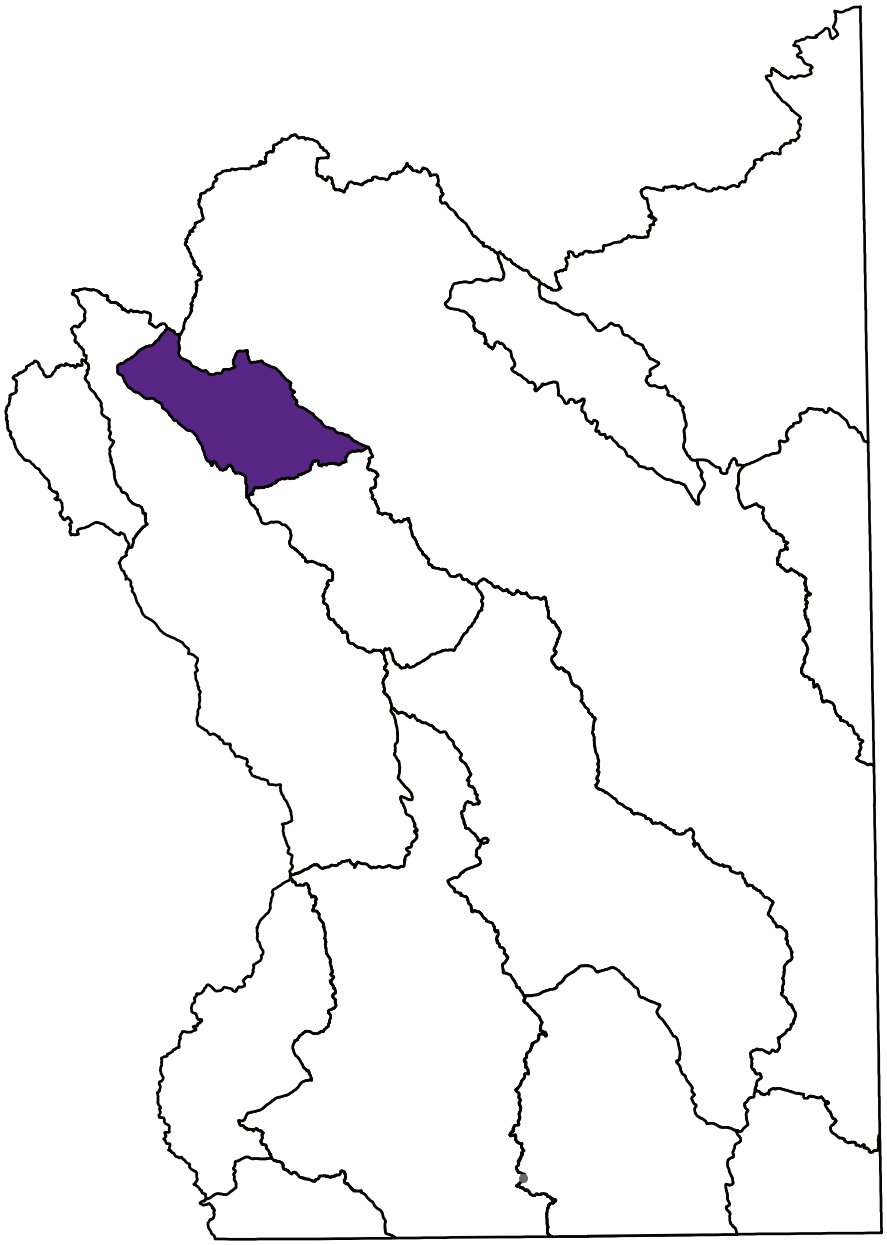
Section 3.6
Dripping Springs Wash Basin



3.6.1 Geography of the Dripping Springs Wash Basin

The Dripping Springs Wash Basin is a small, 378 square mile basin in the northeastern portion of the planning area. Geographic features and principal communities are shown on Figure 3.6-1. The basin is characterized by a mid-elevation mountain range and Arizona uplands Sonoran desertscrub, interior chaparral, semi-desert grassland and madrean evergreen woodland vegetation. (see Figure 3.0-10) Riparian vegetation includes strand and mesquite on the Gila River and cottonwood/ willow, strand and mixed broadleaf on Mescal Creek.

- Principal geographic features shown on Figure 3.6-1 include:
    - Deer Creek and Ash Creek running roughly parallel to one another southeast of Christmas
    - Dripping Springs Wash northwest of Christmas, a tributary of the Gila River
    - Gila River, running east-west creating the boundary between Pinal and Gila Counties
    - Mescal Mountains to the east
    - Dripping Springs Mountains to the west, which include the highest point in the basin at 5,515 feet.
    - The lowest point at approximately 1,900 feet where the Gila River exits the basin.

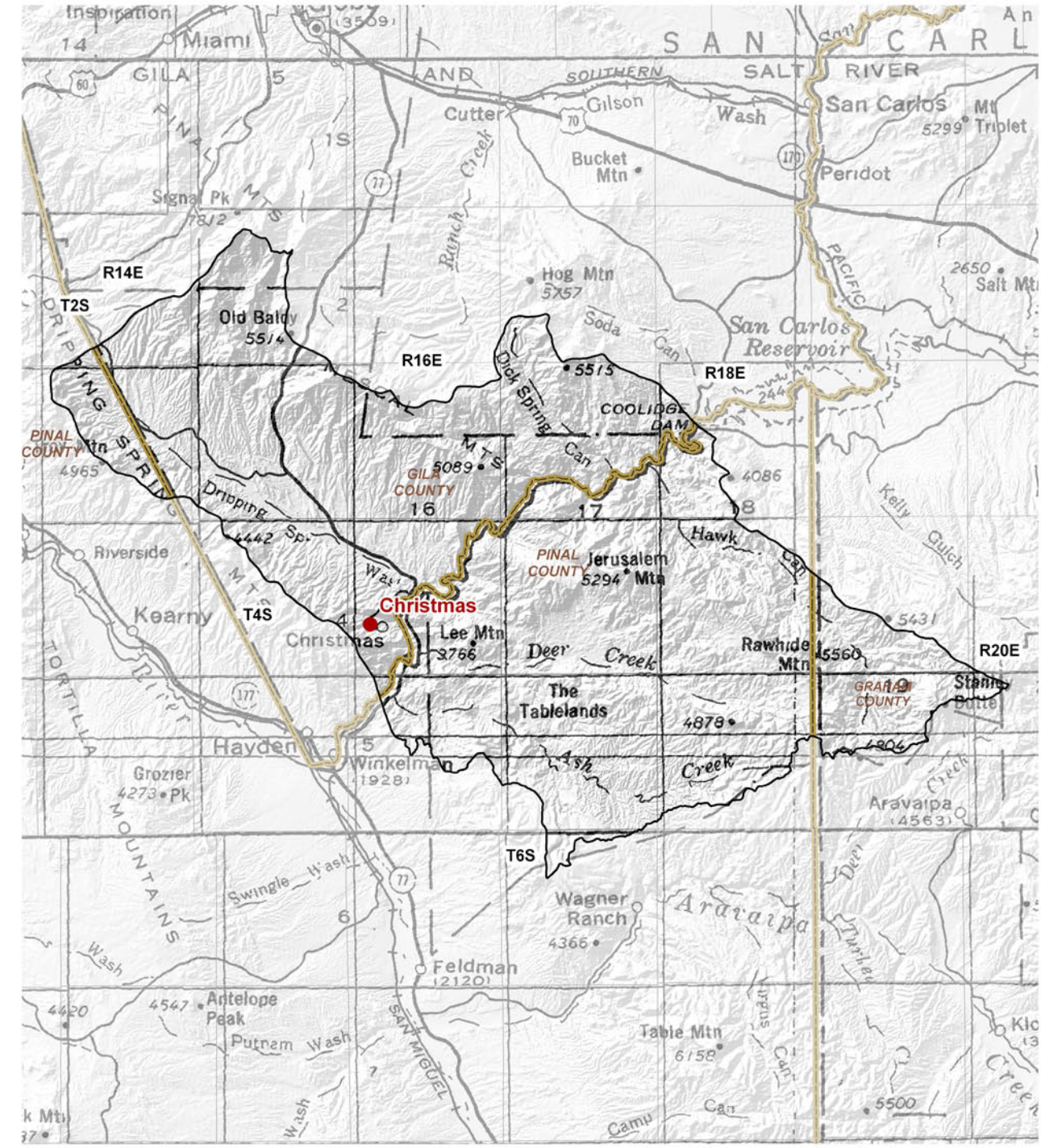


Figure 3.6-1
Dripping Springs Wash Basin
Geographic Features

3.6.2 Land Ownership in the Dripping Springs Wash Basin

Land ownership, including the percentage of ownership in each category, is shown for the Dripping Springs Wash Basin in Figure 3.6-2. Principal features include a significant amount of tribal lands and scattered state owned, Bureau of Land Management and private lands. A description of land ownership data sources and methods is found in Volume 1, Appendix A. More detailed information on National Parks, Monuments, Riparian, Conservation, Wildlife and Wilderness Areas is found in Section 3.0.3. Land ownership categories are discussed below in the order of percentage from largest to smallest in the basin.

Indian Reservations

- 57.8% of the land is under ownership of the San Carlos Apache Tribe.
- The tribal lands contain a number of private in-holdings.
- Primary land use is grazing.

U.S. Bureau of Land Management (BLM)

- 22.0% of land is federally owned and managed by the Safford Field Office of the Bureau of Land Management.
- BLM land is located primarily in the northern portion of the basin and is interspersed with state owned and private lands.
- Primary land uses are grazing and mining.

State Trust

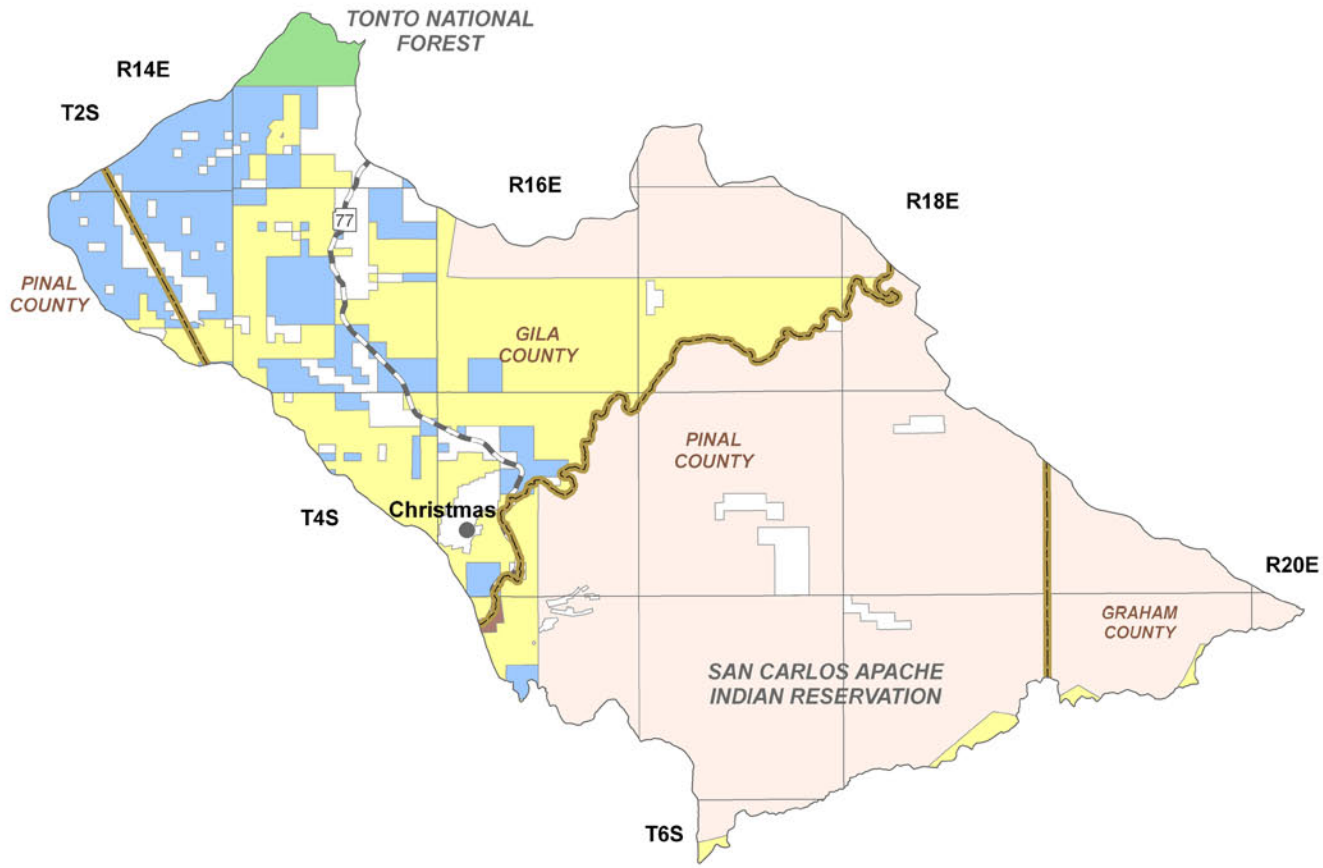
- 11.5% of land in this basin is held in trust for public schools.
- The majority of the state owned land, including a sizable contiguous parcel, is in the northwestern portion of the basin.
- Primary land use is grazing.

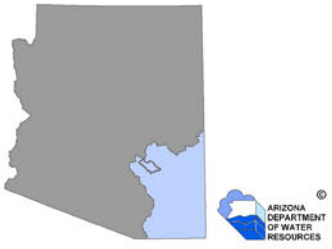
Private

- 7.4% of land is private.
- Private land is scattered in small parcels throughout the basin with a number of in-holdings within the San Carlos Apace Indian Reservation.
- Primary land uses are mining, domestic and grazing.

National Forest

- 1.3% of land is federally owned and managed by the United States Forest Service (USFS).
- The portion of national forest in this basin is in the Tonto National Forest, Globe Ranger District.
- Primary land uses are grazing and recreation.





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Source: ALRIS , 2004

0 3 6 Miles

N

S

Land Ownership (Percentage in Basin)

- Indian Reservation (57.8%)
- U.S. Bureau of Land Management (22.0%)
- State Trust (11.5%)
- Private (7.4%)
- National Forest (1.3%)

COUNTY
Major Road
City, Town or Place

Figure 3.6-2
Dripping Springs Wash Basin
Land Ownership

3.6.3 Climate of the Dripping Springs Wash Basin

Climate data from NOAA/NWS Coop Network and Evaporation Pan stations are complied in Table 3.6-1 and their locations are shown on Figure 3.6-3. Figure 3.6-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Dripping Springs Wash Basin does not contain AZMET and SNOTEL/Snowcourse stations. More detailed information on climate is found in Section 3.0.4. A description of the climate data sources and methods is found in Volume 1, Appendix A.

NOAA/NWS Coop Network

- Refer to Table 3.6-1A
- There is one NOAA/NWS Coop network climate station in the basin at San Carlos Reservoir. The average monthly maximum temperature is 86.6°F and average minimum temperature is 46.4°F.
- Winter, summer and fall season precipitation is similar; 5.36 inches, 5.07 inches and 4.36 inches respectively.
- The dry season is in the spring (April-June) when an average of 1.08 inches is recorded.

Evaporation Pan

- Refer to Table 3.6-1B
- There is one site in the basin, at San Carlos Reservoir located at 2,530 feet with an average annual evaporation of 91.45 inches.

SCAS Precipitation Data

- See Figure 3.6-3
- Other precipitation data shows rainfall as high as 30 inches at the northernmost tip of the basin in the Dripping Springs Mountains, and as low as 12 inches in the vicinity of Christmas.

Table 3.6-1 Climate Data for the Dripping Springs Wash 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
San Carlos Reservoir	2,530	1971-2000	86.6/Jul	46.4/Jan	5.36	1.08	5.07	4.36	15.87

Source: WRCC, 2005.

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
San Carlos Reservoir	2,530	1948 - 2002	91.45

Source: WRCC, 2003.

C. AZMET:

Station Name	Elevation (in feet)	Period of Record	Average Annual Reference Evaportranspiration, 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								

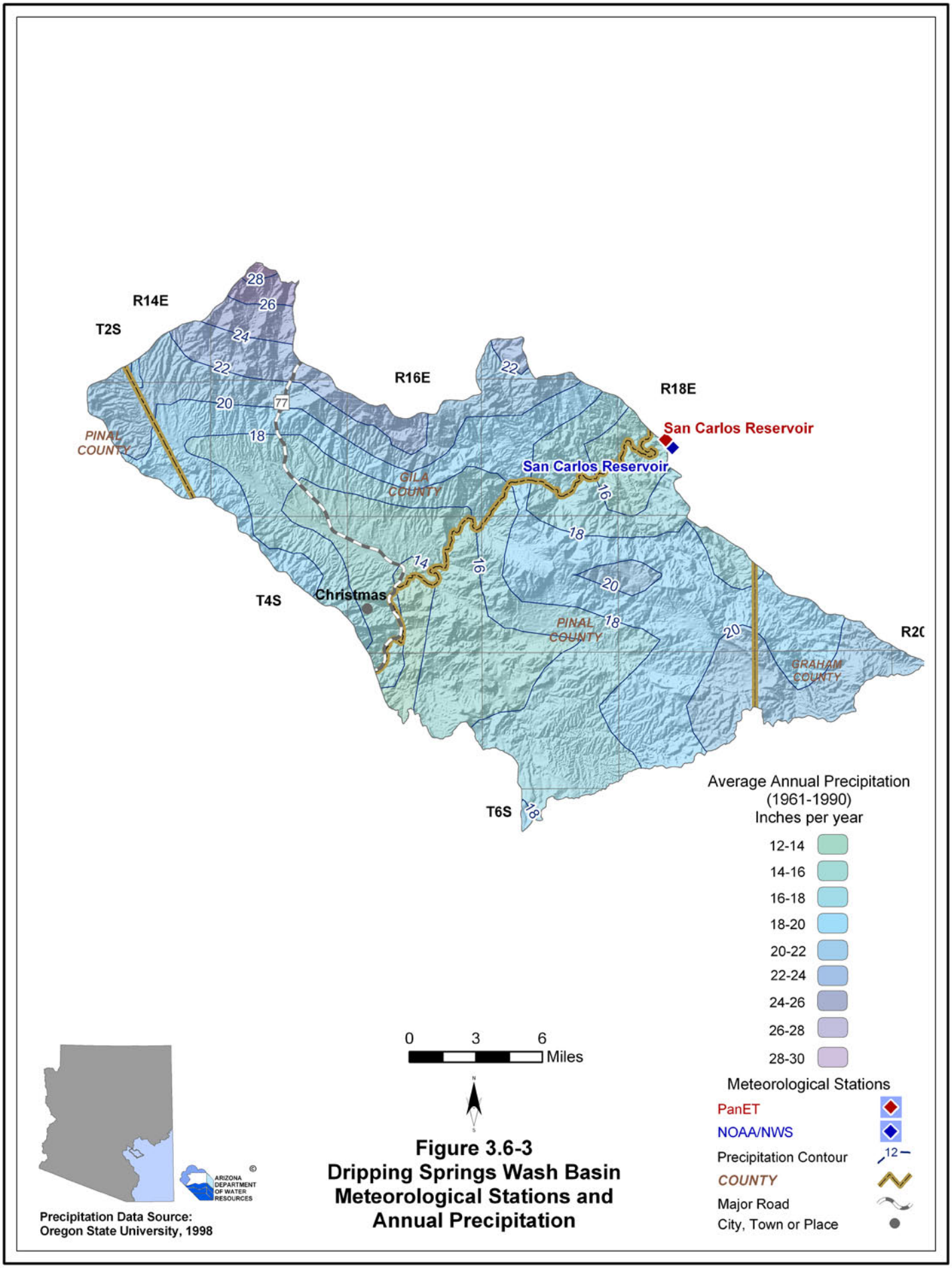


Figure 3.6-3
Dripping Springs Wash Basin
Meteorological Stations and
Annual Precipitation

3.6.4 Surface Water Conditions in the Dripping Springs Wash Basin

Streamflow data, including average seasonal flow, average annual flow and other information is shown in Table 3.6-2. Flood ALERT equipment in the basin is shown on Table 3.6-3. Reservoir and stockpond data are shown in Table 3.6-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 3.6-4. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

Streamflow Data

- Refer to Table 3.6-2.
- Data from one real-time station located at the Gila River below Coolidge Dam are shown on the table and on Figure 3.6-4.
- The average seasonal flow is similar in most seasons due to controlled releases from Coolidge Dam.
- Maximum annual flow was 1,681,500 acre-feet in 1993 and minimum annual flow was 27,590 acre-feet in 1929.

Flood ALERT Equipment

- Refer to Table 3.6-3.
- There is one station in the basin as of October 2005.

Reservoirs and Stockponds

- Refer to Table 3.6-4.
- There are no reservoirs in this basin.
- There are an estimated 79 stockponds in this basin.

Runoff Contour

- Refer to Figure 3.6-4.
- Average annual runoff is 0.5 inches, or 26.65 acre-feet per square mile, in this basin.

Table 3.6-2 Streamflow Data for the Dripping Springs Wash Basin

Station Number	USGS Station Name	Drainage Area (in mi^2)	Gage Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow (in acre-feet/year)				Years of Annual Flow Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9469500	Gila River below Coolidge Dam	12,886	2,309	7/1899-current (real time)	29	28	31	12	27,590 (1929)	231,731	270,458	1,681,500 (1993)	90

Source: USGS (NWIS) 2005 & 2008

Notes:
NA= Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Annual Flows may not equal 100 due to rounding
Period of record may not equal Year of Record used for annual Flow/Year statistics due to only using years with a 12 month record
In Period of Record, current equals November 2008
Seasonal and annual flow data used for the statistics was retreived in 2005

Table 3.6-3 Flood ALERT Equipment in the Dripping Springs Wash Basin

Station ID	Station Name	Station Type	Install Date	Responsibility
905	Downstream Coolidge Dam, Gila River	Precipitation/Stage	NA	Gila County FCD

Source: ADWR 2005a

Notes:
NA = Not available
FCD = Flood Control District

Table 3.6-4 Reservoirs and Stockponds in the Dripping Springs Wash 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	JURISDICTION
None identified by ADWR at this time					

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: 79 (from water right filings)

Stream Data Source: ALRIS, 2005

0 3 6 Miles

Figure 3.6-4
Dripping Springs Wash Basin
Surface Water Conditions

USGS Annual Runoff Contour for 1951-1980 (in inches) — 2
Stream Channel (width of line reflects stream order)
USGS Gage & Station ID — 9999999
Flood ALERT Equip. & Station ID — 9999
COUNTY
Major Road
City, Town or Place

3.6.5 Perennial/Intermittent Streams and Major Springs in the Dripping Springs Wash Basin

Major springs with discharge rates and date of measurement, and the total number of springs in the basin are shown in Table 3.6-5. The locations of major springs as well as perennial and intermittent streams are shown on Figure 3.6-5. Descriptions of data sources and methods for intermittent and perennial reaches and springs are found in Volume 1, Appendix A.

- There are two perennial streams, the Gila River and Mescal Creek, a tributary to the Gila River, which is controlled by releases from Coolidge Dam to meet legal obligations.
- There are two major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time. The largest discharge is 200 gpm at Mescal Warm spring.
- There are no minor springs identified at this time.
- Listed discharge rates may not be indicative of current conditions. Both of the major spring measurements were taken prior to 1985.
- The total number of springs identified by the USGS varies from 76 to 99, depending on the database reference.

Table 3.6-5 Springs in the Dripping Springs Wash Basin

A. Major Springs (10 gpm or greater):

Map Key	Name	Location		Discharge (in gpm)[1]	Date Discharge Measured
		Latitude	Longitude		
1	Mescal Warm	330918	1103815	200	During or prior to 1982
2	Coolidge Dam Warm	331016	1103139	165	During or prior to 1982

B. Minor Springs (1 to 10 gpm):

Name	Location		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
None identified by ADWR at this time				

Source: Compilation of databases from ADWR & others

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005a and USGS, 2006a): 76 to 99

Notes:
[1]Most recent measurement identified by ADWR

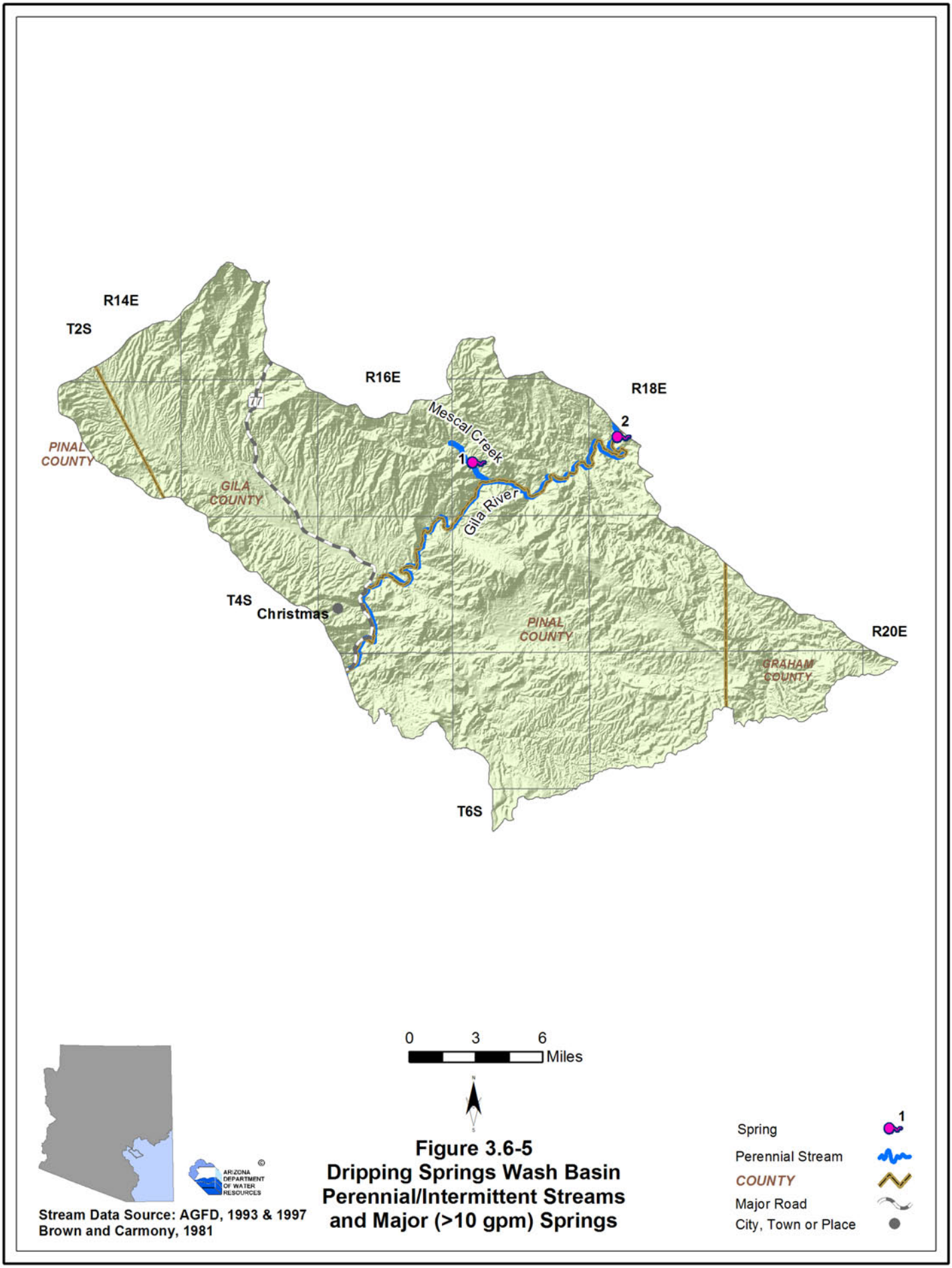


Figure 3.6-5
Dripping Springs Wash Basin
Perennial/Intermittent Streams and Major (>10 gpm) Springs

3.6.6 Groundwater Conditions of the Dripping Springs Wash 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 3.6-6. Figure 3.6-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 3.6-7 contains hydrographs for selected wells shown on Figure 3.6-6. Figure 3.6-8 shows well yields in four yield categories. 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 3.6-6 and Figure 3.6-6.
- The major aquifers in the basin are recent stream alluvium, consisting of mostly sand and silt, and Gila Conglomerate sedimentary rock. The recent stream alluvium is the principal water-producing unit.
- Flow direction is generally from the northwest to the southeast.

Well Yields

- Refer to Table 3.6-6 and Figure 3.6-8.
- As shown on Figure 3.6-8 well yields in this basin range from less than 100 gallons per minute (gpm) to 2,000 gpm.
- One source of well yield information, based on 12 reported wells, indicates that the median well yield in this basin is 394.5 gpm.

Natural Recharge

- Refer to Table 3.6-6.
- Natural recharge estimates range from 3,000 acre-feet per year to 9,000 acre-feet per year.

Water in Storage

- Refer to Table 3.6-6.
- Storage estimates for this basin range from 150,000 acre-feet to 5 less than one million acre-feet to a depth of 1,200 feet.

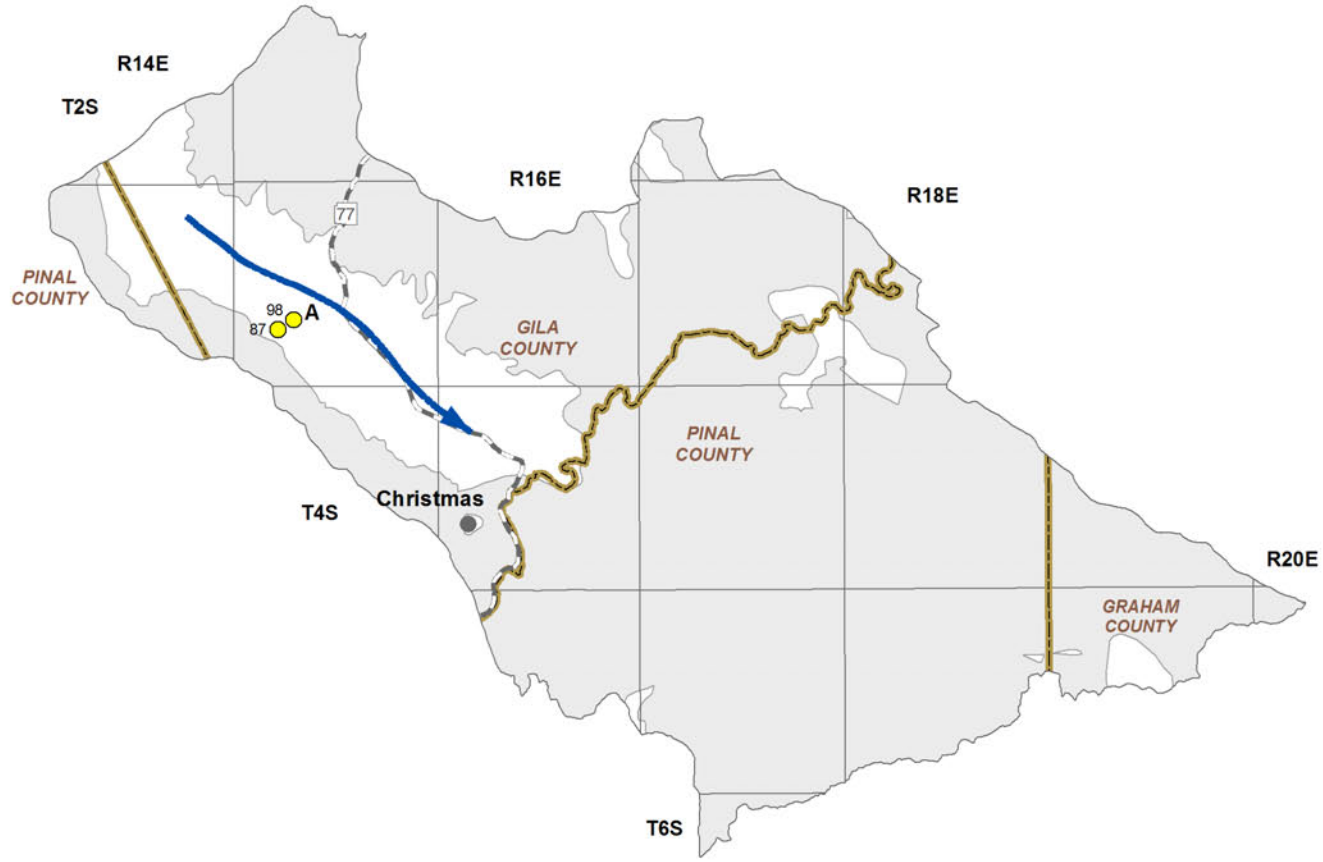
Water Level

- Refer to Figure 3.6-6. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures two index wells in this basin. A hydrograph for one of these wells is shown in Figure 3.6-7.
- There are only two water levels recorded in this basin during 2003-2004. The wells are close to each other and measure 87 feet and 98 feet to water. Water levels in both declined one to 15 feet between 1990-1991 and 2003-2004.

Table 3.6-6 Groundwater Data for the Dripping Springs Wash Basin

Basin Area, in square miles:	378	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Sedimentary Rock (Gila Conglomerate)	
Well Yields, in gal/min:	Range 12 - 1,200 Median 394.5 (12 wells reported)	Reported on registration forms for large (> 10-inch) diameter wells
	<2	ADWR (1994b)
	Range 0 - 500	Anning and Duet (1994)
Estimated Natural Recharge, in acre-feet/year:	3,000	ADWR (1994b)
	9,000	Freethey and Anderson (1986)
Estimated Water Currently in Storage, in acre-feet:	150,000 (to 1,200 ft)	ADWR (1994b)
	<1,000,000[1]	Freethey and Anderson (1986)
Current Number of Index Wells:	2	
Date of Last Water-level Sweep:	1996 (34 wells measured)	

Notes:
[1]Predevelopment Estimate



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0 3 6 Miles

N

Figure 3.6-6
Dripping Springs Wash Basin
Groundwater Conditions

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

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

Between -15 and -1

Generalized Flow Direction

Consolidated Crystalline & Sedimentary Rocks

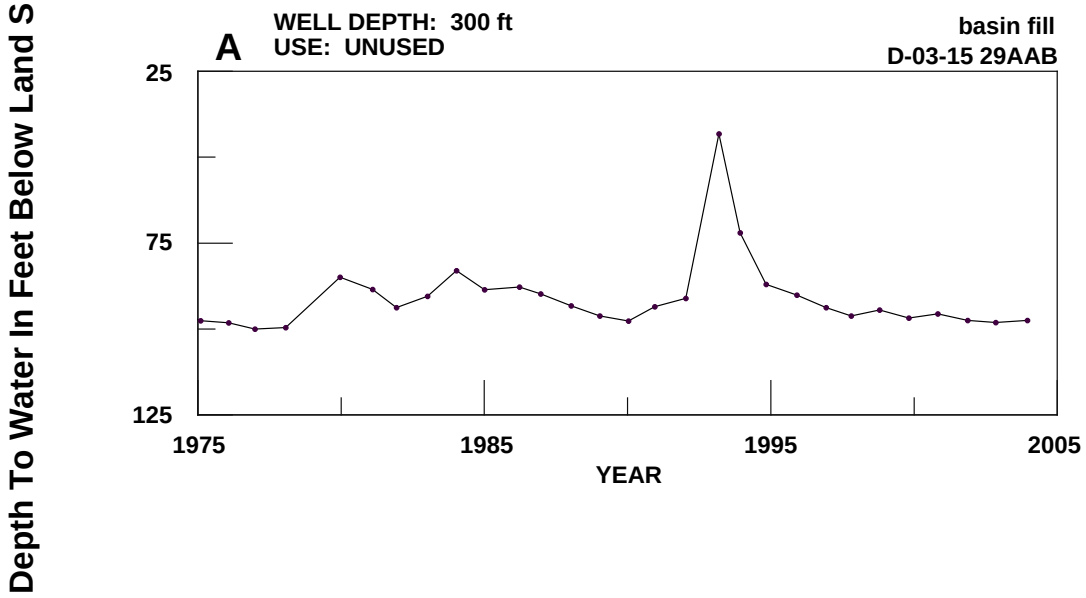
Unconsolidated Sediments

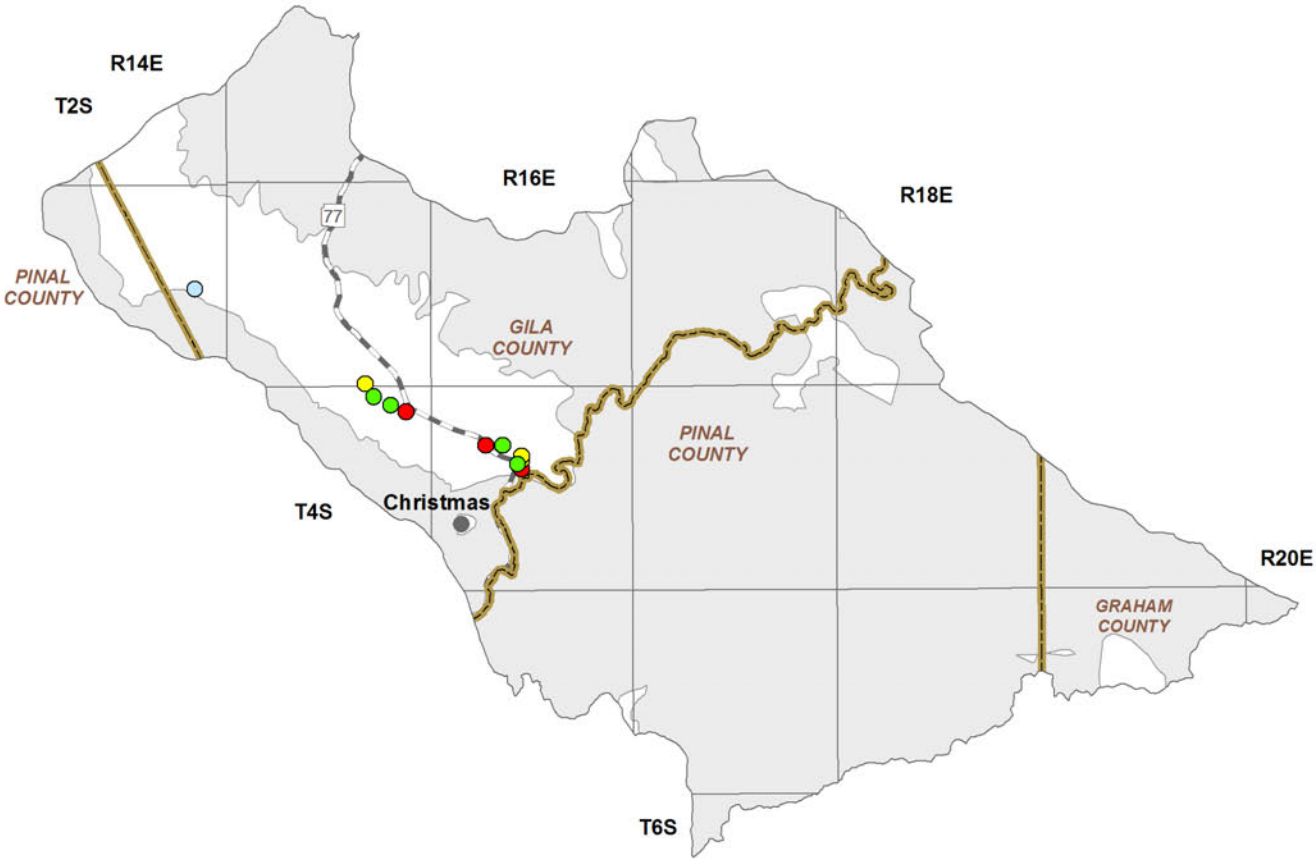
COUNTY

Major Road

City, Town or Place

Figure 3.6-7
Dripping Springs Wash Basin
Hydrographs Showing Depth to Water in Selected Wells





ARIZONA DEPARTMENT OF WATER RESOURCES

0 3 6 Miles

N

Figure 3.6-8
Dripping Springs Wash Basin
Well Yields

Well Yields
- Between 1000 and 2000 gals/min
- Between 500 and 1000 gals/min
- Between 100 and 500 gals/min
- Less than 100 gals/min

Consolidated Crystalline & Sedimentary Rocks

Unconsolidated Sediments

COUNTY

Major Road

City, Town or Place

3.6.7 Water Quality of the Dripping Springs Wash Basin

Data on drinking water standard exceedences in wells, springs and mine sites and impaired lakes and streams are not available for this basin. A description of water quality data sources and methods is found in Volume 1, Appendix A.

3.6.8 Cultural Water Demands in the Dripping Springs Wash 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 3.6-7. A description of cultural water demand data sources and methods is found in Volume 1, Appendix A. More detailed information on cultural water demands is found in Section 3.0.7.

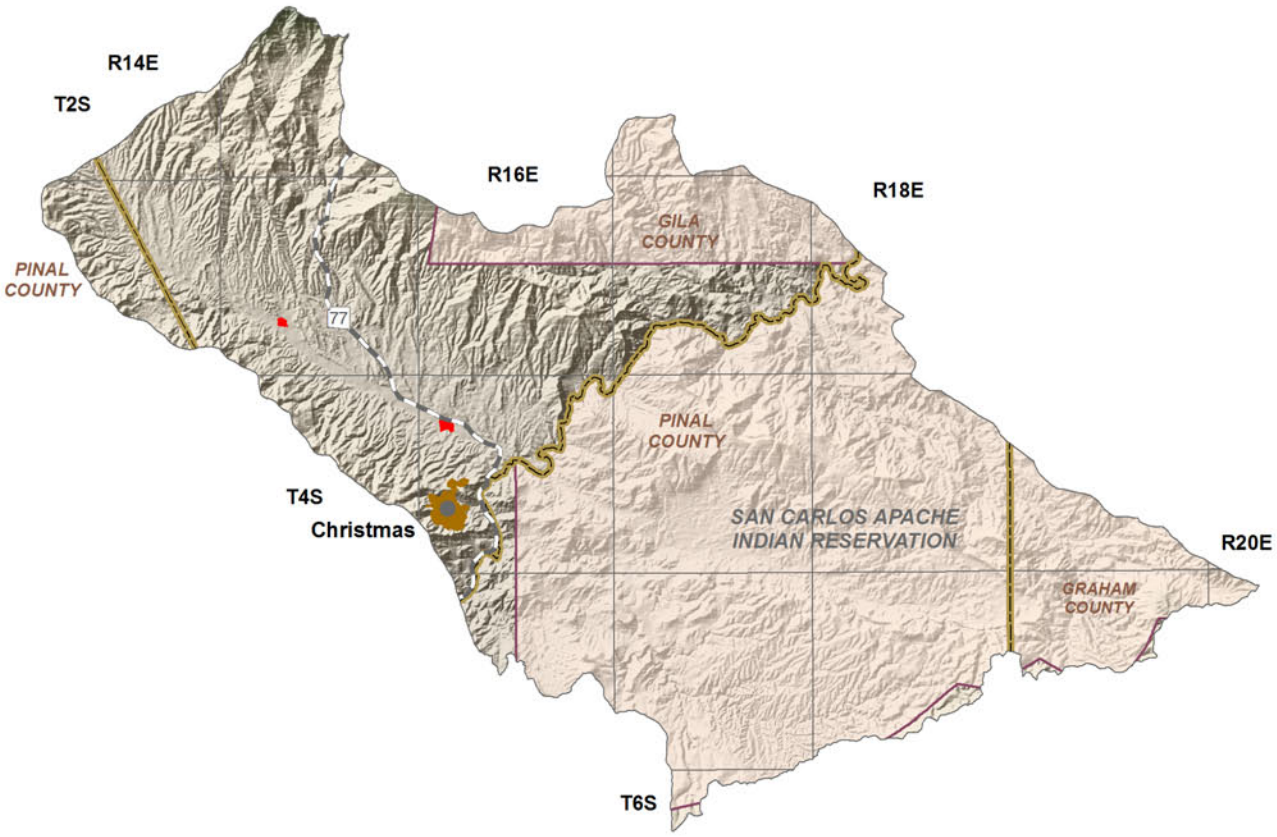
Cultural Water Demands

- Refer to Table 3.6-7 and Figure 3.6-9.
- Population decreased between 1980 and 2005.
- All water use in this basin is groundwater and is to meet municipal demand. Groundwater pumping has decreased since 1971 and remained constant from 1990 to 2005, with less than 300 acre-feet pumped per year during this time.
- High intensity municipal and industrial demand is found in the vicinity of Highway 77.
- There are several inactive mines including the Christmas Mine, New Year Mine and the San Bernardo Jr. Mine in the vicinity of Christmas.
- As of 2005 there were 119 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 40 wells with a pumping capacity of more than 35 gallons per minute.

Table 3.6-7 Cultural Water Demands in the Dripping Springs Wash Basin[1]

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	Agriculture	Municipal	Industrial	Agriculture	
1971		73[2]	21[2]	<1,000			NR			ADWR (1994a)
1972										
1973										
1974										
1975										
1976				<1,000			NR			
1977										
1978										
1979										
1980	329									
1981	318	17	2	<1,000			NR			
1982	307									
1983	295									
1984	284									
1985	273									
1986	262	3	2	<1,000			NR			
1987	251									
1988	239									
1989	228									
1990	217									
1991	213	11	3	<300	NR	NR	NR			USGS (2007)
1992	208									
1993	204									
1994	200									
1995	196									
1996	192	10	3	<300	NR	NR	NR			
1997	188									
1998	183									
1999	179									
2000	175									
2001	177	5	7	<300	NR	NR	NR			
2002	179									
2003	182									
2004	184									
2005	186									
2010	197									
2020	220									
2030	288									
WELL TOTALS:		**119**	**40**							

Notes:
NR = Not reported
[1] Does not include evaporation losses from stockponds and reservoirs or effluent.
[2] Includes all wells through June 1980.



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Primary Data Source: USGS National Gap Analysis Program, 2004

0 3 6 Miles

Figure 3.6-9
Dripping Springs Wash Basin
Cultural Water Demand

Demand Centers

- M&I - High Intensity
- Large Mine
- Indian Reservation
- Indian Reservation Boundary
- COUNTY
- Major Road
- City, Town or Place

3.6.9 Water Adequacy Determinations in the Dripping Springs Wash Basin

There are no water adequacy applications on file with the Department as of December 2008 for the Dripping Springs Wash Basin. 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.

DRIPPING SPRINGS BASIN

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