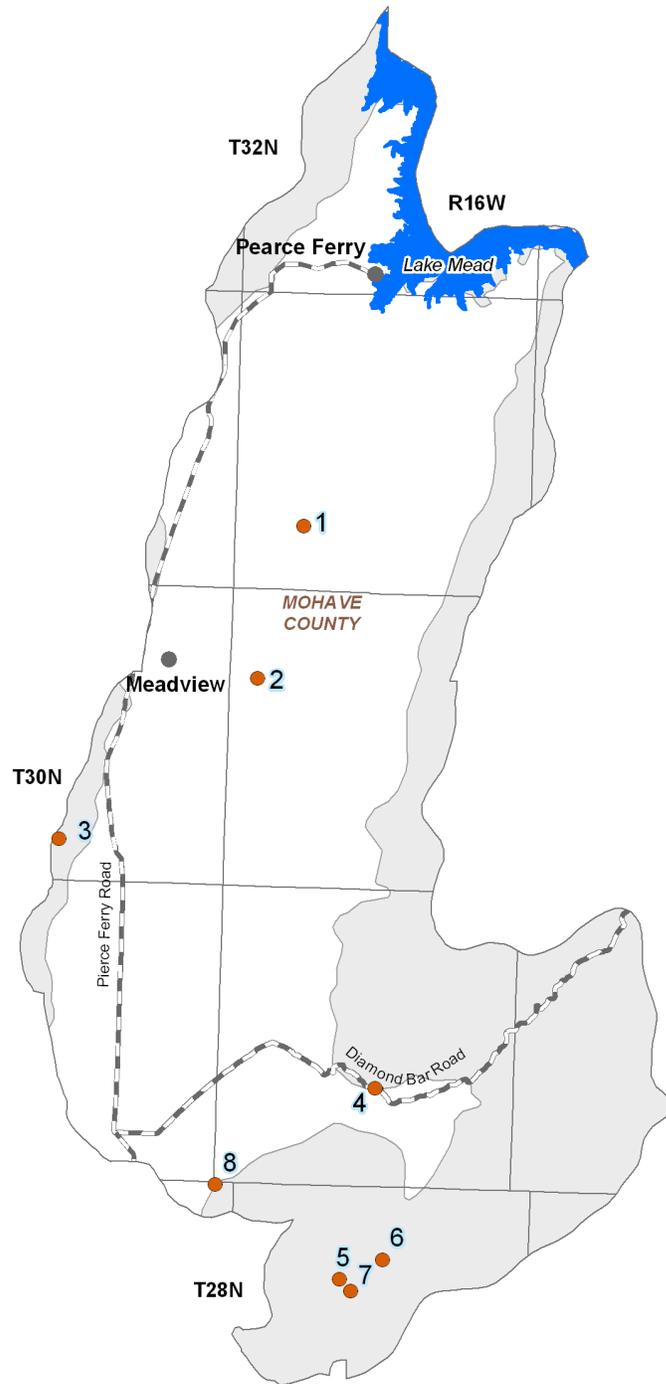


Figure 4.7-9
Meadview Basin
Water Quality Conditions

Well, Spring or Mine Site that has Equaled or Exceeded DWS



Consolidated Crystalline & Sedimentary Rocks



Unconsolidated Sediments



Major Road



City, Town or Place



4.7.8 Cultural Water Demand in the Meadview Basin

Cultural water demand data including population, number of wells and the average well pumpage and surface water diversions by the municipal, industrial and agricultural sectors are shown in Table 4.7-7. There are no wastewater treatment plants in this basin. Figure 4.7-10 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Appendix A. More detailed information on cultural water demand is found in Section 4.0.7.

Cultural Water Demand

- Refer to Table 4.7-7 and Figure 4.7-10.
- Population in this basin is minimal but has increased since 1980, from 104 in 1980 to 823 in 2000.
- There are no reported surface water diversions in this basin. Groundwater use in this basin is minimal, with current use similar to historical use. An average of less than 300 AFA during 2001-2005.
- The only demand center identified by USGS Gap in the basin is low intensity municipal and industrial located east of Pierce Ferry Road, however low intensity M&I is also found north of this center along Pierce Ferry Road, including at Meadview, to the Lake Mead NRA boundary.
- As of 2005 there were 21 registered wells with a pumping capacity of less than or equal to 35 gpm and 15 wells with a pumping capacity of more than 35 gpm.

Table 4.7-7 Cultural Water Demand in the Meadview Basin¹

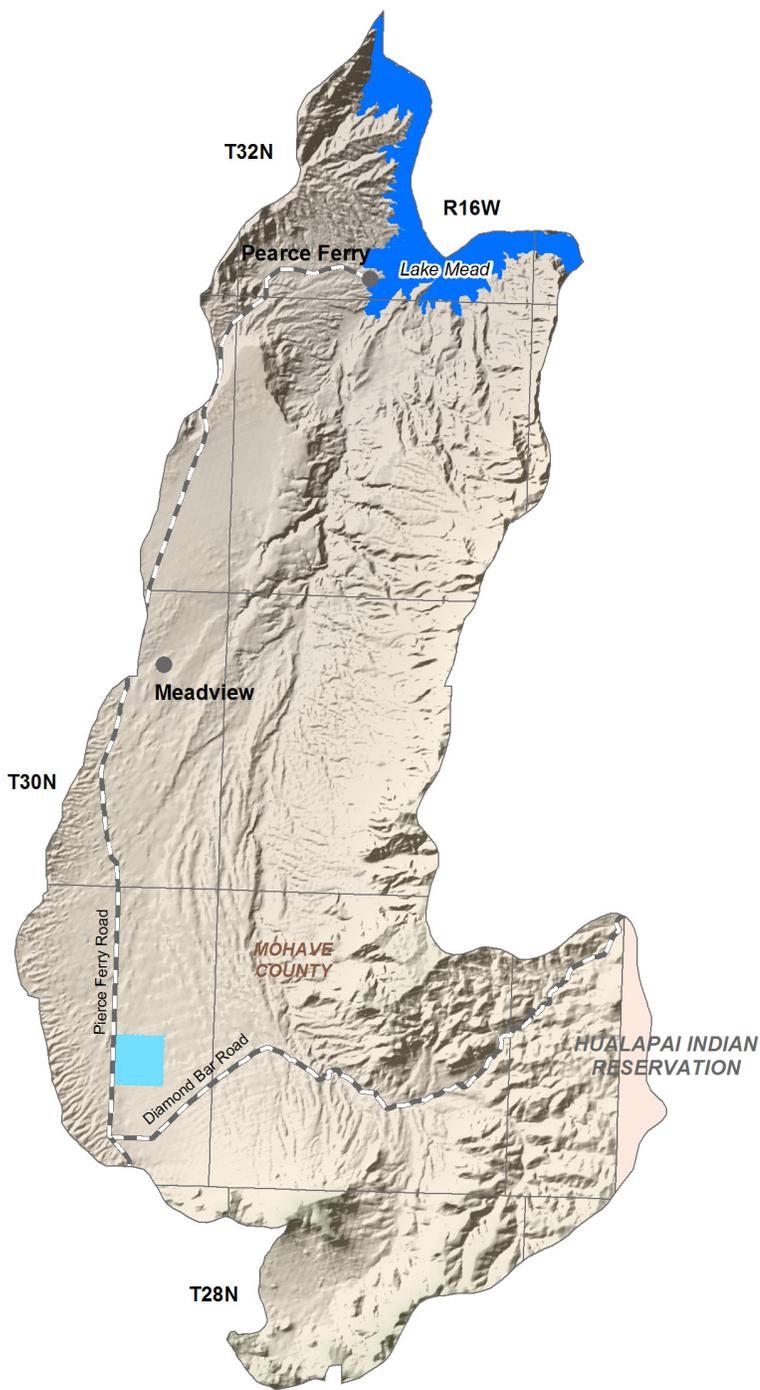
Year	Estimated and Projected Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)						Data Source
				Well Pumpage			Surface-Water Diversions			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Agricultural	Municipal	Industrial	Agricultural	
1971		4 ²	13 ²	<300			NR			ADWR (1994a)
1972										
1973										
1974										
1975										
1976										
1977										
1978				<300			NR			
1979										
1980	104	0	1	<300			NR			
1981	139									
1982	174									
1983	209									
1984	243									
1985	278									
1986	313	2	1	<300			NR			
1987	348									
1988	383									
1989	418									
1990	453	1	0	<300	NR	NR	NR			USGS (2007)
1991	490									
1992	527									
1993	563									
1994	600									
1995	637									
1996	674									
1997	711									
1998	748	1	0	<300	NR	NR	NR			
1999	785									
2000	823									
2001	858									
2002	894	13	0	<300	NR	NR	NR			
2003	929									
2004	964									
2005	1,000									
2010	1,176									
2020	1,495									
2030	1,755									
WELL TOTALS:		21	15							

Notes:

NR = Not reported

¹ Does not include effluent or evaporation losses from stockponds and reservoirs.

² Includes all wells through 1980.



Primary Data Source: USGS National Gap Analysis Program, 2004

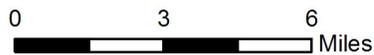


Figure 4.7-10
Meadview Basin
Cultural Water Demand

Demand Centers

M&I - Low Intensity



Indian Reservation



Major Road



City, Town or Place



4.7.9 Water Adequacy Determinations in the Meadview Basin

Water adequacy determination information including the subdivision name, location, number of lots, adequacy determination, reason for the inadequacy determination, date of determination and subdivision water provider are shown in Table 4.7-8. Figure 4.7-11 shows the locations of subdivisions keyed to the Table. A description of the Water Adequacy Program is found in Volume 1, Appendix C. Adequacy determination data sources and methods are found in Volume 1, Appendix A.

- All subdivisions receiving an adequacy determination are in Mohave County. Six water adequacy determinations for 4,793 lots have been made in this basin through December 2008.
- No lots were determined to be adequate. The most common reason for a determination of inadequacy was because the applicant chose not to submit the necessary information and/or available hydrologic data were insufficient to make a determination.
- There is one designated water provider, Joshua Valley Utility Company. The projected or annual estimated demand has not been designated.

Table 4.7-8 Adequacy Determinations in the Meadview Basin¹

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No. ²	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination ³	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section						
1	Lake Mead City Unit No. 15-29-17	Mohave	29 North	17 West	15	25	53-402136	Inadequate	A1	5/8/2006	NA
2	Lake Mead City Unit No. 23-29-17	Mohave	29 North	17 West	23	41	53-500018	Inadequate	A1	3/23/2007	Dry Lot Subdivision
3	Meadview B	Mohave	30 North	17 West	35	336	53-500948	Inadequate	A1, A2, A3	2/17/1984	Dry Lot Subdivision
4	Meadview	Mohave	30 North	17 West	1, 12	3,999	53-500947	Inadequate	A1	8/27/1973	Joshua Valley Utility Company
5	Meadview Highlands	Mohave	30 North	17 West	1	135	53-500949	Inadequate	A2, A3	6/30/1993	Joshua Valley Utility Company
6	Meadview Unit #5	Mohave	29 North	17 West	15	257	53-500950	Inadequate	A2, A3	10/22/1985	Dry Lot Subdivision

B. Designated Adequate Water Supply

Map Key	Water Provider Name	County	Designation No.	Projected or Annual Estimated Demand (af/yr)	Date Application Received	Date Application Issued	Year of Projected or Annual Demand
a	Joshua Valley Utility Company	Mohave	40-900006	No amount designated	NA	6/26/1985	No data, hydrologic study needed

Source: ADWR 2008a

Notes:

¹Each determination of the adequacy of water supplies available to a subdivision is based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. In some cases, ADWR might make a different determination if a similar application were submitted today, based on the hydrologic data and other information currently available, as well as current rules and policies

² Prior to February 1995, ADWR did not assign file numbers to applications for adequacy. Between 1995-2006 all applications for adequacy were given a file number with a 22 prefix.

In 2006 a 53 prefix was assigned to all water adequacy reports and applications regardless of their issue date.

³ A. Physical/Continuous

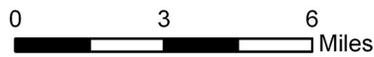
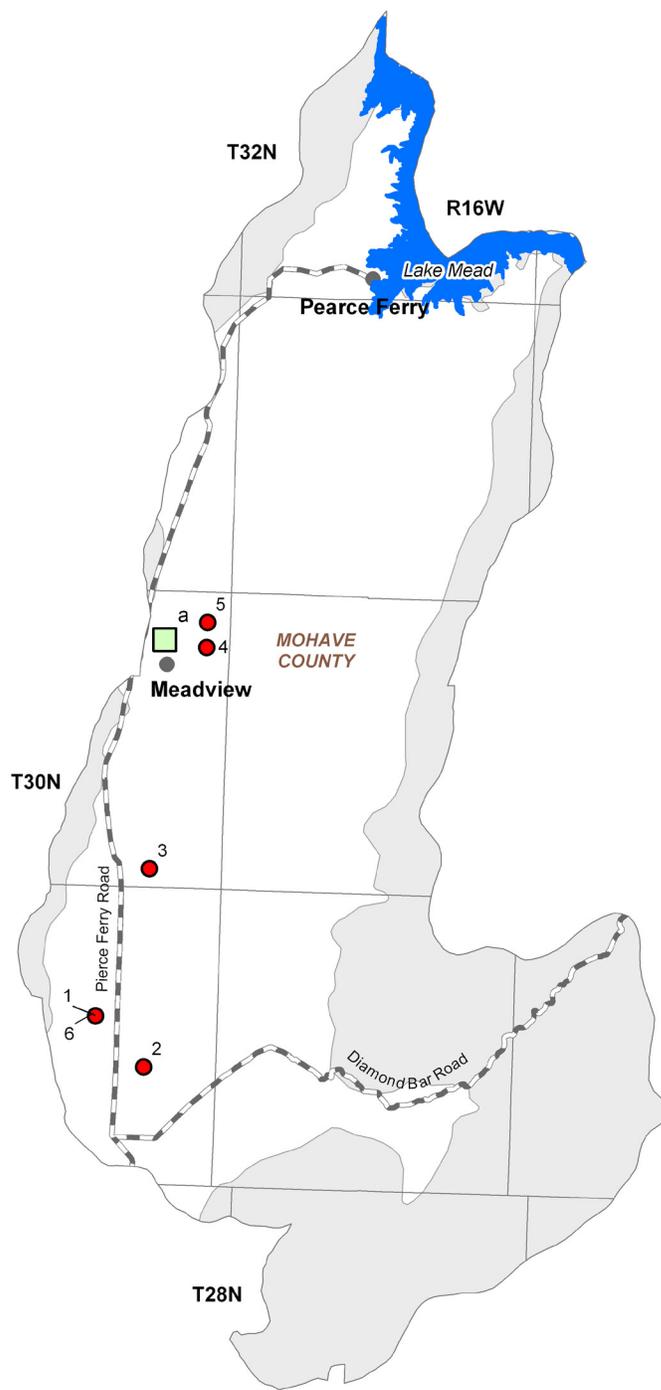
- 1) Insufficient Data (applicant chose not to submit necessary information, and/or available hydrologic data insufficient to make determination)
- 2) Insufficient Supply (existing water supply unreliable or physically unavailable;for groundwater, depth-to-water exceeds criteria)
- 3) Insufficient Infrastructure (distribution system is insufficient to meet demands or applicant proposed water hauling)

B. Legal (applicant failed to demonstrate a legal right to use the water or failed to demonstrate the provider's legal authority to serve the subdivision)

C. Water Quality

D. Unable to locate records

NA = Data not currently available to ADWR



- Adequacy Determinations**
- Inadequate ●
 - Designated Water Provider ■
 - Consolidated Crystalline & Sedimentary Rocks
 - Unconsolidated Sediments
 - Major Road
 - City, Town or Place ●



Figure 4.7-11
Meadview Basin
Adequacy Determinations

Meadview Basin

References and Supplemental Reading

References

A

- Anning, D.W. and N.R. Duet, 1994, Summary of ground-water conditions in Arizona, 1987-90, USGS Open-file Report 94-476.
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