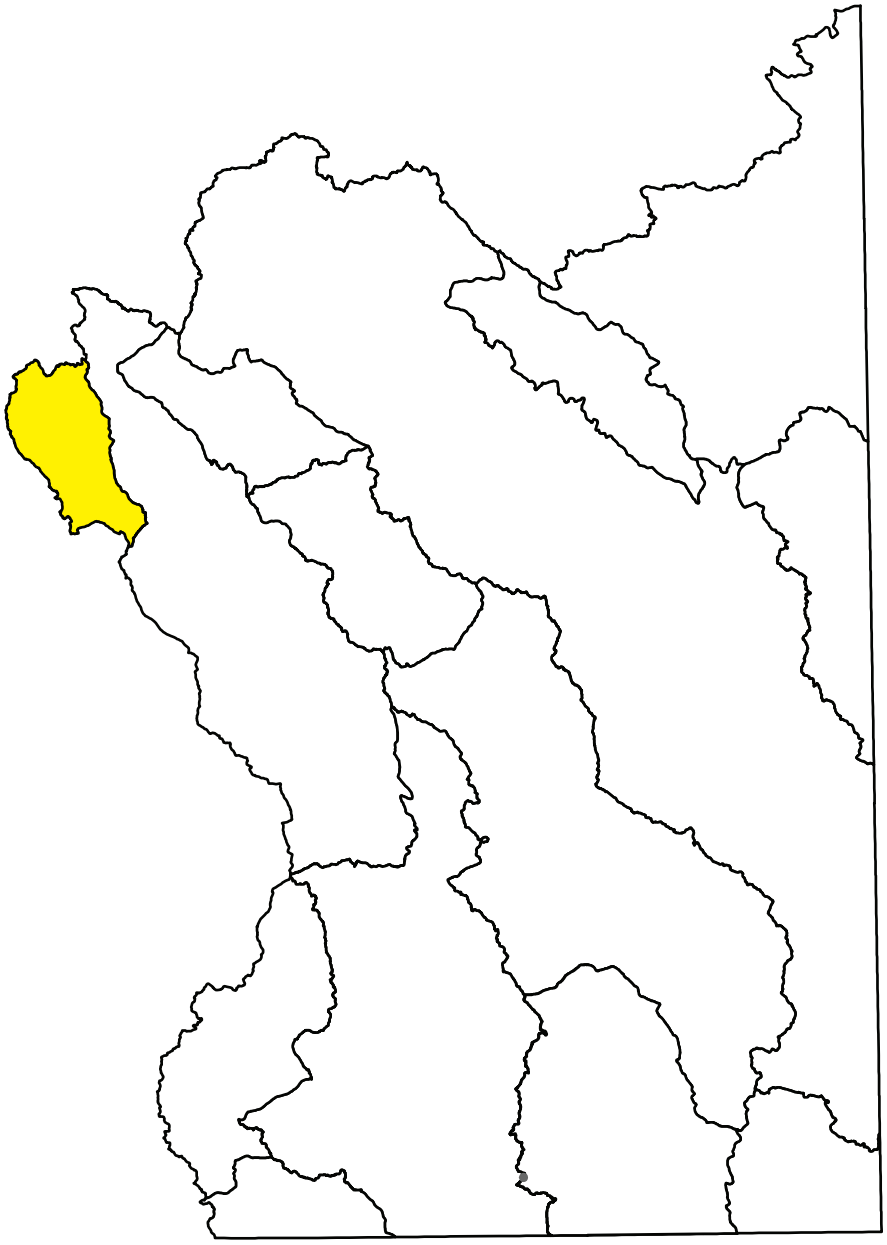
Section 3.4
Donnelly Wash Basin



3.4.1 Geography of the Donnelly Wash Basin

The Donnelly Wash Basin is a small, 293 square mile basin in the northwestern portion of the planning area. Geographic features and principal communities are shown on Figure 3.4-1. The basin is characterized by low elevation hills, washes and canyons. Vegetation is primarily Arizona Sonoran desertscrub with a smaller area of semi-desert grassland. (see Figure 3.0-10).

- Principal geographic features shown on Figure 3.4-1 are:
  - Gila River, which runs east-west through Cochran
  - Box Canyon and Walnut Canyon entering from the north and terminating at the Gila River
  - Donnelly Wash, Cottonwood Wash and Box Wash, which run roughly parallel to each other south of Cochran
  - The Ninety-Six Hills along the southwest boundary, which include the highest point in the basin at 4,420 feet
  - The lowest point at 1,600 feet at Price where the Gila River exits the basin.

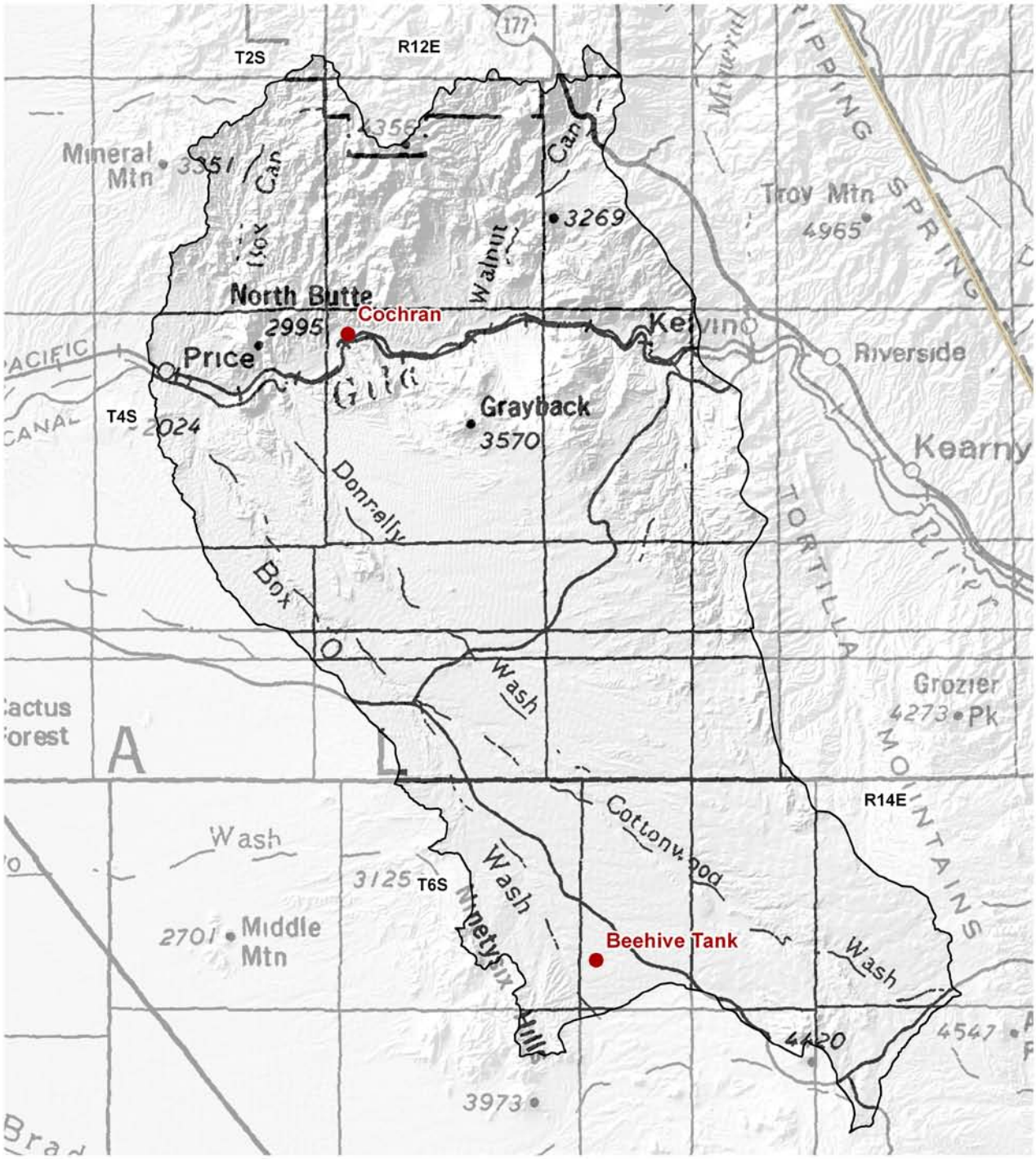


Figure 3.4-1
Donnelly Wash Basin
Geographic Features

3.4.2 Land Ownership in the Donnelly Wash Basin

Land ownership, including the percentage of ownership in each category, is shown for the Donnelly Wash Basin in Figure 3.4-2. Principal features of land ownership in this basin are the significant amount of state trust land, the band of Bureau of Reclamation land and the scattered Bureau of Land Management 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.

State Trust

- 50.5% of land in this basin is held in trust predominantly for public schools and to a lesser extent the hospital for disabled miners.
- The southern portion of the basin contains a sizeable contiguous portion of state owned land.
- The center and northern portion of the basin contain trust lands that are in more of a checkerboard pattern among Bureau of Land Management and Bureau of Reclamation lands.
- Primary land use is grazing.

U.S. Bureau of Land Management (BLM)

- 30.2% of land is federally owned and managed by the Safford Field Office of the Bureau of Land Management.
- Primary land use is grazing

Other (Game and Fish, County and Bureau of Reclamation Lands)

- 11.5% of land is federally owned and managed by the Bureau of Reclamation.
- This land flanks the Gila River and extends south of Cochran.
- Primary land use is for water delivery.

Private

- 6.2% of land is private.
- Private land is scattered in small parcels throughout the basin, with a few in-holdings in BLM lands in the northern portion of the basin.
- Primary land uses are domestic and ranching.

National Forest

- 1.6% of the land is federally owned and managed by the United States Forest Service (USFS).
- The basin includes the Globe Ranger District in the Tonto National Forest.
- Primary land uses are grazing and recreation.

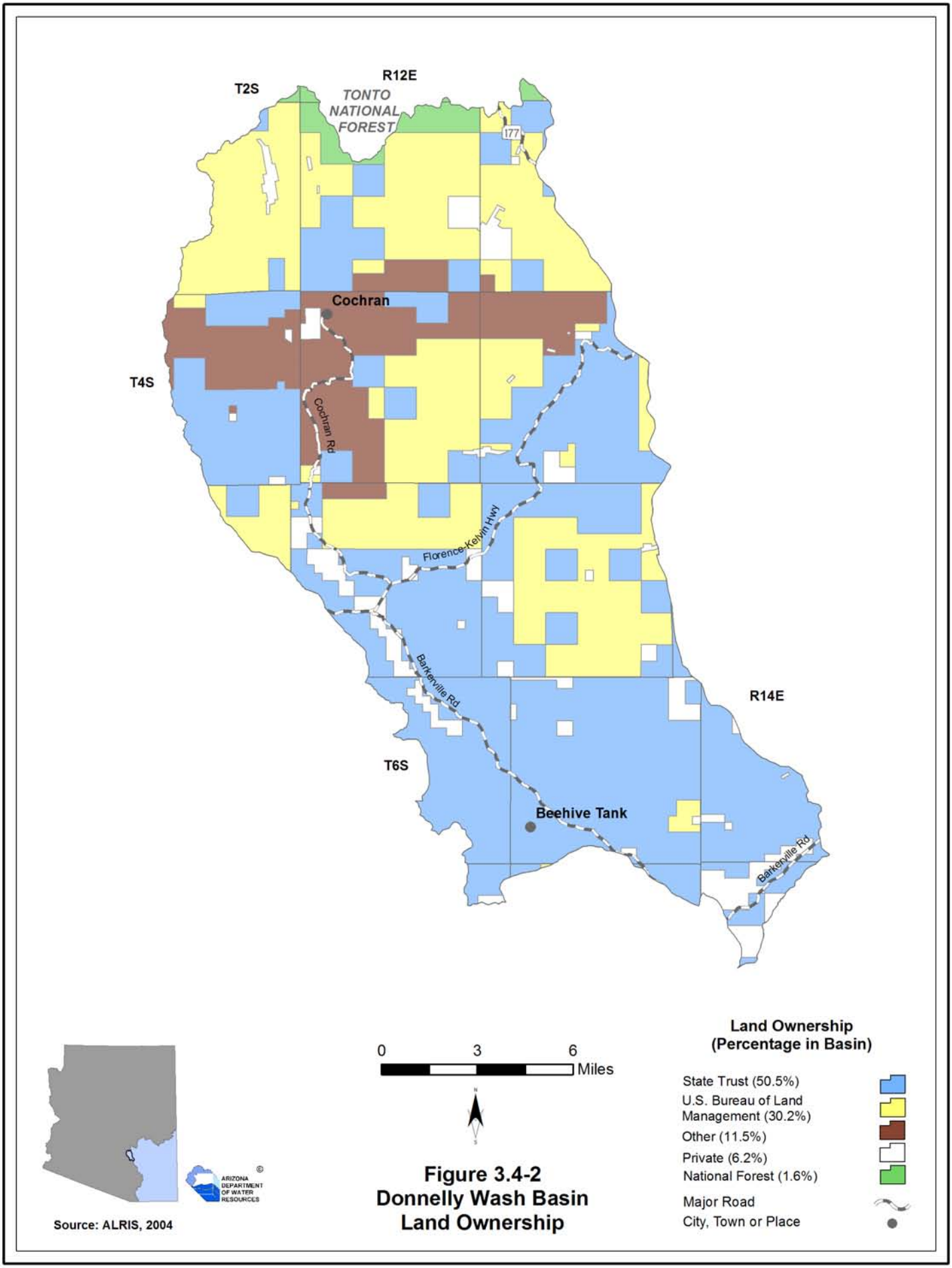


Figure 3.4-2
Donnelly Wash Basin
Land Ownership

3.4.3 Climate of the Donnelly Wash Basin

The Donnelly Wash Basin does not contain any NOAA/NWS Coop Network, Evaporation Pan, AZMET or SNOTEL/Snowcourse stations. Figure 3.4-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. More detailed information on climate is found in Section 3.0.4. A description of this and other climate data sources and methods is found in Volume 1, Appendix A.

SCAS Precipitation Data

- See Figure 3.4-3
- Precipitation data shows average annual precipitation is as high as 20 inches at the northeastern-most tip of the basin and in the southeast portion of the basin and as low as 12 inches in the vicinity of the Gila River.

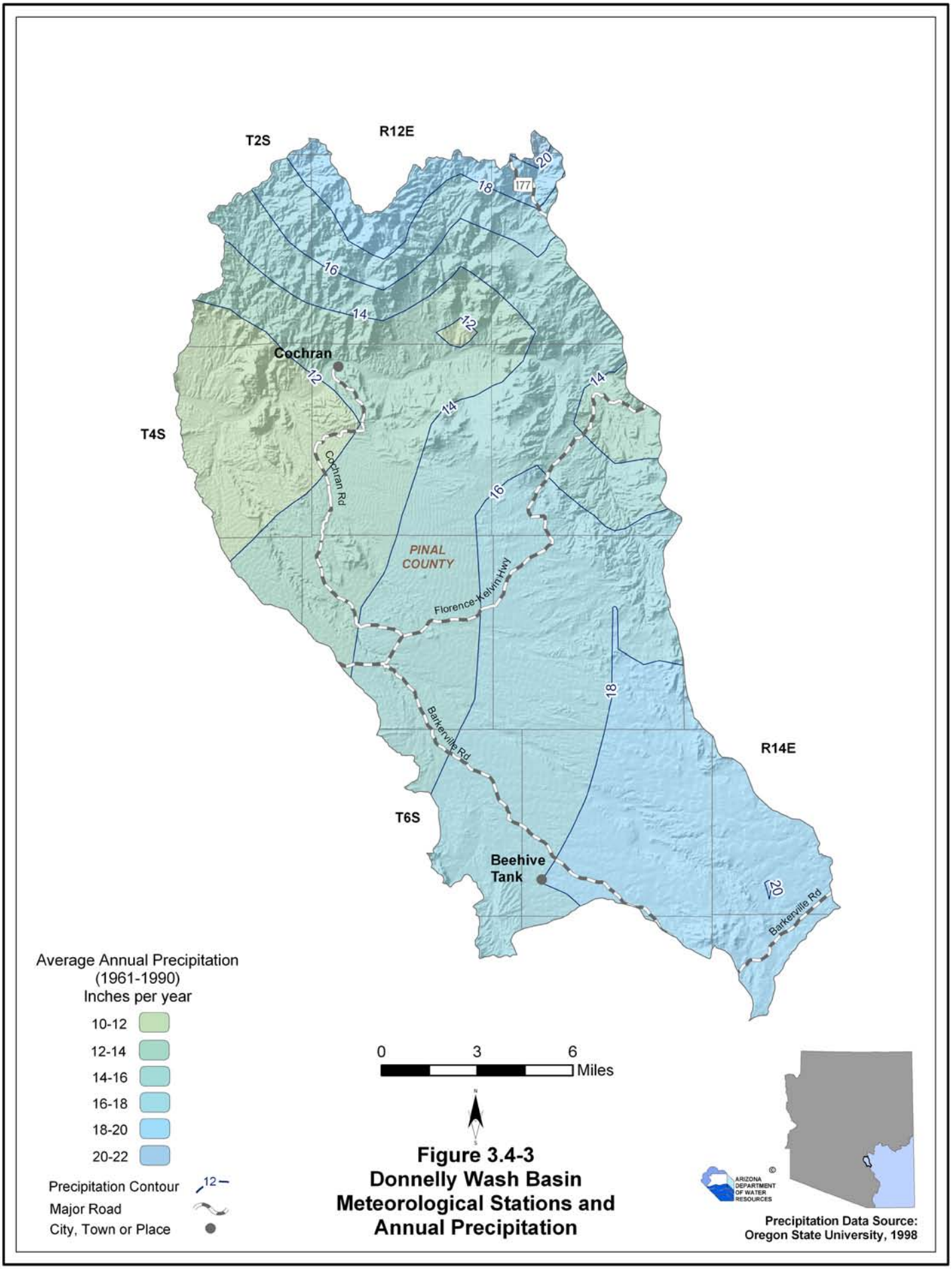


Figure 3.4-3
Donnelly Wash Basin
Meteorological Stations and
Annual Precipitation

3.4.4 Surface Water Conditions in the Donnelly Wash Basin

There are no streamflow data or flood ALERT equipment in this basin. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 3.4-1. The USGS annual runoff contours as well as stream channels are shown on Figure 3.4-4. Descriptions of stream, reservoir and stockpond data sources and methods are found in Volume 1, Appendix A.

Reservoirs and Stockponds

- Refer to Table 3.4-1.
- Surface water is stored or could be stored in two small reservoirs in the basin.
- There are an estimated 89 stockponds in this basin.

Runoff Contour

- Refer to Figure 3.4-4.
- Average annual runoff is 0.5 inches per year, or 26.65 acre-feet per square mile, in this basin.

Table 3.4-1 Reservoirs and Stockponds in the Donnelly 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)[1]

Total number: 2
Total surface area: 10 acres

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

Total number: 89 (from water right filings)

Notes:
[1]Capacity data not available to ADWR

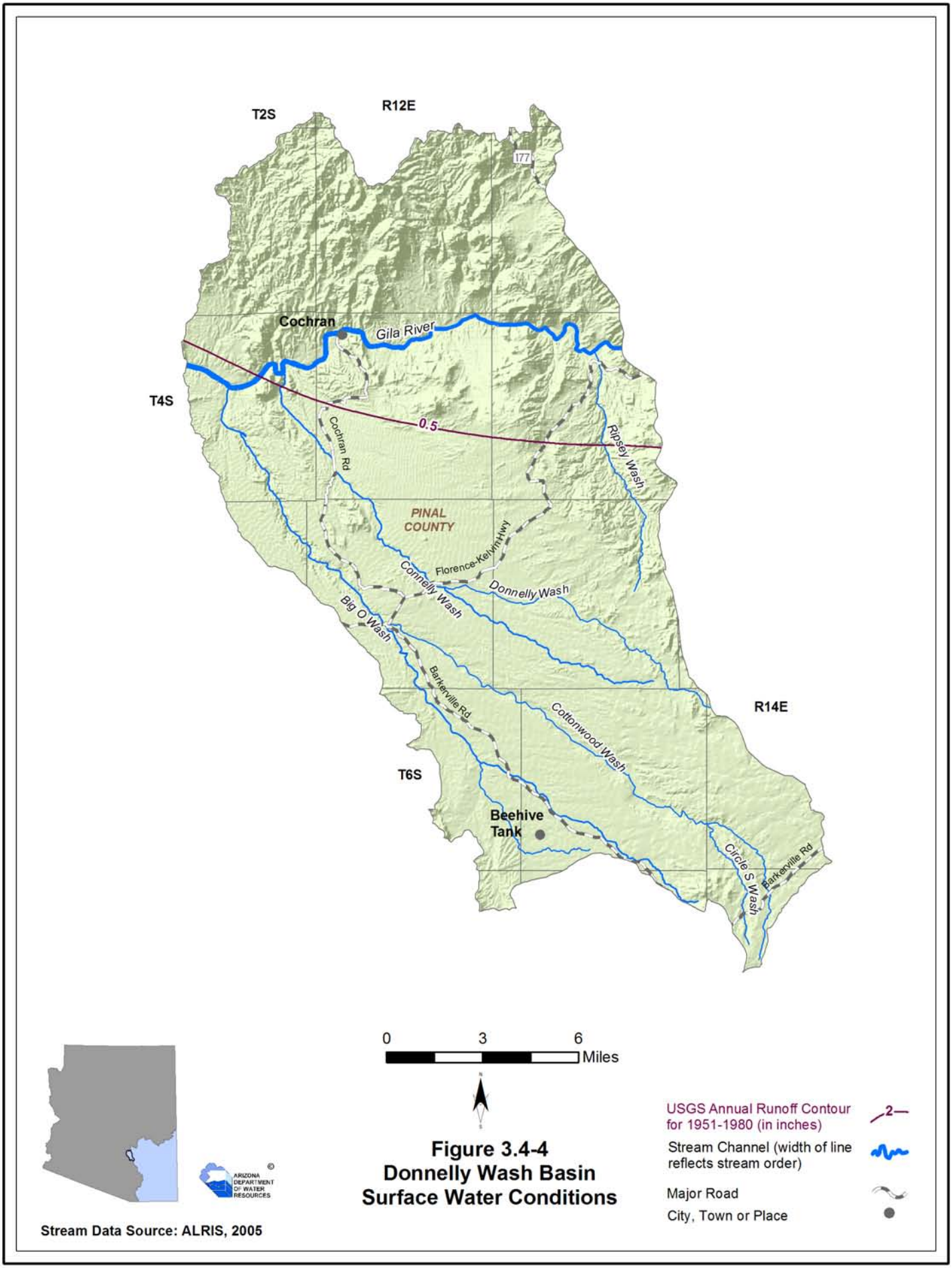


Figure 3.4-4
Donnelly Wash Basin
Surface Water Conditions

3.4.5 Perennial/Intermittent Streams and Major Springs in the Donnelly Wash Basin

The locations of perennial and intermittent streams are shown on Figure 3.4-5. There are no identified major or minor springs in this basin. 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 in this basin, the Gila River and Box Canyon. The Gila River is controlled by releases from Coolidge Dam to meet legal obligations.
- There are a number of intermittent streams in the northern portion of the basin.
- No major or minor springs have been identified by the Department at this time.
- The total number of springs identified by the USGS varies from 12 to 14, depending on the database reference.

Table 3.4-2 Springs in the Donnelly Wash Basin

A. Major Springs (10 gpm or greater):

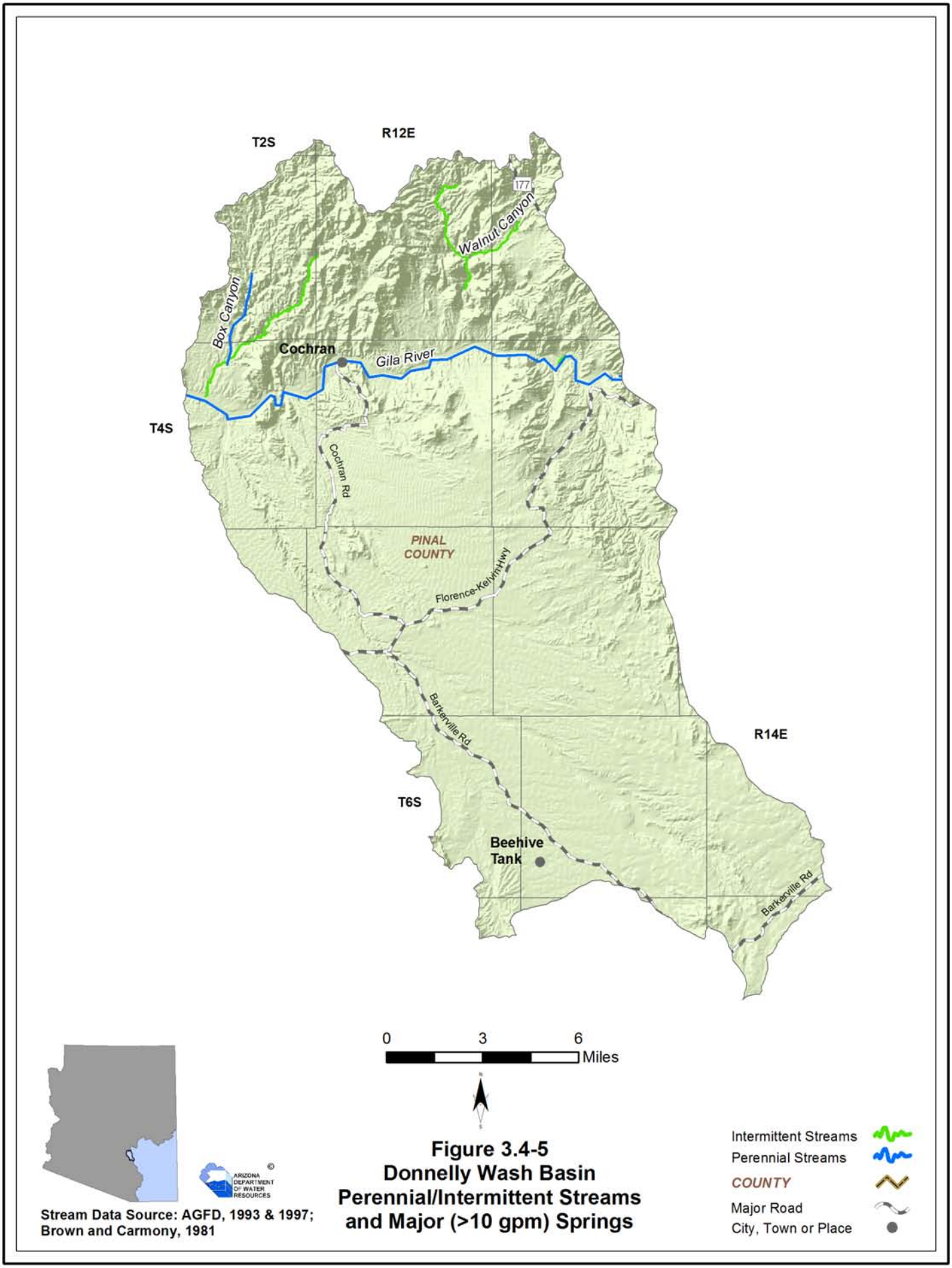
Map Key	Name	Location		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
None identified by ADWR at this time					

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): 12 to 14



Stream Data Source: AGFD, 1993 & 1997; Brown and Carmony, 1981

Figure 3.4-5
Donnelly Wash Basin
Perennial/Intermittent Streams and Major (>10 gpm) Springs

3.4.6 Groundwater Conditions of the Donnelly 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 3.4-3. Figure 3.4-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 3.4-7 contains hydrographs for selected wells shown on Figure 3.4-6. Figure 3.4-8 shows well yields in three 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 3.4-3 and Figure 3.4-6.
- The major aquifer in the basin is a narrow strip of basin fill.
- Flow direction is from the southeast to the northwest.

Well Yields

- Refer to Table 3.4-3 and Figure 3.4-8.
- As shown on Figure 3.4-8 well yields in this basin range from less than 100 gallons per minute (gpm) to 1,000 gpm.
- One source of well yield information, based on four reported wells, indicates that the median well yield in this basin is 62.5 gpm.

Natural Recharge

- Refer to Table 3.4-3.
- The natural recharge estimate for this basin is 3,000 acre-feet per year.

Water in Storage

- Refer to Table 3.4-3.
- There are three storage estimates for this basin, ranging from 140,000 acre-feet to two million acre-feet to a depth of 1,200 feet.

Water Level

- Refer to Figure 3.4-6. Water level is shown for a well measured in 2003-2004.
- The only 2003-2004 recorded water level in the basin is 35 feet northwest of Beehive Tank. A hydrograph corresponding to this well is shown in Figure 3.4-7.

Table 3.4-3 Groundwater Data for the Donnelly Wash Basin

Basin Area, in square miles:	293	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Basin Fill	
	Range 3 - 2,600 Median 62.5 (4 wells reprted)	Reported on registration forms for large (> 10-inch) diameter wells
	Range 0 - 500	Anning and Duet, USGS (1994)
Estimated Natural Recharge, in acre-feet:	3,000	Freethey and Anderson (1986)
Estimated Water Currently in Storage, in acre-feet:	140,000 (to 1,200 ft)	ADWR (1994b)
	<1,000,000[1] (to 1,200 ft)	Freethey and Anderson (1986)
	2,000,000 (to 1,200 ft)	Arizona Water Commission (1975)
Current Number of Index Wells:	0	
Date of Last Water-level Sweep:	1996 (25 wells measured)	

Notes:
NA = Not Available
[1]Predevelopment Estimate

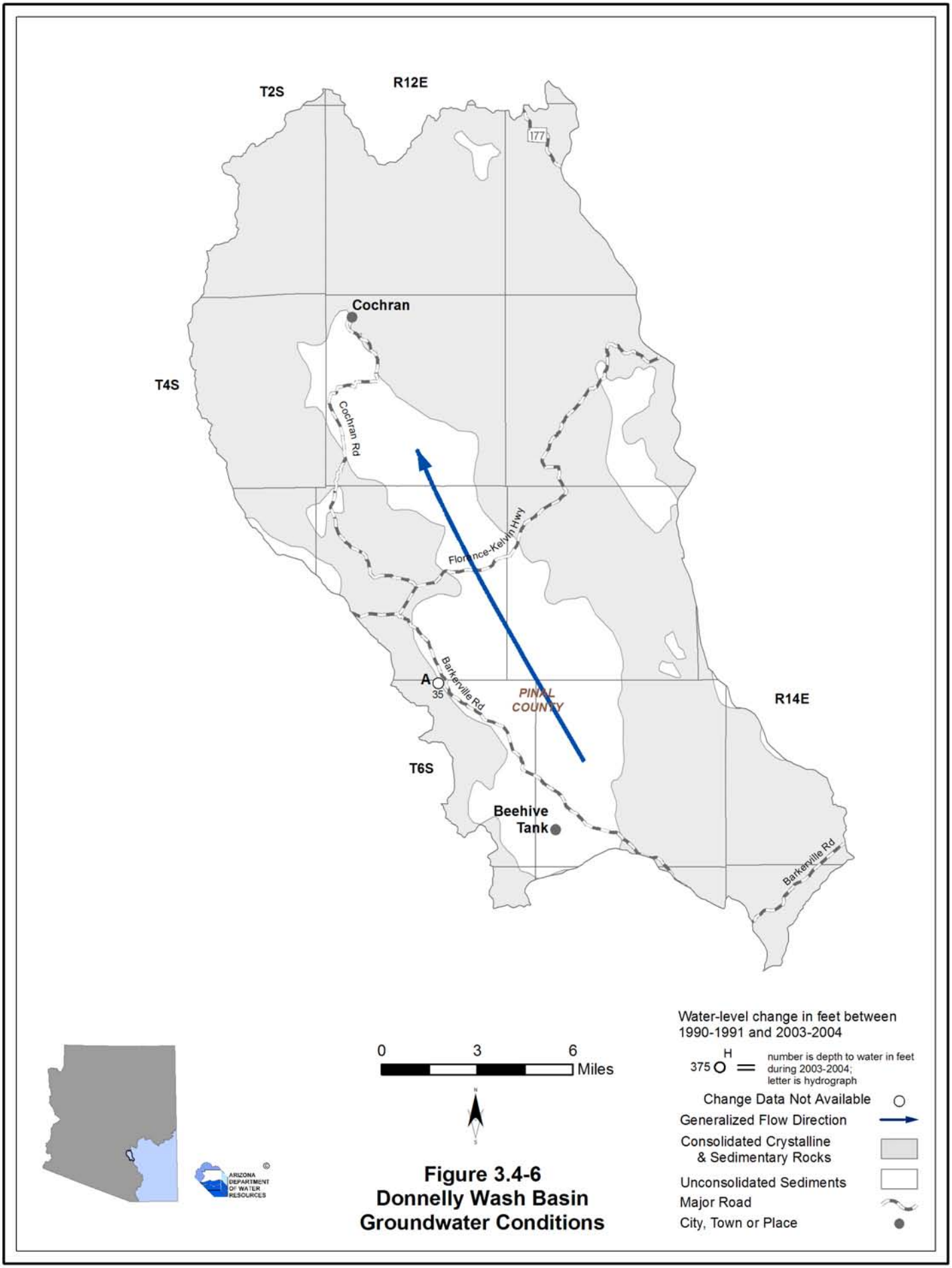
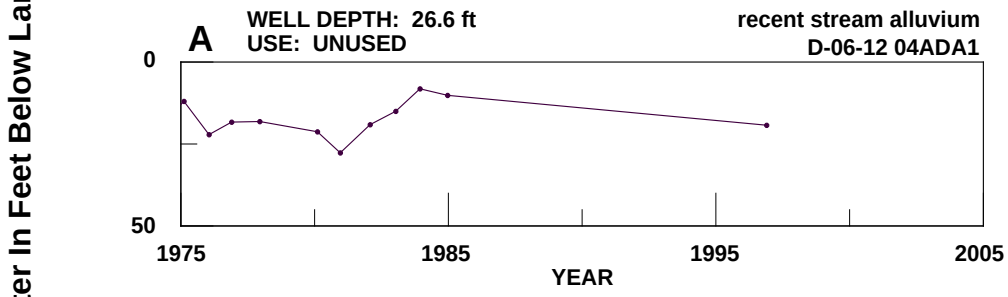


Figure 3.4-6
Donnelly Wash Basin
Groundwater Conditions

Figure 3.4-7
Donnelly Wash Basin
Hydrographs Showing Depth to Water in Selected Wells



Depth To Water In Feet Below Land Surface

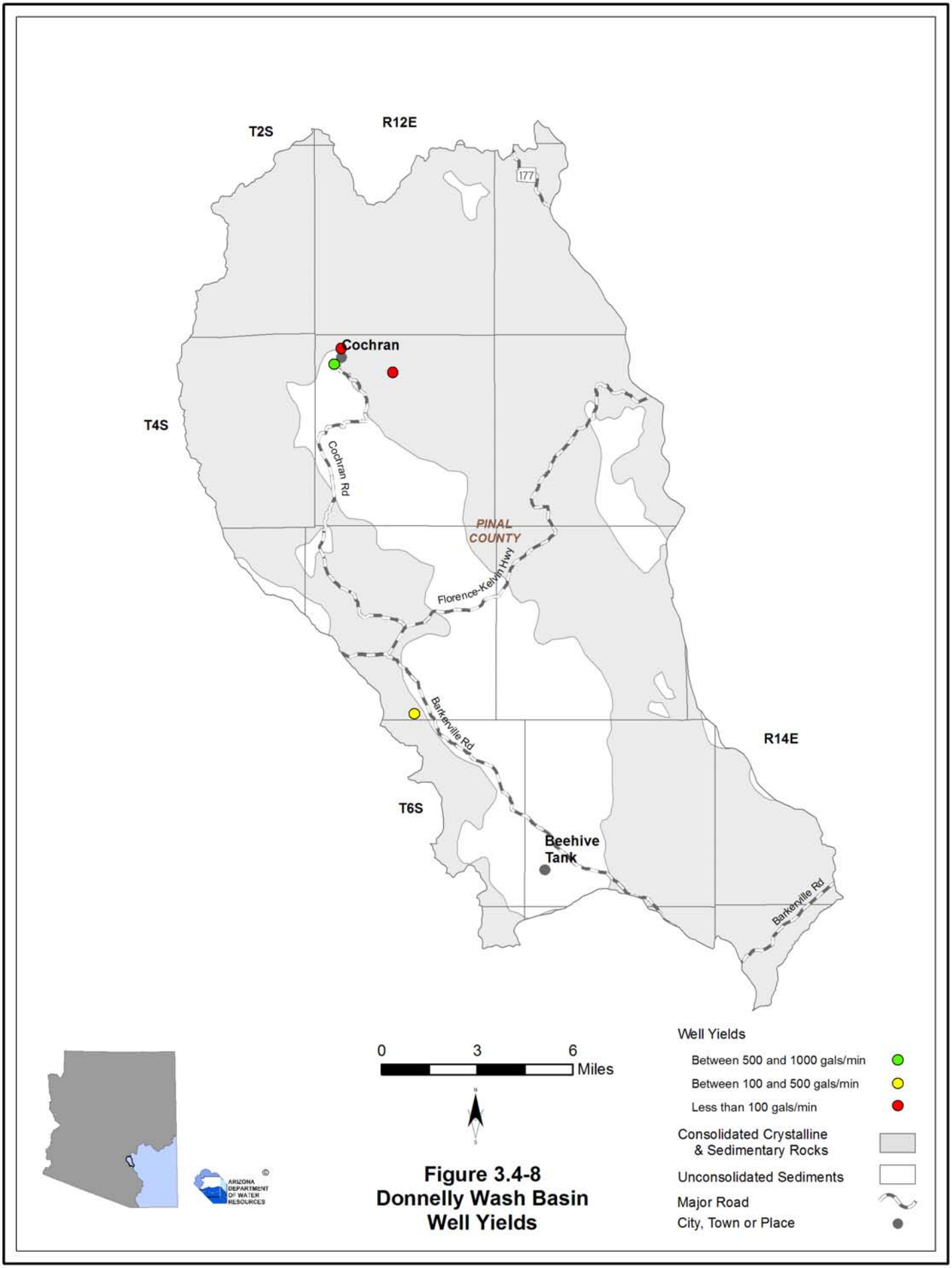


Figure 3.4-8
Donnelly Wash Basin
Well Yields

3.4.7 Water Quality of the Donnelly Wash Basin

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 3.4-4A. There are no data on impaired lakes and streams in this basin. Figure 3.4-9 shows the location of exceedences keyed to Table 3.4-4A. A description of water quality data sources and methods is found in Volume 1, Appendix A. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

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

- Refer to Table 3.4-4A.
- Five sites have parameter concentrations that have equaled or exceeded DWS.
- Equaled or exceeded parameters include arsenic, fluoride and nitrates.

Table 3.4-4 Water Quality Exceedences in the Donnelly Wash Basin[1]

A. Wells, Springs and Mines

Map Key	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
		Township	Range	Section	
1	Well	3 South	12 East	24	As
2	Spring	4 South	12 East	31	F
3	Spring	4 South	13 East	9	F
4	Well	5 South	13 East	7	NO3
5	Well	7 South	14 East	5	NO3

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:
Because of map scale feature locations may appear different than the location indicated on the table
[1] Water quality samples collected between 1996 and 2000.
[2] As = Arsenic
F = Fluoride
NO3 = Nitrate

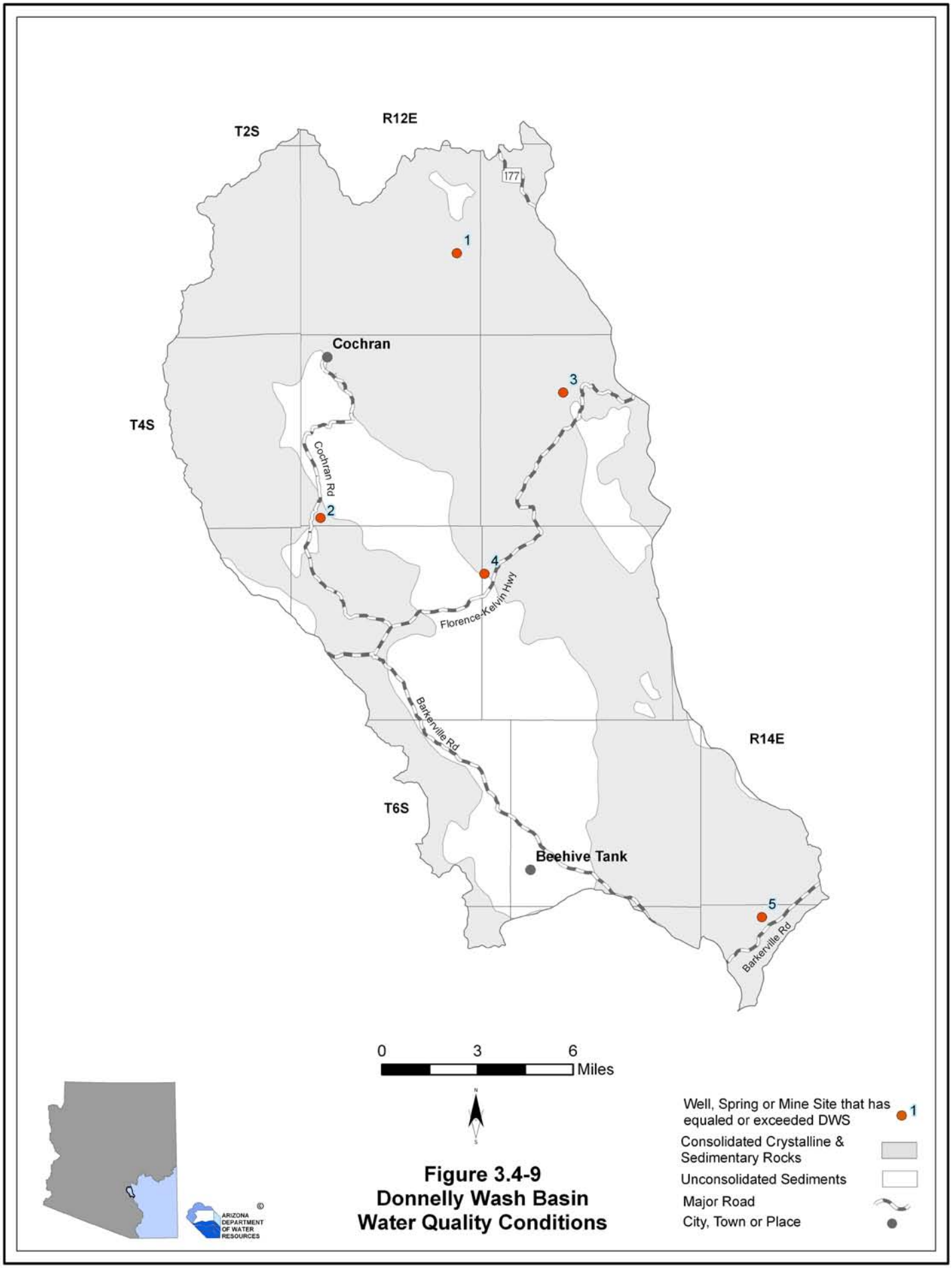


Figure 3.4-9
Donnelly Wash Basin
Water Quality Conditions

3.4.8 Cultural Water Demands in the Donnelly 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 3.4-5. There is no recorded effluent generation in this basin. The USGS National Gap Analysis Program, the source of cultural demand map data, showed no demand centers for this basin. 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 3.4-5.
- Population in this basin is small, with 165 residents in 2000.
- Groundwater pumping remained constant from 1971 to 2005 with less than 300 acre-feet pumped per year.
- All water use in this basin is groundwater, there are no recorded surface-water diversions.
- Municipal demand is the only water demand in this basin and is minimal, less than 300 acre-feet per year.
- As of 2005 there were 140 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and six wells with a pumping capacity of more than 35 gallons per minute.

Table 3.4-5 Cultural Water Demands in the Donnelly 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	Agricultural	Municipal	Industrial	Agricultural	
1971		85[2]	3[2]	<300			NR			ADWR (1994a) USGS (2007)
1972										
1973										
1974										
1975										
1976				<300			NR			
1977										
1978										
1979										
1980	27									
1981	35	13	2	<300			NR			
1982	43									
1983	52									
1984	60									
1985	68									
1986	76	3	1	<300			NR			
1987	85									
1988	93									
1989	101									
1990	109									
1991	115	8	0	<300	NR	NR	NR			USGS (2007)
1992	120									
1993	126									
1994	132									
1995	137									
1996	143	15	0	<300	NR	NR	NR			
1997	148									
1998	154									
1999	159									
2000	165									
2001	169	16	0	<300	NR	NR	NR			
2002	173									
2003	177									
2004	181									
2005	185									
2010	205									
2020	245									
2030	285									
	WELL TOTALS:	**140**	**6**							

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

3.4.9 Water Adequacy Determinations in the Donnelly Wash 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 3.4-6. Figure 3.4-10 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.

- One water adequacy determination for 59 lots has been made in this basin through December 2008.
- The reason for determination of inadequacy is unknown at this time because the Department was unable to locate records.

Table 3.4-6 Adequacy Determinations in the Donnelly Wash Basin[1]

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	Western Sky Airpark	Pinal	5 South	13 East	17	59	22-400718	Inadequate	D	07/07/02	Mescal Lakes Water Systems, Inc.

Source: ADWR 2008

Notes:

[1]Each 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 unavaible;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

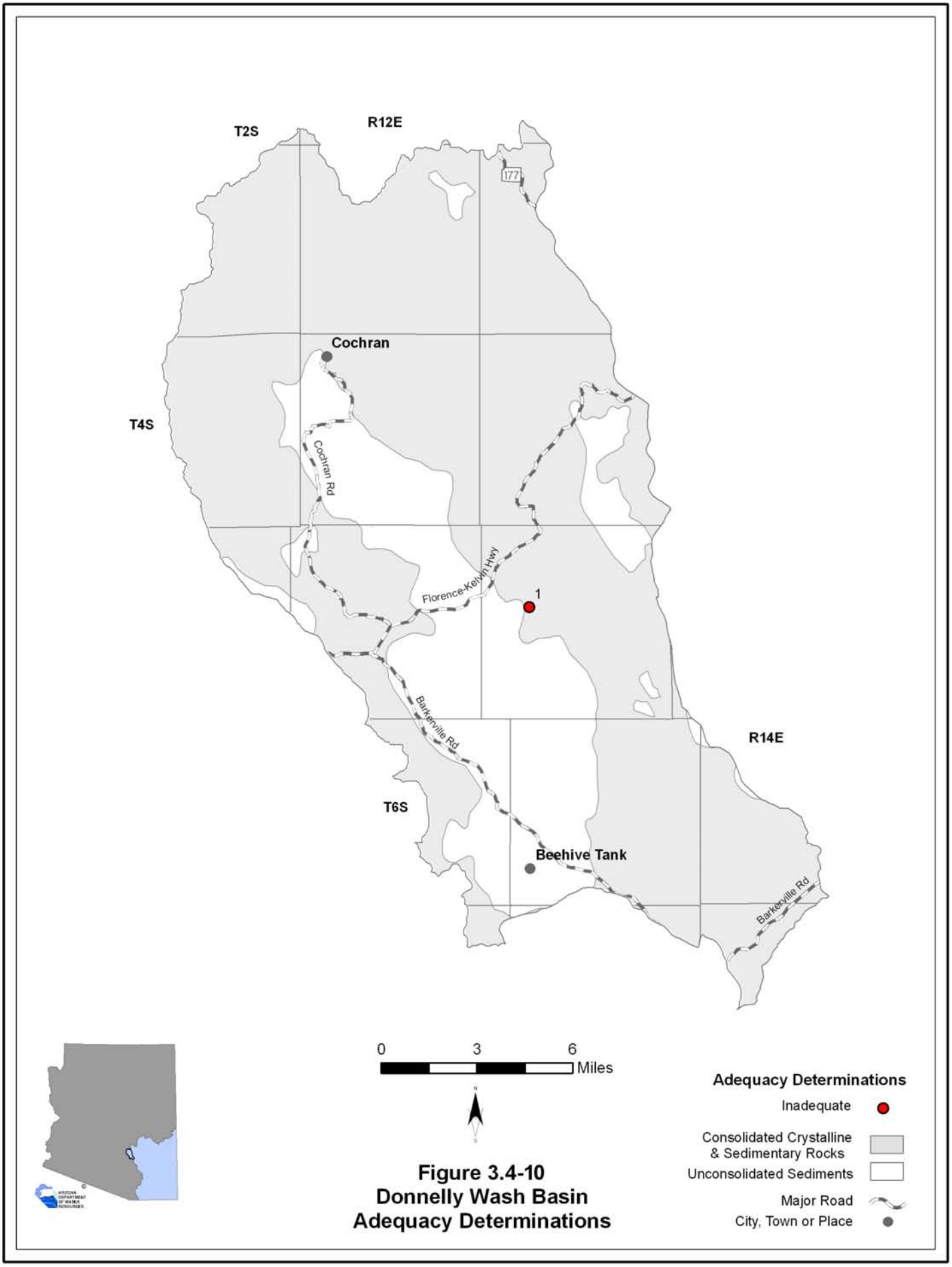


Figure 3.4-10
Donnelly Wash Basin
Adequacy Determinations

DONNELLY WASH BASIN

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