ARIZONA WATER ATLAS
VOLUME 8
ACTIVE MANAGEMENT AREA PLANNING AREA

Arizona Department of Water Resources
DRAFT
JULY 2008

CONTENTS

PREFACE **1**
SECTION 8.0
Overview of the AMA Planning Area **3**
8.0.1 Geography 3
8.0.2 Hydrology 6
Groundwater Hydrology 6
Surface Water Hydrology 13
8.0.3 Climate 19
8.0.4 Environmental Conditions 23
Vegetation 23
Arizona Water Protection Fund Programs 28
Instream Flow Claims 28
Threatened and Endangered Species 31
National Parks, Monuments, Wildlife Refuges and Wilderness Areas 31
8.0.5 Population 35
Population Growth and Water Use 37
8.0.6 Water Supply 42
Central Arizona Project Water 43
Surface Water 45
Groundwater 46
Effluent 47
Contamination Sites 48
8.0.7 Cultural Water Demand 50
Tribal Water Demand 53
Municipal Demand 56
Agricultural Demand 63
Industrial Demand 69
8.0.8 Water Resource Issues in the AMA Planning Area 72
8.0.9 AMA Water Resource Characteristics 75
REFERENCES 79

SECTION 8.1
Water Resource Characteristics of the Phoenix AMA **85**
8.1.1 Geography of the Phoenix AMA 86
8.1.2 Land Ownership in the Phoenix AMA 88
8.1.3 Climate of the Phoenix AMA 91
8.1.4 Surface Water Conditions in the Phoenix AMA 96
8.1.5 Perennial/Intermittent Streams and Springs in the Phoenix AMA 108
8.1.6 Groundwater Conditions of the Phoenix AMA 111
8.1.7 Water Quality Exceedences and Contamination Sites in the Phoenix AMA 132

8.1.8 Cultural Water Demands in the Phoenix AMA 157
8.1.9 Assured Water Supply Determinations in the Phoenix AMA 164
References and Supplemental Reading 198
Index to Section 8.0 204

SECTION 8.2
Water Resource Characteristics of the Pinal AMA 205
8.2.1 Geography of the Pinal AMA 206
8.2.2 Land Ownership in the Pinal AMA 208
8.2.3 Climate of the Pinal AMA 211
8.2.4 Surface Water Conditions in the Pinal AMA 214
8.2.5 Perennial/Intermittent Streams and Springs in the Pinal AMA 219
8.2.6 Groundwater Conditions of the Pinal AMA 222
8.2.7 Water Quality Exceedences and Contamination Sites in the Pinal AMA 237
8.2.8 Cultural Water Demands in the Pinal AMA 247
8.2.9 Assured Water Supply Determinations in the Pinal AMA 252
References and Supplemental Reading 259
Index to Section 8.0 263

SECTION 8.3
Water Resource Characteristics of the Prescott AMA 265
8.3.1 Geography of the Prescott AMA 266
8.3.2 Land Ownership in the Prescott AMA 268
8.3.3 Climate of the Prescott AMA 270
8.3.4 Surface Water Conditions in the Prescott AMA 273
8.3.5 Perennial/Intermittent Streams and Springs in the Prescott AMA 278
8.3.6 Groundwater Conditions of the Prescott AMA 281
8.3.7 Water Quality Exceedences and Contamination Sites in the Prescott AMA 289
8.3.8 Cultural Water Demands in the Prescott AMA 294
8.3.9 Assured Water Supply Determinations in the Prescott AMA 298
References and Supplemental Reading 303
Index to Section 8.0 310

SECTION 8.4
Water Resource Characteristics of the Santa Cruz AMA 311
8.4.1 Geography of the Santa Cruz AMA 312
8.4.2 Land Ownership in the Santa Cruz AMA 314
8.4.3 Climate of the Santa Cruz AMA 316
8.4.4 Surface Water Conditions in the Santa Cruz AMA 319
8.4.5 Perennial/Intermittent Streams and Springs in the Santa Cruz AMA 324
8.4.6 Groundwater Conditions of the Santa Cruz AMA 326
8.4.7 Water Quality Exceedences and Contamination Sites in the Santa Cruz AMA 332

8.4.8 Cultural Water Demands in the Santa Cruz AMA 337
8.4.9 Assured Water Supply Determinations in the Santa Cruz AMA 341
References and Supplemental Reading 345
Index to Section 8.0 349

Section 8.5
Water Resource Characteristics of the Tucson AMA 351
8.5.1 Geography of the Tucson AMA 352
8.5.2 Land Ownership in the Tucson AMA 354
8.5.3 Climate of the Tucson AMA 357
8.5.4 Surface Water Conditions in the Tucson AMA 360
8.5.5 Perennial/Intermittent Streams and Springs in the Tucson AMA 369
8.5.6 Groundwater Conditions of the Tucson AMA 372
8.5.7 Water Quality Exceedences and Contamination Sites in the Tucson AMA 386
8.5.8 Cultural Water Demands in the Tucson AMA 398
8.5.9 Assured Water Supply Determinations in the Tucson AMA 403
References and Supplemental Reading 416
Index to Section 8.0 422

ACRONYMS AND ABBREVIATIONS 424

APPENDIX A: Arizona Water Protection Fund Projects in the AMA Planning Area through 2005 428

APPENDIX B: Central Arizona Project Subcontracts 432

FIGURES

Figure 8.0-1	Arizona Planning Areas	2
Figure 8.0-2	AMA Planning Area	4
Figure 8.0-3	Arizona physiographic provinces	5
Figure 8.0-4	AMA Planning Area USGS Watersheds	14
Figure 8.0-5	Average monthly temperature from 1952-2007 in the AMA Planning Area	19
Figure 8.0-6	Average monthly precipitation from 1948-1952 to 2006-2007	20
Figure 8.0-7	Annual percent of average precipitation measured between 1960-2007	21
Figure 8.0-8	Average annual temperature measured between 1960 and 2007	22
Figure 8.0-9	Average June, July and August temperature measured between 1960 and 2007	23
Figure 8.0-10	AMA Planning Area Biotic Communities and Ecoregions	25
Figure 8.0-11	AMA Planning Area Location of Major Wildfires 2002-2006	27
Figure 8.0-12	AMA Planning Area Instream Flow Applications	29
Figure 8.0-13	AMA Planning Area Protected Areas	32
Figure 8.0-14	Water supply utilized in the AMA Planning Area	42
Figure 8.0-15	Central Arizona Project system map	43
Figure 8.0-16	AMA Water Demand by Sector and Water Source Avg. 2001-2003	51
Figure 8.0-17	City of Nogales, Arizona water use 1996-2006	62
Figure 8.0-18	Large irrigation districts in the AMA Planning Area	65
Figure 8.0-19	Average agricultural water use in the AMA Planning Area 2001-2003	66
Figure 8.1-1	Phoenix AMA Geographic Features	87
Figure 8.1-2	Phoenix AMA Land Ownership	90
Figure 8.1-3	Phoenix AMA Meteorological Stations and Annual Precipitation	95
Figure 8.1-4A	Phoenix AMA, East Valley Area Surface Water Conditions	106
Figure 8.1-4B	Phoenix AMA, West Valley Area Surface Water Conditions	107
Figure 8.1-5	Phoenix AMA Perennial/Intermittent Streams and Major (>10 gpm) Springs	110
Figure 8.1-6	Phoenix AMA Groundwater Conditions	113
Figure 8.1-6A	East Salt River, Fountain Hills & Carefree Sub-basins Groundwater Conditions	114
Figure 8.1-6B	Hassayampa Sub-basin Groundwater Conditions	115
Figure 8.1-6C	Rainbow Valley Sub-basin Groundwater Conditions	116
Figure 8.1-6D	West Salt River Valley/Lake Pleasant Sub-basins Groundwater Conditions	117
Figure 8.1-7	Phoenix Active Management Area Hydrographs Showing Depth to Water in Selected Wells	118

Figure 8.1-8	Phoenix AMA Well Yields	126
Figure 8.1-9	Phoenix AMA Recharge Sites	131
Figure 8.1-10	Phoenix AMA Water Quality Conditions	148
Figure 8.1-10A	Phoenix AMA Impaired Lakes & Streams	149
Figure 8.1-11	Phoenix AMA Contamination Sites	154
Figure 8.1-11A	Central Phoenix AMA Contamination Sites	155
Figure 8.1-12	Phoenix AMA Cultural Water Demands	163
Figure 8.1-13A	Phoenix AMA East Valley Assured Water Supply Determinations	195
Figure 8.1-13B	Phoenix AMA West Valley Assured Water Supply Determinations	196
Figure 8.2-1	Pinal AMA Geographic Features	207
Figure 8.2-2	Pinal AMA Land Ownership	210
Figure 8.2-3	Pinal AMA Meteorological Stations and Annual Precipitation	213
Figure 8.2-4	Pinal AMA Surface Water Conditions	218
Figure 8.2-5	Pinal AMA Perennial/Intermittent Streams and Major (>10 gpm) Springs	221
Figure 8.2-6	Pinal AMA Groundwater Conditions	224
Figure 8.2-6A	Maricopa-Stanfield/Vekol Valley Sub-basins Groundwater Conditions	225
Figure 8.2-6B	Eloy Sub-basin Groundwater Conditions	226
Figure 8.2-7	Pinal Active Management Area Hydrographs Showing Depth to Water in Selected Wells	227
Figure 8.2-8	Pinal AMA Well Yields	233
Figure 8.2-9	Pinal AMA Recharge Sites	236
Figure 8.2-10	Pinal AMA Water Quality Conditions	243
Figure 8.2-11	Pinal AMA Contamination Sites	246
Figure 8.2-12	Pinal AMA Cultural Water Demand	251
Figure 8.2-13	Pinal AMA Assured Water Supply Determinations	258
Figure 8.3-1	Prescott AMA Geographic Features	267
Figure 8.3-2	Prescott AMA Land Ownership	269
Figure 8.3-3	Prescott AMA Meteorological Stations and Annual Precipitation	272
Figure 8.3-4	Prescott AMA Surface Water Conditions	277
Figure 8.3-5	Prescott AMA Perennial/Intermittent Streams and Major (>10 gpm) Springs	280
Figure 8.3-6	Prescott AMA Groundwater Conditions	283
Figure 8.3-7	Prescott Active Management Area Hydrographs Showing Depth to Water in Selected Wells	284
Figure 8.3-8	Prescott AMA Well Yields	286
Figure 8.3-9	Prescott AMA Recharge Sites	288
Figure 8.3-10	Prescott AMA Water Quality Conditions	291
Figure 8.3-11	Prescott AMA Contamination Sites	293
Figure 8.3-12	Prescott AMA Cultural Water Demand	297

Figure 8.3-13	Prescott AMA Assured Water Supply Determinations	302
Figure 8.4-1	Santa Cruz AMA Geographic Features	313
Figure 8.4-2	Santa Cruz AMA Land Ownership	315
Figure 8.4-3	Santa Cruz AMA Meteorological Stations and Annual Precipitation	318
Figure 8.4-4	Santa Cruz AMA Surface Water Conditions	323
Figure 8.4-5	Santa Cruz AMA Perennial/Intermittent Streams and Major (>10 gpm) Springs	325
Figure 8.4-6	Santa Cruz AMA Groundwater Conditions	328
Figure 8.4-7	Santa Cruz Active Management Area Hydrographs Showing Depth to Water in Selected Wells	329
Figure 8.4-8	Santa Cruz AMA Well Yields	331
Figure 8.4-9	Santa Cruz AMA Water Quality Conditions	334
Figure 8.4-10	Santa Cruz AMA Contamination Sites	336
Figure 8.4-11	Santa Cruz AMA Cultural Water Demand	340
Figure 8.4-12	Santa Cruz AMA Assured Water Supply Determinations	344
Figure 8.5-1	Tucson AMA Geographic Features	353
Figure 8.5-2	Tucson AMA Land Ownership	356
Figure 8.5-3	Tucson AMA Meteorological Stations and Annual Precipitation	359
Figure 8.5-4	Tucson AMA Surface Water Conditions	368
Figure 8.5-5	Tucson AMA Perennial/Intermittent Streams and Major (>10 gpm) Springs	371
Figure 8.5-6	Tucson AMA Groundwater Conditions	374
Figure 8.5-6A	Tucson AMA Avra Valley Sub-basin Groundwater Conditions	375
Figure 8.5-6B	Upper Santa Cruz Sub-basin Groundwater Conditions	376
Figure 8.5-7	Tucson Active Management Area Hydrographs Showing Depth to Water in Selected Wells	378
Figure 8.5-8	Tucson AMA Well Yields	382
Figure 8.5-9	Tucson AMA Recharge Sites	385
Figure 8.5-10	Tucson AMA Water Quality Conditions	392
Figure 8.5-11	Tucson AMA Contamination Sites	397
Figure 8.5-12	Tucson AMA Cultural Water Demand	402
Figure 8.5-13	Tucson AMA Assured Water Supply Determinations	415

TABLES

Table 8.0-1	Instream flow claims in the AMA Planning Area	28
Table 8.0-2	Listed threatened and endangered species in the AMA Planning Area	30
Table 8.0-3	Wilderness areas in the AMA Planning Area	34
Table 8.0-4	2000 Census population of AMAs and Indian reservations	35
Table 8.0-5	Communities in Active Management Areas with a Census population greater than 1,000 (listed by 2000 population)	36
Table 8.0-6	Designated water providers in the AMA Planning Area	39
Table 8.0-7	Assured Water Supply determinations in the AMA Planning Area	41
Table 8.0-8	Contamination sites in the AMA Planning Area	49
Table 8.0-9	AMA water demand by sector and water source (Indian and Non-Indian) avg. 2001-2003	52
Table 8.0-10	Average annual municipal water demand in the AMA Planning Area (2001-2003)	56
Table 8.0-11	Water providers serving a minimum of 1,000 acre-feet of water annually (excluding effluent) in the AMA Planning Area	58
Table 8.0-12	Water Use by Golf Courses in 2006	59
Table 8.0-13	Agricultural demand in the AMA Planning Area excluding Indian demand	64
Table 8.0-14	Industrial demand in selected years in the AMA Planning Area	70
Table 8.1-1	Climate Data for the Phoenix AMA	92
Table 8.1-2	Streamflow Data for the Phoenix AMA	97
Table 8.1-3	Flood ALERT Equipment in the Phoenix AMA	100
Table 8.1-4	Reservoirs and Stockponds in the Phoenix AMA	105
Table 8.1-5	Springs in the Phoenix AMA	109
Table 8.1-6	Groundwater Data for the Phoenix AMA	112
Table 8.1-7	Recharge Sites in the Phoenix AMA	127
Table 8.1-8	Water Quality Exceedences in the Phoenix AMA	133
Table 8.1-9	Contamination Sites in the Phoenix AMA	150
Table 8.1-10	Cultural Water Demands in the Phoenix AMA	158
Table 8.1-11	Effluent Generation in the Phoenix AMA	159
Table 8.1-12	Assured Water Supply Determinations in the Phoenix AMA	165
Table 8.2-1	Climate Data for the Pinal AMA	212
Table 8.2-2	Streamflow Data for the Pinal AMA	215
Table 8.2-3	Flood ALERT Equipment in the Pinal AMA	216
Table 8.2-4	Reservoirs and Stockponds in the Pinal AMA	217
Table 8.2-5	Springs in the Pinal AMA	219
Table 8.2-6	Groundwater Data for the Pinal AMA	223
Table 8.2-7	Recharge Sites in the Pinal AMA	234

Table 8.2-8	Water Quality Exceedences in the Pinal AMA	238
Table 8.2-9	Contamination Sites in the Pinal AMA	244
Table 8.2-10	Cultural Water Demands in the Pinal AMA	248
Table 8.2-11	Effluent Generation in the Pinal AMA	249
Table 8.2-12	Assured Water Supply Determinations in the Pinal AMA	253
Table 8.3-1	Climate Data for the Prescott AMA	271
Table 8.3-2	Streamflow Data for the Prescott AMA	274
Table 8.3-3	Flood ALERT Equipment in the Prescott AMA	275
Table 8.3-4	Reservoirs and Stockponds in the Prescott AMA	276
Table 8.3-5	Springs in the Prescott AMA	279
Table 8.3-6	Groundwater Data for the Prescott AMA	282
Table 8.3-7	Recharge Sites in the Prescott AMA	287
Table 8.3-8	Water Quality Exceedences in the Prescott AMA	290
Table 8.3-9	Contamination Sites in the Prescott AMA	292
Table 8.3-10	Cultural Water Demands in the Prescott AMA	295
Table 8.3-11	Effluent Generation in the Prescott AMA	296
Table 8.3-12	Assured Water Supply Determinations in the Prescott AMA	299
Table 8.4-1	Climate Data for the Santa Cruz AMA	317
Table 8.4-2	Streamflow Data in the Santa Cruz AMA	320
Table 8.4-3	Flood ALERT Equipment in the Santa Cruz AMA	321
Table 8.4-4	Reservoirs and Stockponds in the Santa Cruz AMA	322
Table 8.4-5	Springs in the Santa Cruz AMA	324
Table 8.4-6	Groundwater Data for the Santa Cruz AMA	327
Table 8.4-7	Water Quality Exceedences in the Santa Cruz AMA	333
Table 8.4-8	Contamination Sites in the Santa Cruz AMA	335
Table 8.4-9	Cultural Water Demand in the Santa Cruz AMA	338
Table 8.4-10	Effluent Generation in the Santa Cruz AMA	339
Table 8.4-11	Assured Water Supply Determinations in the Santa Cruz AMA	342
Table 8.5-1	Climate Data for the Tucson AMA	358
Table 8.5-2	Streamflow Data for the Tucson AMA	361
Table 8.5-3	Flood ALERT Equipment in the Tucson AMA	363
Table 8.5-4	Reservoirs and Stockponds in the Tucson AMA	366
Table 8.5-5	Springs in the Tucson AMA	370
Table 8.5-6	Groundwater Data for the Tucson AMA	373
Table 8.5-7	Recharge Sites in the Tucson AMA	383
Table 8.5-8	Water Quality Exceedences in the Tucson AMA	387
Table 8.5-9	Contamination Sites in the Tucson AMA	393
Table 8.5-10	Cultural Water Demands in the Tucson AMA	399
Table 8.5-11	Effluent Generation in the Tucson AMA	400
Table 8.5-12	Assured Water Supply Determinations for the Tucson AMA	404

ARIZONA WATER ATLAS
VOLUME 8 –ACTIVE MANAGEMENT AREA PLANNING AREA

Preface

Volume 8, the Active Management Area (AMA) Planning Area, is the eighth in a series of nine volumes that comprise the Arizona Water Atlas. The primary objectives in assembling the Atlas are to present an overview of water supply and demand conditions in Arizona, to provide water resource information for planning and resource development purposes and help to identify the needs of communities.

The Atlas divides Arizona into seven planning areas (Figure 8.0-1). There is a separate Atlas volume for each planning area, an introductory/executive summary volume and a resource evaluation volume that examines resource sustainability. "Planning areas" are an organizational concept that provide for a regional perspective on supply, demand and water resource issues. A complete discussion of Atlas organization, purpose and scope is found in Volume 1. Also included in Volume 1 is general background information for the state, a description of data sources and methods of analysis for the tables and maps presented in the Atlas, and appendices that provide information on water law, management and programs, and Indian water rights claims and settlements.

To the maximum extent possible, the organization and content of this volume of the Atlas mirrors the six other planning areas. However, readers should be aware that the overall scope of this document differs in some important ways.

Five AMAs have been designated in the state as requiring specific, mandatory management practices to preserve and protect groundwater supplies for the future. Four AMAs - Phoenix, Pinal, Prescott and Tucson - were established in 1980 upon enactment of the Groundwater Code (Code) (A.R.S. §§ 45-401 et seq.). In 1994, the Arizona legislature established the Santa Cruz AMA, which had previously been the southeast portion of the Tucson AMA. This legislation recognized the international water management issues facing this area, and that its hydrology required coordinated management of surface water and groundwater.

The AMAs include the state's most urbanized areas, and water use is subject to an extensive regulatory framework. As a result, water supply and demand data within AMAs is often more detailed and comprehensive than outside the AMAs, and unique legal and regulatory complexities exist. By adhering to the standardized Atlas format, Volume 8 provides an important overview of the AMAs and allows for direct comparison with the rest of the state. However, this volume does not include extensive data analysis, nor is it intended to be a comprehensive compilation of information relevant to the AMAs.

This volume of the Atlas is the first document of a larger AMA planning effort that includes the AMA Assessment and the fourth management plan for each AMA. The AMA Assessment includes a compilation of historic data, including detailed water budgets; future scenario development; and issue identification, notably issues related to achievement of the statutory management goals for each AMA. The AMA Assessment is intended to provide an analytical foundation for the

Figure 8.0-1
Arizona Planning Areas

development and promulgation of Fourth Management Plans (A.R.S. §§ 45-561 et seq.). The Management Plans include mandatory regulatory provisions that apply to each water use sector within an AMA. These provisions do not apply to tribal users.

There are additional, more detailed data available to those presented in this volume. These data may be obtained by contacting the Arizona Department of Water Resources (Department).

8.0 Overview of the AMA Planning Area

The AMA Planning Area is composed of five groundwater basins located in the central and south central parts of the state. The AMAs were established pursuant to the 1980 Groundwater Management Act. The basins are designated as the Santa Cruz AMA, the Tucson AMA, the Pinal AMA, the Phoenix AMA, and the Prescott AMA. The AMAs are located in portions of Santa Cruz, Pima, Pinal, and Maricopa counties as well as the central portion of Yavapai County. There are seven Indian reservations within the planning area including the Tohono O'odham Nation (consisting of three reservations in the planning area), Pascua Yaqui Tribe, Ak-Chin Indian Community, Gila River Indian Community, Fort McDowell Yavapai Nation, Salt River Pima-Maricopa Indian Community, and the Yavapai-Prescott Indian Tribe.

In 2006, just over 80% of the state's 6.2 million inhabitants lived in the planning area. In 2003, AMA populations ranged from approximately 38,000 residents in the Santa Cruz AMA to over 3,400,000 residents in the Phoenix AMA. The Arizona Department of Economic Security (DES) estimates that the state's population will likely double by 2050 to over 12 million people. The majority of this growth will occur in the AMA Planning Area.

Between 2001-2003 an average of 3.7 million acre-feet (maf) of water was used annually in the planning area for agricultural, municipal and industrial purposes (including Indian water demands). Of this total demand, approximately 45% was met with groundwater supplies, 30% was met with Central Arizona Project (CAP) water, 20% was met with surface water and 5% was met with effluent or reclaimed water. Agriculture is the largest use sector in the planning area with an average annual demand of approximately 2.2 maf or 60% of the total planning area demand. Municipal sector demand is about 1.3 maf (34%) and industrial sector demand is about 0.23 maf (6%).

8.0.1 Geography

The AMA Planning Area covers approximately 14,700 square miles and stretches continuously from the international border through central Arizona to the northern boundary of Maricopa County. The most northern AMA, the Prescott AMA, is discontiguous from the other four AMAs (Figure 8.0-2). The Prescott AMA is within the boundaries of the Central Highlands Planning Area, which borders the Phoenix AMA on the north. The planning area is located between the Southeastern Arizona Planning Area on the east and the Lower Colorado River Planning Area on the west and includes portions of six watersheds, which are discussed in section 8.0-2, Surface Water Hydrology.

Most of the AMA Planning Area is located in the Basin and Range physiographic province, which

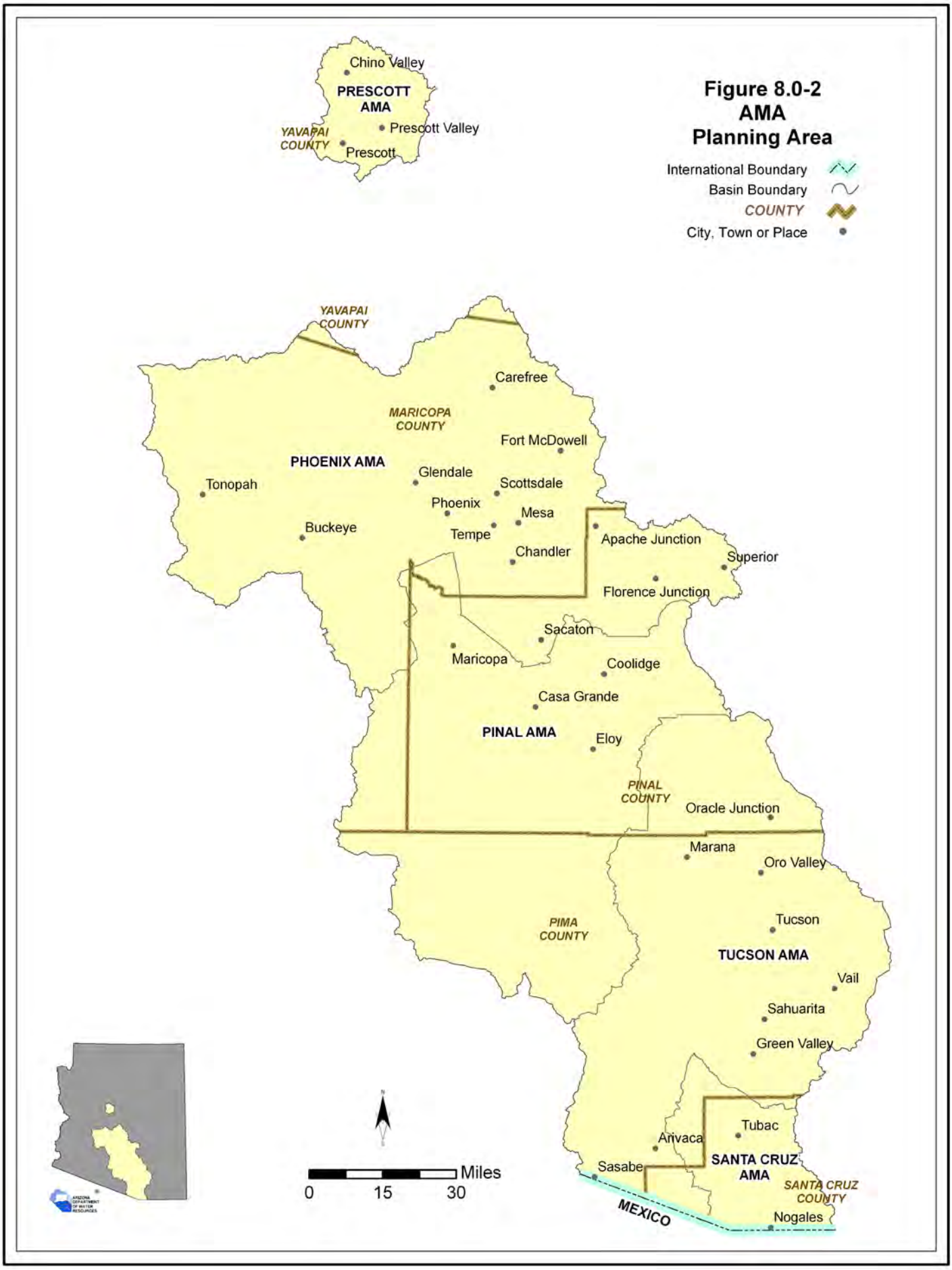


Figure 8.0-2
AMA
Planning Area
International Boundary
Basin Boundary
COUNTY
City, Town or Place
Chino Valley
PRESCOTT AMA
YAVAPAI COUNTY
Prescott Valley
Prescott
YAVAPAI COUNTY
Carefree
MARICOPA COUNTY
Fort McDowell
PHOENIX AMA
Glendale
Scottsdale
Tonopah
Phoenix
Mesa
Buckeye
Tempe
Apache Junction
Chandler
Superior
Florence Junction
Sacaton
Maricopa
Coolidge
Casa Grande
PINAL AMA
Eloy
PINAL COUNTY
Oracle Junction
Marana
Oro Valley
PIMA COUNTY
Tucson
TUCSON AMA
Vail
Sahuarita
Green Valley
Tubac
Arivaca
SANTA CRUZ AMA
Sasabe
SANTA CRUZ COUNTY
MEXICO
Nogales
Miles
0
15
30

is characterized by broad, gently sloping alluvial basins separated by north to northwest trending fault-block mountains. The Prescott AMA and a small portion of the Phoenix AMA lie within the Central Highlands transition zone, which is characterized by a narrow band of mountains of igneous, metamorphic, and sedimentary rocks (Figure 8.0-3). Because of its geographic extent and location in the state, the planning area exhibits a wide range of geographic features, from low elevation, broad, semi-arid Sonoran desert valleys to mountain ranges with summits over 9,000 feet. The topographic variability results in broad variations in the amount of precipitation, temperature range and vegetation type.

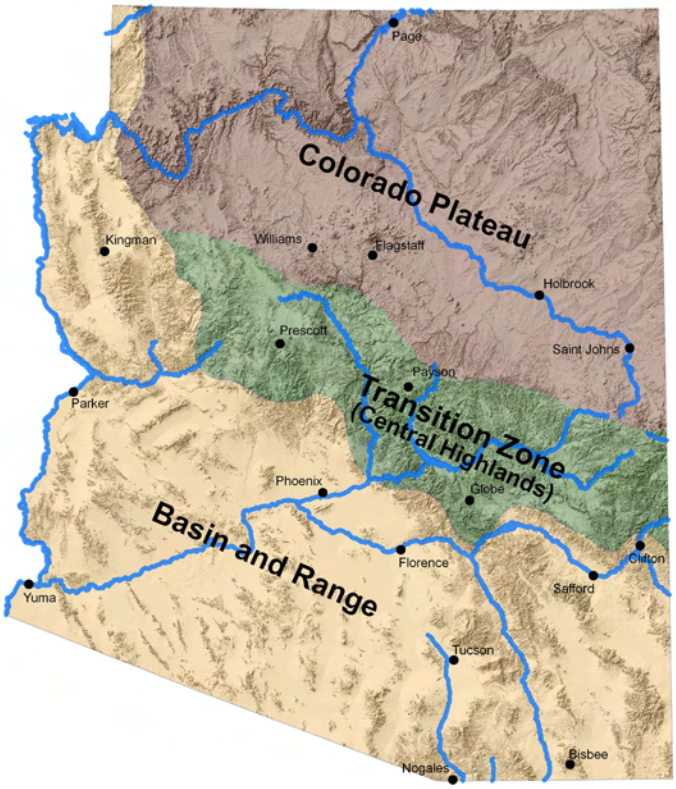


Figure 8.0-3 Arizona physiographic provinces

At approximately 485 square miles in area, the Prescott AMA is the smallest AMA basin and has the highest average elevation. Elevations range from 4,400 feet in the valleys to approximately 7,800 feet in the Bradshaw Mountains. The AMA is characterized by rolling topography, broad sloping alluvial basins and fault block mountains (see Figure 8.3-1). Surface drainages are primarily ephemeral or intermittent.

The Santa Cruz AMA is approximately 716 square miles in area and is the southernmost AMA. It lies adjacent to the international border and its major drainage, the Santa Cruz River, flows from Mexico into the basin. The AMA is characterized by the relatively narrow river drainage flanked by hills and higher elevation mountains on its northern, eastern and western boundaries. Elevations range from 3,000 feet where the Santa Cruz River exits the basin to over 9,400 feet in the Santa Rita Mountains (see Figure 8.4-1).

North and west of the Santa Cruz AMA, the Tucson AMA is approximately 3,866 square miles in area with two major, parallel alluvial valleys, the Upper Santa Cruz in the east and the Avra and Altar Valleys in the west. High elevation mountain ranges form the eastern and southern borders of the AMA. These “sky islands” are relatively isolated ranges separated by valleys that are part of a unique complex of mountain ranges that are also found in northern Mexico and New Mexico (Warshall, 2006). The Santa Cruz River drains the Upper Santa Cruz Valley and is the major drainage in the AMA. The Tucson AMA has the widest elevational range of any of the AMAs with elevations ranging from 1,770 feet north of Picacho Peak, to over 9,400 feet in the Santa Rita Mountains (see Figure 8.5-1).

The Pinal AMA is located to the north and west of the Tucson AMA, and at 4,100 square miles in area is the second largest basin in the planning area. It is characterized by broad, alluvial Sonoran desert valleys and mid-elevation north to northwest trending fault-block mountains. The AMA is semi-arid with average precipitation of less than 8 inches a year in most of the basin. The Gila River flows east to west in the northern part of the basin while the Santa Cruz River enters the basin from the southeast, flowing primarily ephemerally toward the northwest. Elevations range from about 1,000 feet where the Gila River and Santa Cruz River exit the basin in the northwest to over 6,800 feet at Kitt Peak at the southern basin boundary (see Figure 8.2-1).

The Phoenix AMA is the largest AMA basin at approximately 5,646 square miles and is characterized by Sonoran desert valleys that are generally from 1,000 to 2,500 feet above mean sea level, surrounded by mid-elevation mountain ranges. The basin is drained by five major rivers, the Salt, Gila, Verde, Agua Fria and the Hassayampa. While the basin is semi-arid, generally receiving less than eight inches of precipitation a year, the state's most important water producing watersheds, the Salt and the Verde, converge in the Phoenix AMA, representing an important water supply for the area. Elevation ranges from 755 feet where the Gila River exits the basin to almost 5,900 feet in the New River Mountains on the northern basin boundary (see Figure 8.1-1).

8.0.2 Hydrology[1]

Groundwater Hydrology

With the exception of the Prescott AMA, a large portion of the AMA planning area is located in what Anderson, et al. (1992) categorized as the Central basins. Stream alluvial deposits and upper basin fill are the principal water bearing sediments in these basins. The Central basins are characterized by small to moderate amounts of mountain-front recharge, streamflow infiltration and significant underflow in and out of the basins. Groundwater flows tend to move inward from the edges of the basin and higher elevations and then downstream towards the outflow portion of the basin.

The Prescott AMA is located in what Anderson, et al. (1992) categorized as the Highland basins. Highland basins consist of basin fill and alluvium deposits, similar to the Central basins; however, due to their discontinuous nature, little or no underflow occurs between basins. Recharge occurs from surrounding consolidated rock and inflow from stream infiltration.

The central AMAs (Phoenix, Pinal and Tucson) contain deep alluvial aquifers and significant volumes of water in storage. However, since aquifer recharge rates are relatively low and pumping volumes are large, the aquifers have been in an overdraft condition. Within an AMA, overdraft is a condition where groundwater is pumped in excess of safe-yield. The definition of safe-yield is, "to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial groundwater in an active management area." A.R.S. § 45-561(12). The Prescott AMA aquifers are more discontinuous and less extensive than the large basin fill aquifers of the central

[1] Except as noted. much of the information in this section is taken from the Arizona Water Resources Assessment, Volume II, 1994 and the Third Management Plans for the Active Management Areas (ADWR, 1999).

AMAs. As with the central AMAs, the Prescott AMA is in an overdraft condition. In the Santa Cruz AMA there is a close interrelationship between water levels in the stream alluvium along the Santa Cruz River, and precipitation and drought events. The Santa Cruz AMA is currently in a safe-yield condition.

All of the AMAs, with the exception of the Santa Cruz AMA, contain sub-basins: two in the Prescott AMA, seven in the Phoenix AMA, five in the Pinal AMA, and two in the Tucson AMA. Characteristics of each sub-basin are described individually below.

Central Basins

Phoenix AMA

There are seven groundwater sub-basins in the Phoenix AMA: East Salt River Valley, West Salt River Valley, Hassayampa, Rainbow Valley, Fountain Hills, Lake Pleasant, and Carefree. Each sub-basin has its own unique hydrogeologic characteristics. The primary source of groundwater in the AMA is basin fill sediments. Three distinct water bearing units are identified in most of the sub-basins: an upper alluvial unit, a middle fine-grained unit, and a lower conglomerate unit. Although conditions and circumstances vary across the AMA, most groundwater is pumped from the middle unit. Bedrock, consisting of metamorphic and igneous rock, underlies the basin fill sediments and is not considered to be an aquifer. Well yields throughout the AMA are generally high, with median well yields of over 1,400 gpm reported (Table 8.1-6).

Groundwater quality is generally suitable for most uses, but 35 groundwater contamination sites associated with industrial and other activities have been identified in the AMA. Volatile Organic Compounds (VOCs) are the most common contaminant at these sites. Over 1,500 measurements have been made of parameter concentrations that have equaled or exceeded drinking water standards. Of these, nitrate, fluoride, arsenic, manganese and organics are reportedly the most common. All water providers in Arizona that serve more than 25 people or having 15 or more connections are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. Detailed information on groundwater quality in the Phoenix AMA is found in the 1999 Third Management Plan, and in Volume II of the 1994 Arizona Water Resources Assessment.

The East Salt River Valley Sub-basin encompasses the eastern part of the AMA and includes a portion of the City of Phoenix, the cities of Scottsdale, Tempe, Mesa, and Chandler, and the towns of Superior, Apache Junction, Gilbert and Queen Creek. Basin fill sediments extend from less than 100 feet near the basin edges to over 10,000 feet southeast of Gilbert, while the middle unit ranges in thickness from less than 100 feet to over 1,800 feet southeast of Gilbert. Groundwater flows into the sub-basin from the Lake Pleasant Sub-basin, the Eloy Sub-basin in the Pinal AMA, and between the Santan and Sacaton mountains in the southern part of the sub-basin. Groundwater also flows toward a cone of depression caused by groundwater pumping east of Chandler (see Figure 8.1-6). ADWR (1991) estimated the volume of groundwater in storage at 66 maf to a depth of 1,200 feet below land surface (bls). Natural groundwater recharge occurs along stream channels and from mountain front recharge. Substantial water level rises were measured between 1991-1992 and 2002-2003 in several wells in the sub-basin (see Figure 8.1-6A). Increases of over 60 feet were reported in some areas due to a combination of cessation of farming and associated reduction in

pumping, and direct use and recharge of CAP water. Groundwater level depths measured during 2002-2003 ranged from ten feet bls near Superior to over 800 feet bls south of Cave Creek.

The West Salt River Valley Sub-basin includes the communities of Phoenix, Buckeye, Surprise, Glendale, Peoria, Goodyear, Tolleson and Avondale. It is a broad, gently-sloping alluvial plain bounded by hills and low-elevation mountains with a depth to bedrock of over 10,000 feet beneath the Luke Air Force Base area. A large salt body lies southeast of Luke Air Force Base at a depth of 880 feet to over 6,000 feet, which locally affects groundwater salinity. The middle alluvial unit ranges in thickness from less than 100 feet to over 1,300 feet southwest of Glendale. ADWR (1991) estimated the volume of water is storage in the sub-basin was 59 maf to a depth of 1,200 feet. Natural groundwater recharge occurs along stream channels from mountain front recharge. Groundwater also enters the sub-basin from the Lake Pleasant, northern Hassayampa and East Salt River Valley sub-basins, and from the Maricopa-Stanfield Sub-basin in the Pinal AMA. Groundwater flow historically was toward and along the Salt and Gila Rivers. A cone of depression has formed in the vicinity of Sun City and Litchfield Park where water level declines of more than 300 feet in the area of Luke Air Force Base resulted in surface subsidence of more than 18 feet by 1991 (see Figure 8.1-6) (ADWR, 1996). While groundwater levels rose in that part of the sub-basin between 1991-1992 and 2002-2003, they declined in the Glendale/Goodyear/Phoenix area. Depths to groundwater vary widely in the sub-basin with shallower levels present south of I-10 along the Salt and Gila River drainage (Figure 8.1-6D).

The Hassayampa Sub-basin consists of the largely undeveloped Hassayampa Plain in the north and the lower Hassayampa area in the south. The sub-basin is bounded by hills and mountains and drained by the ephemeral Hassayampa River. There is little geologic data for the northern part of the sub-basin so the basin fill sequence is not well understood. However, depths to bedrock beneath the alluvial plain range from a few tens of feet near the basin margins to over 1,200 feet near the sub-basin center. The lower Hassayampa includes the Tonopah Desert and Centennial Wash area where the depth to bedrock is over 1,200 feet at its center. Groundwater enters the Hassayampa Plain from the northeast and groundwater flow is south toward the Gila River. Groundwater historically flowed into the sub-basin from the West Salt River Valley Sub-basin, but is intermittently interrupted due to groundwater pumping in the West Salt River Valley. Sources of groundwater recharge include streambed (Gila and Hassayampa rivers) infiltration and mountain front recharge. The sub-basin has experienced groundwater level rises in several areas while primarily modest declines have been observed near Tonopah and at other locations throughout the sub-basin. Cones of depression exist in Tonopah and south of Tonopah in the Centennial Wash area (see Figure 8.1-6). Depth to groundwater range from about 20 feet bls in the southwest to over 600 feet bls in the northern part of the sub-basin (Figure 8.1-6B).

The Rainbow Valley Sub-basin is an undeveloped alluvial plain located in the southern part of the AMA and drained by Waterman Wash, an ephemeral stream that joins the Gila River near Buckeye. Depths to bedrock may be greater than 9,600 feet in the center of the sub-basin. The basin fill sequence consists of poorly sorted gravel, sand, silt and clay. Recharge includes streambed infiltration along Waterman Wash and mountain front recharge. Groundwater flow is from south to north and may have historically entered the sub-basin from the Maricopa-Stanfield Sub-basin in the Pinal AMA. Groundwater levels generally declined between 1991-1992 and 2002-2003.

Depths to groundwater measured in 2002-2003 ranged from 140 feet bls to almost 500 feet bls (Figure 8.1-6C).

The Fountain Hills Sub-basin is an extensively dissected alluvial plain bounded by mountains. It is drained by the lower Verde River, which is perennial along the axis of the sub-basin, and by the Salt River in the southern part of the sub-basin. The two rivers converge in the southern portion of the sub-basin. The regional aquifer consists of an older basin fill sequence and unconsolidated alluvium deposited by and hydraulically connected to the Verde River. The depth to bedrock may exceed 4,800 feet. The general groundwater flow direction is from north to south, parallel to the sub-basin axis. The regional aquifer may not be connected to adjacent sub-basins. Groundwater recharge occurs through streambed (Verde and Salt rivers) infiltration and from mountain front recharge. Groundwater levels rose in a number of wells in the sub-basin between 1991-1992 and 2002-2003 while depth to groundwater ranged from 51 feet bls to over 500 feet bls (see Figure 8.1-6A).

The Lake Pleasant Sub-basin is a relatively small, gently sloping alluvial plain surrounded by hills and mountains in the northern part of the AMA. It is drained by the lower Agua Fria River, by New River and by Skunk Creek. Depths to bedrock exceed 800 feet near the center of the sub-basin and the basin fill locally may include interbedded basalt. Reported well yields are generally between 100 and 500 gpm. In the New River area, the local aquifer consists of fractured schist and gneiss and the groundwater supply is drought-sensitive. Well yields in this area are relatively low. Groundwater recharge includes streambed infiltration and mountain front recharge. Groundwater flow is generally from north to south and into the West Salt River Valley and East Salt River Valley sub-basins. Groundwater levels were stable or rose in most measured wells between 1991-1992 and 2002-2003. Depths to water ranged from 17 feet bls to almost 300 feet bls in 2002-2003. (see Figure 8.1-6D)

The Carefree Sub-basin, located in the northeastern part of the AMA, contains a small northwest-trending alluvial plain in the southern part of the sub-basin that is groundwater-bearing. The sub-basin is drained by Cave Creek, a small ephemeral stream. The basin fill in the Carefree Sub-basin is relatively thin (up to 2,000 feet thick) and composed of older, partially-consolidated to consolidated sedimentary rocks. The primary aquifer is the Carefree Formation consisting of alluvial fan and playa deposits and underlain by volcanic rocks. The Grapevine Member is the only significant source of groundwater in this formation and reaches a maximum thickness of 1,300 feet (ADWR, 1991). ADWR (1994) estimated that the volume of groundwater in storage in the Carefree Sub-basin was 570,000 acre-feet to a depth of 1,200 feet bls. Natural groundwater recharge is from mountain front recharge and infiltration of streamflow along Cave Creek. Groundwater flow is generally to the west-southwest. Groundwater levels began declining in the early 1960s, but rose in several wells between 1991-1992 to 2002-2003 as many local golf courses converted from solely groundwater to a combination of CAP water, groundwater and effluent. Depth to water in wells measured in 2002-2003 ranged from 27 feet bls to 330 feet bls. Well yields vary with yields east of Carefree in excess of 1,000 gpm (Figure 8.1-8).

Pinal AMA

The Pinal AMA consists of five sub-basins with unique groundwater underflow, storage, and surface water characteristics. These sub-basins include the Maricopa-Stanfield, Eloy, Vekol Valley, Santa

Rosa Valley, and Aguirre Valley. Sub-basin boundaries follow surface water topographic divides, and in the case of the Eloy and Maricopa-Stanfield sub-basins, a groundwater divide. Groundwater underflow between these two sub-basins is limited or non-existent. Most groundwater development has occurred within the Maricopa-Stanfield and Eloy sub-basins while relatively little development and hydrologic information is available for the Vekol Valley, Santa Rosa Valley and Aguirre Valley sub-basins.

The best groundwater-bearing materials in the Maricopa-Stanfield and Eloy sub-basins consist of the unconsolidated sands, gravels, silts, and clays that were deposited by the ancestral Gila and Santa Cruz rivers. Natural recharge is primarily from streambed infiltration along the Gila and Santa Cruz rivers, which produce relatively large volumes of runoff from upstream basins outside the AMA following heavy rains. Lesser amounts of natural recharge occur from mountain fronts. The estimated groundwater in storage in the two sub-basins is about 31.2 maf with another 4 maf of storage in the Vekol Valley Sub-basin. Median well yield is approximately 1,000 gpm. (see Table 8.2-6)

Demand for water by irrigated agriculture has drained a large portion of the Upper Alluvial Unit in both sub-basins and changed the direction of groundwater flow between sub-basins. In the Maricopa-Stanfield Sub-basin, groundwater flow is north toward the Gila River and toward cones of depression that have formed west of both Maricopa and Stanfield (see Figure 8.2-6). However, groundwater levels are now recovering and rising in much of the sub-basin due to use of CAP water in lieu of groundwater pumping. Water level rises of more than 60 feet were observed in many wells between 1993-1994 and 2003-2004 (Figure 8.2-6). Depths to groundwater range from 51 feet bls near the Gila River in the north to more than 600 feet bls in the vicinity of Stanfield (Figure 8.2-6A).

In the Eloy Sub-basin, groundwater flow is generally to the north toward the Gila River and Phoenix AMA. Reductions in groundwater pumping and use of CAP water have contributed to rising water levels in several wells in this sub-basin. However, groundwater levels are also declining in the north due to dissipation of a groundwater mound formed after Gila River flooding; and in the south central sub-basin, probably from deep well pumping (see Figure 8.2-6). Depth to groundwater ranges from 53 feet bls in the northeast to over 400 feet bls near Picacho (Figure 8.2-6B).

Water quality in the Pinal AMA generally meets state and federal drinking water standards, however exceedences of nitrate, fluoride, arsenic and to a lesser extent, other constituents have been measured at some locations (see Table 8.2-8). Pesticide, jet-fuel and hydraulic fluid contamination is found at several contamination sites in the AMA (Table 8.2-9 and Figure 8.2-11).

Santa Cruz AMA

Basin fill sediments along the Santa Cruz River east and north of the City of Nogales to Amado form three aquifer units. Listed in ascending order, they are the Nogales Formation, the Older Alluvium, and the Younger Alluvium (also referred to as the stream alluvium). Both alluvial units are generally unconfined, hydraulically connected, and yield water to wells, although the Older Alluvium aquifer exhibits semi-confined and confined conditions in some places, most notably in Potrero Creek. The Nogales Formation is not generally considered an important aquifer, although local exceptions may occur. The Older Alluvium varies in thickness from a few feet along the

mountains to more than 1,000 feet in the north-central part of the basin. It exhibits relatively low transmissivity and well yields are often low in wells drilled in this aquifer. The Younger Alluvium forms the most productive and most widely utilized aquifer in the AMA with well yields in excess of 1,000 gpm common. The Younger Alluvium ranges from about 40 to 150 feet thick, becoming thicker and wider to the north along the Santa Cruz River. Groundwater storage in the Younger Alluvium has been estimated at about 160,000 acre-feet. Water levels have generally declined in wells measured in 1995 and 2004-2005 throughout the AMA, with most declines totaling from 1 to 15 feet (see Figure 8.4-6). However, a characteristic of the Younger Alluvium in the Santa Cruz AMA is the potential for rapid water level fluctuations.

Natural groundwater recharge occurs from infiltration of Santa Cruz River channel flow and mountain front recharge. Groundwater inflow enters the basin along the Santa Cruz River and west of Nogales. Groundwater flow is then generally south to north. Groundwater quality is generally good, although arsenic concentrations exceeding the safe drinking water standard have been measured at some wells in the basin. In addition, there are two sites near Nogales with VOC and chromium contamination (see Table 8.4-7 and Figure 8.4-9).

Tucson AMA

The Tucson AMA contains two parallel sub-basins. The Upper Santa Cruz Valley Sub-basin is located in the eastern half of the AMA and the Avra Valley Sub-basin is located in the western half. The sub-basins consist of deep alluvial basins filled with layers of sediments and surrounded by mountains. These sediments contain substantial volumes of groundwater, but the composition and productivity of the sediment layers differ between the two sub-basins.

In the center of the Upper Santa Cruz Valley Sub-basin, the depth to bedrock is in excess of 11,000 feet. Alluvial sediments in this sub-basin have been divided into four hydrogeologic units that form the main regional aquifer and are hydrologically connected to varying degrees. In descending order these units are the recent alluvial deposits, Fort Lowell Formation, Tinaja Beds and Pantano Formation. A basement unit underlies the sediments, forming a relatively impermeable bedrock floor that extends to the surrounding mountains.

The recent alluvial deposits occupy streambed channels of the Santa Cruz River and its major tributaries and are generally less than 100 feet thick. The Fort Lowell Formation consists of unconsolidated to moderately consolidated sands and silts that are 300 to 400 feet thick throughout the sub-basin. The underlying Tinaja Beds are up to 5,000 feet thick in the center of the sub-basin and consist of sandstones, conglomerates, siltstones and mudstones. The Tinaja Beds have become the principal supply of groundwater in the Tucson AMA due to widespread dewatering of the overlying Fort Lowell Formation. Beneath the Tinaja Beds, the Pantano Formation, composed of consolidated sandstones, conglomerates and mudstones, is little used as a water supply because of its depth and relative low well yields. Groundwater flow is from the mountains toward the center of the basin and then north-northwest and north from the Santa Cruz AMA.

The Avra Valley Sub-basin is composed of upper and lower alluvial units. The upper unit is the primary water producing unit in the sub-basin. Composed of silt and gravel, it includes the streambed deposits along Altar and Brawley washes and ranges in thickness from less than 100 feet to more than 1,000 feet. The lower alluvial unit consists of gravel and conglomerates at the edges of the

valley, grading to silts and mudstones along the central axis of the sub-basin. Groundwater flow is from the south to north.

Natural recharge is from mountain front and stream channel (Santa Cruz River) recharge and from groundwater inflow from the Santa Cruz AMA. About 84% of the total net natural recharge in the basin occurs within the Upper Santa Cruz Valley Sub-basin. Estimates of groundwater in storage for the Tucson AMA during predevelopment times ranges from 68 maf to 76 maf (ADWR, 2006a).

As shown in Figure 8.5-8, well yields in excess of 1,000 gpm are found in the vicinity of Sahuarita and Green Valley, near Marana and north of Three Points. Water level rises have been recorded in the last ten years in the northern half of the Avra Valley Sub-basin due to agricultural retirement, use of CAP water in lieu of groundwater pumping and groundwater recharge activities (see Figure 8.5-6A). Similar widespread water level rises have not been noted in the Upper Santa Cruz Sub-basin with the exception of an area north of Sahuarita where CAP water is being recharged at the Pima Mine Road Underground Storage Facility. Elsewhere in the sub-basin, water levels have generally decreased (see Figure 8.5-6B).

Water quality in the Tucson AMA is suitable for most uses, although 47 federally recognized groundwater contamination sites have been identified; elevated concentrations of certain natural constituents, including arsenic, fluoride and metals, are measured in wells. Also, nitrate, sulfate and total dissolved solid concentrations that exceed standards have been detected in wells near mining and agricultural operations. Volatile organic compounds (VOCs) associated with industrial and transportation activities are common at the contamination sites (See Table 8.5-9).

<u>Highlands Basins</u>

Prescott AMA

The Prescott AMA consists of two sub-basins, the Little Chino in the north and the Upper Agua Fria in the south. The sub-basins are separated by a surface drainage divide. Prescott AMA aquifers are discontinuous, with the major aquifer found in a deep structural trough that extends 25 miles from near Dewey-Humboldt to near Del Rio Springs. The trough appears to have formed from basin-and-range faulting and warping and was gradually filled with alluvial, sedimentary, and volcanic rocks of Quarternary to upper Tertiary age.

Three hydrogeologic units have been identified in the AMA. In ascending order they are the Basement Unit, the Lower Volcanic Unit, and the Upper Alluvial Unit. The relatively impermeable Basement Unit is composed of igneous and metamorphic rocks that form the floor and sides of the groundwater sub-basins and is exposed at land surface in the surrounding mountains. The Basement Unit has limited groundwater storage and production capacity and is not regarded as an aquifer except for domestic purposes. ADWR (2005) estimated that there was 2.9 maf of groundwater in storage in the AMA.

The Lower Volcanic Unit overlies the Basement Unit in most of the Little Chino Sub-basin. It is composed of a thick sequence of basaltic and andesitic lava flows interbedded with layers of pyroclastic and alluvial material. The productive thickness of this unit is estimated to range

from less than 100 feet up to several hundred feet. The Lower Volcanic Unit forms a highly productive confined (artesian) aquifer with discharge points northwest of and at Del Rio Springs. Natural recharge to the Lower Volcanic Unit aquifer occurs mainly through infiltration of runoff in ephemeral stream channels and along the mountain fronts of the Little Chino Sub-basin.

The Upper Alluvial Unit occurs as relatively thick sedimentary and volcanic rocks that fill a deep structural trough that extends across both sub-basins. This unit constitutes the main, unconfined aquifer in the Prescott AMA. Natural recharge to this unit is from streambed infiltration and mountain front recharge. The thickness of the unit varies considerably. In the Upper Agua Fria Sub-basin it varies from 800-1,200 feet near Prescott Valley to 200-400 feet near Dewey-Humboldt. In the Little Chino Sub-basin, the thickness of the basin fill is difficult to determine but is estimated to be about 700 feet thick near Del Rio Springs with a median thickness of about 450 feet (Blasch et al., 2006). The combined thickness of the Upper Alluvial Unit and Lower Volcanic Unit is greatest in the central and southeastern portions of the sub-basin.

Groundwater flows generally from the mountain fronts toward the valleys, then north from the Little Chino Sub-basin and south from the Upper Agua Fria Sub-basin. Between 1993-1994 and 2004, water levels declined in most measured wells (Figure 8.3-6). Depths to groundwater in wells ranged from 16 feet bls near Del Rio Springs to almost 500 feet bls in the east-central part of the basin. Well yields are generally between 500 gpm and 1,000 gpm in measured wells in the vicinity of Chino Valley, and between 100 gpm to 500 gpm in the Upper Agua Fria Sub-basin. The median reported well yield among 78 wells with a diameter greater than 10 inches was 763 gpm (Table 8.3-6).

Water quality is generally good; however arsenic, and to a lesser extent other constituents at concentrations exceeding the safe drinking water standards, are found at a number of locations (Table 8.3-8). Sites contaminated with hydrocarbons, lead, cyanide and other contaminants are found near Prescott, Chino Valley and Dewey-Humboldt (see Figure 8.3-11).

Surface Water Hydrology

The U.S. Geological Survey (USGS) divides the United States into successively smaller hydrologic units based on hydrologic features. These units are classified into four descending levels. From largest to smallest they are: regions, subregions, accounting units and cataloging units. Each hydrologic unit is identified by a hydrologic unit code (HUC) consisting of two to eight digits depending on the unit level. A 6-digit code corresponds to accounting units, which are used by the USGS for designing and managing the National Water Data Network.

The AMA planning area encompasses portions of six watersheds at the accounting unit level: the Verde River, the Agua Fria River-Lower Gila River, the Salt River, the Middle Gila River, the Santa Cruz River and the Rio Asuncion (Figure 8.0-4). More detailed information on stream flow gages, springs, reservoirs and general surface water characteristics are found in the individual AMA sections.

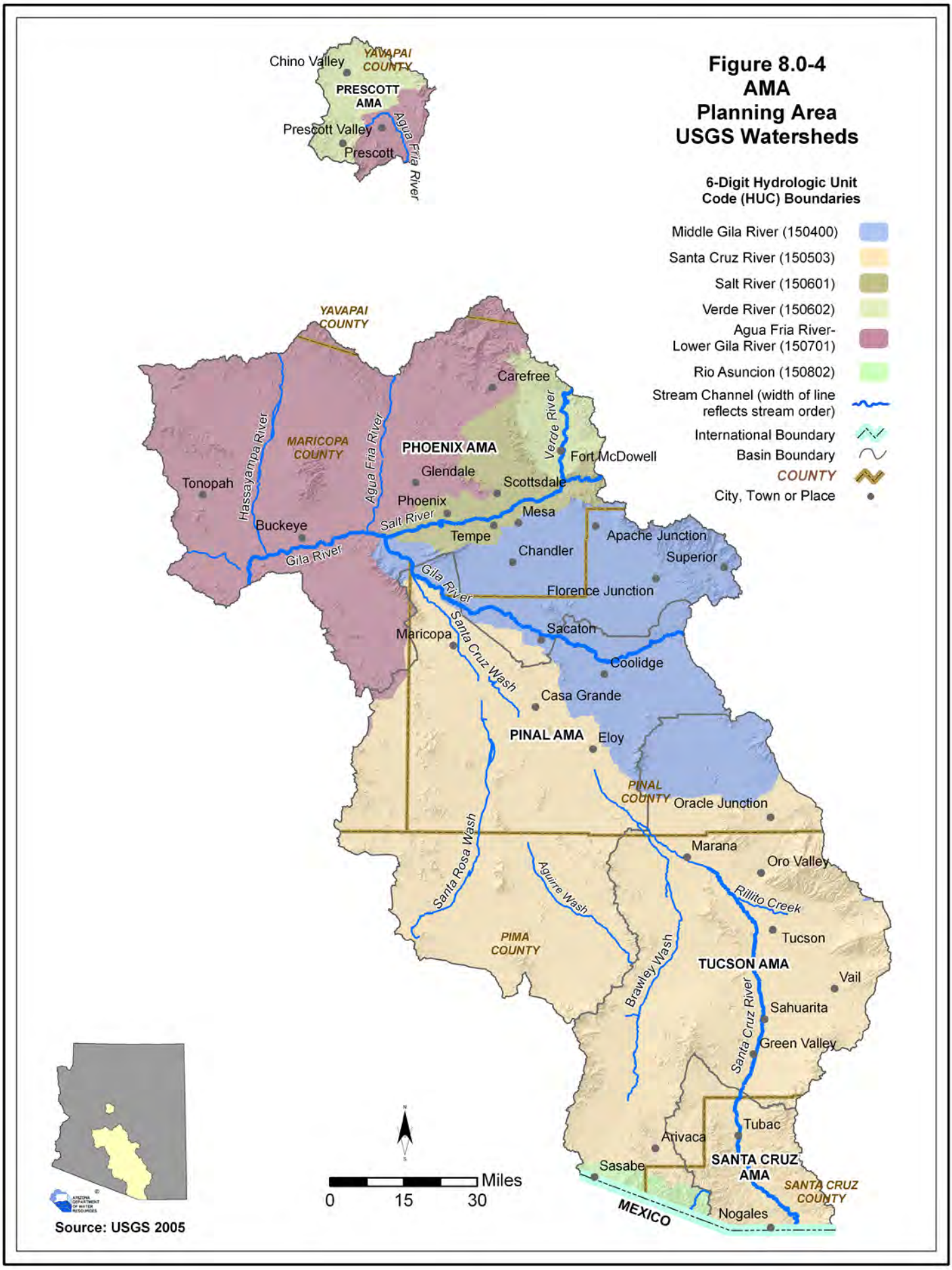


Figure 8.0-4
AMA
Planning Area
USGS Watersheds
6-Digit Hydrologic Unit Code (HUC) Boundaries
Middle Gila River (150400)
Santa Cruz River (150503)
Salt River (150601)
Verde River (150602)
Agua Fria River-Lower Gila River (150701)
Rio Asuncion (150802)
Stream Channel (width of line reflects stream order)
International Boundary
Basin Boundary
COUNTY
City, Town or Place
Chino Valley
YAVAPAI COUNTY
PRESCOTT AMA
Prescott Valley
Prescott
Agua Fria River
YAVAPAI COUNTY
MARICOPA COUNTY
PHOENIX AMA
Carefree
Verde River
Fort McDowell
Tonopah
Hassayampa River
Agua Fria River
Glendale
Scottsdale
Phoenix
Mesa
Buckeye
Salt River
Tempe
Apache Junction
Chandler
Superior
Gila River
Gila River
Florence Junction
Sacaton
Maricopa
Santa Cruz Wash
Coolidge
Casa Grande
PINAL AMA
Eloy
PINAL COUNTY
Oracle Junction
Marana
Oro Valley
Santa Rosa Wash
Aguirre Wash
Rillito Creek
Tucson
PIMA COUNTY
TUCSON AMA
Brawley Wash
Vail
Santa Cruz River
Sahuarita
Green Valley
Tubac
Arivaca
SANTA CRUZ AMA
Sasabe
SANTA CRUZ COUNTY
MEXICO
Nogales
Miles
0
15
30
Source: USGS 2005

Verde River

The 6,100 square mile Verde River Watershed is located in north-central Arizona. A large part of the watershed is located in the Verde River groundwater basin (See Volume 5, Figure 5.0-3). The northern portion of the watershed begins near Seligman with tributaries of Big Chino Wash. The Verde River is perennial and travels almost 140 miles starting from Sullivan Lake Dam just north of the Prescott AMA, eastward to Perkinsville, southeastward to Fossil Creek, then southward through two reservoirs, (Horseshoe and Bartlett), to its confluence with the Salt River. The last 25 miles of the Verde River, and the southernmost part of the watershed are located in the Phoenix AMA. The Verde River enters the AMA in the north Fountain Hills Sub-basin and moves southward where it joins the Salt River between Stewart Mountain Dam and Granite Reef Diversion Dam. The Verde River is regulated by Horseshoe Dam and Bartlett Dam outside the Phoenix AMA, both of which are part of the Salt River Project (SRP). The SRP is composed of two entities that provide water and power to the Phoenix metropolitan area. One of the entities, the Salt River Valley Water Users Association is a private corporation that delivers nearly one maf of water annually to the Phoenix area through an extensive water delivery system that includes reservoirs, wells, canals and irrigation laterals.

The northwestern portion of the Prescott AMA, the Little Chino Sub-basin, is also located in the Verde River watershed. Granite Creek and Willow Creek comprise the major tributaries that drain the Little Chino Sub-basin into the Verde River. An estimated 14% of the base flow in the Verde River comes from the Little Chino Sub-basin (Wirt, 2005). Dams were constructed on both Granite Creek and Willow Creek, forming Watson Lake and Willow Lake respectively, to store water for diversion to the Chino Valley Irrigation District (CVID). The lakes are now used by the City of Prescott for recreation and municipal water use. During periods of prolonged flooding, flows from these lakes join at the confluence of Granite and Willow Creeks, and then flow northward to join the Verde River near Paulden outside the AMA (see Figure 8.3-4). Little Chino Creek and Big Draw Creek drain the northwestern part of the Little Chino Sub-basin. Little Chino Creek drains the CVID area and flows into the Del Rio Springs area where groundwater naturally discharges at the surface.

Del Rio Springs, located in the northern part of the Prescott AMA, is the only large spring in the AMA with a discharge of 874 gpm measured in 1999. In this area, spring discharge provides essentially permanent baseflow conditions below the springs. The only other major spring in this part of the watershed is Camp Spring northeast of Carefree in the Phoenix AMA with a discharge of about 75 gpm. Sycamore Creek, a tributary of the Verde River, and Camp Creek northeast of Carefree both have perennial flow.

Streamgages are located at Del Rio Springs, along Willow and Watson Creeks, and on the Verde River in the Phoenix AMA. Mean flows at the three Granite Creek streamgages are between approximately 3,500 and 5,000 acre-feet a year. Flows on the Verde River in the Phoenix AMA are regulated by releases from Bartlett and Horseshoe Dams. The highest reported annual flow at the two Verde River gages was approximately 1.8 maf in 1993, while the median flow is approximately 298,000 acre-feet (Table 8.1-2).

Agua Fria – Lower Gila River

The Agua Fria – Lower Gila River Watershed begins near Prescott and extends south past Gila

Bend in the Lower Colorado River Planning Area. It includes drainage from the Agua Fria River, the Lower Hassayampa River and the Gila River. Within the AMA planning area, this watershed encompasses the southeastern portion of the Prescott AMA as well as the western half of the Phoenix AMA.

In the Prescott AMA, the Agua Fria – Lower Gila River Watershed includes the Upper Agua Fria Sub-basin. Upper Lynx Creek, Lynx Creek and the Agua Fria River drain the sub-basin. Most of the runoff from Lynx Creek is impounded by a dam and is reserved for recreational and industrial use. A short stretch of the Agua Fria River becomes perennial before leaving the AMA and a portion of it receives effluent discharged from the Prescott Valley Wastewater Treatment Facility (Figure 8.3-10). All other flows in the Upper Agua Fria Sub-basin are ephemeral.

All or portions of five Phoenix AMA sub-basins lie within the Agua Fria – Lower Gila River Watershed including Carefree, Lake Pleasant, Hassayampa, West Salt River Valley and Rainbow Valley. The Agua Fria River enters the AMA approximately 20 miles north of Peoria, in the Lake Pleasant Sub-basin. It is impounded by New Waddell Dam at the northern boundary of the sub-basin and only flows below the dam when water is released during major flood events. From there it flows south along the western edge of the Phoenix metropolitan area and joins the Gila River south of Avondale. Downstream of the confluence of the Salt River, the Gila River flows year round due to effluent discharge from the City of Phoenix 23rd and 91st Avenue wastewater treatment plants (WWTP) into the Salt River, and also from return flows from nearby agricultural areas. The Gila River has been designated as impaired by the Arizona Department of Environmental Quality (ADEQ) due to pesticide concentrations that exceed the use standard (Figure 8.1-10A and Table 8.1-8B). The water is diverted along the way for agricultural and industrial uses. The Gila River exits the Phoenix AMA at Gillespie Dam.

The Hassayampa River originates in the Bradshaw Mountains and flows into the Hassayampa Sub-basin to its confluence with the Gila River west of Buckeye. It is an ephemeral watercourse in the AMA with the exception of short perennial reaches where it enters the AMA and near the Gila River confluence. The Hassayampa River is impaired above the confluence due to high concentrations of selenium and boron (Table 8.1-8B and Figure 8.1-10A).

The only major spring in the watershed is Seven Springs north of Carefree with a discharge of about 75 gpm. Cave Creek and Seven Springs Wash located northeast of Carefree have perennial reaches (Figure 8.1-5).

Flow records from streamgages on watercourses in the watershed are shown in Tables 8.1-2 and 8.3-2. Annual median flow at the Agua Fria River near the Humboldt gage is about 3,400 acre-feet. Annual median flow on the Hassayampa River near Morristown is about 6,500 acre-feet a year. The highest flow measured in the watershed was at a gage on the Gila River (#9514100) with a flow of 6.1 maf in 1993, although the median flow at this gage is only about 12,000 acre-feet a year. (Table 8.1-2)

Salt River

Most of the Salt River Watershed is within the Salt River and Tonto Creek basins in the Central

Highlands Planning Area. Its western edge extends into the Phoenix AMA to the confluence of the Salt and Gila rivers. The Salt River originates in eastern Arizona and drains approximately 6,000 square miles of the Mogollon Rim area in the east-central part of the State. Before entering the Phoenix AMA in the Fountain Hills Sub-basin, surface water from the Salt River Watershed passes through a series of four reservoirs: Roosevelt Lake, Apache Lake, Canyon Lake and Saguaro Lake. These reservoirs and associated dams, operated by the SRP are used to supply water to the agricultural, municipal and industrial sectors in the Phoenix AMA. The Salt River channel enters the AMA north of the Goldfield Mountains; crosses toward the southwest through the East Salt River Valley and West Salt River Valley sub-basins and the cities of Mesa, Tempe, Scottsdale and Phoenix; and joins the Gila River near Laveen. Downstream from the Granite Reef Diversion Dam, the Salt River is ephemeral, only flowing in response to flooding or reservoir releases. The Salt River is perennial further downstream due to effluent discharges from the 23rd Avenue and 91st Avenue WWTPs.

There are no major springs in the AMA portion of the watershed. Flow records from streamgages in the watershed are found in Table 8.1-2. Annual median flow on the Salt River below Stewart Mountain Dam is about 585,700 acre feet with a maximum flow of over 3.2 maf in 1993. Further downstream near its confluence with the Gila River and below the Granite Reef Diversion Dam, annual median flow on the Salt River at 51st Avenue is about 4,300 acre-feet a year.

Middle Gila River

The Middle Gila River Watershed extends west from Coolidge Dam on the Gila River, located in the Southeastern Arizona Planning Area, to the confluence of the Gila and Salt Rivers. The San Pedro and San Francisco rivers are major tributaries to the Gila River outside of the AMA Planning Area. Portions of the Phoenix AMA, Pinal AMA and Tucson AMA are located in this watershed. The Gila River enters the Pinal AMA in its northeastern corner and traverses from east to west. In predevelopment times, the Gila flowed year round through this area. Pre-development flows on the portion of the Gila River that passes through the Pinal AMA are estimated to have been about 500,000 acre-feet per year. The first records of San Carlos Irrigation Project (SCIP) diversions begin in 1930, although diversions to non-Indian farmers began much earlier. Annual diversions from the Gila River by SCIP at Ashurst-Hayden Diversion Dam northeast of Florence in the Pinal AMA have averaged 245,000 acre-feet per year from 1930 to 1995.

There are no major springs in this portion of the Middle Gila River watershed. Short reaches of Queen Creek and Arnett Creek near Superior are perennial. Queen Creek has been designated as impaired from its headwaters about nine miles downstream due to elevated copper concentrations from mining discharge (Table 8.1-8B and Figure 8.1-10A). Flow records from streamgages in the watershed are found in Tables 8.1-2 and 8.2-2. Annual median flow measured at the streamgage, “Queen Creek below Whitlow Dam near Superior”, is about 1,600 acre-feet. Gages on the Gila River are either discontinued or have only recent data. The Gila River near Laveen gage has the longest period of record, 55 years, but was discontinued in 1994. The annual median flow at that gage was 9,420 acre-feet with a maximum flow of almost 1.2 maf in 1993.

Santa Cruz River

A large portion of the AMA Planning Area falls within the Santa Cruz River Watershed, including the Santa Cruz AMA and most of the Tucson and Pinal AMAs. The Santa Cruz River is the main

surface water drainage in the Santa Cruz and Tucson AMAs. The river originates in the San Rafael Valley east of the planning area and flows southward to Mexico before turning north and re-entering the U.S. east of Nogales. Within the planning area it extends from the international border northwestward to its confluence with the Gila River (where it is known as the Santa Cruz Wash) in the northern portion of the Pinal AMA. Major tributaries to the river in the Santa Cruz AMA are Nogales Wash, Sopori Wash and Sonoita Creek. Tributaries to the Santa Cruz River in the Tucson AMA include Rillito Creek, Cañada del Oro Wash and Brawley Wash. Three smaller streams (Vekol Wash, Santa Rosa Wash and Aguirre Wash) drain the southwestern portion of the Pinal AMA. These washes join Santa Cruz Wash upstream from its confluence with the Gila River.

Prior to development, the Santa Cruz River was mostly perennial in its southernmost reach from its headwaters in the San Rafael Valley to near Tubac, often as a series of Cienegas (marshes). North of Tubac, a few short perennial reaches existed including reaches near the mission of San Xavier del Bac south of Tucson and at "A" Mountain near downtown Tucson. From the Nine-Mile water hole north of the confluence of the Santa Cruz River and the Rillito River in Tucson, to its confluence with the Gila River, the Santa Cruz River was dry except during floods. (Tellman, et al., 1997)

Currently, within the Tucson AMA and the Santa Cruz AMA, two segments of the Santa Cruz River flow year round due to wastewater discharges. In 2006, approximately 54,000 acre-feet was discharged at the Ina and Roger Road WWTPs by Pima County. In 2004, approximately 16,200 acre-feet of sewage was treated at the Nogales International WWTP, which treats sewage from both Nogales, Sonora and Nogales, Arizona prior to discharge to the river. Approximately 11,500 acre-feet of the influent was from Mexico. In the Pinal AMA, a portion of the Santa Cruz River receives wastewater discharge from the Casa Grande WWTP. Other perennial flows include portions of Sabino, Romero, Cienega and Rincon Creeks in the east central part of the Tucson AMA and Sonoita Creek in the Santa Cruz AMA. Nogales Wash, a tributary of the Santa Cruz River, originates about five miles south of the international border in Sonora and enters Arizona as a covered floodway. It joins the Santa Cruz River about 8 miles north of the border. Nogales Wash is the major drainage system for both Nogales, Arizona and Nogales, Sonora. (Varady, et al., 1995) Springs create perennial flow in Nogales Wash near its headwaters in Mexico and below the springs, storm flows and uncontrolled sewage discharges also contribute to its flow (IBWC, 1998). In the Santa Cruz AMA the Santa Cruz River and Nogales Wash have designated impaired reaches due to elevated levels of E. coli and other constituents (Figure 8.4-9 and Table 8.4-7).

There are ten major springs in the watershed located near Arivaca, in mountains east of Tucson, and west of Amado in the Santa Cruz AMA. The spring with the largest discharge is Sopori, located west of Amado, with a discharge rate of 377 gpm measured in 1952 (see Tables 8.4-5 and 8.5-5).

Flow records from streamgages in the watershed are found in Tables 8.4-2 and 8.5-2. The annual median flow at the Santa Cruz River near Nogales is 14,013 acre feet with a maximum flow of over 88,000 acre-feet in 1983. Downstream, median flow at the gage on the Santa Cruz River at Cortaro is 38,655 acre-feet with a maximum flow in 1993 of over 182,000 acre-feet.

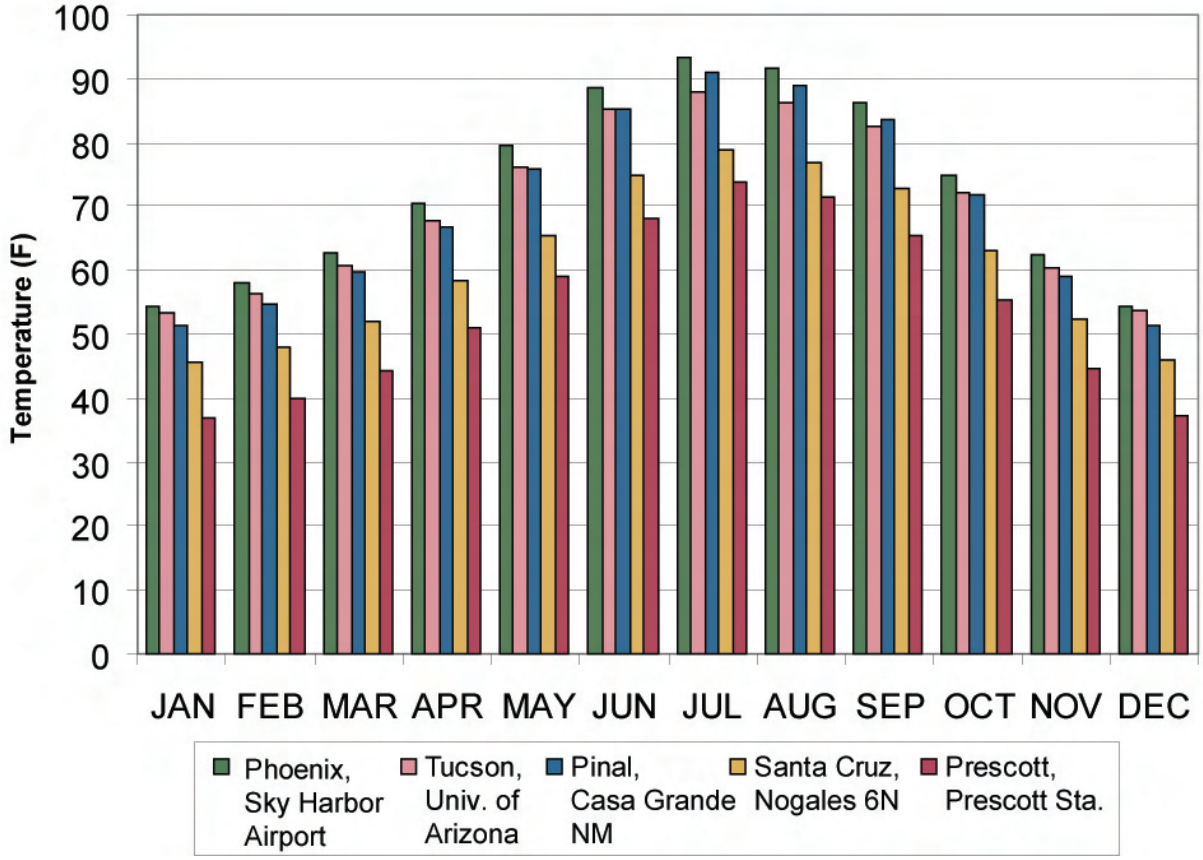
Rio Asuncion

A small part of the Rio Asuncion Watershed is located at the base of the Tucson AMA along the international border. This watershed drains a large area of northwest Sonora, Mexico and discharges into the Sea of Cortez. Sycamore Creek, a perennial stream located in this watershed, flows south-southwest into Mexico. Due to its rich biological diversity, a portion of Sycamore Canyon has been designated as the Gooding Research Natural Area.

8.0.3 Climate

Climate in the AMA Planning Area varies widely due to its geographic extent, with significant temperature and rainfall differences between some AMAs. Average annual temperatures range from 72.9°F in the Phoenix AMA to 53.3°F in the Prescott AMA compared to the statewide average of 59.5°F. Phoenix and Tucson are the warmest AMAs except during the summer monsoon season when Tucson receives a significant amount of its annual rainfall and associated cooler temperatures (Figure 8.0-5). Average annual precipitation (1971-2000) ranges from 8.3 inches at Phoenix Sky Harbor Airport to 18.7 inches at Nogales and Prescott.

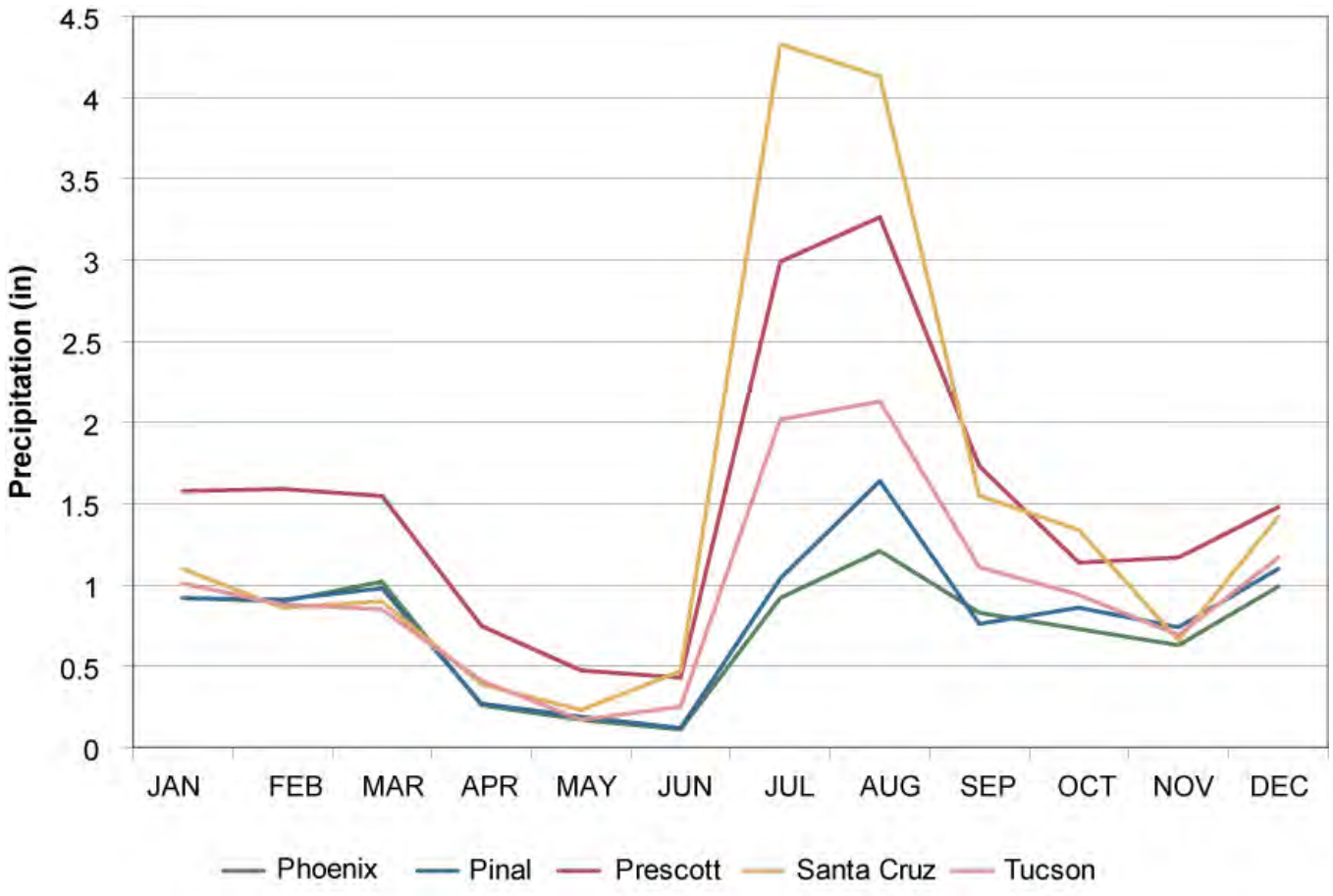
Figure 8.0-5 Average monthly temperature from 1952-2007 in the AMA Planning Area



Source: WRCC, 2008

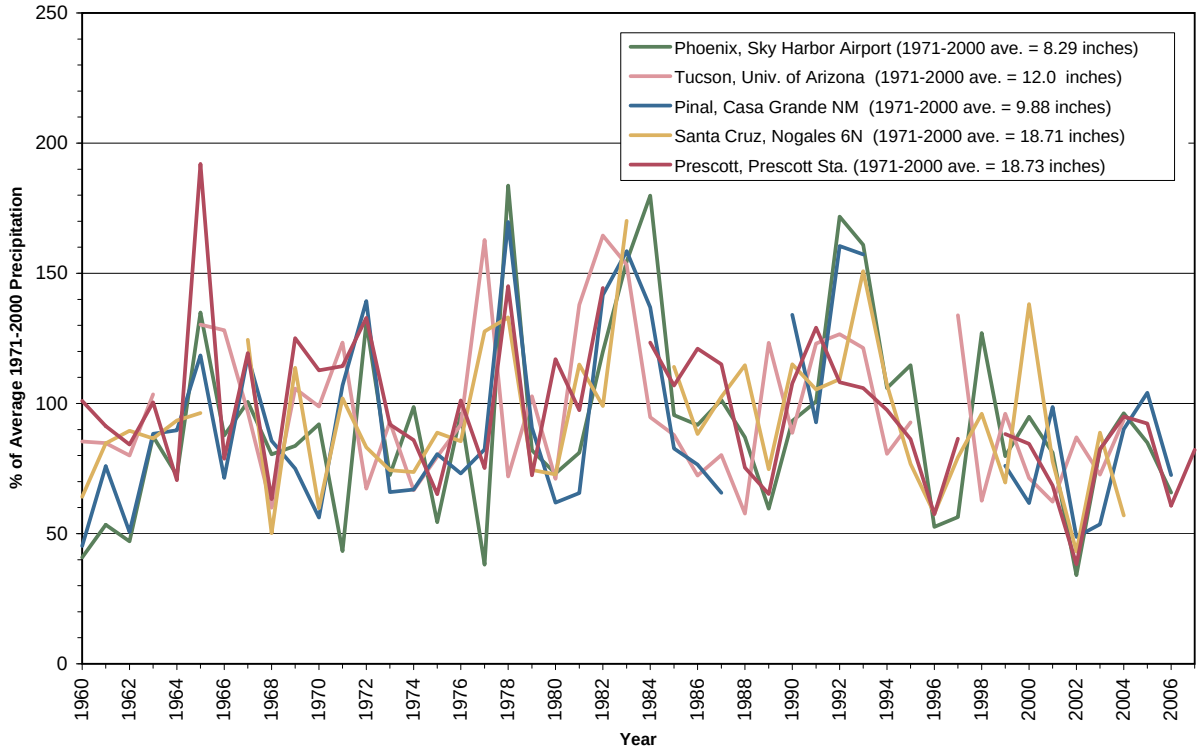
The AMA Planning Area exhibits a bi-modal precipitation seasonality that is characteristic of Arizona (Figure 8.0-6). During the winter and spring, frontal storm systems move west-to-east, guided by the jet stream. Summer monsoon thunderstorms also deliver significant amounts of precipitation, particularly in the Santa Cruz AMA. While precipitation amounts vary widely across the planning area, there are also strong year-to-year variations, due primarily to the influence of the El Nino-Southern Oscillation, as well as long-term wet and dry periods that are linked to multi-decadal ocean variations. Many of the wettest and driest periods since 1960 were synchronous throughout the AMAs with notable wet periods in the late 1970s, early 1980s and early 1990s. Notable dry periods were the early 1960s, the early 1970s and the period from 1996 through 2006 (Figure 8.0-7). The greatest year-to-year precipitation variations during this period occurred in the Phoenix AMA and the least variation in the Prescott AMA, with the exception of 1965 when Prescott received almost double its annual rainfall.

Figure 8.0-6 Average monthly precipitation from 1948-1952 to 2006-2007



Note: Data are from Phoenix, Sky Harbor Airport; Casa Grande NM; Prescott Sta.; Nogales 6N; and Univ. of Arizona WRCC Stations.
Source: WRCC, 2008

Figure 8.0-7 Annual percent of average precipitation measured between 1960-2007



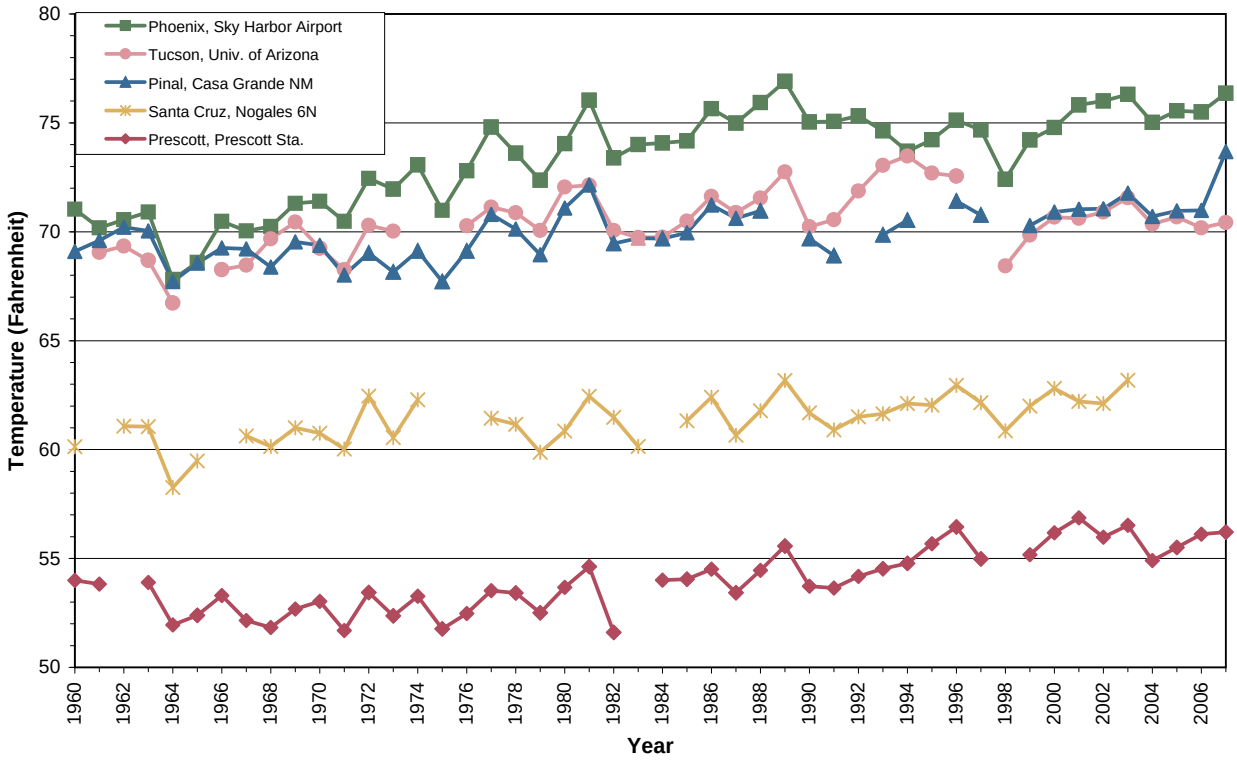
Years with more than five days of missing data in any month were omitted. Each time series was constructed from one recording station. Figure author: Zack Guido, CLIMAS

The planning area encompasses parts of five of Arizona's seven climate divisions. A climate division is a region within a state that is generally climatically homogenous. Long-term climate data for Arizona's climate divisions have been reconstructed from tree ring and instrumental data. These data show that since 1000 A.D., Climate Division 7 experienced more years than the other planning area climate divisions in which precipitation was less than that measured in 2002, one of the driest years in the instrumental record (CLIMAS, 2008). Climate Division 7 encompasses most of the Tucson AMA and all of the Santa Cruz AMA.

Average annual temperatures in the AMA Planning Area have been increasing since 1960, a phenomenon observed throughout the state. Figure 8.0-8 shows that all of the major urban locations in the AMAs have seen temperature increases, reflecting both a regional temperature trend and the influence of urban expansion and development. The effect of urban areas on temperature, precipitation and other climate phenomena is an important consideration in the planning area. Phoenix, for example, has experienced the greatest increase in temperatures during the time period shown. Figure 8.0-9 illustrates an increase in daily minimum temperatures during the summer months in Phoenix and Tucson, and is contrasted with the modest increases measured at Casa Grande National Monument, a relatively non-urbanized area between the two cities.

Research on urbanization and warming in the Phoenix metropolitan area shows that, from 1948-2000, urbanization has increased the nighttime minimum temperature in central Phoenix

Figure 8.0-8 Average annual temperature measured between 1960 and 2007



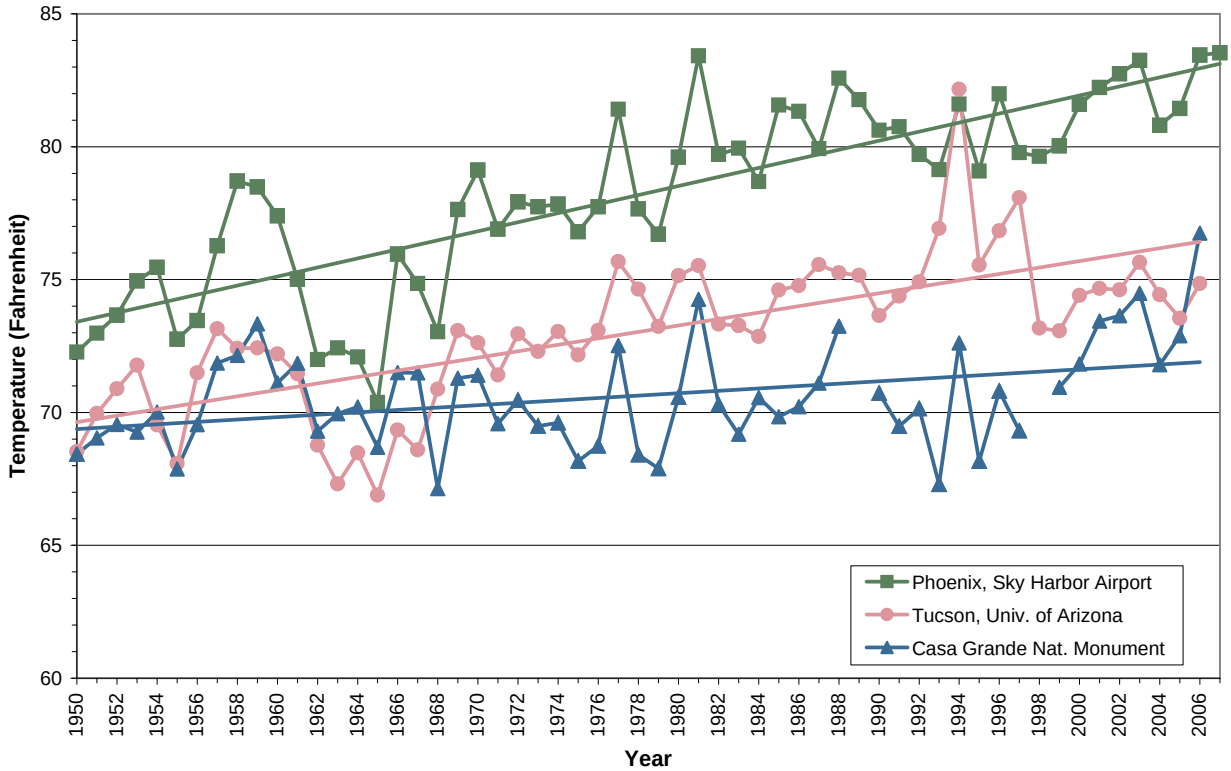
Each time series was constructed from one recording station. Figure author: Zack Guido, CLIMAS

(Sky Harbor Airport) by approximately 9° F and the average daily temperature by approximately 5.5° F (Baker et al., 2002). The number of days with temperatures between 59-100°F at Sky Harbor Airport has increased by about 30 days since 1948, most notably during the spring and fall. During the period 1990-2004, the Phoenix urban heat island expanded substantially, commensurate with increasing population and urban development. Recent research shows that temperatures in areas characterized by urban infill development, and areas in the core of the city were approximately 2° F and approximately 4° F warmer, respectively, than temperatures outside of urban areas (Brazel et al., 2007). Similarly, in central Phoenix the hours per day that exceed 100° F during the months of May through September have doubled since 1948 (Baker et al., 2002).

Tucson's urban heat island effect increased by approximately 5.5° F during the 20th century, with most of the warming since the late 1960s (Comrie, 2000). In the Tucson area, urban temperatures increased at almost 3 times the rate of rural temperatures. Temperature changes are not, however, uniform. Within the urban zone, variations in temperatures are caused by differences in housing density, the amount of green space, topography, and localized cold air flows downslope from mountains.

The impacts of urban warming are varied and include increases in energy consumption, predominantly from longer usage of air conditioning, and stress to animals and humans. Since 1948, the total number of cooling degree days (CDD) in Phoenix has increased by 569 while the

Figure 8.0-9 Average June, July and August temperature measured between 1960 and 2007



Years with more than five days of missing data in any month were omitted. Each time series was constructed from one recording station. Figure author: Zack Guido, CLIMAS

heating degree days (HDD) has declined by 331 (Baker et al., 2002). The CDD and HDD are indices that reflect the demand for energy needed to cool or heat a structure, respectively. Research conducted in 2003 in Phoenix found that distinct neighborhoods experience up to 7° F difference in temperature.

Two recent studies suggest that urbanization and large irrigated areas in the Phoenix metro area increase precipitation to the northeast of the city (Diem and Brown, 2003; Sheperd, 2006). Average precipitation in the northeastern suburbs and exurbs of metropolitan Phoenix has increased by 12-14%, in contrast to the first half of the 20th century (Sheperd, 2006). The study suggests that urban heating, from built surfaces and buildings, affects upward motion in the atmosphere and can increase storminess beyond the urban area. Irrigation increases local water vapor in the atmosphere, and probably contributes to the increased precipitation (Diem and Brown, 2003).

8.0.4 Environmental Conditions

Vegetation

Information on ecoregions and biotic (vegetative) communities in the AMA Planning Area is shown on Figure 8.0-10. The planning area contains five of the six ecoregions found in Arizona; most of the planning area is within the Sonoran Desert ecoregion. The Tucson and Santa Cruz AMAs,

in the southern portion of the planning area, contain Chihuahuan Desert with areas known as "sky islands" of Sierra Madre Occidental pine-oak forest. The northeastern portion of the Phoenix AMA and most of the Prescott AMA are in the Arizona Mountains forests region, and the northern portion of the Prescott AMA includes a portion of the Colorado Plateau shrublands region.

Biotic communities range from Lower Colorado River Valley Sonoran desertscrub to Rocky Mountain (Petran) and Madrean montane conifer forest. Most of the planning area is covered by Lower Colorado River Valley and Arizona Uplands Sonoran desertscrub biotic communities.

Rocky Mountain and Madrean montane conifer forests occur at the highest elevations of the Tucson AMA in the Santa Catalina and Rincon Mountains and in the Prescott AMA in the Bradshaw Mountains. These forests commonly occur between about 7,200 to 8,700 feet. Above 8,000 feet, in areas that receive from 25 to 30 inches of annual rainfall, the forest contains a mix of conifers that may include Douglas and White fir, Limber Pine, Blue Spruce, and White Pine, with Ponderosa Pine on warmer slopes. Aspen and Gambel Oak are prominent in these forests following disturbances. Below 8,000 feet, in areas that receive about 18 to 26 inches of annual precipitation, the mix of species gives way to almost pure stands of Ponderosa Pine. About half of the precipitation occurs during the growing season, which permits forests to exist on less than 25 inches of annual rainfall, making them some of the driest forests in North America (Brown, 1982). Bark beetle infestations have killed large areas of Ponderosa Pine in the Prescott AMA within and in the vicinity of the City of Prescott.

Higher elevations in the Prescott AMA contain areas of Great Plains grassland and Great Basin conifer woodland not found in the other four AMAs. Great Basin Conifer (piñon-juniper) woodlands are found at elevations between about 5,000 and 7,500 feet that receive about 10 to 20 inches of annual precipitation. One of the most extensive vegetation types in the southwest, it is characterized by juniper and piñon pine trees. Great Plain grasslands, primarily composed of mixed or short-grass communities, are located in the center of the AMA at elevations above about 4,000 feet that receive between 11 and 18 inches of annual precipitation. (Brown, 1982).

Madrean evergreen woodlands are relatively widespread in the Tucson and Santa Cruz AMAs. This community occurs in the Santa Catalina, Baboquivari and Santa Rita Mountains and in the mountain ranges along the U.S.-Mexico border where the mean annual precipitation exceeds 16 inches. The woodland consists of evergreen oaks, Alligator Bark and One-seed Junipers, and Mexican Pinyon Pine, and transitions to semidesert grassland at lower elevations. Cacti of the semidesert grassland may extend into the woodland. (Brown, 1982)

Semi-desert grasslands occur predominantly in the Santa Cruz and Tucson AMAs with smaller areas in the Pinal AMA. These grasslands occur at elevations between 3,500 and 5,000 feet that receive annual precipitation of 10 to 17 inches. Grasses were originally perennial bunch grasses with intervening areas of bare ground. Where heavily grazed, grasses have shifted to annual species where summer rainfall is low, or to low growing sod grasses where rainfall is moderate to heavy. Shrubs, cacti and herbaceous plants are commonly found in the semi-desert grassland community. (Brown, 1982)

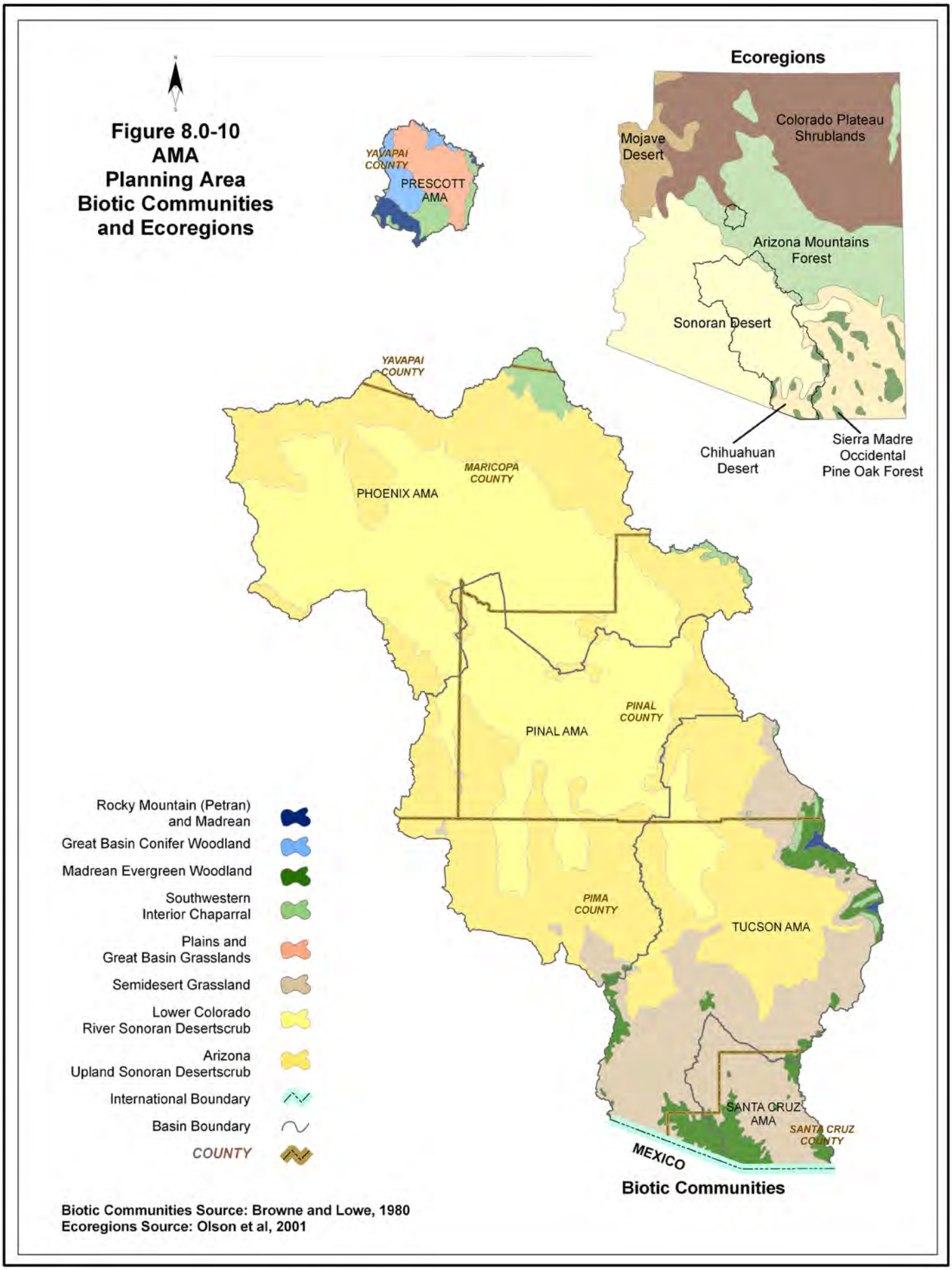


Figure 8.0-10
AMA
Planning Area
Biotic Communities
and Ecoregions
YAVAPAI COUNTY
PRESCOTT AMA
Ecoregions
Colorado Plateau Shrublands
Mojave Desert
Arizona Mountains Forest
Sonoran Desert
Chihuahuan Desert
Sierra Madre Occidental Pine Oak Forest
YAVAPAI COUNTY
MARICOPA COUNTY
PHOENIX AMA
PINAL COUNTY
PINAL AMA
PIMA COUNTY
TUCSON AMA
SANTA CRUZ AMA
SANTA CRUZ COUNTY
MEXICO
Rocky Mountain (Petran) and Madrean
Great Basin Conifer Woodland
Madrean Evergreen Woodland
Southwestern Interior Chaparral
Plains and Great Basin Grasslands
Semidesert Grassland
Lower Colorado River Sonoran Desertscrub
Arizona Upland Sonoran Desertscrub
International Boundary
Basin Boundary
COUNTY
Biotic Communities
Biotic Communities Source: Browne and Lowe, 1980
Ecoregions Source: Olson et al, 2001

Interior chaparral occupies mid-elevation foothill and mountain slopes in the Santa Rita Mountains in the Tucson AMA, the Superstition Mountains in the Phoenix AMA and the Bradshaw Mountains in the Phoenix and Prescott AMAs. Interior chaparral occurs in areas between about 3,500 and 6,000 feet that receive 15 to 25 inches of annual precipitation (Brown, 1982). Typical shrubby species are Mountain Mahogany, Shrub Live Oak, and Manzanita. Chaparral plants are well adapted to drought conditions.

Two subdivisions of the Sonoran desertscrub region, the Lower Colorado River Valley subdivision and the Arizona Upland subdivision, dominate all but the Prescott AMA. The Lower Colorado River Valley subdivision is the hottest and driest of the Sonoran desertscrub subdivisions. There is intense competition for water, with plants widely spaced and more concentrated along drainage channels. Characteristic plants include Creosote Bush, Bursage, Saltbush, and mixed, more diverse vegetation along washes and other areas with more water. These areas may include Blue Palo Verde, Ironwood and Jojoba. Also commonly found in the subdivision are several types of cholla and other cacti. (Brown, 1982)

The Arizona Upland subdivision borders the Lower Colorado River Valley subdivision and occurs primarily on slopes and sloping plains at elevations of 980 to over 3,000 feet where it merges with interior chaparral or semi-desert grassland. This subdivision receives more precipitation than the other Sonoran desertscrub subdivisions with average annual precipitation between 8 to 16 inches. Vegetation is scrubland or low woodland in appearance with Blue and Foothill Palo Verde, Ironwood, Mesquite and Cat-Claw Acacia as common tree species. Cacti are extremely important in this subdivision including Saguaro, Organ Pipe, cholla and barrel cacti. (Brown, 1982)

The occurrence and composition of riparian vegetation has changed along many of the watercourses in the AMA Planning Area, including the Santa Cruz River in the Santa Cruz and Tucson AMAs, the Gila River in the Pinal and Phoenix AMAs, and the Salt and Verde Rivers in the Phoenix AMA.

Riparian vegetation has increased in most reaches of the Santa Cruz River upstream from Tucson that have perennial flow from either base flow or sewage effluent, while there has been complete destruction of the riparian ecosystem at Tucson. Cottonwood and willow have increased in density upstream of developments, but in areas where development is up to the river, cottonwood trees have been eliminated. In the late 1990s and early 2000s, die-off of riparian trees occurred at Nogales and near Rio Rico respectively, and may be related to excessive groundwater pumping. North of Tucson, effluent discharge supports a relatively newly established riparian ecosystem. North of Marana, the Santa Cruz River is ephemeral and there is little historic evidence of riparian vegetation with the exception of tamarisk. Tamarisk density may be increasing at some locations (Webb, et al., 2007)

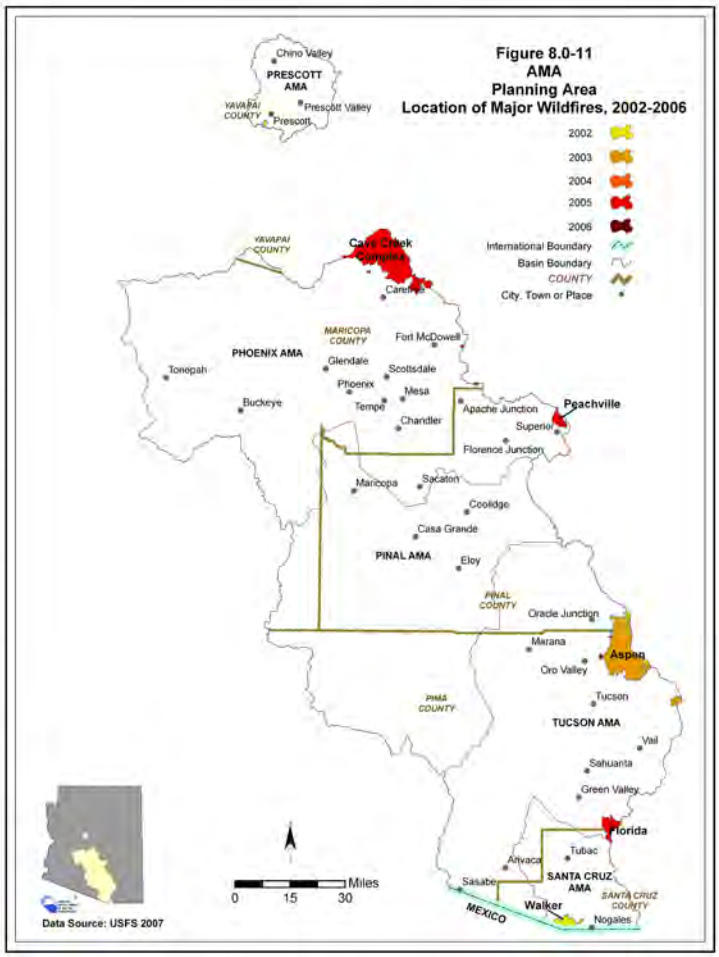
Riparian vegetation on the Gila River has significantly declined between Florence in the Pinal AMA and its confluence with the Salt River in the Phoenix AMA due to surface water diversion and groundwater pumpage. This section historically supported reaches of lush, woody riparian vegetation, but now mostly tamarisk and mesquite are found. However, cottonwood has returned along the Gila River near its confluence with the Salt River due to increasing groundwater levels

and changes in the flow regime of the Salt River. Historic and current groundwater levels are high at the confluence of the Gila and Salt rivers, supporting a cottonwood-willow forest surrounded by "a sea of tamarisk" (Webb, et al., 2007). Effluent discharge from the City of Phoenix and agricultural return flow have created perennial flow and increased riparian vegetation below the confluence, where vegetation is primarily tamarisk and mesquite with small stands of cottonwood-willow (AZGF, 1993).

The reservoir system on the Salt River has stabilized the channel in the Phoenix AMA below the dams (except during large flood events) and allowed establishment of native and nonnative (primarily tamarisk) riparian vegetation. Below its confluence with the Verde River and Granite Reef Dam, most of the surface flow of the Salt River is diverted, and the riparian vegetation declines and disappears downstream to the effluent-dependent section near the confluence of the Salt and Gila rivers. Downstream of Bartlett Dam, native and nonnative riparian vegetation has increased along the Verde River due to relatively steady release of water. (Webb, et al., 2007) Vegetation includes cottonwood-willow, tamarisk and mesquite (AZGF, 1993).

Concerns about receding riparian areas at some locations have resulted in restoration projects in the Phoenix and Tucson metropolitan areas, including the Rio Salado project in downtown Phoenix in the Phoenix AMA; and the San Xavier Riparian Restoration project on the Tohono O'odham Reservation, south of Tucson in the Tucson AMA.

Many of the natural biotic communities in the planning area are threatened by invasive species that interfere with ecosystem function through altering natural fire, nutrient flow and flooding regimes. The most problematic invasive species include: buffelgrass, fountaingrass, Natalgrass, onionweed, Sahara mustard and tamarisk. Numerous agencies and interest groups throughout the planning area have come together to control the spread of these species where feasible, and to educate the public about the threat of these species to ecosystem function. (ASDM, 2008)



Although not necessarily caused or exacerbated by invasive species, several major wildfires occurred in the AMA Planning Area during the recent drought years between 2002-2006 (see Figure 8.0-11). The 2003 Aspen fire in the Tucson AMA burned 85,000 acres, including much of the Town of Summerhaven. The 2005 Cave Creek Complex fire, of which a portion is located in the Phoenix AMA, burned 243,950 acres and is the second largest fire in Arizona to date. Both of these fires occurred in areas with

perennial streams and have had documented impacts on peak-flow events. Rainfall two months after the Aspen fire caused runoff to increase three-fold over pre-burn runoff in the Sabino Creek watershed. (Schaffner and Reed, 2007) Increased peak flows can degrade stream channels and make them unstable, increase sediment production, and cause flood damage (Neary, et al., 2003).

Arizona Water Protection Fund Programs

The objective of the Arizona Water Protection Fund (AWPF) program is to provide grants for the protection and restoration of Arizona's rivers and streams and associated riparian habitats. Thirty-two restoration projects in the AMA Planning Area had been funded by the AWPF through 2005. Six projects were funded in the Phoenix AMA for wetland construction, exotic species control, revegetation and general research. One habitat protection project was funded in the Pinal AMA. Six grants in the Prescott AMA funded feasibility studies, general research and stream restoration. In the Tucson AMA fifteen projects, including general research, habitat restoration and exotic species control, were funded. Finally, four research and revegetation projects were funded in the Santa Cruz AMA. A list of projects and project types funded in the AMA Planning Area through 2005 is found in Appendix A of this volume. A description of the program, a complete listing of all projects funded, and a reference map are found in Appendix C of Volume 1.

Instream Flow Claims

An instream flow water right is a non-diversionary appropriation of surface water for recreation and wildlife use. Fourteen applications for instream flow claims have been filed in the AMA Planning Area. The applications are listed in Table 8.0-1 and are shown on Figure 8.0-12. Claims have been filed in three of the five AMAs, including Phoenix, Tucson and Santa Cruz; and six certificates have been issued, all in the Phoenix AMA. Certificates have been issued for claims on Arnett Creek, Camp Creek, Cave Creek, Hassayampa River, Seven Springs Wash and Sycamore Creek. Claims have been filed for stretches of Queen Creek Wash, Rincon Creek, Sabino Creek and Sonoita Creek.

Table 8.0-1 Instream flow claims in the AMA Planning Area

Map Key	Stream	Applicant	Application No.	Permit	Certificate No.	Filing Date
1	Arnett Creek	Tonto National Forest	33-96235.0	96235	96235	10/20/1992
2	Camp Creek	Tonto National Forest	33-96693.0	96693	96693	7/5/2001
3	Cave Creek	Desert Foothills Land Trust	33-96255.0	Pending	Pending	3/25/1993
3	Cave Creek	Tonto National Forest	33-96302.0	96302	96302	9/27/1993
4	Hassayampa River	Nature Conservancy	33-92304.0	92304	92304	1/20/1987
5	Queen Creek	Boyce Thompson Arboretum	33-92298.0	Pending	Pending	1/20/1987
6	Rincon Creek	Saguaro National Park	33-96733.0	Pending	Pending	12/10/2002
7	Sabino Creek	Joeseph and Lynette Marco	33-87168.1	Pending	Pending	4/17/2001
7	Sabino Creek	Sierra Club, et al	33-93232.0	Pending	Pending	7/28/1987
7	Sabino Creek	Hidden Valley HOA	33-96551.0	Pending	Pending	5/5/1997
8	Seven Springs Wash	Tonto National Forest	33-96303.0	96303	96303	9/27/1993
9	Sonoita Creek	AZ State Parks Board	33-96709.0	Pending	Pending	2/14/2002
9	Sonoita Creek	AZ State Land Department	33-93287.0	Pending	Pending	8/7/1987
10	Sycamore Creek	Tonto National Forest	33-96509.0	96509	96509	5/15/1996

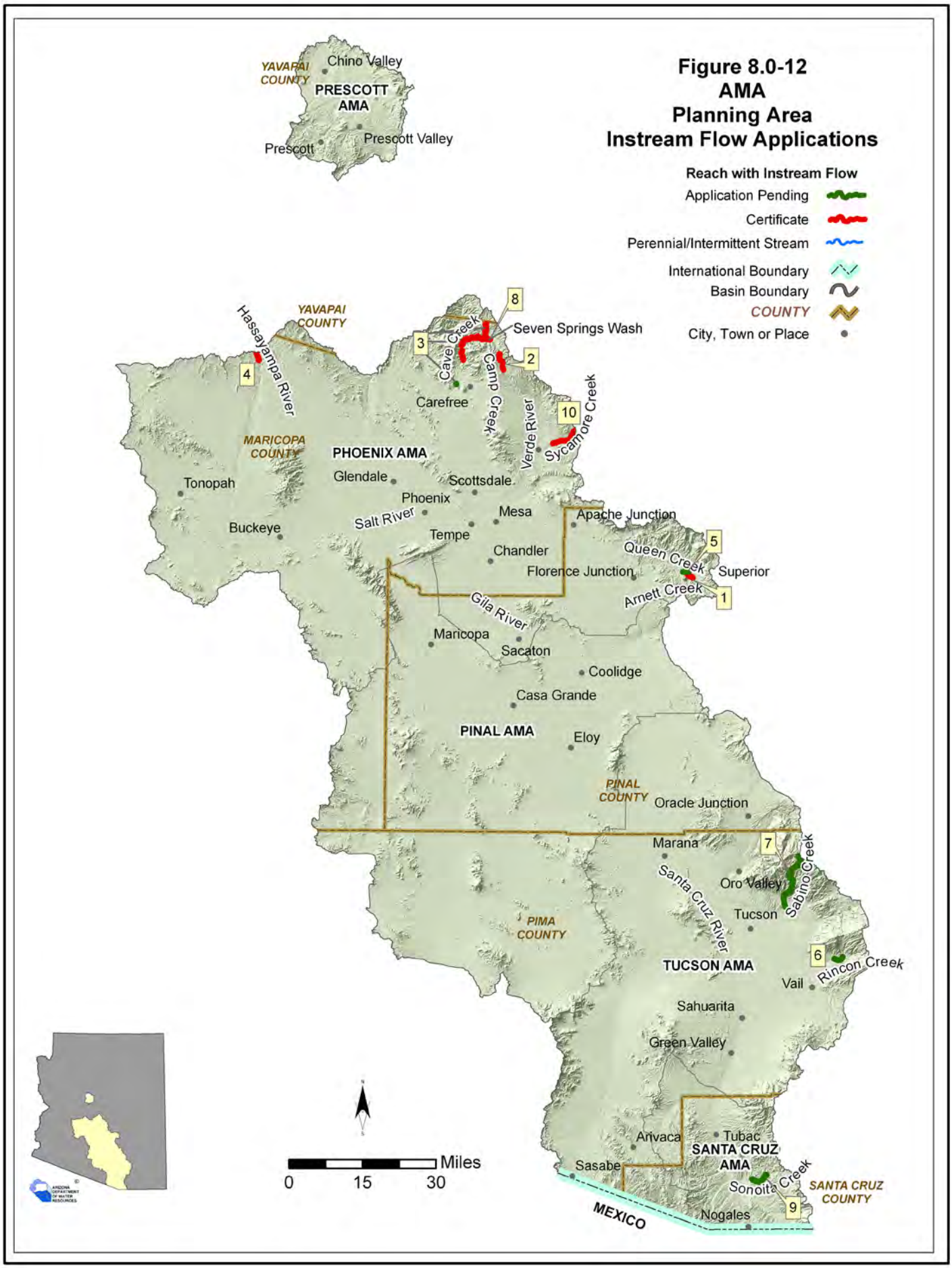


Figure 8.0-12
AMA
Planning Area
Instream Flow Applications
Reach with Instream Flow
Application Pending
Certificate
Perennial/Intermittent Stream
International Boundary
Basin Boundary
COUNTY
City, Town or Place
YAVAPAI COUNTY
Chino Valley
PRESCOTT AMA
Prescott
Prescott Valley
Hassayampa River
YAVAPAI COUNTY
Seven Springs Wash
Cave Creek
Camp Creek
Carefree
Verde River
Sycamore Creek
MARICOPA COUNTY
PHOENIX AMA
Tonopah
Glendale
Scottsdale
Phoenix
Salt River
Mesa
Apache Junction
Buckeye
Tempe
Chandler
Queen Creek
Florence Junction
Superior
Arnett Creek
Gila River
Maricopa
Sacaton
Coolidge
Casa Grande
PINAL AMA
Eloy
PINAL COUNTY
Oracle Junction
Marana
Santa Cruz River
Oro Valley
Sabino Creek
Tucson
PIMA COUNTY
TUCSON AMA
Rincon Creek
Vail
Sahuarita
Green Valley
Arivaca
Tubac
SANTA CRUZ AMA
Sasabe
Sonoita Creek
SANTA CRUZ COUNTY
MEXICO
Nogales
Miles
0
15
30
1
2
3
4
5
6
7
8
9
10

Table 8.0-2 Listed threatened and endangered species in the AMA Planning Area

Common Name	AMA	Threatened	Endangered	Elevation/Habitat
Arizona Agave	PHX		X	3,000 ft/steep, rocky granite slopes, or level hilltops, near chaparral; New River and Sierra Ancha Mountains.
Arizona Cliff Rose	PRE		X	<4,000 ft./White soils of tertiary limestone lakebed deposits.
Bald Eagle*	PHX, PRE	X		Varies/Large trees or cliffs near water.
Chiricahua Leopard Frog	TUC, SAN	X		3,300-8,900ft./Streams, rivers, backwaters, ponds stock tanks.
Desert Pupfish	TUC, PHX		X	<5,000 ft./Shallow springs, small streams and marshes. Tolerates saline and warm water.
Gila Topminnow	TUC, PHX		X	<4,500 ft./Small streams, springs and cienegas vegetated shallows.
Huachuca Water-umbel	TUC		X	2,000 - 6,000 ft /Cienegas or marshy wetlands within Sonoran desertscrub, grassland or oak woodland, and conifer forest.
Jaguar	TUC		X	Approx > 5,000 ft/Lowland wet habitats and oak-pine woodland.
Kearny's Blue Star	TUC		X	3,685 - 4,500 ft/Canyon bottoms and sides in oak woodlands.
Lesser Long-Nosed Bat	SAN, TUC, PHX		X	1,190 - 7,320 ft./Desert grassland and shrubland up to oak transition.
Masked Bobwhite Quail	TUC		X	3,090 - 3,720 ft. /Broad valley desert grassland.
Mexican Spotted Owl	TUC, SAN	X		4,100-9,000 ft./Canyons, dense forests with multi-layered foliage structure.
Nichol's Turk's Head Cactus	PIN, TUC		X	2,400-4,100 ft./Sonoran desertscrub.
Ocelot	TUC, SAN		X	<4,000 ft/Subtropical thorn forest, thorn scrub and dense brushy thickets, often in riparian bottomland.
Pima Pineapple Cactus	TUC, SAN		X	2,300 - 5,000 ft /Ridges in semidesert grassland and alluvial fans in Sonoran desertscrub.
Razorback Sucker	PHX		X	<6,000 ft./Riverine and lacustrine areas, not in fast moving water.
Sonora Chub	TUC	X		<1,000 - 4,000 ft./Large, deep and most permanent pools in Sycamore Creek.
Southwestern Willow Flycatcher	PHX, SAN		X	<8,500 ft./Cottonwood-willow and tamarisk along rivers and streams.
Yuma Clapper Rail	PHX, PIN		X	<4,500 ft./Fresh water and brackish marshes.

*As of 05/01/08 the Bald Eagle is listed as threatened only in the Southwest Region (Region 2).

Sources: AZGF 2008, USFWS 2007

Threatened and Endangered Species

A number of listed threatened and endangered species may be present in the AMA Planning Area. Those listed by the U.S. Fish and Wildlife Service (USFWS) as of January 2008 are shown in Table 8.0-2.[2] Presence of a listed species may be a critical consideration in water resource management and supply development in a particular area. The USFWS should be contacted for details regarding the Endangered Species Act (ESA), designated critical habitat, and current listings.

As shown on Table 8.0-2 the number and type of endangered or threatened species vary by AMA, with only one in the Prescott AMA and twelve in the Tucson AMA. Habitat encroachment by development and growth in the Tucson AMA, primarily in Pima County, required Pima County to develop a Multi-Species Conservation Plan (MSCP). No such plans affect the other AMAs.

The Pima County MSCP was created to comply with the "take" provisions of the ESA.[3] Incidental take of a listed species, as the result of carrying out an otherwise lawful activity, is not allowed without a permit from the USFWS.[4] The Pima County MSCP includes 55 "Priority Vulnerable Species" and will mitigate the effects of development through preservation of 58% of the land in the permit area as open space. The most recent version of the Pima County MSCP was released in August 2006. (Pima County, 2006a) An incidental take permit has not yet been issued by the USFWS.

The Pima County MSCP is part of a larger planning effort known as the Sonoran Desert Conservation Plan (SDCP), which covers 5.9 million acres in Pima County and is focused on six elements: habitat, corridors, cultural resources, mountain parks, ranch conservation and riparian protection. The SDCP planning process began in 1998 as a way to create a science-based conservation plan, update the county's comprehensive land use plan, and comply with the ESA. The plan directs growth to areas with the least natural, historic, and cultural resource values as well as sets aside sensitive habitat through land acquisitions. As of 2006 the county had built a conservation land reserve of 77,000 acres. (Pima County, 2006b)

National Parks, Monuments, Wildlife Refuges and Wilderness Areas

The AMA Planning Area contains eleven Wilderness Areas administered by the Bureau of Land Management (BLM), five by the National Forest Service (USFS) and one administered by the National Park Service. The Planning Area also includes one National Wildlife Refuge (NWR), one National Park and four National Monuments (Figure 8.0-13). The national park and one national monument also contain wilderness areas. In total there are over 823,000 acres of protected federal lands in the planning area, accounting for approximately 9% of the land area. The Tucson AMA contains the largest amount of protected areas with almost 372,000 acres.

[2] An "endangered species" is defined by the USFWS as "an animal or plant species in danger of extinction throughout all or a significant portion of its range," while a "threatened species" is "an animal or plant species likely to become endangered whithin the forseeable future throughout all or a significant portion of its range.
[3] As defined by the ESA, to take means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in other conduct" (16 U.S.C. section 1531[18])
[4] "Incidental take' is defined by the ESA as a take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (50 C.F.R. section 17.22 and 17.32).

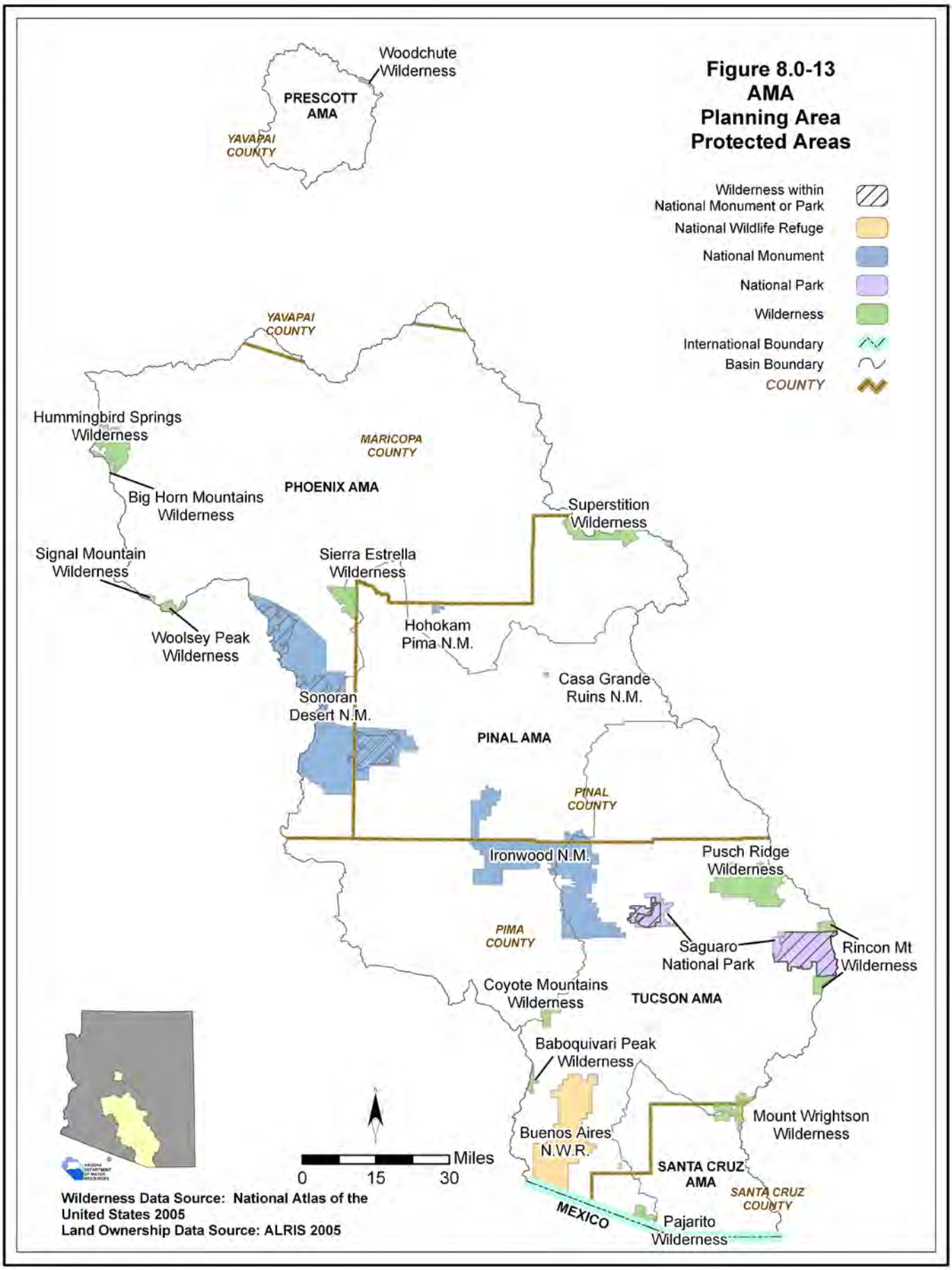


Figure 8.0-13
AMA
Planning Area
Protected Areas
Wilderness within National Monument or Park
National Wildlife Refuge
National Monument
National Park
Wilderness
International Boundary
Basin Boundary
COUNTY
Woodchute Wilderness
PRESCOTT AMA
YAVAPAI COUNTY
YAVAPAI COUNTY
Hummingbird Springs Wilderness
MARICOPA COUNTY
PHOENIX AMA
Big Horn Mountains Wilderness
Superstition Wilderness
Signal Mountain Wilderness
Sierra Estrella Wilderness
Hohokam Pima N.M.
Woolsey Peak Wilderness
Casa Grande Ruins N.M.
Sonoran Desert N.M.
PINAL AMA
PINAL COUNTY
Ironwood N.M.
Pusch Ridge Wilderness
PIMA COUNTY
Saguaro National Park
Rincon Mt Wilderness
Coyote Mountains Wilderness
TUCSON AMA
Baboquivari Peak Wilderness
Mount Wrightson Wilderness
Buenos Aires N.W.R.
SANTA CRUZ AMA
SANTA CRUZ COUNTY
MEXICO
Pajarito Wilderness
Miles
0 15 30
Wilderness Data Source: National Atlas of the United States 2005
Land Ownership Data Source: ALRIS 2005

Nine wilderness areas are entirely within the planning area as well as parts of eight others. Wilderness Areas are designated under the 1964 Wilderness Act to preserve and protect the designated area in its natural condition. Designated wilderness areas, their size, basin location and a brief description of the area are listed in Table 8.0-3.

The largest protected area in the planning area consists of approximately 259,000 acres of the 496,000-acre Sonoran Desert National Monument. The monument, located in the Phoenix and Pinal AMAs, was established by executive proclamation in 2001 and contains extensive areas of saguaro cactus forest and archeological and historic sites. Two wilderness areas are contained within the monument boundaries. (BLM, 2008)

The Ironwood Forest National Monument, located in the center of the planning area in the Tucson and Pinal AMAs, includes over 129,000 acres. An additional 60,000 acres of state trust land and private inholdings are contained within the boundary of the monument but do not have national monument status. Designated in 2000, several endangered and threatened species are found in the monument as well as more than 200 sites dating from the Hohokam period (600 A.D. to 1440 A.D). (BLM, 2008)

Other national monuments in the AMA Planning Area include the Hohokam Pima National Monument in the Phoenix AMA, and the Casa Grande Ruins National Monument in the Pinal AMA. Both national monuments protect ancient Hohokam ruins. The village at the Hohokam Pima National Monument, located on the Gila River Indian Community reservation, was recovered with earth in the 1960s and is not open to the public (NPS, 2008a). Casa Grande Ruins National Monument was created as the nation's first archeological reserve in 1892 and was declared a national monument in 1918. The monument preserves the ancient farming community and its "Great House" (NPS, 2008b). Tumacácori National Historical Park, located in the Santa Cruz AMA, protects three Spanish colonial mission ruins: Tumacácori, Guevavi, and Calabazas, located at three separate sites. Mission San Jose de Tumácacori was established in 1691 and is the main site, located on 310 acres at the town of Tumacácori south of Tubac.

The only national park in the planning area, Saguaro National Park, preserves over 83,000 acres in two distinct districts, the Rincon Mountain District and the Tucson Mountain District. The park is located on the east and west sides of Tucson in the Tucson AMA. Saguaro National Park is thought to be home to ten species of threatened, endangered, or sensitive plants. Seventy-five percent of the park is designated as wilderness. (NPS, 2008c)

The Buenos Aires National Wildlife Refuge, located in the Tucson AMA, contains over 118,000 acres of habitat for threatened and endangered plants and animals including reintroduced populations of masked bobwhite quail and pronghorn antelope. Concerns about public safety have caused managers to close approximately 3,500 acres of this NWR to the public along the U.S./Mexico border. (USFWS, 2008)

Table 8.0-3 Wilderness areas in the AMA Planning Area

Wilderness Area	Acres in the Planning Area	AMA	Description
Baboquivari Peak	2,738	Tucson	Includes Baboquivari Peak; oak, walnut, and pinyon at higher elevations and saguaro, paloverde, and chaparral at lower elevations.
Big Horn Mountains	3,082 (Partial)	Phoenix	Desert plain escarpments, hills, fissures, chimneys and narrow canyons.
Coyote Mountains	4,483	Tucson	Rugged peaks, rounded bluffs, sheer cliff faces and large open canyons with paloverde, saguaro, chaparral, and oak woodlands.
	1,309	Pinal	
Hummingbird Springs	24,453 (Partial)	Phoenix	Includes Sugarloaf Mountain which rises steeply from the Tonopah Desert plains.
Mount Wrightson	10,322	Tucson	Deep canyons, ridges and peaks surrounded by semiarid hills and sloping grasslands. Ponderosa pine, douglas-fir and montane Mexican plants that grow nowhere else north of the border.
	5,542	Santa Cruz	
North Maricopa Mountains*	24,353 (Partial)	Phoenix	Low-elevation Sonoran Desert mountain range and extensive surrounding desert plains.
Pajarito	7,553	Tucson	Includes narrow Sycamore Canyon and Sycamore Creek with rolling hills and oak woodlands.
Pusch Ridge	56,769	Tucson	Pine, fir, aspen, and maple forests; elevation ranging from 2,800 feet to over 9,100 feet.
Rincon Mountain	11,127	Tucson	Desert grasses at the lower elevations and steep hillsides of pinyon, juniper, and oak above deep canyons at higher elevations.
Saguaro*	68,399	Tucson	Vegetation varies with elevation and includes desert scrub, desert grassland, oak woodland, pine-oak woodland, pine forest and mixed conifer forest.
Sierra Estrella	11,715	Phoenix	Steep slopes and rocky canyons with diverse plant communities.
	3,041	Pinal	
Signal Mountain	1,830 (Partial)	Phoenix	Sharp volcanic peaks, steep-walled canyons, arroyos, craggy ridges and outwash plains.
South Maricopa Mountains*	21,331 (Partial)	Phoenix	Low-elevation Sonoran Desert mountain range and extensive surrounding desert plains.
Superstition	22,179 (Partial)	Phoenix	Rugged mountains, rock formations, large vegetation range, prehistoric dwellings, riparian habitat.
Table Top	34,715	Pinal	Includes Table Top Mountain with a 40-acre summit of desert grassland, narrow ridges, wide canyons, lava flows, and washes lined with mesquite and ironwood.
Woodchute	1,411 (Partial)	Prescott	Views, ponderosa pine, pinyon and juniper.
Woolsey Peak	4,913 (Partial)	Phoenix	Sloping lava flows, basalt mesas, rugged peaks and ridges.
Total	**321,539**		

Sources: BLM 2008, USFS 2008, NPS 2008c
* Wilderness areas are within the boundaries of a National Monument of National Park

8.0.5 Population

Population in the planning area has rapidly increased over the last few decades. Between 1990 and 2000 the population in the AMA Planning Area increased by 38%; population increased an additional 25% between 2000 and 2006. Census data for 2000 show a population of approximately 4.1 million residents and Arizona Department of Economic Security (DES) population projections suggest that the planning area population will more than double by 2030. Historic, current and projected AMA populations are shown in the cultural water demand tables for each AMA in Sections 8.1 - 8.5.

The most populous AMA is the Phoenix AMA with approximately 75% of the total planning area population in 2000. The Tucson AMA has the second largest percentage of population in the planning area with 20% in 2000. The 2000 Census populations for each AMA and Indian reservations are shown in Table 8.0-4.

AMA population is growing rapidly as Arizona was the second fastest growing state from 2000 to 2006, with a 20.2% population increase. Almost all AMAs experienced growth rates in excess of the state average. During this time period Prescott AMA population increased by 29%, Phoenix AMA population increased by 25% and the Pinal AMA population grew by 68%. The Tucson AMA population increased at a lower rate of 19% during this period.

Table 8.0-4 2000 Census population of AMAs and Indian reservations

AMA/Reservation	2000 Census Population
Phoenix AMA	3,056,706
Gila River	*7,855*
Fort McDowell Yavapai	*929*
Salt River Pima-Maricopa	*6,243*
Tucson AMA	811,307
Pascua Yaqui	*3,315*
Tohono O'odham	*2,034*
Pinal AMA	93,580
Ak-Chin	*752*
Gila River	*3,435*
Tohono O'odham	*3,016*
Prescott AMA	85,742
Yavapai-Prescott	*183*
Santa Cruz AMA	35,579
Total	***4,082,914***

In the Santa Cruz AMA, population increased by 22% mostly in unincorporated areas. While the City of Nogales population growth rate has remained nearly constant at approximately 0.71% per year, the growth rate in the unincorporated areas of the AMA has risen from approximately 6.3% per year during the 1990s to 8.1% per year in the period between 2000 and 2006. The total population estimate for the unincorporated communities exceeded that of the City of Nogales for the first time in 2006.

Table 8.0-5 Communities in Active Management Areas with a Census population greater than 1,000 (listed by 2000 population)

Communities	Basin	1990 Census Pop.	2000 Census Pop.	Percent Change 1990-2000	2006 Pop. Estimate	Percent Change 2000 2006	Projected 2030 Pop.
Phoenix	Phoenix AMA	983,392	1,321,045	34%	1,505,265	14%	2,201,843
Tucson	Tucson AMA	405,371	486,699	20%	534,685	10%	671,225
Mesa	Phoenix AMA	288,104	396,375	38%	451,360	14%	584,866
Glendale	Phoenix AMA	147,864	218,812	48%	243,540	11%	322,062
Scottsdale	Phoenix AMA	130,075	202,705	56%	237,120	17%	286,020
Chandler	Phoenix AMA	89,862	176,581	97%	235,450	33%	283,792
Tempe	Phoenix AMA	141,993	158,625	12%	165,890	5%	197,970
Gilbert	Phoenix AMA	29,122	109,697	277%	185,030	69%	300,295
Peoria	Phoenix AMA	50,675	108,364	114%	145,135	34%	306,070
Avondale	Phoenix AMA	16,169	35,883	122%	72,210	101%	123,265
Prescott	Prescott AMA	26,592	33,938	28%	42,085	24%	68,099
Apache Junction	Phoenix AMA	18,092	31,814	76%	35,685	12%	113,928
Surprise	Phoenix AMA	7,122	30,848	333%	98,140	218%	401,458
Oro Valley	Tucson AMA	6,670	29,700	345%	40,215	35%	60,344
Casa Grande	Pinal AMA	19,076	25,224	32%	38,455	52%	114,613
Prescott Valley	Prescott AMA	8,904	23,535	164%	35,740	52%	73,737
Nogales	Santa Cruz AMA	19,489	20,878	7%	21,765	4%	26,356
Fountain Hills	Phoenix AMA	10,030	20,235	102%	24,990	23%	33,810
Goodyear	Phoenix AMA	6,258	18,911	202%	49,720	163%	299,397
Florence	Pinal AMA	7,321	14,466	98%	21,295	47%	63,791
Paradise Valley	Phoenix AMA	11,773	13,664	16%	14,000	2%	15,352
Marana	Tucson AMA	2,187	13,556	520%	30,435	125%	89,761
Eloy	Pinal AMA	7,211	10,375	44%	11,535	11%	40,571
Buckeye	Phoenix AMA	4,436	8,497	92%	31,745	274%	419,146
Chino Valley	Prescott AMA	4,837	7,835	62%	12,700	62%	30,286
Coolidge	Pinal AMA	6,934	7,786	12%	9,950	28%	37,609
El Mirage	Phoenix AMA	5,001	7,609	52%	32,605	329%	38,717
South Tucson	Tucson AMA	5,171	5,490	6%	5,805	6%	5,675
Guadalupe	Phoenix AMA	5,458	5,228	-4%	5,570	7%	5,983

Table 8.0-5 Communities in Active Management Areas with a Census population greater than 1,000 (cont)

Communities	Basin	1990 Census Pop.	2000 Census Pop.	Percent Change 1990-2000	2006 Pop. Estimate	Percent Change 2000 2006	Projected 2030 Pop.
Tolleson	Phoenix AMA	4,434	4,974	12%	6,520	31%	10,193
Queen Creek	Phoenix AMA	2,667	4,316	62%	18,690	333%	72,947
Litchfield Park	Phoenix AMA	3,303	3,810	15%	4,890	28%	10,510
Cave Creek	Phoenix AMA	2,925	3,728	27%	4,865	30%	9,656
Superior	Phoenix AMA	3,468	3,254	-6%	3,325	2%	4,249
Sahuarita	Tucson AMA	1,629	3,242	99%	18,035	456%	84,714
Youngtown	Phoenix AMA	2,542	3,010	18%	6,320	110%	7,359
Carefree	Phoenix AMA	1,657	2,927	77%	3,785	29%	6,097
Maricopa	Pinal AMA	-	1,482	N/A	25,830	1643%	90,521
Dewey - Humboldt	Prescott AMA	-	-	N/A	4,230	N/A	6,082
Total > 1,000		2,487,814	3,575,118	44%	4,434,610	24%	7,518,369
Other		466,829	507,796	9%	651,364	28%	1,099,742
Total		**2,954,643**	**4,082,914**	38%	**5,085,974**	25%	**8,618,111**

Source: DES 2005, US Census Bureau 2006

Shown in Table 8.0-5 are communities in the planning area with 2000 Census populations greater than 1,000 persons and growth rates for two time periods: 1990-2000 and 2000-2006. As shown, there are a number of rapidly growing communities in the planning area. The community of Maricopa in the Pinal AMA grew 1,643% between 2000 and 2006. The community of Marana in the Tucson AMA grew 520% between the years 1990 and 2000 and an additional 125% from 2000 to 2006. Many other communities in the planning area have grown by several hundred percentage points during one or both time periods. Gilbert, Surprise and Goodyear, all in the Phoenix AMA, grew by more than 200% between 1990 and 2000. The Town of Prescott Valley in the Prescott AMA grew by 164% in the same time period.

Population Growth and Water Use

A variety of regulatory programs and local initiatives affect water use in conjunction with growth within the AMAs. Three examples at the state level that affect multiple AMAs include the Assured Water Supply Program, Growing Smarter legislation, and Community Water System Planning. Locally, communities and counties may have programs or requirements that address growth and water use through impact fees, zoning, planning guidelines and ordinances. Ordinances may include water conservation features in new construction and landscape restrictions; information on these ordinances may be obtained by contacting local planning and zoning departments.

In the Tucson AMA, the Sonoran Desert Conservation Plan was initiated by Pima County in

1998 in response to conservation needs of rare species, and as an effort to balance growth and environmental concerns. The 50-year plan covers 59 million acres within Pima County. The SDCP was incorporated into Pima County's comprehensive land use plan in 2001 and addresses issues such as land use and water availability.

The Groundwater Code established within each AMA a five-member Groundwater Users Advisory Council (GUAC). Members of the councils are appointed by the governor to represent the users of groundwater in the AMA, and on the basis of their knowledge, interest, and experience with problems relating to the development, use and conservation of water. The GUACs provide recommendations on groundwater management programs and policies to the AMA area director, and to the Director of the Department.

A number of citizen-based advocacy groups, and government-sponsored advisory groups, also provide input into the growth and water use decision-making process within the AMA Planning Area. These groups may include municipal and regional water users associations; watershed groups; county water advisory councils; non-profit conservation groups; water augmentation authorities; and county associations of government.

Assured Water Supply Program

The Department's Assured Water Supply (AWS) program, created as part of the 1980 Groundwater Management Code, is designed to preserve groundwater resources and to promote long-term water supply planning in the AMAs. This is accomplished through regulations that limit the use of groundwater by new subdivisions that require a "Certificate" of AWS and by "Designated" Water Providers that have demonstrated an AWS for their entire service area. The AWS Program also provides consumer protection by requiring developers to demonstrate that sufficient water supplies are available for new subdivisions prior to sale.

Every developer proposing to build a new subdivision is required to demonstrate an AWS that will be physically, legally, and continuously available for the next 100 years before the developer can record plats or sell parcels. The Arizona Department of Real Estate will not issue a Public Report, which allows the developer to sell lots, without a demonstration of an AWS.

In 1995, the Department adopted AWS Rules to implement the AWS statutes. An important component of the AWS Rules is the requirement to demonstrate that renewable water supplies will be used rather than mined groundwater. This requirement did not apply to the Prescott AMA until 1999 when the AMA was declared to no longer be in a safe-yield condition.

The Santa Cruz AMA was established July 1, 1994 near the end of the period when the AWS Rules were being drafted. Consequently, it was not possible to include rule provisions that applied to the management goal of the Santa Cruz AMA at that time since goal criteria had not been developed. Although the general Rule provisions apply, the Department is still developing specific AWS Rules for the Santa Cruz AMA where relatively limited groundwater storage capacity directly influences the availability of water supplies and where the hydrologic situation may affect the course of population growth in this AMA.

Table 8.0-6 Designated water providers in the AMA Planning Area

Water Provider Name	Active Management Area	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated Demand (af/yr)	Year of Projected or Annual Estimated Demand
Apache Junction Water Facility	Phoenix	Pinal	26-400989.0000	06/09/03	02/01/05	2,769	2011
Chapparal City Water Company	Phoenix	Maricopa	26-401242.0000	02/11/04	04/07/04	8,000	2014
City of Avondale	Phoenix	Maricopa	86-002003.0001	06/11/07	02/04/08	21,186	2010
City of Chandler	Phoenix	Maricopa	26-002009.0000	02/15/95	12/31/97	63,615	2010
City of El Mirage	Phoenix	Maricopa	26-400054.0000	03/22/99	11/02/99	7,695	2010
City of Glendale	Phoenix	Maricopa	26-002018.0000	03/15/95	09/25/97	57,074	2010
City of Goodyear	Phoenix	Maricopa	26-402090.0000	04/07/06	01/27/08	15,940	2010
City of Mesa	Phoenix	Maricopa	26-002023.0000	05/28/96	09/19/97	105,061	2010
City of Peoria	Phoenix	Maricopa	26-400679.0000	01/18/02	10/17/02	39,325	2010
City of Phoenix	Phoenix	Maricopa	26-002030.0000	10/11/96	12/31/97	356,521	2010
City of Scottsdale	Phoenix	Maricopa	26-400619.0000	10/11/01	04/25/02	105,986	2008
City of Surprise	Phoenix	Maricopa	26-300431.0000	11/11/97	09/07/99	20,334	2010
City of Tempe	Phoenix	Maricopa	26-002043.0000	03/27/97	12/31/97	70,462	2010
Johnson Utilities	Phoenix	Pinal	26-400665.0000	12/26/01	08/12/03	5,633	2011
Town of Gilbert	Phoenix	Maricopa	26-402208.0000	06/19/06	10/30/07	70,954	2010
City of Casa Grande	Pinal	Pinal	26-400728.0000	05/06/02	07/21/03	4,113	2013
City of Eloy	Pinal	Pinal	26-402148.0000	05/10/06	02/20/07	49,159	2015
Johnson Utilities	Pinal	Pinal	26-401382.0000	05/26/04	10/14/05	551	2007
Santa Cruz Water Company	Pinal	Pinal	26-402008.0000	01/24/06	12/27/07	23,979	2013
Town of Florence	Pinal	Pinal	26-401284.0000	03/12/04	01/25/05	12,310	2014
City of Prescott	Prescott	Yavapai	26-401501.0000	09/02/04	09/16/05	14,350	2014
Baca Float Water Company, Inc.	Santa Cruz	Santa Cruz	26-400800.0000	08/13/02	11/17/04	333	2011
City of Nogales	Santa Cruz	Santa Cruz	26-401358.0000	05/14/04	04/19/05	6,322	2009
City of Tucson	Tucson	Pima	26-400957.0000	04/29/03	06/12/07	183,956	2015
Marana Municipal Water System	Tucson	Pima	26-402254.0000	07/31/06	05/07/07	7,580	2017
Metropolitan Domestic Water Imp. Dist. - West	Tucson	Pima	26-401922.0000	10/20/05	09/25/06	1,014	2016
Metropolitan Domestic Water Improvement District	Tucson	Pima	26-401062.0000	09/02/03	07/31/06	13,302	2016
Sahuarita Water Company	Tucson	Pima	26-401203.0000	01/06/04	12/01/04	2,578	2014
Spanish Trail WC	Tucson	Pima	26-000170.0000	07/18/97	04/16/96	1,843	2005
Town of Oro Valley	Tucson	Pima	26-400765.0000	07/01/02	06/26/03	15,049	2013
Vail Water Company	Tucson	Pima	26-401752.0000	05/03/05	11/10/05	3,749	2015
Willow Springs Utilities Company	Tucson	Pinal	26-402225.0000	07/06/06	04/15/08	2,635	2017

Following adoption of the AWS Rules, rapid population growth in the Pinal AMA led to modification of the AMA's AWS Rules in order to reduce the over allocation of groundwater supplies. This rule change, which took effect on October 1, 2007, substantially reduced the volume of groundwater that can be used without replenishment by new developments, from close to 100% under the old rules to as little as 10% under the new rules.

Under the AWS Rules, the developer can prove a 100 year water supply by satisfying the requirements to obtain a Certificate of AWS or by a written commitment of service from a provider with a Designation of AWS. The AWS Rules list in detail what an applicant for a Certificate of AWS or a Designation of AWS must demonstrate. In addition to securing a water supply that is physically, legally, and continuously available for the next 100 years, the developer, in order to obtain a Certificate, must prove that the supply is of sufficient quality and is consistent with the AMA management goal and management plan. Finally, the developer must demonstrate the financial capability to construct any necessary water storage, treatment, and delivery systems. Water providers seeking a Designation of AWS must demonstrate a 100-year water supply for their entire service area for both current and committed demand, as well as projected demand. A list of current Designated water providers in the planning area can be found in Table 8.0-6.

Before the AWS program was created in 1980, the Adequate Water Supply program was effective statewide. This program was created in 1973 as a consumer protection program and is still in effect outside the AMAs. If a developer can successfully demonstrate that water of sufficient quality will be physically, legally and continuously available for the next hundred years, the Department will issue a Water Adequacy Report with a determination that the water supply is adequate. If the Department determines that there is an inadequate water supply, the developer can still sell the lots but must disclose this fact to potential buyers. Because the Adequate Water Supply program was in effect in the planning area prior to 1980, some Water Adequacy Reports issued for older developments in the AMAs exist.

Prior to obtaining a Certificate of AWS, developers also have the option to obtain an Analysis of AWS (Analysis). An Analysis is generally used to prove that water will be physically available for master planned communities but may be used to demonstrate other criteria required for a Certificate of AWS. An applicant for an Analysis must demonstrate that one or more of the requirements for an AWS are met, but need not demonstrate that all have been met. If an Analysis is issued for groundwater, it reserves a specific volume of water for 10 years for the specific property that is the subject of the Analysis. However, an Analysis cannot be used to obtain a Public Report and must be followed by a complete demonstration of all the criteria to obtain a Certificate of AWS.

A summary of the planning area's AWS determinations including AWS Certificates (27's), Analysis of AWS (28's), Water Adequacy Reports (53's) and AWS Designations (26's) can be found in Table 8.0-7. Detailed information on individual subdivisions are found in the AMA Assured Water Supply sections, 8.1.9- 8.5.9.

Growing Smarter

Four out of the five counties in the planning area have requirements under the Growing Smarter Plus Act of 2000 (GSP Act). The GSP Act requires that counties with a population greater than 125,000

Table 8.0-7 Assured Water Supply determinations in the AMA Planning Area

	AWS Certificates	Analysis of AWS	Water Adequacy Reports	AWS Designations
Phoenix AMA	865	18	196	15
Pinal AMA	192	18	16	5
Prescott AMA	104	2	9	1
Santa Cruz AMA	34	6	32	2
Tucson AMA	201	4	90	9
Total	**1396**	**48**	**343**	**32**

Note: Totals do not include change of ownership or re-issuance of AWS Certificates

(2000 Census) include planning for water resources in their Comprehensive Plans. Counties in the planning area that must meet this requirement are Maricopa, Pinal, Pima and Yavapai. Santa Cruz is the only county in the planning area with a population less than 125,000 residents.

The GSP Act also requires that 30 communities in the AMAs include a water resources element in their general plan. These communities are:

Phoenix AMA	Apache Junction
	Avondale
	Buckeye
	Cave Creek
	Chandler
	El Mirage
	Fountain Hills
	Gilbert
	Glendale
	Goodyear
	Mesa
	Paradise Valley
	Peoria
	Phoenix
	Queen Creek
	Scottsdale
	Surprise
	Tempe
Pinal AMA	Casa Grande
	Eloy
	Florence
	Maricopa City
Prescott AMA	Chino Valley
	Prescott
	Prescott Valley
Santa Cruz AMA	Nogales
Tucson AMA	Marana
	Oro Valley
	Sahuarita
	Tucson

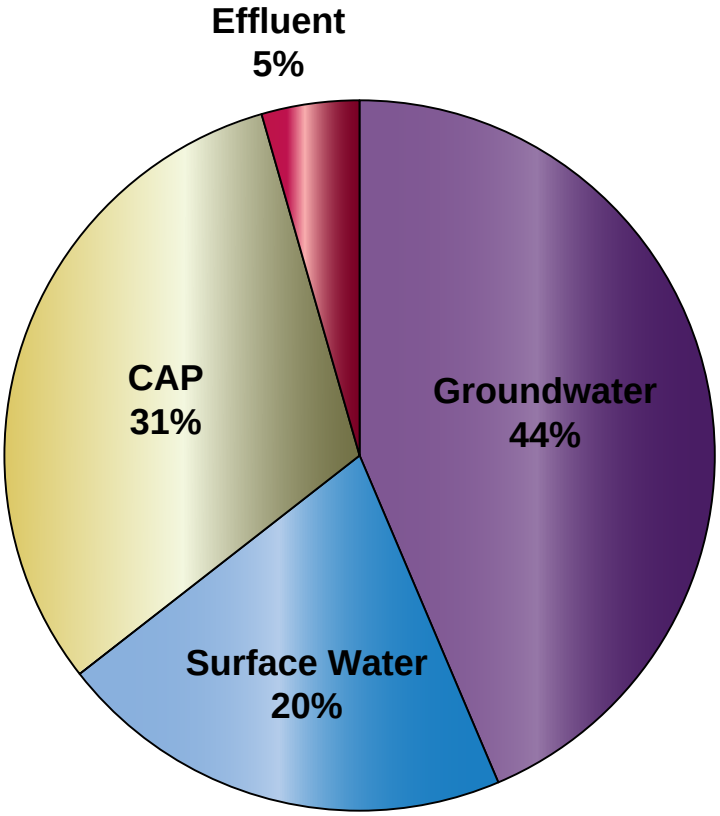
As of December, 2007, all but Nogales had complied with the general plan requirement. Plans must consider water demand and water resource availability in conjunction with growth, land use and infrastructure. These plans may contain useful water resource information.

Community Water System Planning

Beginning in 2007, all community water systems in the state are required to submit annual water use reports and system water plans to the Department. The reports and plans are intended to reduce community water systems' vulnerability to drought, and to promote water resource planning to ensure that water providers are prepared to respond to water shortage conditions. Community water systems located within the AMA Planning Area have been reporting their annual water use to the Department and have been regulated under the Department's mandatory municipal conservation program since the early 1980s. They are now subject to the system water plan requirements, though exemptions from some components of the plans may apply for large municipal providers, as well as providers with an AWS designation.

The Department is working to establish local drought impact groups (LDIGs) throughout the state. LDIGs are county-level groups that will coordinate drought preparedness at the local level. They are led by the county extension agent and county emergency manager, and have three main objectives: collect and report drought impact information, coordinate drought public awareness, and develop and implement local mitigation and response options. Participants include municipal and private water providers, irrigation districts, tribal governments, local non-governmental organizations, state/federal agencies, and other interested citizens. LDIGs have been established in Cochise, Yavapai, Santa Cruz, Pinal, Pima, Graham, Greenlee, and Navajo Counties. Formation of LDIGs in the remaining counties are planned for 2008-2009.

Figure 8.0-14 Water supply utilized in the AMA Planning Area



8.0.6 Water Supply

Water supplies in the AMA Planning Area include Central Arizona Project (CAP) water, surface water, groundwater and effluent. As shown in Figure 8.0-14, on average more than half of the annual water demand in the planning area from 2001-2003 was met with non-groundwater supplies. Non-groundwater or renewable supplies in the planning area are comprised mainly of CAP water and surface water diverted from the Salt, Verde, Gila, Agua Fria or Santa Cruz rivers. Effluent is also a growing non-groundwater source used in the planning area. Non-groundwater supplies were the primary water supply source in the Pinal and Phoenix AMAs between 2001-2003. In the Pinal AMA,

53% of the average annual water demand between 2001-2003 was met with a non-groundwater source and 47% of the demand was met with groundwater. The Phoenix AMA also relies heavily on non-groundwater sources. 62% of its average annual demand in 2001-2003 was met with non-groundwater sources and 38% of its demand was met with groundwater.

In 2001-2003, an average of 45% of the planning area water demand was met with groundwater. The Prescott AMA used solely groundwater supplies with the exception of small amounts of effluent during this period. The Santa Cruz AMA uses a combination of groundwater, and surface water from the younger alluvium that is withdrawn from wells and collectively considered groundwater. Between 2001 and 2003, the Tucson AMA used approximately 73% groundwater and 27% non-groundwater supplies to meet demands. The percentage of non-groundwater sources, primarily CAP, used in the Tucson AMA has increased rapidly over the last five years due to the increased recharge and recovery capacity in the municipal sector.

Central Arizona Project Water

The primary non-groundwater source in the planning area is CAP water. The CAP was constructed to annually deliver 1.5 maf of Arizona's allocation of Colorado River water to Pima, Pinal and Maricopa counties through a series of canals and pumping stations. (See Figure 8.0-15) The project is 336 miles long and lifts Colorado River water 2,400 feet to its final destination just south of the City of Tucson. Water is withdrawn at Lake Havasu at the Mark Wilmer Pumping Plant. It then crosses the Parker, Ranegras Plain and Harquahala basins via the Hayden-Rhodes Aqueduct to the CAP service area in central and southern Arizona.

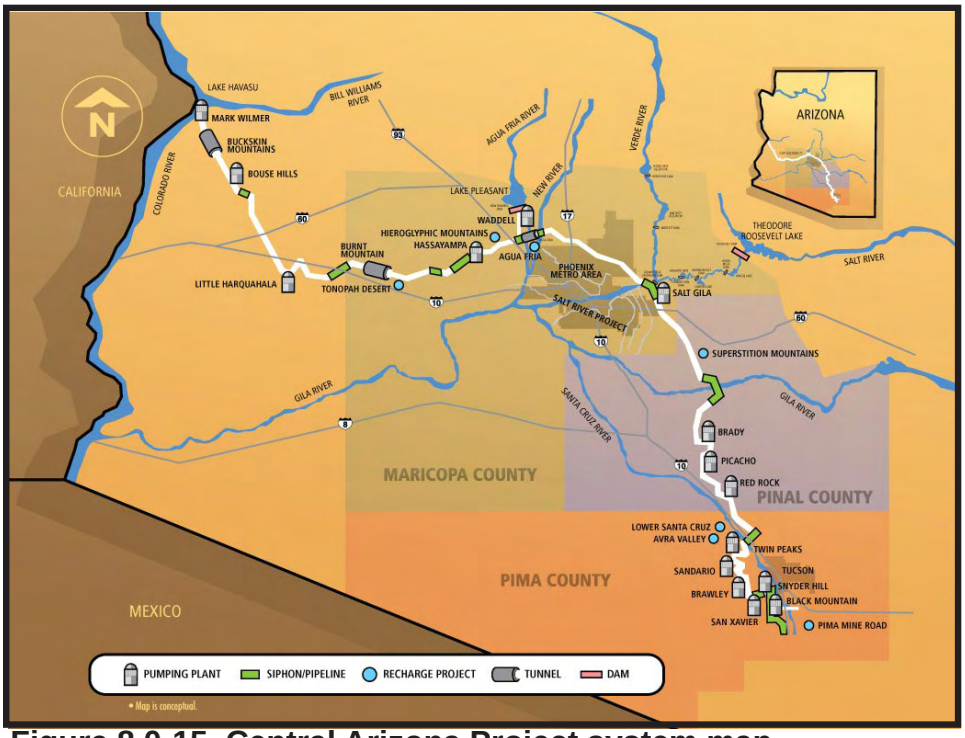


Figure 8.0-15 Central Arizona Project system map
(Source: CAP, 2008)

The CAP canal enters the planning area on the western side of the Phoenix AMA and runs toward the east and southeast across much of the AMA. A significant portion of CAP water is stored in Lake Pleasant behind New Waddell Dam at the northern edge of the Phoenix AMA. It then travels in a southerly direction and enters the Pinal AMA north of Florence, crosses the northeastern portion of the AMA and enters the Tucson AMA near Picacho Peak. The CAP canal terminates at Pima Mine Road in the Tucson AMA just south of the San Xavier District of the Tohono O'odham Nation. Turnouts from the CAP aqueduct connect it to municipal water treatment plants and irrigation district canals for distribution. CAP water is used both directly and

indirectly through the Department's recharge program, in the Phoenix, Pinal and Tucson AMAs. CAP was first used in the planning area in 1985.

There are three main CAP user categories: municipal and industrial (M&I), non-Indian agricultural and Indian. Almost all non-Indian agricultural subcontracts have been declined or terminated and CAP water is used pursuant to the Department's recharge program discussed below. The status of CAP subcontracts as of March 2008 is found in Appendix B. According to the status report, subcontract totals were:

M&I Subcontracts	620,678 acre-feet
Indian Contracts	555,806 acre-feet
Non-Indian Agricultural Subcontracts	9,026 acre-feet
Currently Uncontracted Water	155,787 acre-feet
Other Under Contract	73,703 acre-feet

To encourage the direct use of renewable water supplies, the recharge program restricts the type of water that may be stored long-term to renewable sources that cannot be used directly. Persons who wish to store water through the recharge program must apply to the Department for permits. There are two types of facilities and associated permits; Underground Storage Facility (USF) Permits and Groundwater Savings Facility (GSF) Permits. In addition, a Water Storage (WS) Permit (A.R.S. § 45-831.01) allows the permit holder to store water at a USF or a GSF and a Recovery Well (RW) Permit (A.R.S. § 45-834.01) allows the permit holder to recover long-term storage credits or to recover stored water annually.

CAP water use on non-Indian agricultural land is pursuant to GSF Permits (A.R.S. § 45-812.01), which allows the permit holder to deliver a renewable water supply, called "in lieu" water, to a recipient (farm) who agrees to replace groundwater pumping with in lieu water, thus creating a groundwater savings. The permit holder accrues recharge credits which can be recovered later from a well elsewhere in the AMA (or INA). When withdrawn, the water retains the character of the water that was recharged at the GSF.

A USF Permit (A.R.S. § 45-811.01) allows the permit holder to operate a facility that stores water in the aquifer in one of two ways. A constructed underground storage permit allows water to be stored by using some type of constructed device, such as an injection well or percolation basin. A managed underground storage facility permit allows water to be discharged to a naturally water-transmissive area such as a streambed where the water percolates into the aquifer without the assistance of a constructed device.

Most of the water delivered to recharge facilities in the AMA Planning Area is CAP water with lesser amounts of effluent and surface water. In 2005, over 423,000 acre-feet of CAP water, 91,600 acre-feet of effluent and 11,400 acre-feet of surface water was delivered to USFs and GSFs, for a total of over 526,000 acre-feet delivered. As of 2005, more than 3.7 maf of long term storage credits had been accrued in the AMA Planning Area. The location of GSF and USF sites and facility information is shown on maps and tables in the groundwater conditions section for each AMA.

Surface Water

In addition to CAP water, the principal sources of surface water in the planning area are the Salt and Verde rivers. Most of this water is appropriated to shareholders of the Salt River Valley Water Users Association or Salt River Project (SRP). The SRP was established in 1903 as the nation's first multipurpose reclamation project. Today, it is the nation's third largest public power utility and one of the state's largest water suppliers. Working with other agencies, the SRP manages or assists with the management of seven dams. This reservoir system is utilized in conjunction with about 250 groundwater wells to provide water through 131 miles of canal to a 2,900 square mile service area that delivers more than 1 maf of water annually to its customers.. The SRP encompasses portions of the East Salt River Valley and West Salt River Valley sub-basins in the Phoenix AMA, including portions of Glendale, Peoria, Phoenix, Scottsdale, Tempe, Tolleson, Chandler, Gilbert, and Mesa. (SRP, 2008) Historically SRP water was used predominantly for agricultural irrigation; now a large portion of the project's service area is urbanized. In addition to the SRP, the Roosevelt Water Conservation District and the Buckeye Water Conservation District use surface water from the Salt and Verde rivers.

The Gila River is also an important water supply in both the Phoenix and Pinal AMAs where it is used primarily for agricultural irrigation. Water is diverted for the San Carlos Irrigation Project (SCIP) at Ashurst-Hayden Diversion Dam located 12 miles east of Florence in the Pinal AMA. The dam, completed in 1922, consists of diversion works and is not a storage or flood control facility. Diverted water is conveyed to the San Carlos Irrigation and Drainage District (SCIDD), located in the Pinal AMA, consisting of approximately 200 miles of unlined main and lateral canals and 40 miles of canals owned jointly with the SCIP (ADWR, 1998). In addition to agricultural uses, SCIDD delivers Gila River water mixed with groundwater for landscape irrigation to subdivisions, schools, parks, Casa Grande, Coolidge and Florence (ADWR, 1999b). The SCIP also delivers Gila River water to tribal lands within the Gila River Indian Community located in the Phoenix and Pinal AMAs. The Buckeye Water Conservation and Drainage District in the West Salt River Sub-basin of the Phoenix AMA also uses Gila River water as part of its water supply.

Maricopa Water District (MWD) in the West Salt River Valley Sub-basin uses a combination of CAP and Agua Fria River water stored in Lake Pleasant behind New Waddell Dam, which was completed in 1992. This water is delivered to the MWD service area via the 33-mile Beardsley Canal. MWD owned and operated Waddell Dam, the original storage and flood control structure on the Agua Fria River, which was breached and inundated by the enlarged Lake Pleasant. (ADWR, 1998)

A few additional sources of surface water are utilized in the planning area. Santa Cruz River water is diverted for agricultural irrigation by the Central Arizona Irrigation and Drainage District in the Eloy Sub-basin of the Pinal AMA. In the Tucson AMA, surface water diverted from Cienega Creek is used for turf irrigation at Del Lago Golf Course at Vail and springs are the water supply for the community of Summerhaven, located in the Santa Catalina Mountains.

In the Prescott AMA, the City of Prescott has acquired surface water rights to water stored at Watson Lake and Willow Creek reservoirs from the Chino Valley Irrigation District (CVID). Under the agreement the City maintains the lakes for recreational purposes and releases approximately 1,500

acre-feet per year for recharge, which it recovers on an annual basis. As part of the agreement the City of Prescott annually provides up to 1,500 acre-feet of recovered effluent credits to CVID members for irrigation. While the City of Prescott holds surface water rights to water stored at Lynx and Upper Goldwater reservoirs, this water is not used as a water supply.

Groundwater

Groundwater is an important water supply in the planning area. It is the primary water source in the Prescott and Santa Cruz AMAs, as these AMAs do not have access to CAP water. Water supplies are managed jointly as "groundwater" in the Santa Cruz AMA due to the close hydrologic relationship of surface water, groundwater and effluent. Up until relatively recently, the Tucson AMA also relied primarily on groundwater to meet demand. Groundwater is also a vital water supply for the Phoenix and Pinal AMAs, although currently, surface water supplies surpass groundwater supplies in both AMAs. Groundwater is a relatively abundant water supply with maximum well yields in all five AMAs exceeding 4,000 gpm.

As a result of long term groundwater pumping in the AMAs, moderate to severe regional and localized water level declines have occurred. Over time, groundwater declines can lead to increased pumping costs, decrease in water quality, riparian damage, land subsidence and land fissuring, all of which have occurred in the planning area. In the last two decades localized groundwater level rises have also occurred at some locations. Localized water level rises are primarily due to retirement of agricultural lands, use of CAP water in lieu of groundwater and a growing number of underground storage projects.

All groundwater used in the AMAs is currently pumped from within the AMAs. The Groundwater Transportation Act of 1991 restricts the transportation of groundwater from non-AMA groundwater basins to AMAs; however, there are a few exceptions. Specific statutes allow the transportation of groundwater from the Butler Valley, Harquahala and McMullen Valley basins and the Big Chino sub-basin into AMAs. For example, the City of Phoenix owns 14,000 acres of agricultural land in the McMullen Valley Basin allowing it to transport up to 6 maf of groundwater into the Phoenix AMA. The City of Scottsdale has also applied to the Department to transport 3,645 acre-feet of groundwater per year from historically irrigated land in the Harquahala Basin.

Groundwater transportation from the Big Chino Sub-basin of the Verde River Basin, northwest of the Prescott AMA, represents the largest source of alternative water supply currently available for municipal water users within the Prescott AMA. Under A.R.S. § 45-555(E), the City of Prescott may withdraw an amount not to exceed 14,000 acre-feet per year. The Director has issued an advisory opinion that the amount that may be withdrawn by the City of Prescott is 8,717 acre-feet; however, a final determination has not been made. No water may be withdrawn for transportation into the AMA pursuant to this statute until the Director has made a final determination. Additionally, the statute allows for cities and towns to withdraw groundwater associated with historically irrigated acres (HIA) for transportation into the Prescott AMA. The Department will make a determination regarding the volume of water that can be transported from HIA lands after an application in submitted by a city or town. In general, the allotment associated with HIA is 3 acre-feet per acre per year.

In order to improve available groundwater supply information, the Department has established automated groundwater monitoring sites that record water levels in wells. This information is available through an interactive map on the Department's website (www.azwater.gov/dwr/). These devices are generally placed in areas that the Department wishes to monitor closely, such as areas of growth, subsidence and areas affected by drought. Currently there are 70 monitoring sites in the planning area: 34 in the Phoenix AMA; 16 in the Prescott AMA; 11 in the Tucson AMA; five in the Santa Cruz AMA; and four in the Pinal AMA. Index well hydrographs, which display historic water level conditions, are available through an interactive map on the same website for 830 wells in the planning area.

Information on major aquifers, well yields, estimated natural recharge, aquifer flow direction, and water level changes are found in groundwater data tables, groundwater condition maps, hydrographs and well yield maps for each AMA in Sections 8.1.6 through 8.5.6.

Effluent

Effluent, also referred to as reclaimed water, is a growing non-groundwater supply in the AMA Planning Area, accounting for approximately 5% of the annual supply during the 2001-2003 time period. Since effluent production is tied directly to population, population growth generally leads to increased effluent supply. However, lack of infrastructure to deliver effluent to potential users is often a limiting factor. The Phoenix and Tucson AMAs generate the majority of the effluent in the planning area, which is used by agricultural, municipal and industrial sectors.

Many municipalities, as well as private entities in the planning area, recharge effluent in permitted basins and streambeds. This storage in turn earns the entity recharge credits that it can either pump from the ground at a later date through a permitted recovery well, or use towards assured water supply certificates or designations. The option of recharge is often favored by entities as a way of using the effluent if direct use is not possible due to the lack of a distribution system.

There is increasing interest in effluent as a water supply as growth continues and other renewable water sources become more extensively used. Some utilities, for example Tucson Water, Phoenix, Prescott and Scottsdale, have made substantial investments in effluent reuse. Recently, Global Water Resources, a private water and wastewater utility, is promoting reuse technology at new development in Maricopa where its water center uses non-potable water for irrigation and toilet flushing.

Most of the effluent in the Phoenix AMA is generated at the 91st Avenue WWTP. The treatment plant processes approximately 139,000 acre-feet of wastewater annually from much of Glendale, Mesa, Phoenix, Scottsdale, and Tempe, who co-own the facility as part of a multi-city partnership known as SROG, the Sub-regional Operating Group. A large portion of the effluent is used at the Palo Verde Nuclear Generating Station for cooling purposes. Unused effluent from the plant is discharged into the Salt and Gila Rivers, supporting perennial flow and flowing out of the AMA. Effluent is also a water supply for agricultural irrigation. Effluent generated from Phoenix's 23rd Avenue WWTP is used to irrigate crops in the Roosevelt Irrigation District and effluent from Chandler's Lone Butte WWRP is used for irrigation on the Gila River Indian Reservation. In addition to industrial and agricultural uses, effluent is used for landscape and golf course watering.

Major cities in the Phoenix AMA and the City of Tucson in the Tucson AMA have extensive distribution systems for delivery of reclaimed wastewater to golf courses, parks and schools.

In the Pinal AMA, Casa Grande, Coolidge, Eloy and Florence all have municipal WWTPs. These plants deliver treated effluent for a variety of purposes, including agricultural irrigation, golf course watering, and power generation. Florence and Eloy also have permitted underground storage facilities for recharging effluent. The City of Maricopa's wastewater needs are handled by a private utility and the effluent is used for watering turf and filling subdivision lakes. There are several other WWTPs serving unincorporated communities. Effluent from these facilities is used for golf course watering, and in some cases the excess is recharged at underground storage facilities (see Table 8.2-7).

Effluent is an important water supply in the Tucson AMA where it meets approximately 3% of the total AMA water demand. The City of Tucson operates an extensive reclaimed water system that has been in operation since the early1980s. The system consists of almost 160 miles of pipe, 33 mgd of production capacity, 15 million gallons of storage capacity and four supply sources including the Tucson Water Reclaimed Water Treatment Plant, a treatment wetlands and a managed underground storage facility. The system extends throughout the Tucson water service area and extends into northeast Marana near the Tortolita Mountains and interconnects to the Oro Valley system where it is used for golf course irrigation in the Town of Oro Valley. Reclaimed water is delivered to approximately 900 sites in the Tucson Water service area including 14 golf courses, 35 parks, 46 schools and more than 700 single family homes. (Tucson Water, 2007)

Three communities in the Prescott AMA have permitted recharge facilities that receive effluent: the City of Prescott, the Town of Prescott Valley and the Town of Chino Valley. Effluent availability at the Town of Chino Valley is currently limited as the Town is largely unsewered. However it is in the process of constructing a centralized sewer system to serve new and existing developments. Effluent is a source of supply both directly and through recharge and recovery for three golf courses, a community park, and a sand and gravel operation in Prescott, as well as for a golf course at Prescott Valley. Effluent stored by the City of Prescott is recovered by CVID for agricultural irrigation. Effluent stored by Prescott Valley is not currently recovered.

The Nogales International Wastewater Treatment Plant (NIWWTP) is the primary treatment facility in the Santa Cruz AMA. It treats over 16,000 acre-feet of sewage from both Nogales, Arizona and Nogales, Sonora, which is currently discharged to the Santa Cruz River. Several smaller "package" treatment plants provide treatment to developments within the AMA, but do not provide a significant amount of useable effluent.

Contamination Sites

Sites of environmental contamination may impact the use of some water supplies. An inventory of Department of Defense (DOD), Resource Conservation and Recovery Act (RCRA), Superfund, Water Quality Assurance Revolving Fund (WQARF), Voluntary Remediation Program (VRP) and Leaking Underground Storage Tank (LUST) sites was conducted for the planning area. Table 8.0-8 provides a summary of contamination sites, by cleanup program, for each AMA. Tables listing the

contaminant and affected media as well as maps showing the location of all contamination sites can be found in the AMA Water Quality sections.

Table 8.0-8 Contamination sites in the AMA Planning Area

AMA	Leaking Underground Storage Tanks	Voluntary Remediation Program	Resource Conservation and Recovery Act	Department of Defense	Water Quality Assurance Revolving Fund	Superfund
Phoenix	4,042	39	9	1	12	4
Pinal	292	3	1	NA	NA	NA
Prescott	180	3	NA	NA	NA	NA
Santa Cruz	26	1	1	NA	NA	NA
Tucson	1,157	15	2	1	7	1
Total	**5,697**	**61**	**13**	**2**	**19**	**5**

Sources: ADEQ 2002, ADEQ 2006

In the AMA Planning Area there are 61 active VRP sites. The majority (39) of these sites are located in the Phoenix AMA. The VRP is a state administered and funded voluntary cleanup program. Any site that has soil and/or groundwater contamination, provided that the site is not subject to an enforcement action by another program, is eligible to participate. To encourage participation, ADEQ provides an expedited process and a single point of contact for projects that involve more than one regulatory program (Environmental Law Institute, 2002).

There are 14 RCRA sites in the AMA Planning Area, 10 in the Phoenix AMA, two in the Tucson AMA and one each in the Pinal and Santa Cruz AMAs. The RCRA program regulates the management of hazardous waste handlers which includes generators, transporters and facilities for treatment, storage and disposal (ADEQ, 2002). The sites listed in Table 8.0-8 and in the AMA Water Quality sections are RCRA corrective action sites where contamination of groundwater and/or soil has occurred due to improper handling of hazardous waste.

Two DOD sites are located in the AMA Planning Area, the 161st Air National Guard site in the Phoenix AMA and the Davis-Monthan Air Force Base site in the Tucson AMA. DOD sites listed in the AMA Water Quality sections are contamination sites that are located at active duty bases, bases being closed under the Base Realignment and Closure regulations or Formerly Used Defense sites that are eligible for funding under the Installation Restoration Program overseen by ADEQ (ADEQ, 2008).

There are 19 WQARF sites and five Superfund sites in the AMA Planning Area. These sites are located in the Phoenix and Tucson AMAs. WQARF is a state administered funding mechanism created to support hazardous substance cleanup efforts. Superfund is the federal government's program, administered by the Environmental Protection Agency (EPA), to clean up the most contaminated hazardous waste sites across the country. (ADEQ, 2008) Almost all WQARF and Superfund sites in the planning area involve Trichloroethylene (TCE) and/or Tetrachloroethene (PCE) contamination. One Superfund site, 19th Avenue Landfill in the Phoenix AMA, was removed from the National Priorities List (NPL) of Superfund sites in 2006 after the EPA and ADEQ determined that no further cleanup activities were necessary (ADEQ, 2006).

There are 5,697 active LUST sites in the planning area. Four thousand and forty-two sites are located in the Phoenix AMA, 292 in the Pinal AMA, 180 in the Prescott AMA, 26 in the Santa Cruz AMA and 1,157 in the Tucson AMA.

8.0.7 Cultural Water Demand

Total cultural water demand in the AMA Planning Area averaged approximately 3,750,800 acre-feet per year during the 2001-2003 time period; approximately 52% of the total demand in Arizona. Total non-Indian and Indian demand, by water source and water demand sector for each AMA, is shown in Figure 8.0-16 and Table 8.0-9. Tribal demand and non-Indian municipal, agricultural and industrial sector demand are discussed later in this section. Tribal and non-tribal demands are discussed separately because non-Indian water use in AMAs is regulated under the Groundwater Code which requires annual reporting of water use by all groundwater rightholders, compliance with mandatory conservation requirements, and other regulations. As a consequence, these data are generally reported in Departmental and other publications.

As shown in Figure 8.0-16, cultural water demands vary widely between the AMAs due to differences in geographic area, population, land use and available water supplies. Total cultural water demand is the highest in the Phoenix AMA and lowest in the Santa Cruz AMA with an average annual total demand of 2,335,200 acre-feet and 23,800 acre-feet, respectively.

Municipal demand accounted for 34% of the cultural water demand with approximately 1,258,200 acre-feet of average annual demand during the 2001-2003 time period. Municipal demand includes water delivered by a water provider and water withdrawn from domestic (exempt) wells.[5] As would be expected, the Phoenix AMA accounts for the largest (81%) of the total municipal demand in the planning area. Across the AMAs, 61% of the municipal demand is met with CAP, surface water and effluent supplies. As with the agricultural sector, this source of supply differs between AMAs. The Phoenix AMA meets over 71% of its municipal demand with CAP, surface water and effluent supplies while the other AMAs use primarily groundwater.

The agricultural sector is the highest demand sector with 2,211,000 acre-feet or approximately 59% of the total cultural demand. Agricultural demand exists within all AMAs but the volumes vary significantly between them. The largest annual average agricultural demand is in the Phoenix AMA at 1.1 maf (47% of total Phoenix AMA demand) and the smallest is in the Prescott AMA with 6,100 acre-feet (25% of total Prescott AMA demand). The sources of water used to meet demand also vary between the AMAs. Agricultural demand in the Prescott AMA is met with groundwater and recovered effluent credits; surface water use has recently ceased. In the Phoenix and Pinal AMAs, more than half of the agricultural demand is met with CAP, surface water and effluent supplies. In Tucson, approximately 27% of the agricultural demand is met with CAP water and the remainder by groundwater.

Industrial demand accounted for the remaining 7% of the annual cultural water demand within the planning area for the 2001-2003 time period. Although groundwater is the predominant water supply for industrial uses in all AMAs, significant volumes of effluent are used in the Phoenix and

[5] An exempt well is a well having a pump capacity of not more than thirty-five gallons per minute. Within an AMA, a person may withdraw groundwater from an exempt well for a non-irrigation use without a groundwater right or permit.

Figure 8.0-16
AMA Water Demand by Sector and Water Source Avg. 2001-2003

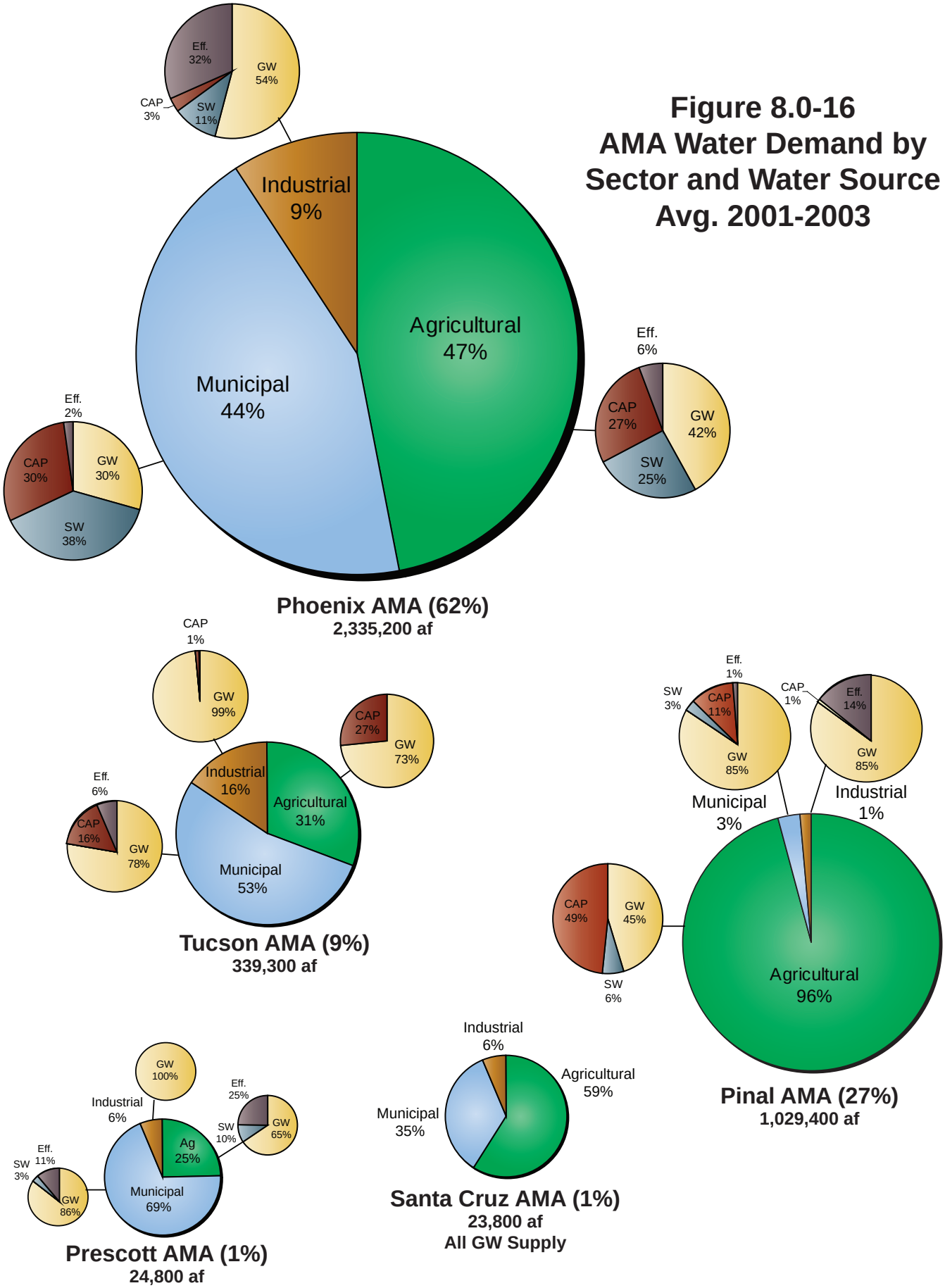


Table 8.0-9 AMA water demand by sector and water source (Indian and Non-Indian) avg. 2001-2003

Phoenix AMA

	Groundwater	Surface Water	CAP	Effluent	Total
Municipal					
Non-Indian	298,200	392,800	302,000	21,600	**1,014,600**
Indian	7,900	200	0	0	**8,100**
Total	**306,100**	**393,000**	**302,000**	**21,600**	**1,022,700**
Industrial					**0**
Non-Indian	115,700	23,400	7,100	67,400	**213,600**
Total	**115,700**	**23,400**	**7,100**	**67,400**	**213,600**
Agricultural					**0**
Non-Indian	388,100	168,900	266,100	65,000	**890,200**[1]
Indian	73,100	108,900	26,900	0	**208,900**
Total	**461,200**	**277,800**	**293,000**	**65,000**	**1,097,000**
Grand Total	**883,000**	**694,200**	**602,100**	**154,000**	**2,333,300**

Prescott AMA[2]

	Groundwater	Surface Water	Effluent	Total
Municipal	14,800	600	1,900	**17,300**
Industrial	1,500	0	0	**1,500**
Agricultural	4,000	600	1,500	**6,100**
Grand Total	**20,300**	**1,200**	**3,400**	**24,900**

Santa Cruz AMA[2]

	Groundwater
Municipal	8,300
Industrial	1,500
Agricultural	14,000
Grand Total	**23,800**

Pinal AMA

	Groundwater	Surface Water	CAP	Effluent	Total
Municipal					
Non-Indian	22,600	800	3,000	400	**26,800**
Indian	1,100	0	0	0	**1,100**
Total	**23,700**	**800**	**3,000**	**400**	**27,900**
Industrial					
Non-Indian	11900	0	100	2,000	**14,000**
Total	**11,900**	**0**	**100**	**2,000**	**14,000**
Agricultural					
Non-Indian	383,800	52,100	409,700	1,600	**847,200**
Indian	60,600	6,100	73,500	0	**140,200**
Total	**444,400**	**58,200**	**483,200**	**1,600**	**987,400**
Grand Total	**480,000**	**59,000**	**486,300**	**4,000**	**1,029,300**

Tucson AMA

	Groundwater	Surface Water	CAP	Effluent	Total
Municipal					
Non-Indian	141,600	80	28,700	11,600	**181,980**
Indian	200	0	0	0	**200**
Total	**141,800**	**80**	**28,700**	**11,600**	**182,180**
Industrial					
Non-Indian	50,600	0	500	200	**51,300**
Indian	1,400	0	0	0	**1,400**
Total	**52,000**	**0**	**500**	**200**	**52,700**
Agricultural					
Non-Indian	76,600	0	16,800	0	**93,400**
Indian	0	0	11,000	0	**11,000**
Total	**76,600**	**0**	**27,800**	**0**	**104,400**
Grand Total	**269,000**	**80**	**57,000**	**11,800**	**337,880**

Total All AMAs

	Groundwater	Surface Water	CAP	Effluent	Total
Municipal					
Non-Indian	485,500	394,280	333,700	35,500	**1,248,980**
Indian	9,200	200	0	0	**9,400**
Total	494,700	394,480	333,700	35,500	**1,258,380**
Industrial					
Non-Indian	181,200	23,400	7,700	69,600	**281,900**
Indian	1,400	0	0	0	**1,400**
Total	182,600	23,400	7,200	69,600	**282,800**
Agriculture					
Non-Indian	866,500	221,600	692,600	68,100	**1,848,800**
Indian	133,700	115,000	111,400	0	**360,100**
Total	1,000,200	336,600	804,000	68,100	**2,208,900**
Grand Total	**1,677,500**	**754,480**	**1,144,900**	**173,200**	**3,750,080**

Pinal AMAs. The nature of the industrial demand differs between the AMAs. Water use by turf-related facilities is the largest industrial demand in the Santa Cruz, Prescott and Phoenix AMAs. In the Tucson AMA, mining accounts for almost 70% of the industrial demand. In the Pinal AMA, dairies and feedlots are the largest industrial demand category, accounting for 47% of the industrial total.

Tribal Water Demand

With the exception of the Santa Cruz AMA, there are tribal lands within all AMAs. Tribal communities, in alphabetical order, are: Ak-Chin Indian Community (Pinal AMA); Fort McDowell Yavapai Nation (Phoenix AMA); Gila River Indian Community (Phoenix and Pinal AMAs); Pascua Yaqui Tribe (Tucson AMA); Salt River Pima-Maricopa Indian Community (Phoenix AMA); Tohono O'odham Nation (Pinal and Tucson AMAs); and Yavapai-Prescott Indian Tribe (Prescott AMA). Annual tribal demand is approximately 371,100 acre-feet per year. Ninety seven percent of tribal demand is agricultural irrigation. Groundwater meets about 39% of all tribal demand with large proportions of surface water (31%) and CAP water (30%) also utilized.

Ak-Chin Indian Community

The Ak-Chin Indian Community is a 21,480-acre area located entirely within the Pinal AMA in northwest Pinal County approximately 50 miles south of the Phoenix metropolitan area. The community has approximately 750 tribal members comprised of both the Tohono O'odham and Pima people (2000 Census). The community includes a 109-acre industrial park and 15,000 acres of irrigated fields (ITCA, 2008). Additionally, in 1994, the Ak-Chin Community entered into a management agreement to construct the Harrah's Phoenix Ak-Chin Casino located within the community.

The Ak-Chin Indian Community was originally allocated 58,300 acre-feet of CAP water in 1983. Pursuant to the community's water rights settlement in 1984, it is entitled to 75,000 acre-feet of Colorado River water in a normal year, 85,000 acre-feet in a surplus year and not less than 72,000 acre-feet in a shortage year. The intended use of the CAP water is irrigation (CAP, 2008). In addition to on-reservation use of CAP water, the Ak-Chin Indian Community has entered into long term CAP lease agreements, primarily with Anthem. In 2007, approximately 7,000 acre-feet of CAP lease water was used by off-reservation users.

Fort McDowell Yavapai Nation

The almost 25,000-acre Fort McDowell Yavapai reservation is located in northeastern Maricopa County approximately 23 miles northwest of Phoenix. The reservation is bisected by the Verde River and is located entirely within the Phoenix AMA. The Nation has slightly more than 900 members comprised of the Yavapai and Apache people (2000 Census). There are a number of commercial operations within the reservation. The Fort McDowell Casino is a gaming facility located adjacent to a 247-room Radisson Resort and Conference Center and the 18-hole We-Ko-Pa Golf Club. Fort McDowell Yavapai Materials is a sand and gravel facility that has been in operation since 1980. The Fort McDowell Tribal Farm includes 2,000 irrigated acres of alfalfa, pecans and citrus.

Recreational activities associated with the Verde River and Fort McDowell Adventures are other tribal enterprises (NAU, 2008; ITCA, 2008).

The Fort McDowell Yavapai Nation was originally allocated 4,300 acre-feet of CAP water in 1983. Pursuant to the tribe's water rights settlement in 1990, the nation now has 18,233 acre-feet of CAP allocation with the intended use identified as tribal homeland (CAP, 2008). In 2007, the City of Phoenix executed a long-term lease of 4,300 acre-feet/year of the Fort McDowell Yavapai Nation entitlement.

Gila River Indian Community

The 373,000-acre Gila River Indian Community (GRIC) reservation straddles the Phoenix and Pinal AMAs, occupying lands on both sides of the Gila River south of Phoenix, Tempe, and Chandler. It is inhabited by 14,000 people of the Pima and Maricopa tribes (ITCA, 2008), with approximately 11,300 inhabitants within the planning area. Industrial parks, gaming facilities and agriculture are the primary demand sectors. There are three industrial parks and a business park that occupy more than 800 acres of developable land. The agricultural industry brings more than $25 million of annual income to the GRIC in the form of 15,000 irrigated acres of GRIC farms and 22,000 independently farmed acres that produce cotton, wheat, millet, alfalfa, barley, melons, pistachios, olives, citrus and vegetables (ITCA, 2008). The Wild Horse Pass Casino and Vee Quiva collectively form the Gila River Casinos. The Sheraton Wild Horse Pass Resort and Spa includes a 17,500 square foot spa, two 18-hole golf courses, an equestrian center, and a 2½ mile long replica of the Gila River with scenic boat rides (NAU, 2008; ITCA, 2008).

The GRIC was originally allocated 173,100 acre-feet/yr of CAP water for irrigation purposes in 1983. An additional 138,700 acre-feet/yr were allocated to the GRIC pursuant to the Arizona Water Settlement Act (Act) bringing their total CAP allocation to 311,800 acre-feet/yr (CAP, 2008). The Act and a subsequent settlement agreement specify the water rights assigned to the GRIC. The GRIC have rights to 13 categories of water including CAP, surface water, effluent and groundwater. In addition to CAP water, supplies include 125,000 acre-feet/yr of Globe Equity Decree Water (Gila River water) and 156,700 acre-feet of groundwater. In total, the GRIC are entitled to an estimated average of 653,500 acre-feet/yr for any period of ten consecutive years. In 2004, the GRIC pumped or received about 217,000 acre-feet of water. Ninety-eight percent of the demand was for agriculture. (ADWR, 2006b) The Community is in the planning stages of a large irrigation project with plans to establish an irrigation system to deliver water to 146,300 acres of land in seven reservation districts (GRIC, 2008). While up to 41,000 acre-feet/yr of Indian priority CAP water has been approved for lease to Phoenix AMA cities by the Tribal Council, no leases have been executed.

Pascua Yaqui Tribe

The Pascua Yaqui Tribe is composed of nine communities located in the Tucson, Phoenix and Pinal AMAs. The largest in terms of population is New Pascua, consisting of 1,152 acres of trust land located about 15 miles southwest of Tucson. New Pascua is recognized as the Pascua Yaqui reservation. The second largest community is Guadalupe located in the Town of Guadalupe southeast of Phoenix. Other communities in the Tucson AMA are: Old Pascua near downtown Tucson; Barrio Libre in the Town of South Tucson and Yoem Pueblo in Marana. Other communities in the

Phoenix AMA are Penjamo in Scottsdale and High Town in Chandler. Pinal AMA communities are located at Coolidge and Eloy (Pascua Yaqui Tribe, 2005).

There are 3,315 members of the Pascua Yaqui tribe at New Pascua (2000 Census), but many tribal members live off the reservation in other communities in the planning area and also outside of Arizona. According to the Pascua Yaqui Tribe, in July 2005 there were almost 7,700 tribal members in the nine communities with a total Arizona population of approximately 13,100 (Pascua Yaqui Tribe, 2005). There is no irrigated acreage on the Pascua Yaqui Tribe reservation and the land dedicated to development of an industrial park currently remains vacant (NAU, 2008). There are two gaming facilities on the reservation and the 4,400 seat Anselmo Valencia Tori Amphitheater is southern Arizona's largest concert venue. The Pascua Yaqui tribe holds a CAP allocation for tribal homeland uses of 500 acre-feet/yr (CAP, 2008).

Salt River Pima-Maricopa Indian Community

The Salt River Pima-Maricopa Indian Community (SRPMIC) is located entirely within the Phoenix AMA adjacent to the cities of Scottsdale, Fountain Hills, Mesa, Tempe and Phoenix. The lands within the 56,000-acre reservation have been allocated for different uses including agriculture, industrial and commercial use with the remaining acres reserved for recreation, housing and desert preservation (NAU, 2008). There are more than 6,200 members on the reservation representing the Pima and Maricopa tribes (2000 Census). There are 13,000 acres of irrigated lands with the primary crops being cotton, melons, potatoes, onions and carrots. Commercial land use is largely restricted to lands that bound Pima Road and the primary commercial use is a 140-acre retail center, "The Pavilions". Other industrial uses include Cypress Golf Course (two nine-hole courses), Talking Stick Golf Club (a 36-hole course), a sand and gravel operation and a 200-acre landfill. There are two gaming facilities on the reservation, the Casino Arizona at McKellips and the Casino Arizona at Talking Stick. The SRPMIC holds a CAP allocation for irrigation use of 13,300 acre-feet/yr (CAP, 2008). The SRPMIC has executed long-term leases of CAP water to the cities of Gilbert (4,088 acre-feet/yr), Chandler (2,586 acre-feet/yr), Glendale (1,814 acre-feet/yr), Mesa (1,669 acre-feet/yr), Scottsdale (60 acre-feet/yr) and Tempe (60 acre-feet/yr).

Tohono O'odham Nation

The 2.8 million acre Tohono O'odham Nation is comprised of four separate reservations. The largest reservation, Tohono O'odham, is located within both the Pinal and Tucson AMAs and tribal lands extend south into Mexico. The Gila Bend Reservation (San Lucy District) is outside of the planning area in the Gila Bend Basin. The 71,095-acre San Xavier Reservation is located south of Tucson within the Tucson AMA. The smallest reservation is the 20-acre Florence Village located 2 miles west of Florence in the Pinal AMA. There are almost 24,000 members of the Nation with just over 5,000 members within the planning area. Industrial uses within the Nation include a 120-acre industrial park located within the San Xavier District of the Tohono O'odham Reservation. The Nation operates two casinos in the planning area, both located south of Tucson; the Desert Diamond I-19 Casino and the Desert Diamond Casino.

The entire Tohono O'odham Nation holds a 74,000 acre-foot CAP allocation. The Southern Arizona Water Rights Settlement Act (SAWRSA) of 2004 (Title III of the Arizona Water Settlements Act) and the subsequent settlement agreement specified that the Nation was entitled to 79,200

acre-feet of water rights within the Tucson AMA for use on the San Xavier Reservation and the Eastern Schuk Toak District. Of this total, 66,000 acre-feet is CAP water and 13,200 acre-feet is groundwater. Both San Xavier and Schuk Toak have recently started large-scale irrigation projects. In 2005, more than 13,300 acre-feet of CAP water was used primarily for agricultural irrigation on these lands. (ADWR, 2006c) The Nation may lease up to 15,000 acre-feet of CAP water to off-reservation users.

Yavapai-Prescott Indian Tribe

The Yavapai-Prescott Indian Tribe reservation is approximately 1,400 acres located within the City of Prescott in the Prescott AMA. The reservation has approximately 180 members (2000 Census) of the Yavapai-Prescott Indian Tribe. Historical land uses included timber, mining and ranching, however, current tribal uses are business oriented. The tribe operates the 12-acre Sundog Industrial Park and the 250-acre Frontier Village shopping center. There are two gaming facilities on the reservation; the Yavapai Bingo and Gaming Center and Bucky's Casino with the adjacent 160-room Prescott Resort and Conference Center (ITCA, 2008; NAU, 2008). The Yavapai-Prescott Tribe received an original allocation of 500 acre-feet of CAP water that was relinquished in 1994 by the tribe pursuant to its water rights settlement and acquired by the City of Scottdale in 1996 (CAP, 2008). Currently, the tribe is provided water by the City of Prescott, although they retained up to 1,000 acre-feet of annual surface water rights from Granite Creek.

Municipal Demand

Municipal, non-Indian demand is summarized by AMA and water supply in Table 8.0-10. Average annual demand during the 2001-2003 time period was almost 1.25 maf. Throughout the planning area, approximately 39% of the municipal demand is met with groundwater, 31% with surface water, 27% with CAP water and 3% with effluent (see Table 8.0-10). However, different supplies are utilized to meet municipal demand among the AMAs. The Phoenix AMA is unique in that it meets over 68% of its municipal demand with surface water from the CAP and the Salt and Verde river systems. Groundwater is the primary municipal water supply in the Pinal and Tucson AMAs. The Tucson AMA uses effluent to meet 6% of its municipal demand, the largest percentage of any AMA.

Table 8.0-10 Average annual municipal water demand in the AMA Planning Area (2001-2003)

Basin	Groundwater	Surface Water	CAP	Effluent	Total
Phoenix AMA	298,200	392,800	302,000	21,600	1,014,600
Pinal AMA	22,600	800	3,000	400	26,800
Prescott AMA	14,800	600	0	1,900	17,300
Santa Cruz AMA	8,300	0	0	0	8,300
Tucson AMA	141,600	80	28,700	11,600	181,980
Total Municipal	**485,500**	**394,280**	**333,700**	**35,500**	**1,248,980**

Notes: Does not include Indian municipal use

Within the Santa Cruz AMA, water is not separately defined as surface water or groundwater, therefore all volumes are reported as groundwater.

Municipal supplies in the Prescott AMA are primarily groundwater, and smaller volumes of effluent and surface water. All of the water supplies in the Santa Cruz AMA are considered groundwater.

A total of 52 water providers within the planning area each served more than 1,000 acre-feet of water, excluding effluent, in 2003 (see Table 8.0-11). Of these largest water providers, 33 are located in the Phoenix AMA and met 85% of the Phoenix AMA potable municipal demand. The 11 largest water providers in the Tucson AMA met 93% of the AMA's potable municipal demand. In the other AMAs, the largest water providers met between 72% and 76% of the AMA's potable municipal demand in 2003.

Water providers fall primarily into two categories: public water systems or private water companies. Private water companies are regulated by the Arizona Corporation Commission (ACC), which oversees setting water rates in these service areas. Publically owned systems are not regulated by the ACC and have the authority to enact water conservation ordinances and establish water rates as approved by the appropriate governing body. This authority may provide greater flexibility to manage water resources within their water service areas.

There are regulatory requirements for water providers within AMAs. Under the conservation programs in the AMA Management Plans, ADWR regulates water providers that annually serve more than 250 acre-feet of water for non-irrigation use as large municipal water providers. The Groundwater Code expressly mandates that these conservation programs require reasonable reductions in per capita water use through time and implementation of conservation measures designed to reduce water use within the service area. The Code also requires that reasonable conservation requirements be established for small municipal water providers.

Golf Course Demand

Golf courses within the planning area used approximately 125,000 acre-feet of water in 2006 (See Table 8.0-12). Each AMA within the planning area has golf course demand; however, there are significant differences in the number of golf courses within each AMA and the sources of water used to supply them.

Pursuant to the Groundwater Code, water provided directly to a golf course by a water provider is categorized as municipal use and is calculated as part of the overall municipal demand. Groundwater that is withdrawn by the facility itself, through its own wells, is categorized as industrial use. Data from both municipal and industrial golf courses are shown in Table 8.0-12. Additionally, some golf courses receive effluent, surface water and CAP, either through direct delivery or via recovery of stored water, and these volumes may or may not be calculated within a water provider's deliveries. Other unique situations also exist. For example, in the Santa Cruz AMA, the Palo Duro Golf Course receives water from municipal wells but it also receives remediated poor-quality water from the United Musical Instruments RCRA remediation site.

Table 8.0-11 Water providers serving a minimum of 1,000 acre-feet of water annually (excluding effluent) in the AMA Planning Area

Water Provider	1990 (AF)	2000 (AF)	2003 (AF)	Water Provider	1990 (AF)	2000 (AF)	2003 (AF)
Phoenix AMA							
City of Phoenix	268,598	304,743	329,711	City of El Mirage	1,686	3,360	4,666
City of Mesa	71,023	101,461	100,458	Johnson Utilities Company	N/A	N/A	4,062
City of Scottsdale	43,317	79,479	77,901	City of Tolleson	1,477	2,920	3,594
City of Tempe	50,748	63,236	57,668	Queen Creek Water Company	669	2,063	3,502
City of Chandler	24,433	61,500	57,256	Town of Buckeye	662	1,094	2,601
City of Glendale	33,484	45,660	48,149	City of Goodyear	1,030	1,189	2,520
Town of Gilbert	7,838	30,070	37,743	Rio Verde Utilities, Inc.	1,173	2,711	2,450
City of Peoria	10,691	23,514	20,898	New River Utility Company	7	983	1,862
Arizona-American Water Co. - Sun City System	13,271	13,076	14,601	Turner Ranches Water and Sanitation Company	1,068	2,669	1,842
City of Avondale	3,072	6,392	11,931	Apache Junction Facilities District	761	1,611	1,821
Arizona-American Water Co. - Paradise Valley System	8,369	11,069	11,034	Luke Air Force Base	1,622	1,701	1,524
Arizona Water Co. - Apache Junction System	3,725	10,627	10,983	City of Surprise		821	1,515
Litchfield Park Service Company	1,940	3,982	7,144	Cave Creek Water Company	736	1,406	1,437
Arizona-American Water Co. - Agua Fria System	841	4,952	7,237	Rose Valley Water Company	114	915	1,376
Chaparral City Water Company	2,716	6,363	7,152	Berneil Water Company	729	1,194	1,229
Arizona-American Water Co. - Sun City West System	4,269	6,250	5,981	Carefree Water Company	1,281	1,000	1,071
Pima Utilities Company	3,274	5,526	5,832				
Pinal AMA							
Arizona Water Co. - Casa Grande System	7,381	10,411	13,540	Arizona Water Co. - Coolidge System	1,305	1,646	1,647
City of Eloy	2,223	2,211	2,206	Town of Florence	797	1,999	1,547
Prescott AMA							
City of Prescott	5,014	6,614	6,948	Prescott Valley Water District	1,795	3,912	4,342
Santa Cruz AMA							
City of Nogales	4,529	4,375	4,235	Rio Rico Utilities	678	1,756	2,092
Tucson AMA							
City of Tucson	95,519	117,656	123,852	Community Water Co. of Green Valley	1,713	2,243	2,525
Town of Oro Valley (formerly Canada Hills Water Co.)	2,731	9,085	10,233	University of Arizona	1,631	1,516	1,514
Metro Domestic Water Improvement District	7,190	8,642	9,002	Metro Water District - Hub	872	1,105	1,126
Flowing Wells Irrigation District	2,646	2,879	2,865	Avra Water Co-op	534	1,027	1,076
Lago Del Oro Water Co.	422	2,220	2,586	Davis-Monthan Air Force Base	1,755	1,423	1,073
Green Valley Water Co.	1,918	2,225	2,497				

Phoenix AMA

For the 2001-2003 time period, the annual municipal demand in the Phoenix AMA, excluding Indian demand, averaged 1,014,600 acre-feet. Municipal water demand has become the AMA's major non-Indian demand sector and is steadily growing. Approximately 61% of the municipal demand is located within the cities of Phoenix, Mesa, Scottsdale, Tempe, and Chandler. In addition to public and private water companies, water for municipal use, including urban irrigation, is provided by water districts and water users associations. These include SRP, Roosevelt Water Conservation District (RWCD), Buckeye Water Conservation and Drainage District and Roosevelt Irrigation District. The largest by far is SRP which operates an extensive water delivery system that includes portions of Glendale, Peoria, Phoenix, Scottsdale, Tempe, Chandler, Gilbert and Mesa. Its eight canals deliver Salt and Verde river water, supplemented by groundwater, to municipal and agricultural users. It also wheels other kinds of water, including CAP water, through its system. In addition to providing untreated water for urban irrigation, the system is connected to eight municipal water treatment plants for delivery of potable water through municipal water systems.

Table 8.0-12 Water Use by Golf Courses in 2006

AMA	# of Golf Courses	# of Holes	# Acres	Water Demand (AF)	Water Supply
Phoenix	184	3,533	18,946	99,000	Groundwater (45%)
					Surface water (18%)
					CAP (14%)
					Effluent (23%)
Pinal	12	180	N/A	49,000[1]	Groundwater (56%)
					CAP (35%)
					Effluent (9%)[1]
Prescott	6	108	N/A	3,000	Groundwater (30%)
					Effluent (70%)
Santa Cruz	4	72	535	2,000	Groundwater (97%)[2]
					Remediated water (3%)
Tucson	43	838	4,312	21,000	Groundwater (47%)
					Surface water (2%)
					CAP (3%)
					Effluent (48%)

Note: Golf course water demand includes both industrial courses and those served by municipal providers.
[1] The volume of water associated with the Dave White Golf Course is not included within this number. This course receives effluent water directly from the City of Casa Grande's treatment plant and does not report usage to the AMA.
[2]Within the Santa Cruz AMA, water is not separately defined as surface water or groundwater so all volumes are reported under groundwater.

The largest water provider in the Phoenix AMA is the City of Phoenix which delivered 329,711 acre-feet of water in 2003. Its service area covers more than 500 square miles and serves a population in excess of 1.3 million (2000 Census). The City of Phoenix water system also provides water to a portion of the Town of Paradise Valley. The water system for the City includes four primary sources of supply with their associated percentages of use: surface water from the Salt and Verde river systems provided to the City by the SRP (54%); CAP water (36%); groundwater (3%); and effluent (7%) from three treatment facilities. The total potable system capacity is currently more than 780,000 acre-feet with a planned expansion to 1.2 maf. Major system components include five surface water treatment plants (Verde River plant, 24th Street, Deer Valley, Valley Vista and Union Hills); the Granite Reef Diversion Dam interconnect facility; a groundwater well system that includes 30 active wells; and more than 6,000 miles of water mains (City of Phoenix, 2005).

The City utilizes reclaimed water from the Cave Creek Water Reclamation Plant to irrigate turf in northeast Phoenix and provides reclaimed water from the 91st Avenue WWTP, through the Tres Rios Wetlands Project, to the Buckeye Irrigation Company and the Palo Verde Nuclear Generating Station for cooling purposes. The City also provides reclaimed water from the 23rd Avenue WWTP to the Roosevelt Irrigation District for agricultural irrigation. The volume of reclaimed water available exceeds demand and the City is developing ways to fully utilize this water source. (City of Phoenix, 2005)

The Cities of Mesa, Scottsdale, Tempe and Chandler, all located in the East Salt River Valley, each served over 50,000 acre-feet of water in 2003 (see Table 8.0-11). The City of Mesa is the second largest provider in the AMA; serving over 100,000 acre-feet of water in 2003. The western part of the Mesa service area is within the SRP and RWCD boundaries and receives Salt and Verde river water. Approximately half of Mesa's demand is supplied by the SRP and 11% by RWCD. Mesa utilizes a variety of other water supplies including groundwater, CAP water, other Colorado River water, SRPMIC lease water and effluent (City of Mesa, 2004). The City of Scottsdale delivered almost 78,000 acre-feet of water in 2003. About 48% of the City's demand is met with CAP water and 47% by groundwater. Less than 5% of its water supply is SRP surface water. Scottsdale operates the Scottsdale Water Campus that treats wastewater and CAP water. Wastewater is treated to irrigation standards for use at golf courses, and when irrigation needs are reduced in the winter, the wastewater is treated to drinking water standards and recharged to the aquifer via injection wells. (City of Scottsdale, 2007 and ADEQ, 2008) The City of Tempe delivered approximately 57,700 acre-feet of water to customers in 2003. Most of its water supply is surface water from the SRP. Groundwater provides from 1% to 7% of the total supply depending on surface water availability. In 2005, about 7% of Tempe's water demand was met by groundwater. (City of Tempe, 2006) The City of Chandler is the fifth largest water provider in the Phoenix AMA; delivering over 57,000 acre-feet of water in 2003. Water supplies include SRP water, Salt and Verde river water, CAP water, Colorado River water, groundwater and effluent (City of Chandler, 2002).

Pinal AMA

For the 2001-2003 time period, the average annual municipal demand in the Pinal AMA, excluding Indian demand, was 26,800 acre-feet. Average annual municipal demand has increased almost 20% over the last decade, spurred by a population that grew by 65% from 2000-2006. However, municipal demand is still a relatively small percentage of non-Indian demand within the AMA, accounting for only 3% of the demand. There are four population centers within the Pinal AMA, Casa Grande, Coolidge, Eloy, and Florence, with the fastest population growth occurring in the Casa Grande area where more than 70% of the municipal demand is located. Almost 85% of the municipal demand is met with groundwater, although the four water providers serving these population centers hold CAP allocations sufficient to meet almost 50% of the 2006 municipal demand. The lack of water treatment facilities to treat CAP water for potable use is currently a limiting factor to utilize this supply (City of Casa Grande, 2001).

The largest water provider in the Pinal AMA is a private water company, Arizona Water Company - Casa Grande System (AWCCG), that supplied 13,540 acre-feet of water to Casa Grande and the surrounding area in 2003. The service area for the AWCCG is about 140 square miles with a distribution system consisting of approximately 466 miles of pipes. The primary source of supply used by the AWCCG is groundwater withdrawn from 15 active wells. The AWCCG also provides

untreated CAP water to two private golf courses and an electric power plant within its service area. In addition, the City of Casa Grande WWTP delivers effluent to the power plant and the City's municipal golf course. The treatment plant produces approximately 2,900 acre-feet of effluent per year.

Prescott AMA

For the 2001-2003 time period, the average annual municipal demand in the Prescott AMA was 17,300 acre-feet. This includes Indian demand as the Yavapai-Prescott Indian Tribe currently receives potable water from the City of Prescott. The Prescott AMA continues to experience an increase in municipal water use and a decrease in agricultural demand. Municipal demand accounts for almost 70% of water use within the AMA and that demand is met primarily with groundwater. The "tri-cities" of Prescott, Prescott Valley and Chino Valley are the population centers of the Prescott AMA, with Prescott and Prescott Valley accounting for nearly 80% of the municipal deliveries.

The largest water provider in the Prescott AMA is the City of Prescott, which supplied over 6,900 acre-feet of groundwater in 2003 to a service area that covers approximately 50 square miles. Although groundwater is the primary source of water used to meet municipal demand, the City also holds surface water rights, including recently purchased rights to surface water stored in Watson and Willow Lakes. Due to the lack of a surface water treatment facility, any use of surface water is done through underground recharge and recovery. During the 2001-2003 time period the City of Prescott recovered 570 acre-feet of surface water recharge credits, delivered approximately 1,400 acre feet of effluent to turf facilities and recovered approximately 130 acre-feet of effluent recharge credits for municipal use.

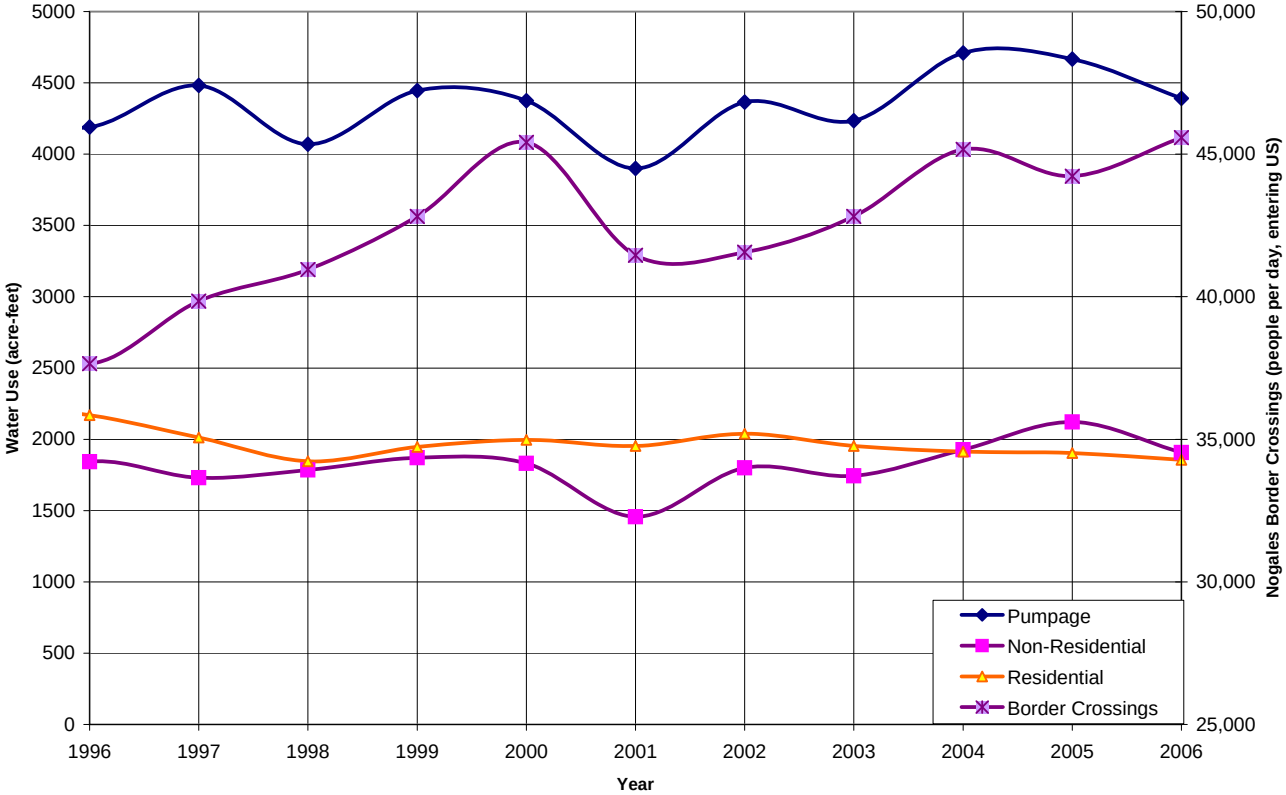
The second largest water provider in the Prescott AMA is the Town of Prescott Valley that supplied almost 5,000 acre-feet of groundwater in 2003. In 2003, the Town also recharged more than 1,700 acre-feet of effluent and directly delivered over 300 acre-feet of effluent for golf course use. The Town of Chino Valley and the newly incorporated town of Dewey-Humboldt meet most of their municipal demand through small private domestic (exempt) wells.

Santa Cruz AMA

For the 2001-2003 time period, the average annual municipal demand in the Santa Cruz AMA was 8,300 acre feet. There is no Indian demand within this AMA. Like the other AMAs, the Santa Cruz AMA is experiencing an increase in municipal demand; however, this is still secondary to agricultural demand. Municipal demand accounted for almost 35% of the total demand with the two primary demand centers served by the City of Nogales and Rio Rico Utilities. The service areas of these two providers have shown a 5-8% annual increase in population over the last decade.

The City of Nogales is the largest water provider and served more than 4,200 acre-feet to its customers in 2003. Its service area is located along the international border both east and west of Interstate 19, encompasses approximately 20 square miles, and includes areas both inside and outside the city limits. The City currently has a Designation of AWS, with an aggregate volume of 6,322 acre-feet per year in normal years, and 5,473 acre-feet per year in a drought year. Total pumpage by the City has fluctuated, with a slight increase during the period 1996-2006 (Figure 8.0-17). Fluctuations may be related to a number of factors including: the number of border

Figure 8.0-17 City of Nogales, Arizona water use 1996-2006



crossings, weather conditions, distribution system problems, and record-keeping changes. The City currently operates 14 wells, and relies on a combination of surface water and groundwater withdrawn from wells near the Santa Cruz River, as well as water withdrawn from the Potrero groundwater basin. One well near Coronado Canyon in the Potrero basin accounts for over one-third of the City's total pumpage.

Municipal water uses consist of residential demand, produce storage and processing, tourist service industry use, and light manufacturing. Two turf-related facilities, Palo Duro and Kino Springs golf courses, use water supplied by the City of Nogales. Residential demand has slightly decreased, while non-residential demand has increased since 1996. Nogales has a relatively high GPCD rate due in part to the greater proportion of non-residential water demand (approximately 1:1 with residential use). Part of this non-residential demand is due to water uses associated with the large number of people who cross the border from Nogales, Sonora into Nogales, Arizona each day. Annual non-residential demand trends closely track the number of border crossings reported by US Customs and Border Patrol; in particular, a reduction in crossings due to increased border security measures implemented in 2001 corresponds to a steep drop in demand. Overall, the number of border crossings into Arizona at the Nogales ports of entry rose 21% from 1996-2006 (see Figure 8.0-17).

Tucson AMA

For the 2001-2003 time period, the total annual municipal demand in the Tucson AMA was 181,980 acre-feet, excluding Indian demand. Municipal demand accounts for almost 56% of the total non-Indian demand and almost 78% of that demand was met with groundwater supplies during 2001-2003. In general, surface water sources are limited within the Tucson AMA and

CAP water is the most abundant renewable supply available. The City of Tucson, one of the four population centers of the AMA, accounts for approximately 68% of the municipal demand. The other population centers are Marana, Oro Valley and the Sahuarita/Green Valley area.

The City of Tucson municipal water utility, Tucson Water, has the highest municipal demand of any large water provider in the Tucson AMA. In 2003 it served over 123,000 acre-feet of water to its customers within a service area approximately 300 square miles in size. The City's system includes both a potable and non-potable (reclaimed) system. (City of Tucson, 2004)

Until the 1990s, Tucson Water relied solely on groundwater and a relatively small volume of effluent for its supply, although it currently has a CAP allotment of 144,000 acre-feet. In 1992, Tucson Water began direct delivery of CAP water to residential customers. Those deliveries were discontinued in 1994 due to aesthetic issues and delivery problems. In 1995, a voter approved initiative restricted Tucson Water from delivering treated CAP water directly. In response to this initiative, Tucson Water chose to recharge the CAP water and then deliver the recovered water to residential customers. In 1996, Tucson Water began operation of the 80,000 acre-foot Central Avra Valley Storage and Recovery Project (CAVSRP). In 2008, a second recharge facility, the 60,000 acre-foot Southern Avra Valley Storage and Recovery Project (SAVSRP), was completed (see Figure 8.5-9). A series of recovery wells has been constructed in conjunction with each of these recharge sites with the anticipation that Tucson Water will eventually be able to store and recover its entire CAP allocation.

Tucson Water also relies on effluent to meet demand and offset the use of groundwater. In 2000, reclaimed water use accounted for 8% of Tucson Water's total demand. (City of Tucson Water Department, 2004) Average annual effluent demand was approximetly 11,600 acre-feet during the 2001-2003 time period. Golf courses in the City of Tucson and Oro Valley consume approximately 66% of the reclaimed water. The rest is served to parks, schools and individual home owners. In addition to direct delivery of reclaimed water deliveries through the non-potable system, the City of Tucson recharges a portion of its effluent. (City of Tucson Water Department, 2007)

In addition to Tucson Water, eleven water providers serve over 1,000 acre-feet of water annually in the Tucson AMA. In the northwest area of the Tucson AMA the largest providers are the Town of Oro Valley, which served approximately 10,233 acre-feet in 2003, and Metropolitan Domestic Water Improvement District (Metro Water), which served 9,002 acre-feet in the same year. Green Valley Water Company and the Community Water Company of Green Valley served a combined total of 5,022 acre-feet to their customers in 2003. A number of large providers in the Tucson AMA have a CAP allocation; however, many do not have physical access to the supply and currently none are serving it directly (see Appendix B). A growing number of providers are using their allocations through annual storage and recovery.

Agricultural Demand

The planning area includes AMAs where agriculture is the predominant demand sector and AMAs with little agricultural use, although agricultural demand exists in every AMA. Total annual average non-Indian agricultural demand for the 2001-2003 time period was in excess of 1.8 maf

(see Table 8.0-13). Agricultural demand is the greatest in the Phoenix and Pinal AMAs where it accounts for almost 42% and 95% respectively, of the total non-Indian demand.

Table 8.0-13 Agricultural demand in the AMA Planning Area excluding Indian demand

	1991-1995 (acre-feet)	1996-2000 (acre-feet)	2001-2003 (acre-feet)
Phoenix AMA			
Groundwater	453,800	431,700	388,100
Surface Water	453,100	262,000	168,900
CAP	119,000	292,200	266,100
Effluent	30,000	59,700	65,000
Other	2,000	2,000	2,100
Total	**1,057,900**	**1,047,600**	**890,200**
Pinal AMA			
Groundwater	297,600	397,100	383,800
Surface Water	162,600	99,900	52,100
CAP	269,600	373,800	409,700
Effluent	2,800	1,500	1,600
Total	**732,600**	**872,300**	**847,200**
Prescott AMA			
Groundwater	5,600	5,400	4,000
Surface Water	9,500	3,100	600
Effluent	900	1,400	1,500
Total	**16,000**	**9,900**	**6,100**
Santa Cruz AMA			
Groundwater	11,400	13,500	14,000
Total	**11,400**	**13,500**	**14,000**
Tucson AMA			
Groundwater	85,000	82,300	76,600
CAP	3,000	23,400	16,800
Effluent	2,600	1,400	0
Total	**90,600**	**107,100**	**93,400**
Total All Basins	**1,908,500**	**2,050,400**	**1,850,900**

Notes:
Within the Santa Cruz AMA water is not separately defined as surface water or groundwater, therefore all volumes are reported as groundwater.

Agricultural water use within AMAs is subject to Groundwater Code regulations that limit use of groundwater for irrigation purposes in several ways. Within AMAs there is a prohibition on new irrigated lands and management plan conservation requirements set maximum annual groundwater allotments. The maximum annual groundwater allotment for an irrigation right is determined by multiplying the irrigation water duty by the water duty acres in the farm. The irrigation water duty is the annual amount of water (in acre-feet per acre) that is reasonable to apply to land to produce the crops historically grown (1975 to 1980) divided by an assigned irrigation efficiency. To be in compliance with management plans, irrigation efficiency must improve through time. Under the management plans, agricultural water users may participate in alternative conservation programs such as the historic cropping program or a best management practices (BMP) program. All agricultural conservation programs are required to conserve equivalent volumes of water.

Due to the AMA regulations that restrict new irrigated acres and require improved efficiencies, agricultural demand should not significantly increase within the AMAs as may occur in non-AMA planning areas. Additionally, as the AMA population centers grow, urbanization should result in a decrease in agricultural demand over time. This is evident in the Phoenix AMA where over 130,000 acres of agricultural land have been urbanized since 1984.

The AMA Planning Area includes two of the largest agricultural areas in Arizona, Pinal and Maricopa Counties, located in the Pinal and Phoenix AMAs, respectively. Only Yuma County is larger statewide in terms of production and water use. Crops grown in Maricopa County include (in order of harvested acres for 2003) alfalfa hay, upland cotton, wheat, principal vegetables (includes lettuce, broccoli, cauliflower, onion, and melons), barley, citrus, other hay and corn for grain. Annual agricultural sales are reported to total over $740 million. In Pinal County, the crops grown include (in order of harvested acres for 2003) upland cotton, alfalfa hay, durum wheat, barley, corn for grain, other hay, and Pima cotton. Annual agricultural sales are reported to total over $424 million (NASS, 2008).

There are 39 irrigation districts within the planning area located as follows: Phoenix AMA (33); Pinal AMA (4); Prescott AMA (1); Santa Cruz AMA (0); and Tucson AMA (1). Figure 8.0-18 shows the general location of the largest irrigation districts within the planning area.

Figure 8.0-18 Large irrigation districts in the AMA Planning Area

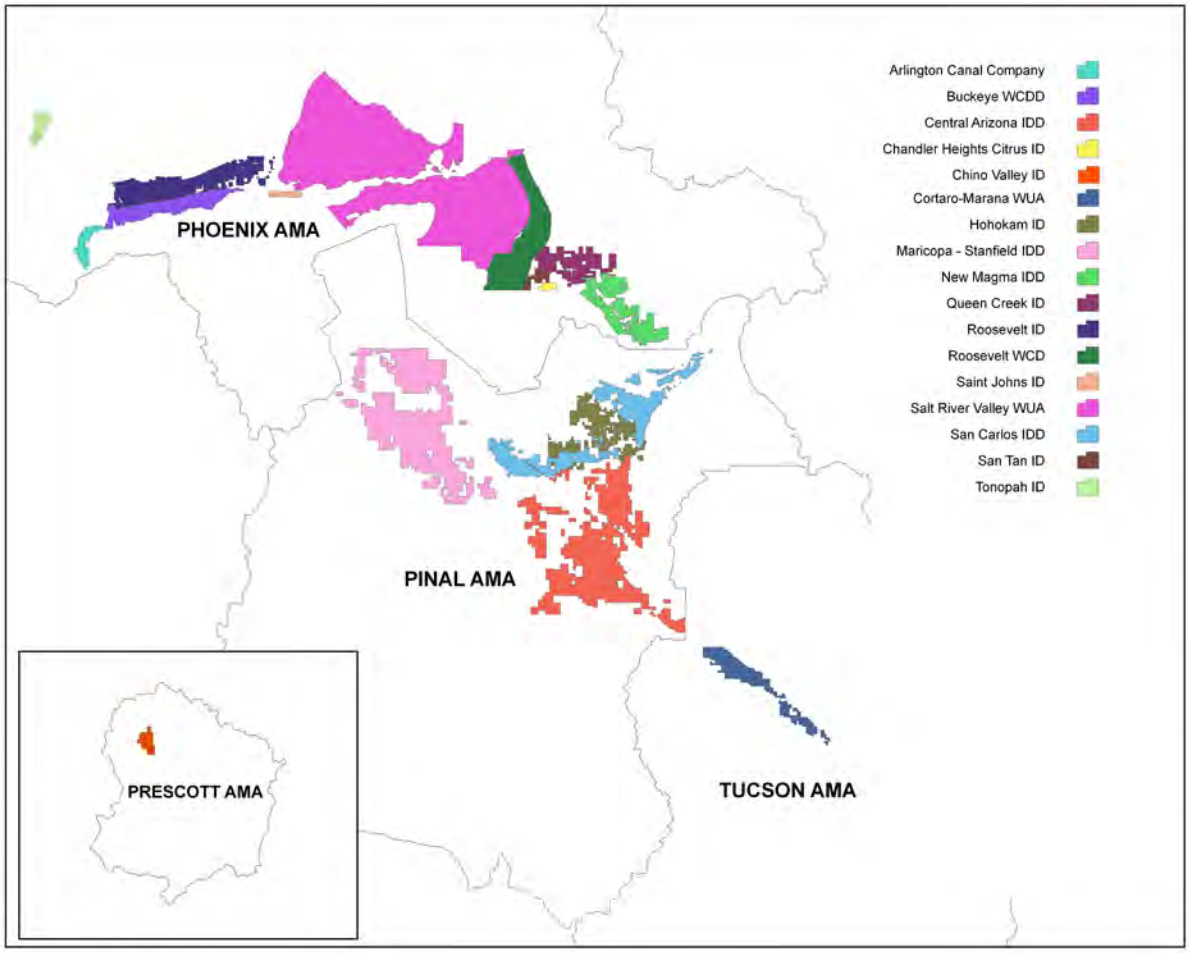
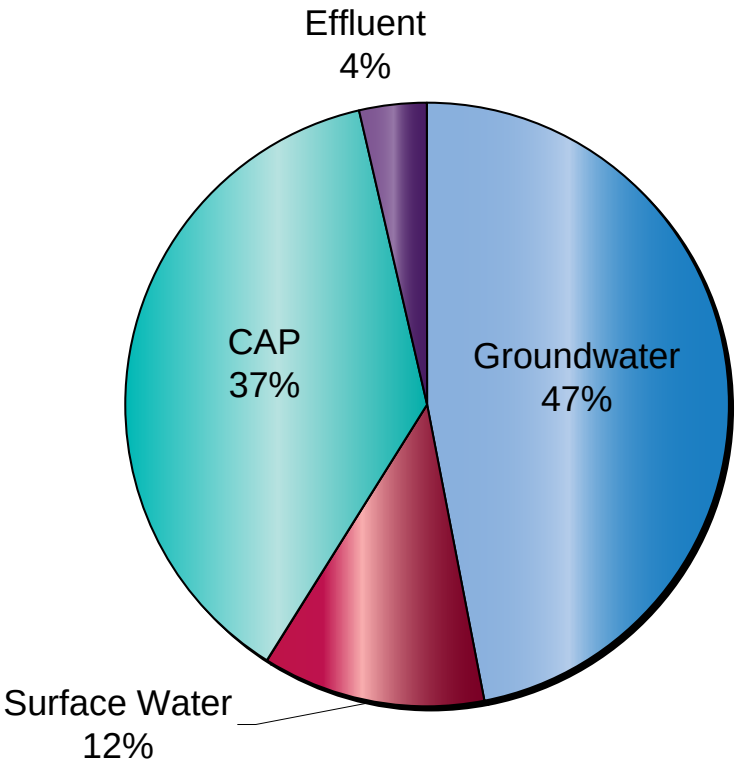


Figure 8.0-19 Average agricultural water use in the AMA Planning Area 2001-2003



The source of water used for irrigation differs widely throughout the planning area. Due to regulations on agricultural water users within the AMAs, some irrigation districts utilize a number of different water sources to ensure that they remain in compliance with conservation requirements. Overall, the sources of water available are groundwater, in lieu water, CAP water, effluent, surface water, and tailwater. In lieu water is a renewable water supply, typically CAP water, that is delivered by a water storer to a groundwater savings facility (GSF), typically a farm or irrigation district, pursuant to permits issued under A.R.S. § 45-812.01. The in lieu water is used in an AMA or an irrigation non-expansion area (INA) by the recipient (agricultural water user) on a gallon-for-gallon substitute basis for groundwater that otherwise would have been pumped from within that AMA or INA. In lieu water is included as CAP water demand in the Atlas. Water supplies used by the agricultural sector are shown in Figure 8.0-19. Approximately 47% of the agricultural demand is met by groundwater, 37% by CAP water, 12% by surface water and 4% by effluent.

Water that runs off the end of the field after an irrigation event is called tailwater and is used most frequently in the Phoenix AMA. Irrigators benefit by capturing and reusing this runoff because while the first application of water is counted within the allotment given to agricultural rightholders, if tailwater can be collected and re-used in any way, the second (and subsequent) applications of water do not count against an allotment. Use of tailwater is a component of the Agricultural BMP conservation program previously discussed.

Phoenix AMA

Average non-Indian agricultural demand in the Phoenix AMA for the 2001-2003 time period was just over 890,000 acre-feet per year, or 40% of the total agricultural demand in the planning area. Agricultural water demand has shown a decreasing trend over the last decade. The majority (approximately 80%) of agricultural demand is associated with seven of the largest irrigation districts: Salt River Project, Roosevelt Irrigation District (RID), Roosevelt Water Conservation District (RWCD), Buckeye Water Conservation and Drainage District (Buckeye), New Magma Irrigation and Drainage District (NMIDD), Maricopa Water District and Queen Creek Irrigation District. Most of the irrigated lands are located in the central and south-central portions of the AMA (see Figure 8.1-12). Water supplies to meet agricultural demand include groundwater, in lieu water, CAP water, surface water, effluent and tailwater. All seven of the largest irrigation districts utilize at least three different sources of supply. The largest irrigation district within the Phoenix AMA is the SRP.

Analysis of agricultural water demand trends of five irrigation districts in the Phoenix AMA shows an overall decrease in water use of approximately 11,500 acre-feet per year between 1984 and 2002. There have been spatial variations in this decrease due to the proximity of agricultural lands to urban areas and the availability and cost of water supplies. Agricultural lands in the SRP service area decreased by more than 50% from 1984 to 2002 with an associated reduction in demand of approximately 9,800 acre-feet/year. RWCD, also located near the Phoenix metropolitan area, experienced similar declines, though not as pronounced as SRP. Demand within the RID, located on the western edge of the Phoenix metropolitan area, has been stable, likely due to increased utilization of effluent and changes in crop type. Buckeye, located south of and adjacent to RID is in a waterlogged area, requiring pumping of excess water. Water demand has increased within RID, likely due to increased farming to offset reductions in production in other parts of the AMA. Similarly, demand increased within the NMIDD, located in the southeastern part of the AMA. The increase is likely related to the availability of Colorado River water and, like RID, increased farming to offset reductions in production due to urbanization. (Hetrick and Roberts, 2004)

Pinal AMA

Non-Indian agricultural demand in the Pinal AMA for the 2001-2003 time period averaged approximately 847,000 acre-feet per year, or 46% of the total agricultural demand in the planning area. Agricultural water demand has remained relatively constant in the Pinal AMA with a 15-year average water use of approximately 778,000 acre-feet per year. However, there has been a significant shift in the source of supply within the Pinal AMA (see Table 8.2-10). Prior to the availability of CAP water in the AMA (approximately 1987) almost all agricultural demand was met with groundwater or surface water supplies from the Gila River. Today, approximately 410,000 acre-feet of CAP water is used to meet demand.

The majority (approximately 87%) of agricultural demand in the AMA is associated with four large irrigation districts: Central Arizona Irrigation and Drainage District (CAIDD), Maricopa-Stanfield Irrigation and Drainage District (MSIDD), Hohokam Irrigation and Drainage District (HIDD), and San Carlos Irrigation and Drainage District (SCIDD). Most irrigated lands are located in the northern half of the AMA (see Figure 8.2-12). Groundwater is pumped to supplement CAP deliveries in CAIDD, MSIDD and HIDD and surface water in SCIDD, up to the total amount of water allotted annually to the farms in each district. SCIDD receives and distributes surface water from the Gila River pursuant to the Globe-Equity Decree[6].

The largest irrigation district within the Pinal AMA is MSIDD. The MSIDD was organized in 1962 to obtain supplemental water from the CAP and construction of all CAP facilities in the district was completed in 1989. The district operates the Santa Rosa Canal, 78 miles of main conveyance canals, 116 miles of lateral canals and pipelines and 484 irrigation wells. MSIDD does not own the individual irrigation wells but leases them from the landowners; only 80 are directly connected to MSIDD's distribution system. The district boundaries encompass approximately 148,000 acres and 89,000 acres have a recent history of irrigation.

[6] In 1935 the U.S. District Court entered a consent decree (Globe Equity No. 59) for all diversions of the mainstem of the Gila River from its confluence with the Salt River to the headwaters in New Mexico, including the Gila River and San Carlos Apache reservation and non-Indian landowners below and above Coolidge Dam.

Prescott AMA

Average annual agricultural demand in the Prescott AMA for the 2001-2003 time period was 6,100 acre-feet, or less than 1% of the total agricultural demand in the planning area. There has been a significant decrease (approximately 60%) in agricultural use within the AMA over the past two decades. Agricultural demand is now approximately 24% of the total Prescott AMA demand. Historically, both groundwater and surface water supplies were utilized to meet agricultural demand; however, there has been a shift to greater utilization of groundwater and recovery of effluent credits due to transfer of Chino Valley Irrigation District (CVID) surface water rights to the City of Prescott.

Most of the irrigated lands are located in the northern part of the AMA near the Town of Chino Valley (approximately 1,800 acres) where groundwater and recovered effluent are used. An additional 476 acres are currently irrigated with groundwater in the southern portion of the AMA along the Agua Fria River (see Figure 8.3-12).

The only irrigation district within the Prescott AMA is CVID, located in the Little Chino Sub-basin. CVID originated at around the turn of the 20th century as the Arizona Land and Irrigation Company and was incorporated as CVID in 1926. Historically, the CVID was entirely a surface water provider that supplied water to slightly more than 2,500 acres of irrigated lands (Gookin, 1977). Surface water was diverted from two reservoirs, Watson Lake and Willow Lake that are connected by a cross-cut canal constructed in 1965. In 1998, CVID entered into an intergovernmental agreement (IGA) with the City of Prescott in which CVID's surface water rights were relinquished to the City. Pursuant to the IGA, all CVID deliveries from Prescott are now effluent through recovery of long-term storage credits; however, CVID retained a small commitment to serve surface water to three CVID properties (< 30 acre-feet). The maximum annual recovery limit under the IGA is 1,500 acre-feet until a total of 33,000 acre-feet have been recovered. As of 2007, CVID consisted of approximately 480 irrigated acres and had ceased delivery of surface water.

Santa Cruz AMA

Agricultural demand in the Santa Cruz AMA for the 2001-2003 time period averaged 14,000 acre-feet per year, or less than 1% of the total agricultural demand in the planning area. Agricultural demand has remained relatively stable in the AMA, which has no organized irrigation districts. The predominant agricultural use is pasture land and one irrigation right holder accounts for 33-50% of all agricultural use in the AMA.

Tucson AMA

Non-Indian agricultural demand in the Tucson AMA for the 2001-2003 time period averaged 93,400 acre-feet per year, or approximately 5% of the total agricultural demand in the AMA Planning Area. Agricultural demand has remained relatively constant and accounts for approximately 28% of the Tucson AMA water demand. Groundwater is the primary agricultural water supply. During 2001-2003, in lieu CAP water was also used, which met about 18% of the agricultural demand. There are two primary agricultural centers: Avra Valley near the town of Marana, and the Green Valley area along the Santa Cruz River (see Figure 8.5-12).

The only agricultural irrigation district in the AMA with a consolidated distribution system is the Cortaro-Marana Irrigation District (CMID). Located in the Avra Valley/Marana area, the District

is an arm of the Cortaro Water Users' Association, which was formed in 1948. CMID pumps water from wells to serve its customers. It has several surface water rights and claims wells as points of diversion; however, the Department accounts for this water as groundwater in its water budget. The District operates a delivery system that provides water to about 11,000 irrigated acres. The system consists of almost 54 miles of concrete lined canals, eight miles of pipeline and 45 irrigation wells. In 2003, CMID delivered approximately 40,000 acre-feet of water to its customers. Approximately 2,000 acre-feet of this water was in lieu CAP.

Other farming operations in the Avra Valley include those within the Avra Valley Irrigation District (which does not operate a consolidated distribution system), BKW Farms, and other irrigators. Both groundwater and CAP water are used to irrigate crops, which are predominantly cotton in this area. In 2003 approximately 16,000 acre-feet of groundwater was used, along with approximately 6,900 acre-feet of in lieu CAP.

A large agricultural operation, Farmers Investment Company (FICO), is located in the Sahuarita – Green Valley area and consists of predominantly pecans. FICO is separated into two operating areas: the northern section has approximately 4,000 acres and the southern section approximately 1,800 acres. FICO used approximately 28,400 acre-feet of groundwater in 2003. Although FICO is currently permitted to receive in lieu CAP, the physical infrastructure necessary to deliver CAP does not yet exist.

Another relatively large farming operation is located in the northern part of the AMA near Red Rock. Kai Farms-Red Rock grows predominantly row crops and has recently planted pecans. In lieu CAP water and groundwater are used for irrigation. In 2003, 8,378 acre-feet of in lieu CAP was used to meet demand.

Industrial Demand

Industrial demand in the AMA Planning Area averaged just over 283,000 acre-feet annually between 2001and 2003, with 2003 demand slightly more than 250,000 acre-feet. Industrial demands accounted for 7.5% of the total water demand in the planning area during the 2001-2003 time period.

While the composition of industrial demand differs among the AMAs, turf demand is the highest demand sector overall, followed by power plants and mining. Industrial demand is the greatest in the Phoenix AMA with 75% of the total industrial demand in the planning area. The Tucson AMA has the second largest volume of industrial demand in the planning area, accounting for 18% of the total. (See Table 8.0-14)

Within the AMA Planning Area, industrial water use is specifically defined as water that is utilized pursuant to specific non-irrigation groundwater rights or permits. Water that is supplied by municipal providers for industrial or commercial use is not reflected within the industrial sector but is instead included within municipal demand. Based on this definition of industrial use, the predominant source of supply is groundwater; however, some CAP water and effluent is used to meet demands. All users classified as industrial users within the AMAs have general conservation requirements under the AMA management plans. Additional, specific conservation requirements exist for turf-

related facilities, power plants, sand and gravel facilities, dairies, feedlots, large cooling facilities, new large landscape users and new large industrial users. "Other industrial users" shown in Table 8.0-14 are subject to the general requirements that apply to all industrial users.

Table 8.0-14 Industrial demand in selected years in the AMA Planning Area

	1991	2000	2003
Type/*AMA*	**Water Use (acre-feet)**		
Power Plant Total	**52,800**	**67,500**	**67,800**
Phoenix AMA	51,500	62,600	64,200
Pinal AMA	0	0	700
Tucson AMA	1,300	4,900	2,900
Turf Total[1]	**70,500**	**106,000**	**101,100**
Phoenix AMA	60,200	93,400	88,100
Pinal AMA	1,600	2,700	2,600
Prescott AMA	400	500	800
Santa Cruz AMA	1,100	1,100	1,100
Tucson AMA	7,200	8,300	8,500
Dairy/Feedlot Total	**10,270**	**15,300**	**19,500**
Phoenix AMA	7,400	10,500	12,400
Pinal AMA	2,800	4,700	7,000
Tucson AMA	70	100	100
Mining Total[2]	**53,350**	**51,300**	**42,090**
Phoenix AMA	7,600	6,700	9,100
Pinal AMA	400	300	1,400
Prescott AMA	50	100	70
Santa Cruz AMA	200	100	120
Tucson AMA	45,100	44,100	31,400
Other Total[3]	**16,470**	**21,800**	**27,800**
Phoenix AMA	11,700	15,000	20,000
Pinal AMA	800	2,000	3,200
Prescott AMA	70	400	700
Santa Cruz AMA	200	200	200
Tucson AMA	3,700	4,200	3,700

Source: ADWR 2008

[1] Turf-related facilities include golf courses, schools, parks, cemeteries and common areas of subdivisions

[2] Mining uses include both hard rock or metal mining and sand and gravel operations

[3] Other category includes water used by large cooling users, new large landscape users, new large industrial users and other users

Phoenix AMA

Industrial demand in the Phoenix AMA in 2003 was 193,800 acre-feet or 75% of the total industrial demand in the planning area. On average, industrial demand was approximately 213,600 acre-feet/yr during 2001-2003, or 10% of the Phoenix AMA non-Indian demand. The largest industrial use category in the AMA is turf related facilities, primarily golf courses, which accounted for 45% of the industrial use in 2003. Power plants, specifically the Palo Verde Nuclear Generating Facility,

are the second highest use at 35%. Palo Verde uses over 60,000 acre-feet per year, a majority of which is effluent. Although the total annual demand in the AMA has been increasing, the portion attributed to industrial use has remained fairly stable.

Though dairy operations have been relocating from the Phoenix AMA to the Pinal AMA and rural Arizona, there are still 87 large-scale operations in the AMA representing 6% of the total industrial demand in 2003. Sand and gravel operations are a fairly stable demand within the Phoenix AMA with approximately 5% of the total industrial demand. Approximately 10% of the industrial demand is by "other" industrial users such as small-scale dairies, industrial facilities and high water use landscape areas less than ten acres in size.

Pinal AMA

Industrial demand in the Pinal AMA in 2003 was 14,900 acre-feet, or 6% of the total industrial demand in the planning area. On average, industrial demand was 14,000 acre-feet/yr during 2001-2003, or 2% of the Pinal AMA non-Indian demand. The largest industrial use category in the AMA is dairies and feedlots. Seventeen new, large-scale dairies were constructed in the Pinal AMA during the period from 2000 to 2006, bringing the total number to 28. Many of the new dairies relocated from the Phoenix AMA, as that area underwent urbanization. The number of new dairies in the AMA has leveled off, with only three dairies having started operation since January 2004. The Department is aware of only one dairy that is currently in the planning stage and likely to be constructed. In addition to the increased industrial demand associated with new dairies, the increase in the number and size of dairies has led to both a significant increase in the acreage of forage crops and conversion to forage crops in the AMA, impacting agricultural demand as well.

Prescott AMA

Industrial demand within the Prescott AMA is limited to two golf courses (Prescott Country Club and Quailwood), sand and gravel operations and other industrial uses. Groundwater is the only water supply used by the industrial sector. The 2003 demand was approximately 1,570 acre-feet, less than 1% of the total industrial demand in the planning area. On average, industrial demand was approximately 1,500 acre-feet/yr, or 6% of the Prescott AMA demand during 2001-2003.

Santa Cruz AMA

Approximately 6% of the average (2001-2003) total water demand in the Santa Cruz AMA is industrial. In 2003, industrial demand was 1,420 acre-feet, less than 1% of the total industrial demand in the planning area. Most industrial demand occurs at two industrial golf courses, other turf-related facilities, and sand and gravel operations.

Tucson AMA

Industrial demand in the Tucson AMA in 2003 was 46,600 acre-feet, or 18% of the total industrial demand in the planning area. On average, industrial demand was approximately 51,300 acre-feet during 2001-2003, accounting for 16% of the Tucson AMA demand. Industrial demand is met primarily with groundwater.

The mining sector accounts for almost 70% of the industrial demand in the AMA. The majority of mining demand is from the metal mining industry, specifically copper. Water use in this industry

has fluctuated through time, reaching a peak in the mid 1990s when almost 50,000 acre-feet of water was used. By 2002, water use fell by almost half due to low copper prices. More recently, with the price of copper at historic highs, mining water use numbers are on the rise. Historically, all mining water use has been supplied by groundwater.

In addition to the metal mining industry, other industrial users in the Tucson AMA include sand and gravel facilities, turf facilities, electric power plants, a dairy and other types of industrial users.

8.0.8 Water Resource Issues in the AMA Planning Area

A number of complex issues exist in the AMA Planning Area. Issues have been identified by the Department within management plans, through stakeholder processes, a Governor's Commission, the Arizona Town Hall, and numerous community water resource groups. Groundwater pumping, achievement of management goals, access to renewable water supplies, statutory constraints, environmental protection, local area management and increasing salinity are some of the important considerations in the planning area. Discussed below are issues that have been identified in the past decade and are common to multiple AMAs. The Department is currently identifying AMA issues as it begins development of the fourth management plan and will more specifically evaluate them through that process.

Residual (Allowable) Groundwater Pumping and Management Goals

The amount of groundwater withdrawals allowed under the Groundwater Code, management plans and Assured Water Supply (AWS) Rules through groundwater rights, groundwater permits, and certificates and designations of AWS creates a significant obstacle towards achieving AMA management goals. Four of the five AMAs have a safe-yield component as part of their goal. Safe-yield is defined as, "to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial groundwater in an active management area." A.R.S. § 45-561(12). Groundwater pumped in excess of safe-yield is termed groundwater "mining" or overdraft.

The safe-yield AMAs (Phoenix, Prescott, Santa Cruz and Tucson) have made progress toward achieving their management goals through recharge, replenishment, retirement of agricultural pumpage and conservation although there are still challenges. As allowed by the Code, AWS Rules and the management plans, the responsibility to reduce mined groundwater pumping does not apply proportionately or equitably to all water-using sectors. For example, water providers designated as having an AWS are required to use renewable supplies, though they are authorized to continue to use a limited amount of groundwater. Although there are incentives in the management plans for industrial and agricultural users to use renewable water supplies, there are no mandatory restrictions. Access to sufficient non-groundwater sources by these water users is also a long-term obstacle to achieving safe-yield. In some AMAs the allowable pumping volume may be a large proportion of the overdraft.

Pumpage by domestic/exempt wells is a water use that is neither subject to groundwater replenishment or management plan requirements. Exempt well pumpage represents a significant amount of water demand in some AMAs. For example, it is estimated that there are over 9,000 exempt wells in use in the Prescott AMA, which may account for as much as 25 percent of the

municipal water use. (Since exempt wells are exempt from the Department's reporting requirement, the actual water use is unknown). With the ongoing practice of parcel splits not subject to the State's subdivision laws, the number of exempt wells serving these parcels is expected to increase. Dry lot developments, where each lot owner drills their own well due to the lack of a centralized water service, may also increase.

Access to Renewable Water Supplies

Utilization of renewable supplies has increased over the past 20 years, facilitated by the construction of surface water treatment plants and completion of the CAP, allowing use of Colorado River water either directly or indirectly through artificial recharge and recovery projects. A number of issues have been identified associated with the use of CAP water. These issues include: limited CAP supplies; the need to construct new infrastructure to permit full utilization of supplies; financing of infrastructure; and the long term roles of the Central Arizona Groundwater Replenishment District (CAGRD) and the Arizona Water Banking Authority (AWBA) to ensure long-term availability of renewable supplies for AMAs.

As groundwater supplies diminish and more development occurs that requires groundwater replenishment (e.g. the AWS Rules), there will be more competition for renewable water supplies to meet current and future demands. In addition to the current users, smaller water providers and other groundwater users may not have physical access to these supplies to offset their ongoing use of groundwater. The reallocation of CAP Non-Indian Agricultural water is an example of how much interest there is in renewable water supply acquisition, even for a relatively small volume of low priority, expensive water.

A number of CAP Municipal and Industrial (M&I) subcontractors lack direct access to CAP water and must utilize the resource indirectly through underground storage facilities (USF), or groundwater savings facilities (GSF), located in proximity to the CAP infrastructure. Because the recovery is not required to occur in the area of replenishment, some areas may experience local water level declines and encounter physical availability limitations in the future. Funding for extension of the CAP canal in Tucson, as well as for treatment and other secondary infrastructure in all AMAs, is an issue to renewable supply utilization in some areas.

The CAGRD is also competing for the same renewable water supplies as other users in the Phoenix, Tucson and Pinal AMAs in order to meet its replenishment obligations to its member lands and member service areas under the AWS program. Developers and water providers contract with the CAGRD to replenish groundwater withdrawals as required by the AWS Rules. If the CAGRD cannot meet its obligations, its plan of operation will be considered inconsistent with the AMA management goal, which could impact approval of AWS Certificates and jeopardize the status of AWS Designations. There are also concerns regarding the spatial disconnect between CAGRD storage sites and recovery sites.

AMAs without access to CAP water must look to other water supplies to meet their management goals. For the Prescott AMA transporting alternative long-term supplies into the AMA is critical to achieving safe-yield in this groundwater-dependent AMA. The only alternative supplies currently available are a limited amount of effluent and transportation of groundwater from the adjacent Big Chino Sub-basin pursuant to A.R.S. § 45-555. In the Santa Cruz AMA access to both renewable

and groundwater supplies are influenced by water demand in the large upstream community of Nogales, Sonora. Some of this demand is offset by delivery and treatment of effluent generated in Mexico at the Nogales, Arizona, International Wastewater Treatment Plant (IWWTP), which discharges treated effluent to the Santa Cruz River near Rio Rico. However, there are currently no treaties or legal agreements regarding rights to the treated effluent nor for continued delivery and treatment of Mexican effluent at the IWWTP.

Effluent is a growing renewable resource in all AMAs, but physical distance between the location where the effluent is generated and the location of potential users, and lack of delivery infrastructure, limit its direct use in some areas. As with CAP water, recharge and recovery is utilized with similar concerns about the spatial disconnect between storage and pumping.

Statutory differences between groundwater and non-groundwater sources and conjunctive use
Groundwater and surface water are managed under different statutes with limited integration and consistency in approach. In the rapidly growing AMAs with multiple water sources, the statutory ability to manage only groundwater may be problematic. If any groundwater is part of the supply, the entire supply can be managed as groundwater, but there are many instances where non-groundwater supplies are exclusively used. Water management efforts are currently fragmented because effluent, CAP water, surface water and groundwater are all regulated differently and owned and controlled by different entities. This fragmentation exacerbates other issues, particularly those associated with ownership of water supplies. An exception is the Santa Cruz AMA, where the legislation that created the AMA expressly addressed its unique hydrogeology and the inter-connection of surface and groundwater supplies. It is necessary to coordinate management of these supplies to meet the Santa Cruz AMA management goal due to the highly seasonal and drought-sensitive conditions along the Santa Cruz River.

Environmental Protection
Few perennial riparian habitats remain in the AMA Planning Area; restoration and preservation of these areas have become a high priority in some AMAs. Issues center on the effects on these areas by continued groundwater pumping and surface water diversions. These riparian areas function as natural recharge zones through streambed infiltration and can beneficially serve both environmental and water management objectives if managed appropriately.

Critical Area Management
There is a growing consensus throughout the AMA Planning Area that a mechanism is needed to address water management problems in specific geographic areas within each AMA. Currently, management goals and programs apply to the entire AMA, regardless of local conditions. However, within AMAs areas exist with specific critical concerns. For example, hydrologic conditions can vary widely, from waterlogged areas to areas with severe groundwater overdraft that may result in land subsidence, earth fissures, and aquifer compaction. Areas of severe overdraft may compromise water supply reliability for local groundwater dependent users who may not have access to renewable water supplies.

Salinity
Salinity, or total dissolved solids (TDS) levels in CAP water, surface water and effluent typically

exceed that in native groundwater. As these supplies are increasingly utilized in the planning area, salinity levels will increase in both soil and groundwater. Human activities also contribute salts through industrial and commercial waste, water softeners and other wastes. It is estimated that 1.3 million tons of waterborne salts are annually transported into the Phoenix area from the Salt River and CAP canal and another 140,000 tons of salt are added annually from human activity. Studies suggest there is an annual net gain of approximately 1.1 million tons of salts in the Phoenix area and about 100,000 tons in the Tucson area. (USBOR, 2003)

High salinity levels in water reduce its suitability for some uses or may require more extensive and expensive treatment. Salinity reduces the life of household appliances, may require water softening for some purposes, and reduces crop yields. Salt accumulation in agricultural area soils requires supplemental water to flush salts below plant root zones. Because salts become concentrated in wastewater, irrigation with reclaimed water may be problematic and its disposal increases salt-loading in groundwater. Typical TDS levels in Phoenix area reclaimed water range from 800 to 1400 mg/l compared to a range of 580 to 650 mg/l found in CAP water. Although not currently perceived as a critical issue, it is a growing concern that is being actively studied. (USBOR, 2003)

8.0.9 AMA Water Resource Characteristics

Sections 8.1 through 8.5 present data and maps on water resource characteristics of the groundwater basins in the AMA Planning Area. A description of the data sources and methods used to derive this information is found in Section 1.3 of Volume 1 of the Atlas. This section briefly describes general information that applies to all of the basins and the purpose of the information. This information is organized in the order in which the characteristics are discussed in Sections 8.1 through 8.5.

Geographic Features
Geographic features maps are included to present a general orientation to principal land features, roads, counties and cities, towns and places in the groundwater basin.

Land Ownership
The distribution and type of land ownership in a basin have implications for land and water use. Large amounts of private land typically translate into opportunities for land development and associated water demand, whereas Federal lands are typically maintained for a public purpose with relatively little associated water use. State-owned land may be sold or traded, and is often leased for grazing and farming. The extent of State-owned lands is due to a number of legislative actions. The State Enabling Act of 1910 and the Act that established the Territory of Arizona in 1863 set aside sections 2, 16, 32 and 36 in each township to be held in trust by the State for educational purposes. Other legislation authorized additional State Trust Lands for specified purposes, which are identified for each basin (ASLD, 2006).

Climate
Climate data including temperature, rainfall, evaporation rates and snowfall are critical components of water resource planning and management. Averages and variability, seasonality of precipitation and long term climate trends are all important factors in demand and supply planning. Important in

the AMA Planning Area is the heat island effect, which is affecting climate in the major metropolitan areas.

Surface Water Conditions

Depending on physical and legal availability, surface water may be a potential supply in a basin. Stream gage, flood gage, reservoir, stockpond and runoff contour data provide information on physical availability of this supply. Seasonal flow information is relevant to seasonal supply availability. Annual flow volumes provide an indication of potential volumetric availability.

Criteria for including stream gage stations in the AMA tables are that there is at least one year of record, and annual streamflow statistics are included only if there are at least three years of record. There are different types of stations and those that only serve repeater functions were not included.

Flood gage information is presented to direct the reader to sources of additional precipitation and flow information that can be used in water resource planning. Large reservoir storage information provides data on the amount of water stored in the basin, its uses, and ownership. Because of the large number of small reservoirs, and less reliable data, individual small reservoir data is not provided. The number of stockponds is a general indicator of small-scale surface water capture and livestock demand. Runoff contours reflect the average annual runoff in tributary streams. They provide a generalized indication of the amount of runoff that can be expected at a particular geographic location.

Perennial and Intermittent Streams and Major Springs

A map of perennial and intermittent streams is provided for each AMA. For some AMAs, more than one source of information was used. Stream designations may not accurately reflect current conditions in some cases. Spring data was compiled from a number of sources in an effort to develop as comprehensive a list as possible. Spring data is important to many researchers and to the environmental community due to their importance in maintaining habitat, even from small discharges.

Groundwater Conditions

Several indicators of groundwater conditions are presented for each AMA. Aquifer type can be a general indicator of aquifer storage potential, accessibility of the supply, aquifer productivity, water quality and aquifer flux. Well yield information for large diameter wells is provided and is generally measured when the well is drilled and tested and is reported on completion reports. It was assumed that large diameter wells were drilled to produce a maximum amount of water and, therefore, their reported pump capacities are indicative of the aquifer's potential to yield water to a well. However, many factors can affect well yields including well design, pump size and condition and the age of the well. Reported well yields are only a general indicator of aquifer productivity and specific information is available from well measurements conducted as part of basin investigations. Natural recharge is often one of the least well known component of a water budget. Recharge estimates are generally from hydrologic studies conducted within the AMA.

Water level data are from measured wells, usually collected during the period when the wells were

not actively being pumped or only minimally pumped. Depth to water measurements are shown on mapped wells for the most recent measurement. The basin hydrographs show water-level trends for selected wells, typically over a 30-year period from 1975 to the year of most recent measurement, which varies between AMAs.

The flow directions that are shown generally reflect long-term, regional aquifer flow in the basin and are not meant to depict temporary or local-scale conditions. However, flow directions in some AMAs indicate how localized pumping has altered regional flow patterns.

Groundwater recharge is an important water management program in the AMAs and has had significant effects on groundwater levels at a number of locations. Permit information and the location of underground storage facilities and groundwater savings facilities where CAP water, effluent and surface water are stored for later recovery are shown on maps and tables.

Water Quality

Water quality conditions impact the suitability of water supplies for certain uses. Water providers serving more than 25 people or having 15 or more connections are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards (for more information see www.azdeq.gov). Water quality data were compiled from a variety of sources as described in Volume 1 Section 1.3. The data indicate areas where water quality exceedences have previously occurred, however additional areas of concern may currently exist where water quality samples have not been collected or sample results were not reviewed by the Department (e.g. samples collected in conjunction with the ADEQ Aquifer Protection Permit programs). It is important to note also that the exceedences presented may or may not reflect current aquifer or surface water conditions. Due to a high density of measured sites in the Phoenix, Pinal, Santa Cruz and Tucson AMAs, most sites within 0.75 miles of one another share a common map key. Also shown are contamination sites including DOD, RCRA, Superfund, WQARF, VRP and LUST sites including location, affected media and specific contaminant.

Cultural Water Demand

Cultural water demand, defined in the Atlas as municipal, industrial and agricultural water demand, is an important component of a water budget. Mandatory metering and reporting of water use in the AMAs has resulted in the collection of extensive and relatively accurate demand data. Municipal demand includes water company and domestic (self-supplied) demand estimates. AMA demand information is compiled from several sources in order to prepare as accurate an estimate as possible. Annual demand estimates have been averaged over a specific time period. This provides general trend information without focusing on potentially inaccurate annual demand estimates due to incomplete data or anomalous weather conditions in a single year.

Locations of major cultural water uses are primarily from a 2004 USGS land cover study using older satellite imagery that may not represent recent changes. The cultural demand maps provide only general information about the location of water users.

Effluent generation data were compiled from several sources to provide an estimate of how much of this renewable resource might be available for use. However, effluent reuse is often difficult to

determine both logistically and economically since a potential user may be far from the wastewater treatment plant.

Assured Water Supply

Detailed information on Assured Water Supply (AWS) determinations for subdivisions, master planned communities and service areas are shown on maps and tables. Also shown are Water Adequacy Reports which were issued prior to enactment of the Groundwater Code in 1980. Change of ownership of a previously issued determination is not counted in the totals shown on tables and maps.

Developers of subdivisions within AMAs are required to obtain a determination of whether there is sufficient water of adequate quality available for 100 years and that the development is consistent with the management plan and management goal of the AMA. In addition to these subdivision determinations for which a Certificate of AWS is issued, water providers may apply for assured water supply designations for their entire service area. If a subdivision is to be served water from a designated service area, then a separate Certificate of AWS is not required.

Developers also have the option to obtain an Analysis of AWS, which is generally used to prove that water will be physically available for master planned communities. If an Analysis is issued for groundwater, it reserves a specific volume of water for 10 years for the specific property. (See Appendix A, Volume 1 for more information about the Assured Water Supply Program and Section 8.0-5).

REFERENCES

Anderson, T.W., Freethey, G.W., and Tucci, Patrick, 1992, Geohydrology and water resources of alluvial basins in south-central Arizona and adjacent states: U.S. Geological Survey Professional Paper 1406-B

Arizona Department of Environmental Quality (ADEQ), 2008, Superfund and WQARF programs, Accessed June 2008 at http://www.azdeq.gov/environ/waste/sps/index.html

_____, 2008, Notice of the Preliminary Decision to Issue an Individual Aquifer Protection Permit Significant Amendment; City of Scottsdale Water Campus and CAP Water Treatment Plant Aquifer Protection Permit (APP) # 102633, LTF No.33526

_____, 2006, Active DOD, Superfund, WQARF, and LUST contamination sites in Arizona: GIS cover, received February 2006.

_____, 2002, The Status of Water Quality in Arizona – 2002: Volume 1. Arizona's Integrated 305(b) Assessment and 303(b) Listing Report

Arizona Department of Water Resources (ADWR), 2008, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006a, Regional Groundwater Flow Model of the Tucson Active Management Area Tucson, Arizona: Simulation and Application, Modeling Report No. 13

_____, 2006b, Technical Assessment of the Gila River Indian Community Water Rights Settlement, In re The General Adjudication of the Gila River System and Source

_____, 2006c, Technical Assessment of the Tohono O'odham Nation Water Rights Settlement (Southern Arizona Water Rights Settlement), In re The General Adjudication of the Gila River System and Source

_____, 2005, Prescott Active Management Area 2003-2004 Hydrologic Monitoring Report

_____, 1999a, Third Management Plan for Phoenix, Pinal, Prescott, Santa Cruz and Tucson Active Management Area 2000-2010, 5 Volumes

_____, 1999b, Third Management Plan for Pinal Active Management Area, 2000-2010

_____, 1998, Water Service Organizations in Arizona

_____, 1996, An Application of the Regional Groundwater Flow Model on the Salt River Valley, Arizona. Analysis of Future Water Use and Supply Conditions Current Trends Alternative 1989-2025, Modeling Report No.11

_____, 1994, Arizona Water Resources Assessment. Volume II Hydrologic Summary

_____, 1991, unpublished file data, Salt River Valley model study

Arizona Game and Fish Department (AZGF), 2008, Arizona Heritage Data Management System, accessed in 2008 at: http://www.azgfd.gov/w_c/edits/species_concern.shtml

_____, 1993, Arizona Riparian Inventory and Mapping Project: GIS cover.

Arizona-Sonora Desert Museum (ASDM), 2008, Center for Sonoran Desert Studies: Accessed January, 2008 at http://www.desertmuseum.org/

Arizona Land Resource Information System (ALRIS), 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.

Arizona State Land Department (ASLD), 2006, Historical overview-Land Grant and Designation Beneficiaries: Accessed February 2006 at http://www.land.state.az.us/history.htm.

Baker, L. A., A. J. Brazel, et al., 2002, ”Urbanization and warming of Phoenix (Arizona, USA): Impacts, feedbacks and mitigation.” Urban Ecosystems 6: 183-203.

Blasch, K.W., Hoffman, J.P., Graser, L.F., Bryson, J.R., and Flint, A.L., 2006, Hydrogeology of the upper and middle Verde River watersheds, Central Arizona: U.S. Geological Survey Scientific Investigations Report 2005-5198, 101 p. 3 plates.

Brazel, A., P. Gober, S. Lee, S. Grossman-Clarke, J. Zehnder, B. Hedquist and E. Comparri., 2007, Determinants of changes in the regional urban heat island in metropolitan Phoenix (Arizona, USA) between 1990 and 2004. *Climate Research* 33(2):171-182.

Brown, D. and Lowe, C., 1980, Biotic Communities of the Southwest: GIS cover digitized by Arizona Game and Fish Department: Accessed 2007 at http://www.dot.co.pima.az.us/gis/maps/mapguide

Brown, D., ed., 1982, Biotic Communities of the Southwest-United States and Mexico, Special Issue of Desert Plants, Volume 4. Numbers 1-4, Published by the University of Arizona.

Central Arizona Salinity Study (CASS), 2003, Central Arizona Salinity Study, Phase I Report

Central Arizona Project (CAP), 2008, Subcontract status report: accessed May, 2008 at http://www.cap-az.com/docs/SubcontractStatusReport_03_13_08.pdf

City of Casa Grande, 2001, City of Casa Grande General Plan 2010

City of Chandler, 2002, City of Chandler General Plan, Water Resources Element

City of Mesa, 2004, Water Resources Plan

City of Phoenix, 2005, Water Resources Plan 2005 Update

City of Scottsdale, 2007, Drought Situation FAQs: accessed July, 2008 at http://www.scottsdaleaz.gov/water/DroughtFAQs.asp

City of Tempe, 2006, City of Tempe Water Service Area-Water Resources Plan

City of Tucson, Water Department, 2007. Reclaimed Water System Status Report 2007.

_____, 2004, Water Plan:2000-2050. Final Draft - Mayor and Council, November 22, 2004.

Climate Assessment for the Southwest (CLIMAS), 2008, Climate Reconstructions for Arizona Climate Divisions, accessed May, 2008 at www.climas.arizona.edu/research/paleoclimate

Comrie, A. C., 2000, "Mapping a wind-modified urban heat island in Tucson, Arizona (with comments on integrating research and undergraduate learning)." Bulletin of the American Meteorological Society 81(10): 2417-2431.

Diem, J. E. and D. P. Brown, 2003, "Anthropogenic impacts on summer precipitation in central Arizona, U.S.A." The Professional Geographer 55(3): 343-355.

Environmental Law Institute, 2002, An Analysis of State Superfund Programs: 50 State Study, 2001 Update.

Gila River Indian Community (GRIC), 2008, Water Settlement: accessed July, 2008 at http://www.gilariver.org/

Gookin, W.S., 1977, Comprehensive Water Study of The City of Prescott and Environs, Gookin and Associates, Consulting Engineers.

Hanson, R.T., S.R. Anderson, and D.R. Pool, 1990. Simulation of ground-water flow and potential land subsidence, Arva Valley, Arizona. United States Geological Survey Water-Resources Investigations Report 90-4178, 41pp.

Hanson, R.T. and J.F. Benedict, 1994. Simulation of ground-water flow and potential land subsidence, Upper Santa Cruz Basin, Arizona. United States Geological Survey Water-Resources Investigation Report 93-4196, 47pp.

Hetrick, J., and Roberts, D., 2004 "Trends in Non-Indian Agricultural Water Use Within the Phoenix Active Management Area"; Salt River Project

International Boundary Water Commission (IBWC), 1998, Binational Nogales Wash United States/Mexico Groundwater Monitoring Program Interim Report

Inter Tribal Council of Arizona (ITCA), Inc., 2008, Member Tribes: accessed May 22, 2008 at http://www.itcaonline.com/tribes.html

National Agricultural Statistics Services (NASS), 2008, Arizona 2003 Annual Statistics Bulletin

Neary, D.G., Gottfried, G.J., and Ffolliott, P.F., 2003, Post-Wildfire Watershed Flood Responses, Proceedings of the 2nd International Fire Ecology Conference, American Meteorological Society, Orlando, Florida, Paper 65982, 8p.

Northern Arizona University (NAU), Center for American Indian Economic Development \ (CAIED), 2008: accessed May 22 2008 at http://www.franke.nau.edu/caied/

Olson, D. M, Dinerstein, E., Wikramanayake, E.D., Burgess, N.D., Powell, G.V.N., Underwood, E.C., D'amico, J.A., Itoua, I., Strand, H.E., Morrison, J.C., Loucks, C.J., Allnutt, T.F., Ricketts, T.H., Kura, Y., Lamoreux, J.F., Wettengel, W.W., Hedao, P. & Kassem, K.R., 2001. Terrestrial Ecoregions of the World: A New Map of Life on Earth. BioScience 51:933-938

Pascua Yaqui Tribe, 2005, Pascua Yaqui Tribe Demographics: accessed July, 2008 at www.pascuayaqui-nsn.gov

Pima County, 2006a, Draft IV: Pima County Multi-species Conservation Plan.

_____, 2006b, Sonoran Desert Conservation Plan: A Glance at Where We Are Today, available at http://www.pima.gov/CMO/SDCP/PDF/ SDCP_WhereWeAreToday.pdf

Salt River Project (SRP), 2008, Irrigation service territory and canal distances: Accessed at http://www.srpnet.com/water/canals/distances.aspx#arizona

Schaffner, M. and Reed, W.B, 2007, Effects of Wildfire in the Mountainous Terrain of Southeast Arizona: An Empirical Formula to Estimate 5-Year Peak Discharge from Small Post-Burn Watersheds: NOAA Technical Memoranda

Shepherd, J. M., 2006, "Evidence of urban-induced precipitation variability in arid climate regimes." Journal of Arid Environments 67: 607-628.

Tellman, B., Yarde, R., and Wallace, M., 1997, Arizona's changing rivers: How people have affected rivers: Water Resources Research Center, University of Arizona, Tucson, Arizona.

U.S. Bureau of Land Management (BLM), 2008, National Monuments: accessed January 2008 at http://www.blm.gov/az/st/en/prog/blm_special_areas/natmon.html

U.S. Bureau of Reclamation, 2003, Central Arizona Salinity Study, Phase I Final Report. Prepared in partnership with the City of Glendale, City of Mesa, City of Phoenix, City of Scottsdale, City of Tempe, Arizona-American Water Company, City of Chandler, City of Goodyear, City of Peoria, City of Surprise, City of Tucson, Town of Buckeye, Town of Gilbert, Queen Creek Water Company, and Brown and Caldwell.

U.S. Census Bureau, (Census) 2000, on-line data files: Accessed June 2008 at http://www.census.gov/

U.S. Fish and Wildlife Service (USFWS), 2008, Buenos Aires National Wildlife Refuge: accessed January 2008 at http://www.fws.gov/southwest/refuges/arizona/buenosaires/index.html

_____, 2007, Endangered Species List by County: Accessed in 2007 at www.fws.gov/arizonaes/documents/countylists

U.S. Forest Service (USFS), 2008, Wilderness areas: Accessed 2007 at http:// www.fs.fed.us/r3/

_____, 2007, Wildland fire permitiers (Southwest Region): GIS Datasets accessed in 2007 at http://www.fs.fed.us/r3/gis/datasets.shtml

U.S. Geological Survey (USGS), 2005, 1:2,000,000-Scale Hydrologic Unite Boundaries: GIS Cover, accessed in 2007 at http://nationalatlas.gov/atlasftp.html?opernChapters=chpwater#chpwater

U.S. National Park Service (NPS), 2008a, Hohokam Pima National Monument: accessed January 2008 at http://www.nps.gov/pima/

_____, 2008b, Casa Grande Ruins National Monument: accessed January 2008 at http://www.nps.gov/cagr/index.htm

_____, 2008c, Saguaro National Park: accessed January 2008 at http://www.nps.gov/sagu/

Varady, R. G., Ingram, H., and Milich, L., 2005, "The Sonoran Pimería Alta: Shared Environmental Problems and Challenges", Journal of the Southwest, Volume 37, Number 1 Spring 1995

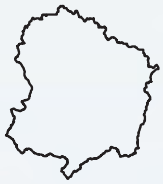
Warshall, P., 2006, Southwestern Sky Island Ecosystems: Accessed August 2006 at http://biology.usgs.gov/s+t/frame/r119.htm

Webb, R.H., Leake, S.A., and Turner, R.M., 2007, The Ribbon of Green-Change in Riparian Vegetation in the Southwestern United States; The University of Arizona Press, Tucson

Western Regional Climate Center, 2008, Historical Climate Information, Arizona: accessed May 2008 at http://www.wrcc.dri.edu/summary/Climsmaz.html

Wirt, L., DeWitt, E., Langenheim, V. eds., 2005, Geologic framework of aquifer units and groundwater flowpaths, Verde River headwaters, north central Arizona: USGS Open-file report 2004-1411.

Section 8.1
Phoenix AMA



8.1.1 Geography of the Phoenix AMA

The Phoenix AMA is 5,646 square miles in area, the largest AMA in the planning area. Geographic features and principal communities are shown on Figure 8.1-1. The AMA is characterized by valleys surrounded by mid-elevation mountain ranges. Vegetation types are predominantly Lower Colorado River Valley and Arizona Uplands Sonoran desertscrub with a small area of southwestern interior chaparral in the northeastern portion of the AMA. Riparian vegetation, primarily tamarisk, is found extensively along the Gila River below the 91st Avenue Wastewater Treatment Plant (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.1-1 are:
    - The Gila River, the major drainage in the AMA, running from the southeast near Sacaton to the northwest, exiting the AMA south of Arlington.
    - The Salt River running east to west through the center of the AMA to its confluence with the Gila River southeast of Goodyear.
    - The Verde River running north to south in the northeastern part of the AMA to its confluence with the Salt River south of Fort McDowell.
    - The Agua Fria River, running south west of Anthem from Lake Pleasant, to its confluence with the Gila River south of Goodyear.
    - The Hassayampa River in the western part of the AMA, running south to its confluence with the Gila River.
    - Other tributaries to the rivers listed above including Skunk Creek, New River and Cave Creek in the northeast, Waterman Wash and Centennial Wash in the southwest and Queen Creek in the southeast.
    - Numerous valleys and plains including Paradise and Deer Valleys in the east and Rainbow Valley and Hassayampa Plain in the west.
    - Mid-elevation mountain ranges along the AMA boundaries including the Vulture, Hieroglyphic and New River Mountains on the north, the Mazatzal, Goldfield and Superstition Mountains on the east, the Santan, Sacaton, South, Sierra Estrella and Maricopa Mountains and the Buckeye Hills on the south, and the Gila Bend, Big Horn and Belmont Mountains on the west. (Some of these features are not well shown on the map).
    - The lowest point in the AMA, 755 feet, south of Buckeye at Gillespie Dam where the Gila River exits the AMA.
    - The highest point in the AMA is 5,868 feet in the New River Mountains.

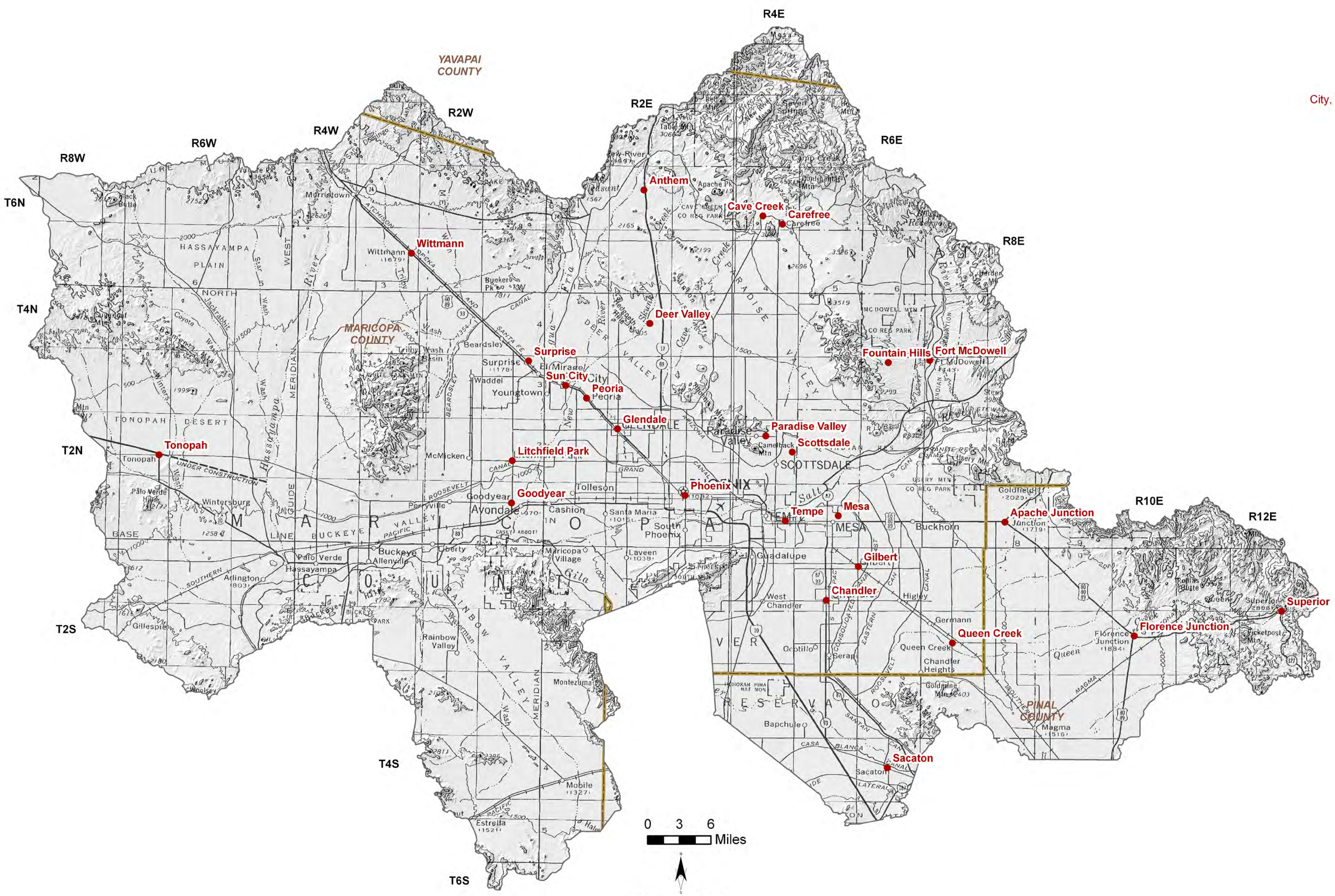


Figure 8.1-1
Phoenix AMA
Geographic Features

Base Map: USGS 1:500,000, 1981

8.1.2 Land Ownership in the Phoenix AMA

Land ownership, including the percentage of ownership by category, for the Phoenix AMA is shown in Figure 8.1-2. The principal feature of land ownership in the AMA is the large proportion of private land. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of largest to smallest percentage in the AMA.

Private

- 43.7% of the land is private.
- Land uses include domestic, commercial and agriculture.

U.S. Bureau of Land Management (BLM)

- 18.3% of the land is federally owned and managed by the Hassayampa and Lower Sonoran Field Offices of the Bureau of Land Management.
- The AMA includes 3,082 acres of the 21,000-acre Big Horn Wilderness, 24,453 acres of the 31,200-acre Hummingbird Springs Wilderness, 1,830-acres of the 13,350-acre Signal Mountain Wilderness and 11,715 acres of the 14,400-acre Sierra Estrella Wilderness. The AMA also includes a portion of the Sonoran Desert National Monument that encompasses two additional wilderness areas, the North and South Maricopa Mountains Wilderness areas (See Figure 8.0-13).
- Land uses include resource conservation, recreation and grazing.

State Trust Land

- 16.0% of the land is held in trust for public schools and multiple other entities under the State Trust Land system.
- Land uses include agriculture and grazing.

National Forest

- 10.2% of the land is federally owned and managed as National Forest.
- Forest lands in the AMA are part of the Tonto National Forest and include 22,179 acres of the 160,000-acre Superstition Wilderness.
- Land uses include recreation and grazing.

Indian Reservation

- 8.0% of the land is under tribal ownership as the Fort McDowell Yavapai Nation, Salt River Pima-Maricopa Indian Community and Gila River Indian Community.
- Land uses include domestic, commercial and agriculture.

Other

- 3.6% of the land is owned and managed by the Bureau of Reclamation (BOR) and county or local governments.
- “Other” includes land managed by BOR for the Central Arizona Project canal and pumping stations as well as a number of local and regional parks. Parks include the 30,000-acre White Tank Mountain Regional Park in the western portion of the AMA, most of the

16,000-acre South Mountain Park on the southern boundary, 19,840 Estrella Mountain Regional Park in the southwest and the 21,099-acre McDowell Mountain Regional Park north of Fountain Hills

- Land uses include water infrastructure and recreation.

U.S. Military

- 0.2% of the land is federally owned and managed by the U.S. Military.
- Military lands include the Luke Air Force Base in the center of the AMA near Litchfield Park.
- Primary land use is military activity.

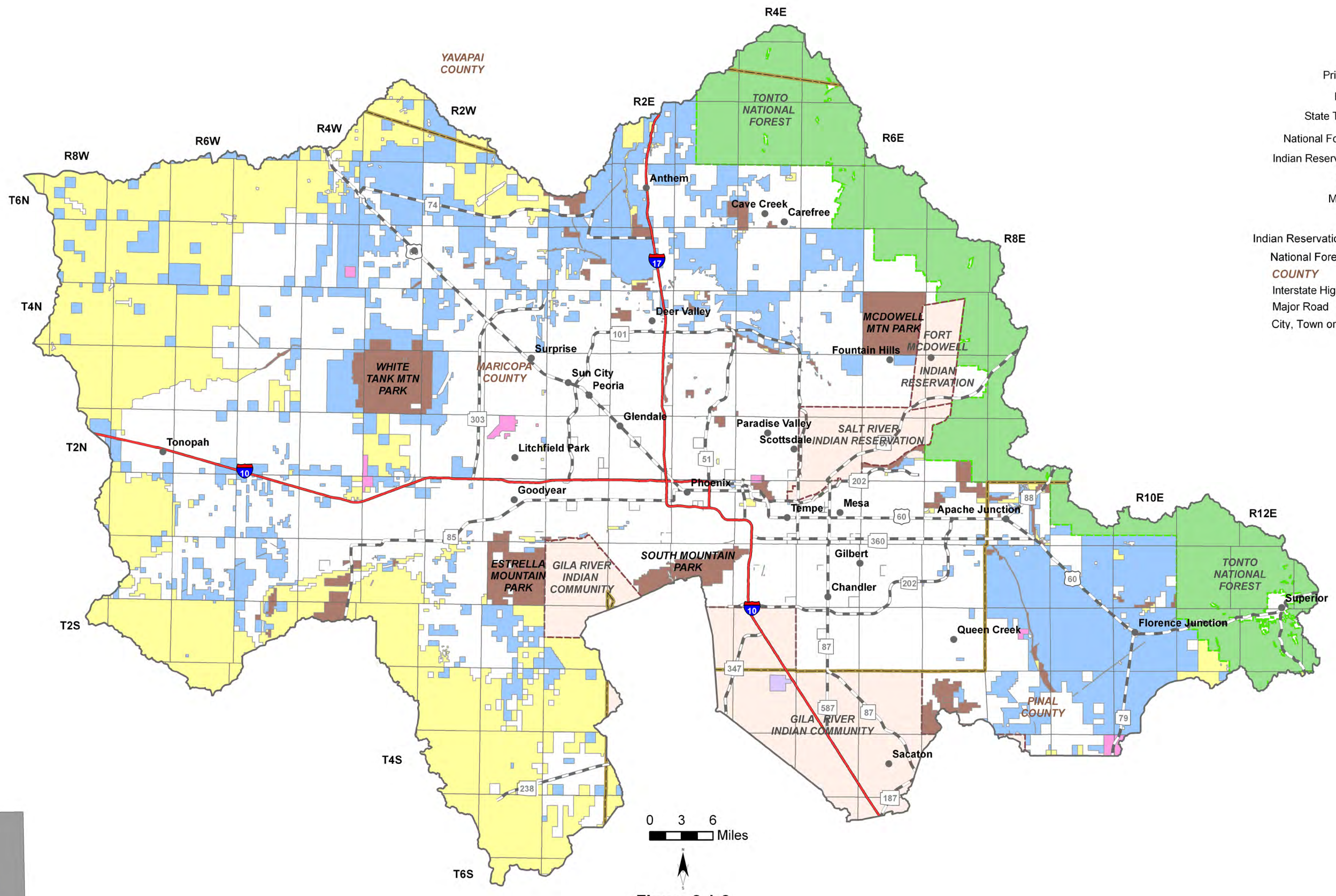


Figure 8.1-2
Phoenix AMA
Land Ownership

8.1.3 Climate of the Phoenix AMA

Climate data from NOAA/NWS Co-op Network, Evaporation Pan and AZMET stations are complied in Table 8.1-1 and the locations are shown on Figure 8.1-3. Figure 8.1-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Phoenix AMA does not contain SNOTEL/Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.1-1A
- There are 32 NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July at all stations and ranges between 86.8°F and 94.8°F. The average monthly minimum temperature occurs in December or January and ranges between 48.5°F and 55.5°F.
- Highest average seasonal rainfall occurs in both the summer (July-September) and winter (January-March). For the period of record used, the highest annual rainfall is 20.24 inches at the Superior station and the lowest is 5.91 inches at the Tonopah 5NE station.

Evaporation Pan

- Refer to Table 8.1-1B
- There are five evaporation pan stations in the AMA. Elevation at the stations range from 1,170 feet to 1,650 feet and the corresponding annual average evaporation ranges from 74.3 inches to 117.5 inches.

AZMET

- Refer to Table 8.1-1C
- There are 10 AZMET stations in the AMA. Elevation at the stations range from 1,000 feet to 1,700 feet and corresponding annual average evaporation ranges from 80.94 inches to 73.15 inches.

SCAS Precipitation Data

- See Figure 8.1-3
- Additional precipitation data shows average annual rainfall as high as 28 inches on the AMA boundary north of Cave Creek and as low as six inches in the southwestern portion of the AMA.

Table 8.1-1 Climate Data for the Phoenix AMA

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Alhambra 2 NE	1,142	1948-1976[1]	90/Jul	51.2/Jan	1.43	0.71	1.93	2.78	6.85
Apache Junction	1,723	1962-1979[1]	91.7/Jul	52.4/Jan	3.38	0.81	2.50	3.03	9.72
Apache Junction 5 NE	2,070	1971-2000	89.5/Jul	52.7/Jan	4.87	0.82	3.26	3.34	12.29
Arizona Falls 1 WNW	1,250	1948-1963	89.5/Jul	51.9/Jan	2.17	0.57	2.73	1.67	7.14
Bartlett Dam	1,650	1971-2000	89.9/Jul	53.7/Jan	5.90	1.22	4.45	4.28	15.85
Buckeye	890	1971-2000	91.3/Jul	52/Dec	2.59	0.45	2.64	2.20	7.91
Carefree	2,530	1971-2000	88.4/Jul	51.6/Jan	5.27	0.81	3.56	3.64	13.28
Cave Creek	2,123	1950-1961	88.4/Jul	50.9/Jan	3.47	1.08	3.98	2.59	11.12
Chandler Heights	1,425	1948-2006[1]	90/Jul	51.9/Jan	3.03	0.64	1.65	2.27	7.59
Deer Valley	1,257	1971-2000	90.6/Jul	52.5/Dec,Jan	2.92	0.57	2.27	2.13	7.78
Falcon Field	1,322	1948-1976[1]	87/Jul	50.4/Jan	2.06	0.64	1.83	3.31	7.84
Fountain Hills	1,582	1971-2000	90.7/Jul	52.6/Jan	4.62	0.69	3.27	3.39	11.97
Granite Reef Dam	1,322	1893-1979[1]	89.5/Jul	52.1/Jan	2.99	0.80	2.37	3.05	9.21
Laveen 3 SSE	1,115	1971-2000	92.2/Jul	52.9/Dec	2.74	0.54	2.91	2.56	8.70
Litchfield Park	1,030	1971-2000	91.5Jul	52/Dec	3.19	0.53	2.59	2.37	8.62
Marinette	1,152	1913-1964	90.6/Jul	50.2/Jan	2.27	0.68	2.53	2.39	7.87
Mesa	1,235	1971-2000	91.3/Jul	53.7/Dec	3.19	0.56	2.92	2.56	9.23
Phoenix City	1,098	1948-1998	92.9/Jul	54.7/Jan	3.01	0.59	2.39	2.52	8.51
Phoenix Sky Harbor	1,106	1971-2000	94.8/Jul	55.5/Dec	2.67	0.51	2.68	2.44	8.29
Sacaton	1,285	1971-2000	90.8/Jul	50.5/Dec	2.80	0.53	2.84	2.51	8.68
Scottsdale	1,201	1968-1985[1]	90.5/Jul	51.5/Dec	3.03	0.63	2.91	2.84	9.41
South Phoenix	1,155	1971-2000	88.2/Jul	52.5/Dec	3.10	0.58	2.73	2.54	8.95
Stewart Mountain	1,422	1971-2000	88.8/Jul	51.7/Dec	5.15	0.93	3.79	3.83	13.70
Superior	2,995	1971-2000	86.8/Jul	52/Jan	7.03	1.52	6.51	5.18	20.24
Superstition Mtn	1,962	1948-1962	91.1/Jul	54.1/Jan	3.11	0.96	4.05	2.71	10.83
Tempe 1 SE	1,152	1926-1984[1]	89.2/Jul	50.5/Jan	2.79	0.82	2.83	2.68	9.12
Tempe 3 S	1,181	1905-1952	88/Jul	48.5/Jan	2.60	0.69	3.18	2.22	8.69
Tempe ASU	1,170	1971-2000	89.9/Jul	53.9/Dec	3.20	0.53	2.95	2.68	9.36
Tonopah 5 NE	1,150	1971-2000	92/Jul	51.4/Dec	2.65	0.36	1.55	1.55	5.91
Waddell 3 SSE	1,099	1952-1960	87.1/Jul	50.3/Jan	2.20	0.20	2.60	1.60	6.60
Wittmann	1,703	1923-2007	91.1/Jul	49.9/Jan	2.75	0.72	3.42	2.25	9.14
Youngtown	1,135	1971-2000	93.5/Jul	54.6/Dec	3.33	0.52	2.63	2.59	9.03

Source: WRCC

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

Table 8.1-1 Climate Data for the Phoenix AMA (cont)

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
Bartlett Dam	1,650	1939-2005	117.54
Mesa	1,235	1896-2005	94.38
Sacaton	1,285	1908-2005	107.42
Stewart Mountain	1,422	1948-2005	106.23
Tempe ASU	1,170	1953-2005	74.29

Source: WRCC

C. AZMET:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
Buckeye	1,000	1999 - current	80.94*(6)*
Desert Ridge	1,700	2003 - current	76.54(2)
Laveen	1,033	1999 - 2000	73.15(2)
Litchfield	1,014	1999 - 2002	80.59(4)
Mesa	1,202	2004 - current	78.39(1)
Phoenix Encanto	1,099	1999 - current	73.76(6)
Phoenix Greenway	1,316	1999 - current	74.89(6)
Queen Creek	1,410	1999 - current	77.33(6)
Scottsdale	1,539	NA	NA
Waddell	1,335	1999 - current	77.22(6)

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	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								

Source: NRCS, 2005

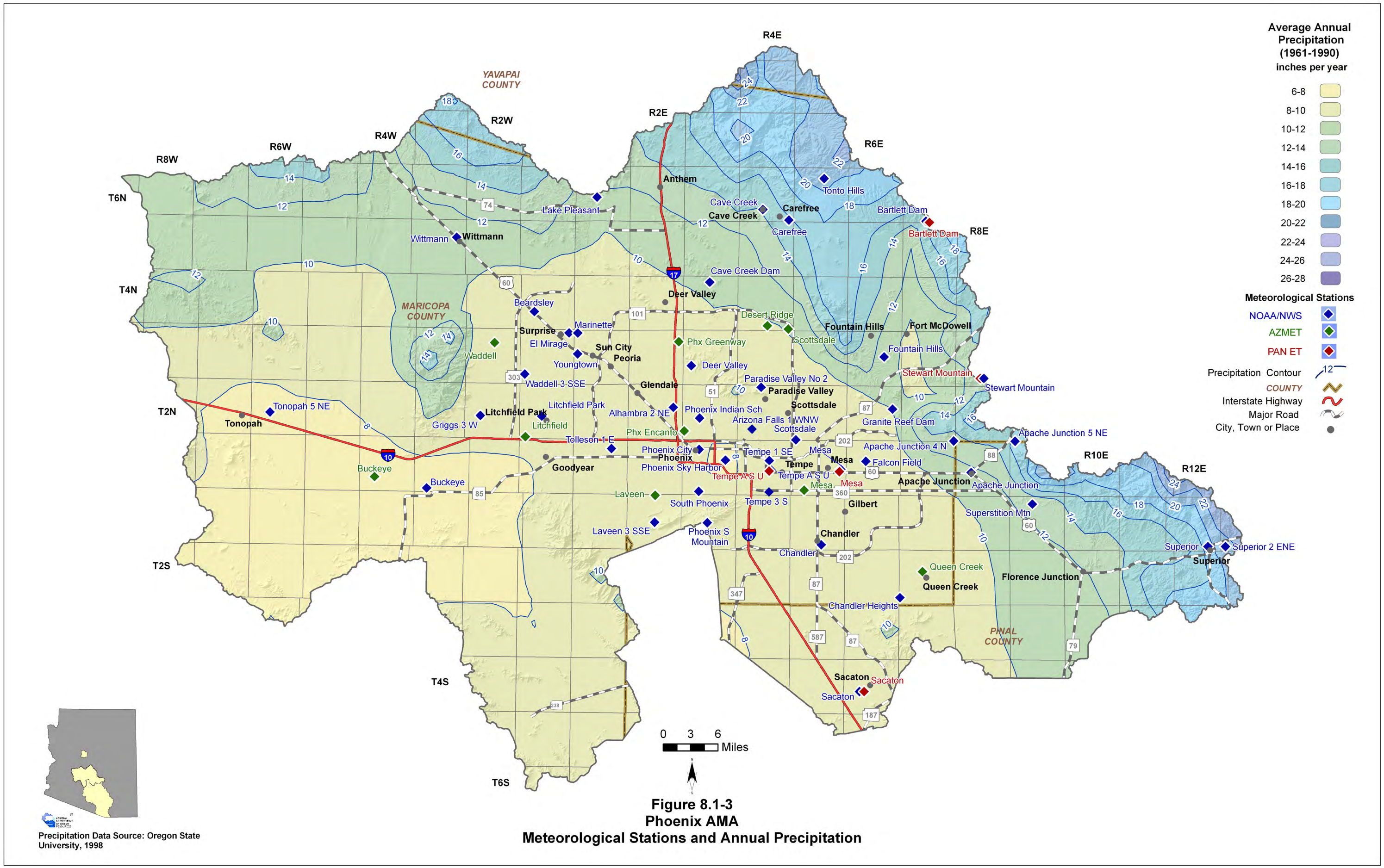


Figure 8.1-3
Phoenix AMA
Meteorological Stations and Annual Precipitation

8.1.4 Surface Water Conditions in the Phoenix AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.1-2. Flood ALERT equipment in the AMA is shown in Table 8.1-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.1-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 8.1-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.1-2.
- Data from 35 stations located at 13 watercourses are shown in the table and on Figure 8.1-4.
- Average seasonal flow varies and regulated releases from dams on the Salt, Verde, Gila and Agua Fria rivers influence the seasonal flow regime. On other drainages, average seasonal flows are generally greatest in the winter season (January-March).
- The largest annual flow recorded in the AMA is 6.1 million acre-feet in 1993 at the Gila River at Estrella Parkway near Goodyear with a contributing drainage area of 45,585 square miles.

Flood ALERT Equipment

- Refer to Table 8.1-3.
- There are 190 ALERT gages in the Phoenix AMA.

Reservoirs and Stockponds

- Refer to Table 8.1-4.
- The AMA contains five large reservoirs. The largest by far is Lake Pleasant, which is actually located in the Agua Fria Basin. However, the dam that impounds Lake Pleasant, New Waddell, is located in the AMA.
- Four reservoirs are used for recreation. Other reservoir uses include flood control, hydroelectric power generation, irrigation and water supply.
- Surface water is stored or could be stored in 41 small reservoirs.
- There are 711 registered stockponds in the AMA.

Runoff Contour

- Refer to Figure 8.1-4.
- Average annual runoff is highest, 1 inch per year or 53.3 acre-feet per square mile, on the northeastern AMA boundary and decreases to 0.1 inches, or five acre-feet per square mile, in the center of the AMA.

Table 8.1-2 Streamflow Data for the Phoenix AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9478350	Gila River near Sacaton	NA	1,290	6/1995-1/1999 (discontinued)	44	0	56	0	0 (1997)	207	185	348 (1996)	3
9478500	Queen Creek Below Whitlow Dam near Superior	144	2,040	5/2001-current (real-time)	68	8	17	7	879 (2002)	1,646	5,749	18,827 (2005)	4
9479000	Queen Creek near Florence Junction	192	1,919	9/1939-6/1941 (discontinued)	No statistics run, less than 3 years data								
9479200	Queen Creek Trib at Apache Junction	1	1,712	2/1961-9/1968 (discontinued)	1	0	66	33	0 (1962)	6	6	13 (1966)	6
9479350	Gila River near Maricopa	19,915	1,114	6/1995-current (real-time)	21	1	77	1	0 (2003)	2	87	737 (2005)	10
9502000	Salt River Below Stewart Mountain Dam.	6,232	1,370	10/1940-current (real-time)	24	33	34	9	114,962 (2003)	585,878	711,279	3,276,254 (1993)	65
9502500	Salt River at Mcdowell	6,268	1,327	1/1904-12/1909 (discontinued)	44	26	12	18	246,880 (1904)	1,239,876	1,533,770	3,744,920 (1905)	6
9510000	Verde River Blw Bartlett Dam	6,161	1,570	10/1944-current (real-time)	39	25	18	17	113,131 (2002)	297,890	419,877	1,812,549 (1993)	61
9511300	Verde River near Scottsdale	6,250	1,320	3/1961-current (real-time)	45	22	15	18	96,980 (2002)	298,074	454,965	1,794,415 (1993)	44
9512060	Salt River at Alma School Rd	NA	1,200	10/1991-9/1993 (discontinued)	No statistics run, less than 3 years data								
9512100	Indian Bend Wash at Scottsdale	139	1,280	10/1960-9/1984 (discontinued)	17	0	34	48	0 (1977)	312	828	4,075 (1978)	22
9512162	Indian Bend Wash at Curry Road, Tempe	82	1,162	10/1992-current (real-time)	63	2	13	22	99 (2002)	1,146	2,695	20,693 (1993)	13
9512165	Salt River at Priest Drive	13,223	1,135	1/1994-current (real-time)	94	5	1	1	0 (1997)	2,000	149,839	903,969 (2005)	12
9512170	Salt River at Jointhead Dam	13,225	1,130	3/1978-9/1980 (discontinued)	No statistics run, less than 3 years data								

Table 8.1-2 Streamflow Data for the Phoenix AMA (cont)

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9512180	Salt River Trib 2 at Phoenix	0	NA	8/1963-7/1965 (discontinued)	No statistics run, less than 3 years data								
9512190	Salt River at 24th Street at Phoenix	13,263	1,100	10/1989-9/1991 (discontinued)	No statistics run, less than 3 years data								
9512200	Salt River Trib. in South Mountain Park	2	1,405	10/1960-9/1998 (discontinued)	6	0	68	26	0 (1997)	1	8	71 (1990)	37
9512280	Cave Creek Blw Cottonwood Creek	83	2,280	10/1980-current (real-time)	74	5	8	14	15 (2002)	1,438	4,806	37,140 (1993)	25
9512300	Cave Creek near Cave Creek	121	1,236	5/1958-9/1967 (discontinued)	8	3	24	65	92 (1962)	1,142	3,212	11,911 (1959)	8
9512400	Cave Creek at Phoenix	90	1,236	10/1989-9/1991 (discontinued)	No statistics run, less than 3 years data								
9512406	Salt River at 51st Avenue	13,405	1,050	10/2002-current (real-time)	99	0	0	1	73 (2003)	4,319	294,974	880,530 (2005)	3
9513650	Agua Fria River at El Mirage	195	NA	2/1986-9/1998 (discontinued)	92	0	4	5	34 (1997)	64	1,168	5,599 (1991)	5
9513700	Agua Fria River Trib A Youngtown	0	NA	3/1961-9/1968 (discontinued)	23	5	32	41	1 (1962)	12	11	19 (1965)	6
9513780	New River near Rock Springs	68	2,310	10/1965-current (real-time)	75	4	5	16	0 (1977)	3,791	9,228	55,605 (1978)	39
9513800	New River at New River	83	1,984	10/1960-9/1982 (discontinued)	68	5	6	20	0 (1975)	2,254	10,160	54,691 (1978)	21
9513835	New River at Bell Road, near Peoria	185	1,190	10/1967-9/1993 (discontinued)	79	0	4	17	0 (1977)	4,620	8,006	45,634 (1978)	18
9513860	Skunk Creek near Phoenix	65	1,473	10/1967-current (real-time)	36	0	31	33	0 (1994)	485	1,057	6,213 (1982)	38
9513910	New River near Glendale	323	1,135	10/1964-9/1998 (discontinued)	57	2	17	24	0 (1969)	12,198	17,041	80,156 (1993)	12

Table 8.1-2 Streamflow Data for the Phoenix AMA (cont)

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9513970	Agua Fria River at Avondale	633	950	10/1967-9/1982 (discontinued)	83	0	3	14	0 (1981)	94	26,078	176,688 (1980)	12
9514100	Gila River at Estrella Parkway, near Goodyear	45,585	883	10/1992-current (real-time)	92	7	0	1	2,276 (2002)	12,332	613,777	6,116,656 (1993)	13
9514300	Gila River at State Hwy 85, near Buckeye	46,345	820	5/1979-9/1992 (discontinued)	No statistics run, less than 3 years data								
9516500	Hassayampa River near Morristown	796	1,831	10/1938-current (real-time)	77	12	6	5	146 (1996)	6,452	23,178	163,981 (1993)	20
9517000	Hassayampa River near Arlington	1,471	823	10/1990-current (real-time)	35	16	20	29	29,379 (1994)	47,477	45,276	63,153 (2000)	15
9517490	Centennial Wash at Southern Pacific Railroad Brdg	1,817	841	10/1980-current (real-time)	28	4	62	6	0 (2002)	1,134	1,486	5,652 (1993)	17
9517500	Centennial Wash near Arlington	1,870	773	10/1960-9/1979 (discontinued)	17	0	64	20	0 (1977)	1,685	3,065	9,152 (1978)	18

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal 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

Table 8.1-3 Flood ALERT Equipment in the Phoenix AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
775	Gila @ Maricopa Rd	Precip/Stage	4/6/1995	FCD Maricopa Co
4500	Cesar Chavez Park	Precipitation	8/15/1990	FCD Maricopa Co
4505	Gateway C.College	Weather Station	12/16/2003	FCD Maricopa Co
4510	Roeser @ 2nd St.	Precipitation	2/12/1991	FCD Maricopa Co
4515	Salt R. @ 40th St.	Precipitation	3/22/1996	FCD Maricopa Co
4520	Salt R. @ Priest Dr.	Precip/Stage	9/21/1995	FCD Maricopa Co
4525	ASU South	Precipitation	7/14/1995	FCD Maricopa Co
4530	Kleinman Park	Precipitation	3/26/1991	FCD Maricopa Co
4535	Broadway @ Dobson	Precipitation	10/1/1995	FCD Maricopa Co
4540	Fitch Park	Precipitation	3/27/1991	FCD Maricopa Co
4545	Brown Rd. @ Horne	Precipitation	1/1/1995	FCD Maricopa Co
4550	Mountain View Park	Precipitation	3/21/1991	FCD Maricopa Co
4555	Falcon Field	Precipitation	10/1/1995	FCD Maricopa Co
4560	Spookhill FRS	Precip/Stage	3/13/1984	FCD Maricopa Co
4570	Price Drain @ 202	Precip/Stage	2/13/2001	FCD Maricopa Co
4580	Salt River Landfill	Precipitation	1/30/1998	FCD Maricopa Co
4585	Reata Pass Wash	Precip/Stage	5/15/2001	FCD Maricopa Co
4590	Pima @ Union Hills	Precipitation	10/22/1997	FCD Maricopa Co
4595	Pinnacle Peak Vista	Precipitation	4/21/1998	FCD Maricopa Co
4600	IBW @ McKellips Rd.	Precip/Stage	5/21/1985	FCD Maricopa Co
4605	Osborn @ 64th St.	Precipitation	10/22/1997	FCD Maricopa Co
4610	IBW @ Indian Bend Rd.	Precip/Stage	3/25/1992	FCD Maricopa Co
4615	IBW @ Indian School	Weather/Stream	11/26/1997	FCD Maricopa Co
4620	IBW @ Interceptor	Precip/Stage	9/28/1983	FCD Maricopa Co
4625	Highland @ 68th St.	Precipitation	11/13/1997	FCD Maricopa Co
4628	IBW@McDonald Dr	Stage	11/27/1997	FCD Maricopa Co
4630	Thunderbird Academy	Weather Station	1/1/1982	FCD Maricopa Co
4635	Tatum Basin	Precip/Stage	6/3/1994	FCD Maricopa Co
4640	IBW @ Sweetwater	Precip/Stage	12/27/1990	FCD Maricopa Co
4645	East Fork CC #1	Precip/Stage	3/2/1994	FCD Maricopa Co
4650	Paradise Valley Park	Precipitation	2/27/1989	FCD Maricopa Co
4653	Tatum Basin Outflow	Stage	6/3/1994	FCD Maricopa Co
4655	East Fork CC #4	Precip/Stage	1/18/1994	FCD Maricopa Co
4660	Lost Dog Wash	Precipitation	7/13/1990	FCD Maricopa Co
4665	EFCC nr 7th Ave.	Precip/Stage	5/8/1997	FCD Maricopa Co

Table 8.1-3 Flood ALERT Equipment in the Phoenix AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
4675	Lake Marguarite	Precip/Stage	11/25/1997	FCD Maricopa Co
4680	East Fork CC #3	Precip/Stage	9/13/1994	FCD Maricopa Co
4685	Berneil Wash	Precip/Stage	7/30/1998	FCD Maricopa Co
4690	IBW @ Shea Blvd.	Precip/Stage	6/9/1998	FCD Maricopa Co
4695	Aztec Park	Precipitation	2/3/1998	FCD Maricopa Co
4700	Durango Complex	Weather Station	6/23/1980	FCD Maricopa Co
4710	Jefferson @ 4th Ave.	Precipitation	1/29/1991	FCD Maricopa Co
4715	Grand @ 27th Ave.	Precipitation	10/11/1996	FCD Maricopa Co
4720	Thomas @ 16th St.	Precipitation	1/17/1991	FCD Maricopa Co
4730	Perry Park	Precipitation	8/22/1990	FCD Maricopa Co
4740	Papago Park	Precipitation	8/15/1990	FCD Maricopa Co
4745	Old X-cut @ McDowell	Precip/Stage	7/27/1994	FCD Maricopa Co
4750	Thomas @ 48th St.	Precipitation	1/30/1991	FCD Maricopa Co
4755	Salt River @ 67th Ave.	Precipitation	4/23/1998	FCD Maricopa Co
4760	Maryvale Muni Golf	Precipitation	8/17/1989	FCD Maricopa Co
4765	Buckeye @ 75th Ave.	Precipitation	8/1/1996	FCD Maricopa Co
4770	City of Glendale	Precipitation	7/13/1989	FCD Maricopa Co
4775	Maryland @ 27th Ave.	Precipitation	12/22/1994	FCD Maricopa Co
4780	Missouri @ 16th St.	Precipitation	1/17/1991	FCD Maricopa Co
4785	Butler Park	Precipitation	9/9/1998	FCD Maricopa Co
4790	Paradise Valley CC	Precipitation	7/13/1989	FCD Maricopa Co
4800	Dreamy Draw Dam	Precip/Stage	1/24/1984	FCD Maricopa Co
4805	ACDC @ 36th St.	Precip/Stage	2/24/1994	FCD Maricopa Co
4810	ACDC @ 14th St.	Precip/Stage	2/9/1994	FCD Maricopa Co
4815	10th St. Wash Basin #1	Precip/Stage	10/23/1996	FCD Maricopa Co
4820	ACDC @ 43rd Ave.	Precip/Stage	11/14/1990	FCD Maricopa Co
4825	Phoenix Basin #3	Precip/Stage	12/18/2001	FCD Maricopa Co
4830	Cave Creek @ Cactus	Precip/Stage	7/13/1991	FCD Maricopa Co
4835	ACDC @ Cave Creek	Precipitation	3/11/1997	FCD Maricopa Co
4840	Greenway @ 32nd Ave.	Precipitation	1/31/1991	FCD Maricopa Co
4848	Phoenix E Park	Stage	11/28/2001	FCD Maricopa Co
4850	Phoenix Basin #7	Precip/Stage	10/17/1996	FCD Maricopa Co
4855	Phoenix West Park	Precip/Stage	11/29/2001	FCD Maricopa Co
4860	Rawhide Wash	Precip/Stage	7/22/1999	FCD Maricopa Co
4890	Cave Creek	Precip/Stage	5/29/2003	FCD Maricopa Co

Table 8.1-3 Flood ALERT Equipment in the Phoenix AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
4900	Cave Buttes Dam	Precip/Stage	1/25/1984	FCD Maricopa Co
4910	Stagecoach Wash	Precip/Stage	6/13/2001	FCD Maricopa Co
4915	Cave Creek Landfill	Precipitation	4/22/1993	FCD Maricopa Co
4918	Cave Cr. nr Cave Cr.	Stage	5/27/2004	FCD Maricopa Co
4920	Cave Cr.@ Spur Cross	Precip/Stage	6/16/1993	FCD Maricopa Co
4930	Carefree Ranch	Weather Station	7/1/1985	FCD Maricopa Co
4935	Reata Pass Dam	Precip/Stage	8/26/1993	FCD Maricopa Co
4960	Seven Springs Wash	Precip/Stage	3/12/2002	FCD Maricopa Co
5055	Sugarloaf Mountain	Precipitation	5/27/2004	FCD Maricopa Co
5070	I-10 @ 355th Ave.	Precipitation	9/7/2001	FCD Maricopa Co
5075	Cruff Wash	Precip/Stage	5/14/2002	FCD Maricopa Co
5095	Webb Mountain	Precipitation	5/22/2002	FCD Maricopa Co
5100	Centennial Railroad	Precip/Stage	2/9/1990	FCD Maricopa Co
5105	Delaney Wash	Precip/Stage	12/20/1999	FCD Maricopa Co
5115	Winters Wash	Precip/Stage	7/11/2000	FCD Maricopa Co
5135	Four Mile Wash	Precipitation	7/5/2001	FCD Maricopa Co
5145	Upper Grass Wash	Precipitation	11/1/2002	FCD Maricopa Co
5195	Dead Horse Wash	Precipitation	11/1/2000	FCD Maricopa Co
5200	Buckeye FRS #1	Precip/Stage	7/26/1983	FCD Maricopa Co
5205	Buckeye FRS #2	Precip/Stage	11/11/1992	FCD Maricopa Co
5210	Hassayampa Landfill	Precipitation	4/15/1993	FCD Maricopa Co
5215	Jackrabbit Wash	Precip/Stage	9/14/1982	FCD Maricopa Co
5220	Morristown	Precipitation	5/13/1992	FCD Maricopa Co
5223	Hassy nr Morris	Stage	5/7/1996	FCD Maricopa Co
5240	Belmont Mountains	Precipitation	12/16/2002	FCD Maricopa Co
5250	Twin Peaks	Precipitation	3/27/2003	FCD Maricopa Co
5265	Coyote Wash	Precipitation	11/27/2002	FCD Maricopa Co
5270	Box Wash	Precip/Stage	3/11/2003	FCD Maricopa Co
5280	Hassy R. @ I-10	Weather/Stream	11/9/1994	FCD Maricopa Co
5300	Sun Valley at Northern	precip/stage	8/2/2005	FCD Maricopa Co
5400	Agua Fria @ Buckeye	Precip/Stage	10/11/1988	FCD Maricopa Co
5405	Colter @ El Mirage	Precip/Stage	6/29/1994	FCD Maricopa Co
5410	Dysart Drain @ LAFB	Precip/Stage	8/22/1996	FCD Maricopa Co
5415	White Tank FRS 3	Precip/Stage	3/12/1986	FCD Maricopa Co
5422	Dysart @ El Mirage	Stage	3/7/1997	FCD Maricopa Co

Table 8.1-3 Flood ALERT Equipment in the Phoenix AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
5425	Ford Canyon Wash	Precip/Stage	2/5/2002	FCD Maricopa Co
5430	White Tank Peak	Repeater/Precip	4/1/1981	FCD Maricopa Co
5435	McMicken Floodway	Weather/Stream	5/19/1992	FCD Maricopa Co
5440	McMicken Dam South	Precip/Stage	2/13/2002	FCD Maricopa Co
5445	McMicken Dam	Precip/Stage	3/20/1983	FCD Maricopa Co
5450	Patton Rd.	Precipitation	5/13/1992	FCD Maricopa Co
5455	Wittmann	Precipitation	5/13/1992	FCD Maricopa Co
5460	Chrysler P. Ground	Precipitation	10/31/1990	FCD Maricopa Co
5465	NW Regional Landfill	Precipitation	4/27/1993	FCD Maricopa Co
5470	CAP @ 163rd Ave.	Precipitation	12/10/2002	FCD Maricopa Co
5475	Circle City	Precipitation	10/1/1982	FCD Maricopa Co
5485	Upper Trilby Wash	Precip/Stage	9/25/2001	FCD Maricopa Co
5490	Castle Hot Springs	Precipitation	10/20/1981	FCD Maricopa Co
5500	Agua Fria @ Grand Ave.	Precip/Stage	4/27/1994	FCD Maricopa Co
5505	New River @ Glendale	Precip/Stage	3/21/1990	FCD Maricopa Co
5510	Dysart @ Bell Rd.	Precipitation	10/25/1992	FCD Maricopa Co
5515	Sun City West	Precipitation	3/30/1995	FCD Maricopa Co
5520	ACDC @ 67th Ave.	Weather/Stream	6/7/1990	FCD Maricopa Co
5525	Grand @ Peoria Ave.	Precipitation	7/11/1996	FCD Maricopa Co
5535	Adobe Dam	Precip/Stage	10/25/1982	FCD Maricopa Co
5543	Scatter Wash	Stage	9/18/1996	FCD Maricopa Co
5545	Upper Cline Creek	Precipitation	11/21/2001	FCD Maricopa Co
5550	Deer Valley Airport	Precipitation	1/23/1991	FCD Maricopa Co
5555	Fig Springs	Precipitation	11/14/2001	FCD Maricopa Co
5565	Skunk Creek @ I-17	Precip/Stage	11/8/1989	FCD Maricopa Co
5580	Cline Creek	Precip/Stage	8/1/1981	FCD Maricopa Co
5585	Skunk Cr. nr New R.	Precip/Stage	6/28/2001	FCD Maricopa Co
5595	New River @ Bell Rd.	Precip/Stage	4/4/1990	FCD Maricopa Co
5610	New River Dam	Precip/Stage	5/1/1986	FCD Maricopa Co
5625	Sunup Ranch	Precipitation	6/1/1981	FCD Maricopa Co
5630	New River Landfill	Precipitation	4/29/1993	FCD Maricopa Co
5640	Cooks Mesa	Precipitation	3/21/1984	FCD Maricopa Co
5900	Asher Hills	Precipitation	8/2/1990	FCD Maricopa Co
5915	McDowell Mtn. Park	Precipitation	8/6/1990	FCD Maricopa Co
5920	McDowell Mtn. Road	Precip/Stage	5/18/2004	FCD Maricopa Co

Table 8.1-3 Flood ALERT Equipment in the Phoenix AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
5930	Fraesfield Mtn.	Precipitation	7/28/1989	FCD Maricopa Co
5945	Thompson Peak Repeater	Repeater/Weather Station	7/27/1989	FCD Maricopa Co
5950	Fountain Hills FD	Weather Station	12/9/1993	FCD Maricopa Co
5965	StoneRidge Dam	Precip/Stage	12/11/1996	FCD Maricopa Co
5970	Sun Ridge Canyon Dam	Precip/Stage	2/4/1997	FCD Maricopa Co
5975	Cloudburst Wash	Precipitation	3/13/1997	FCD Maricopa Co
5978	Golden Eagle Park Dam	Stage	12/12/1996	FCD Maricopa Co
5980	North Heights Dam	Precip/Stage	10/11/1996	FCD Maricopa Co
5985	Golden Eagle Blvd.	Precipitation	2/12/1997	FCD Maricopa Co
5988	Aspen Dam	Stage	1/2/1997	FCD Maricopa Co
5990	Hesperus Dam	Precip/Stage	12/18/1996	FCD Maricopa Co
5995	Hesperus Wash	Precipitation	3/10/1997	FCD Maricopa Co
6500	Guadalupe FRS	Precip/Stage	6/29/1989	FCD Maricopa Co
6510	South Mountain Park	Weather Station	9/28/1982	FCD Maricopa Co
6520	Carriage Lane Park	Precipitation	3/26/1991	FCD Maricopa Co
6525	South Mtn.Park HQ	Precipitation	5/1/1997	FCD Maricopa Co
6530	Chandler @ Alma School	Precipitation	7/25/1996	FCD Maricopa Co
6540	Mesa Tower	Precipitation	7/19/1989	FCD Maricopa Co
6545	Broadway @ Lindsay	Precipitation	1/1/1995	FCD Maricopa Co
6550	Ahwatukee	Precipitation	3/4/1996	FCD Maricopa Co
6570	EMF @ Broadway	Precip/Stage	8/10/1989	FCD Maricopa Co
6575	Williams Field Road	Precipitation	7/3/2001	FCD Maricopa Co
6580	EMF @ Queencreek Rd.	Precip/Stage	1/18/1989	FCD Maricopa Co
6590	Elliot @ Hawes Rd.	Precipitation	6/26/2001	FCD Maricopa Co
6595	EMF @ Arizona Ave.	Precip/Stage	5/10/1989	FCD Maricopa Co
6600	Guadalupe Channel	Precip/Stage	8/7/1998	FCD Maricopa Co
6605	Freestone Basin	Precip/Stage	12/19/1995	FCD Maricopa Co
6610	Queen Creek Rd.	Precipitation	5/1/1982	FCD Maricopa Co
6615	Queen Creek Landfill	Precipitation	4/23/1993	FCD Maricopa Co
6620	Crossroads Park	Weather/Stage	12/18/1995	FCD Maricopa Co
6625	Signal Butte FRS	Precip/Stage	11/10/1987	FCD Maricopa Co
6640	Usery Mtn. Park	Precipitation	6/20/1985	FCD Maricopa Co
6650	Usery Park WS	Weather Station	2/24/1994	FCD Maricopa Co
6655	Thunder Mountain	Precipitation	4/1/1982	FCD Maricopa Co
6670	Apache Junction FRS	Precip/Stage	12/16/1981	FCD Maricopa Co

Table 8.1-4 Reservoirs and Stockponds in the Phoenix AMA

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
1	Lake Pleasant (New Waddell Dam)[2]	Bureau of Reclamation	1,108,600	C,H,R,S	Federal
2	Tempe Town Lake	City of Tempe	2,846	R	Local
3	White Tanks #4	Flood Control District of Maricopa County	2,250	R, C	Local
4	Camp Dyer Diversion (Lower Lake Pleasant)	Maricopa Water District	690	I	Public

Source: U.S. Army Corps of Engineers 2005, US Bureau of Reclamation 2007

B. Other Large Reservoirs (50 acre surface area or greater)[3]

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE[1]	JURISDICTION
5	Fire Bird	Gila River Indian Community	132	R	Tribal

Source: USGS 2005

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

Total number: 2
Total maximum storage: 250 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)[3]

Total number: 39
Total surface area: 643 acres

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

Total number: 711

Notes:
[1]C= Flood Control, H= Hydroelectric, I = Irrigation, R = Recreation, S = Water Supply
[2] Dam is located in the Phoenix AMA but lake storage is in the Agua Fria Basin
[3]Capacity data is not available to ADWR

Figure 8.1-4A
Phoenix AMA, East Valley Area
Surface Water Condtitions

0 3 6 Miles

Figure 8.1-4B
Phoenix AMA, West Valley Area
Surface Water Conditions

USGS Annual Runoff Contour for 1951-1980 (in inches)
Stream Channel (width of line reflects stream order)
Large Reservoir
USGS Gage and Station ID
Flood ALERT Equip. & Station ID
Sub-basin Boundary
COUNTY
Interstate Highway
Major Road
City, Town or Place

8.1.5 Perennial/Intermittent Streams and Springs in the Phoenix AMA

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the AMA are shown in Table 8.1-5. The locations of major springs and perennial and intermittent streams are shown on Figure 8.1-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- Principal perennial streams include the Verde River, Gila River and the Salt River. Only the Verde River is perennial throughout the AMA. Perennial flow in the Salt River and the Gila River below the 91st Avenue WWTP and 23rd Avenue WWTP is from effluent discharge.
- Flow in the Salt and Verde Rivers is dependent on releases from a series of upstream dams.
- Numerous intermittent streams are found in the southeastern portion of the AMA in the Superstition Mountains and in the northern portion of the AMA in the New River Mountains.
- There are two major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time located in the northeastern part of the AMA.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 8.1-5B. There are three minor springs.
- Listed discharge rates may not be indicative of current conditions. All of the measurements were taken during or prior to 1983.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from 110 to 132, depending on the database reference.

Table 8.1-5 Springs in the Phoenix AMA

A. Major Springs (10 gpm or greater):

Map Key	Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
1	Seven Springs	335740	1115043	75	1/11/1983
2	Camp Creek	335445	1114856	75	1/11/1983

B. Minor Springs (1 to 10 gpm):

Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
Columbine	335502	1114905	3	1/11/1983
Kentuck	335445	1114913	3	1/11/1983
Jims	335119	1120045	1	5/1/1974

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 110-132

Notes:
[1] Location datum is NAD 27

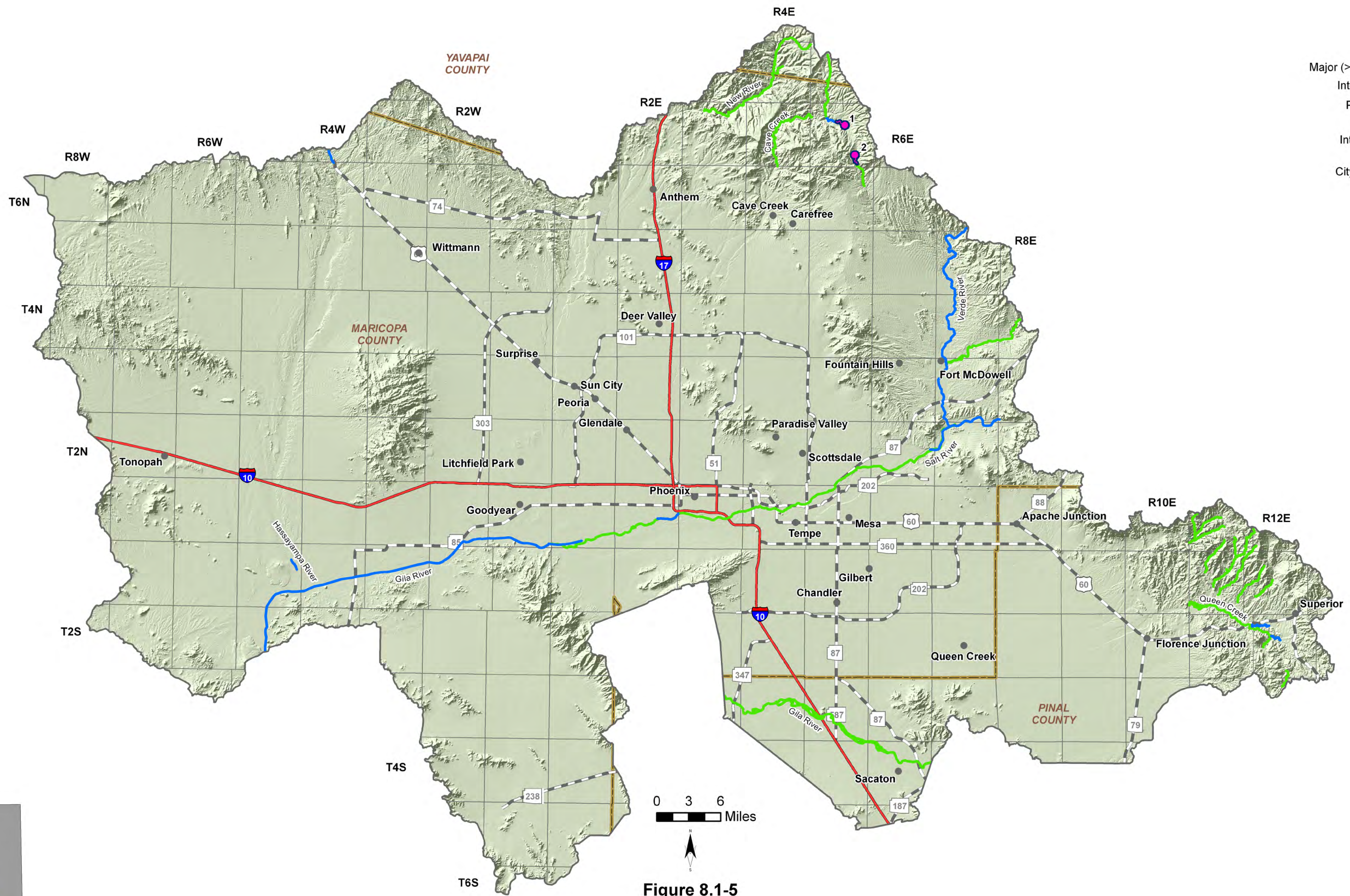


Figure 8.1-5
Phoenix AMA
Perennial/Intermittent Streams
and Major (>10gpm) Springs

Stream Data Source: AZGF, 1993 & 1997

8.1.6 Groundwater Conditions of the Phoenix AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.1-6. Figure 8.1-6 shows aquifer flow direction and water-level change between 1991-1992 and 2002-2003 for the entire Phoenix AMA. Figures 8.1-6A-D show depth to water during 2002-2003 and water-level change between 1991-1992 and 2002-2003 for selected wells by sub-basin. Figure 8.1-7 contains hydrographs for selected wells shown on Figures 8.1-6A-D. Figure 8.1-8 shows well yields in five yield categories. Underground Storage Facilities (USF) and Groundwater Savings Facilities (GSF) are shown on Table 8.1-7 with facility name, facility permit number and type, permittee name, permitted acre-feet per year and water source. Locations of USFs and GSFs are shown on Figure 8.1-9. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.1-6 and Figure 8.1-6
- The major aquifers in the AMA are recent stream alluvium and basin fill. Groundwater is also found in sedimentary rock in some areas.
- Groundwater flow has been artificially modified generally toward the Gila River drainage and groundwater pumping centers. Groundwater flow is toward cones of depression near Scottsdale, Mesa, and Queen Creek in the East Salt River Valley and to the southwest toward cones of depression in the Tonopah Desert and Centennial Wash area in the Hassayampa sub-basin.
- In the West Salt River Valley sub-basin, the direction of groundwater flow originally was along the Salt and Gila Rivers into the Hassayampa sub-basin. Groundwater flow has been artificially modified toward cones of depression near Luke AFB and Deer Valley.
- In the Fountain Hills sub-basin, groundwater flows to the south. (Not shown on map)
- Groundwater flow in the Rainbow Valley sub-basin is to the northwest, in the Lake Pleasant sub-basin from north to south and in the Carefree sub-basin to the west-southwest.

Well Yields

- Refer to Table 8.1-6 and Figure 8.1-8
- As shown on Figure 8.1-8, well yields are generally greater than 1,000 gallons per minute (gpm).
- One source of well yield information, based on 2,397 reported wells, indicates that the median well yield is 1,280 gpm.

Natural Recharge

- Refer to Table 8.1-6
- Natural recharge in the Phoenix AMA is 24,100 acre-feet per year.
- Mountain front and streambed are the principal sources of natural recharge.

Water Level

- Refer to Figure 8.1-6A-D. Water levels are shown for wells measured in 2002-2003. Not all water level data shown on Fiugre 8.2-6 are shown on Figures 8.2-6 A-B.

- The Department annually measures 442 index wells in the AMA; hydrographs for 20 index wells are shown on Figure 8.1-7.
- The deepest water level shown is 866 feet in the vicinity of Cave Creek and the shallowest is 10 feet in the vicinity of Superior. Both wells are shown on Figure 8.1-7A.

Recharge Sites

- Refer to Table 8.1-7 and Figure 8.1-9.
- There are 43 active USFs and 10 GSFs.
- Total permitted storage capacity for USFs is 962,000 acre-feet per year.
- Total permitted storage capacity for GSFs is 517,520.

Table 8.1-6 Groundwater Data for the Phoenix AMA

Basin Area, in square miles:	5,646	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill	
	Basin Fill (Carefree Formation)	
	Basin Fill with interbedded basalt	
	Sedimentary Rock (conglomerate)	
Well Yields, in gal/min:	Range .1-6,944 Median 1,470 (2,354 wells measured)	ADWR GWSI
	Range 1-6,944 Median 1,280 (2,397 wells reported)	ADWR Wells55 (>10 inch diameter)
Estimated Natural Recharge, in acre-feet/year:	24,100	ADWR Phoenix TMP
Current Number of Index Wells:	442	
Date of Last Water-level Sweep:	2003 (1,781 wells measured)	

TMP = Third Management Plan

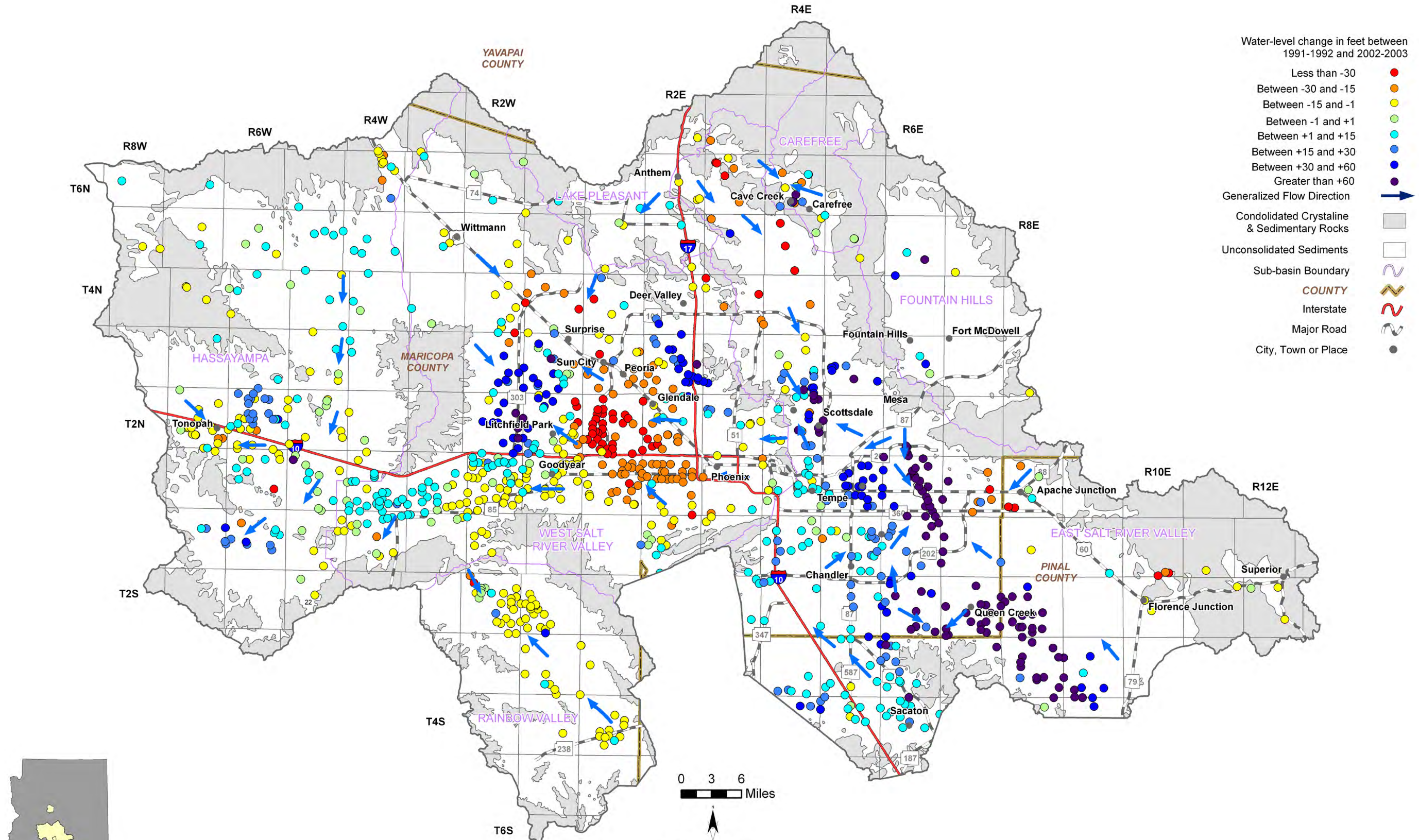


Figure 8.1-6
Phoenix AMA
Groundwater Conditions

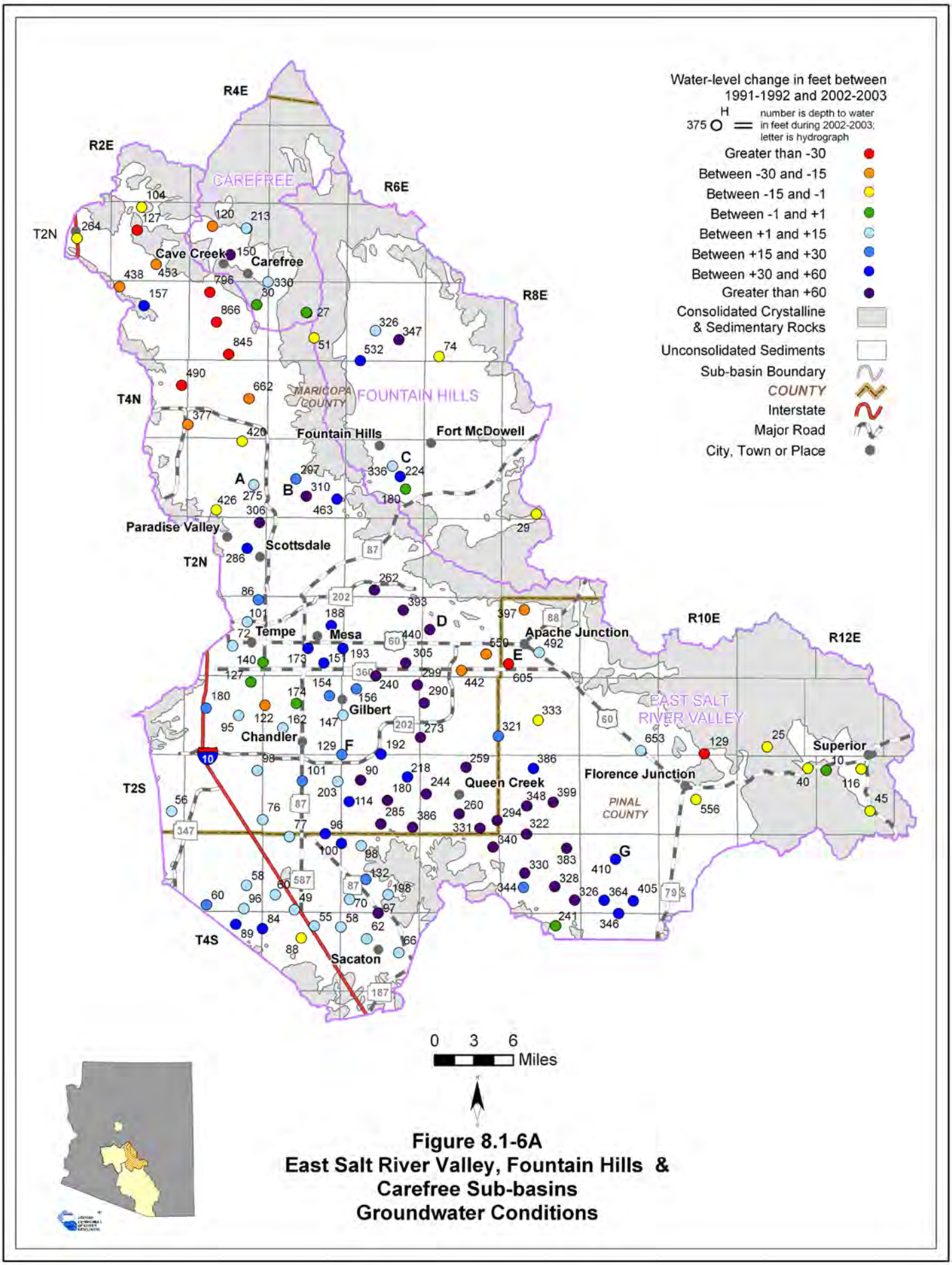


Figure 8.1-6A
East Salt River Valley, Fountain Hills & Carefree Sub-basins Groundwater Conditions

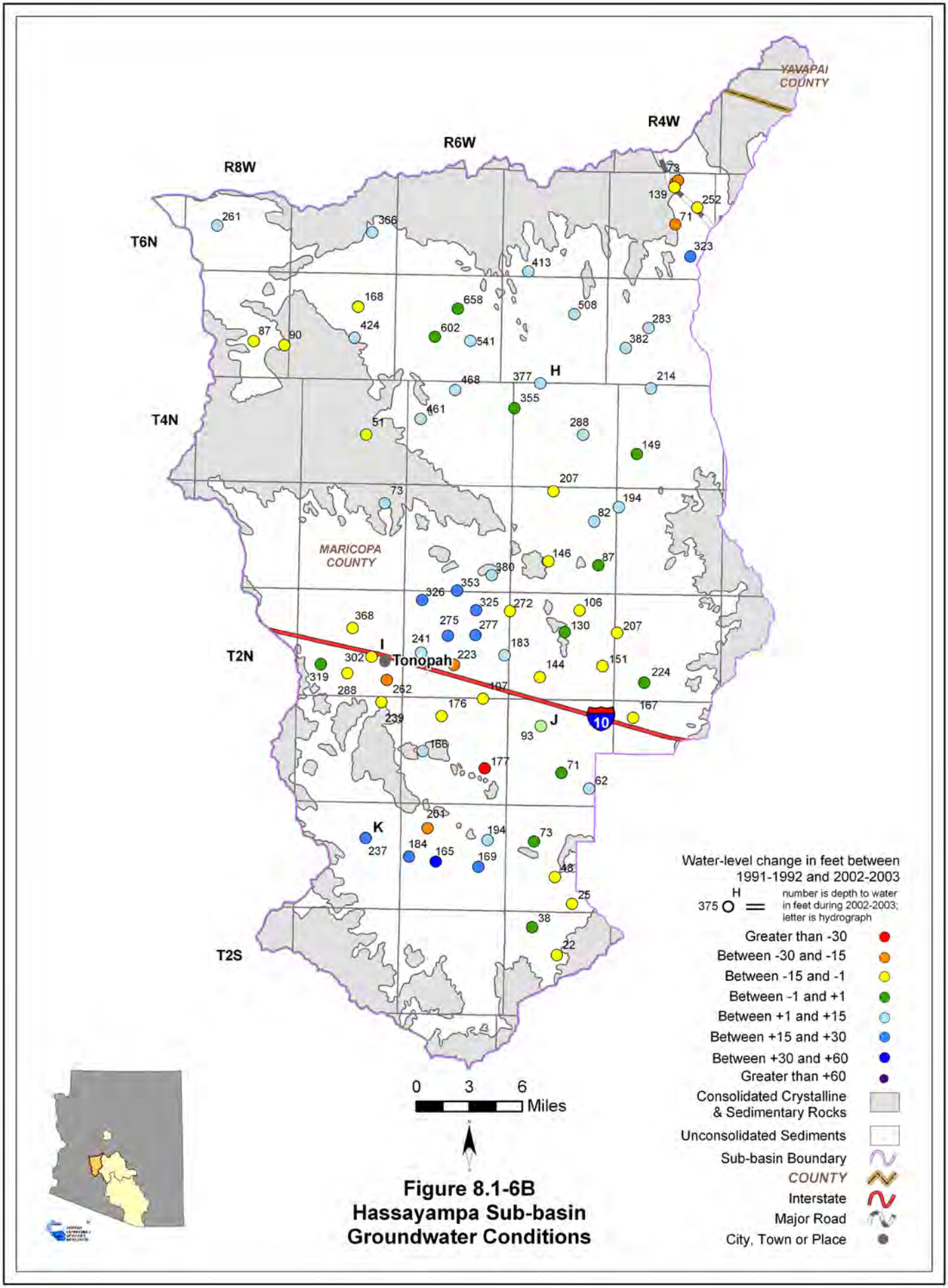


Figure 8.1-6B
Hassayampa Sub-basin
Groundwater Conditions

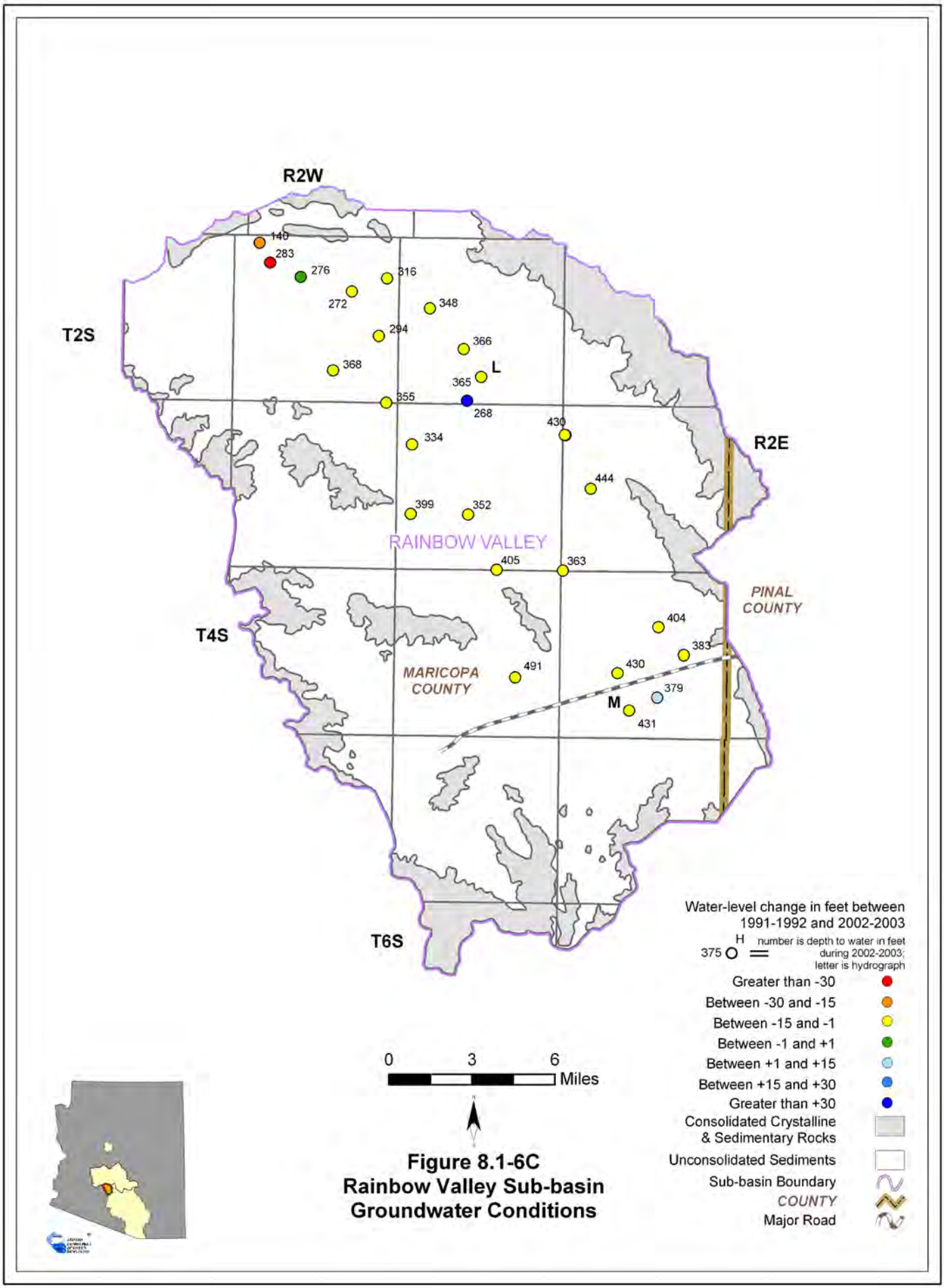


Figure 8.1-6C
Rainbow Valley Sub-basin
Groundwater Conditions

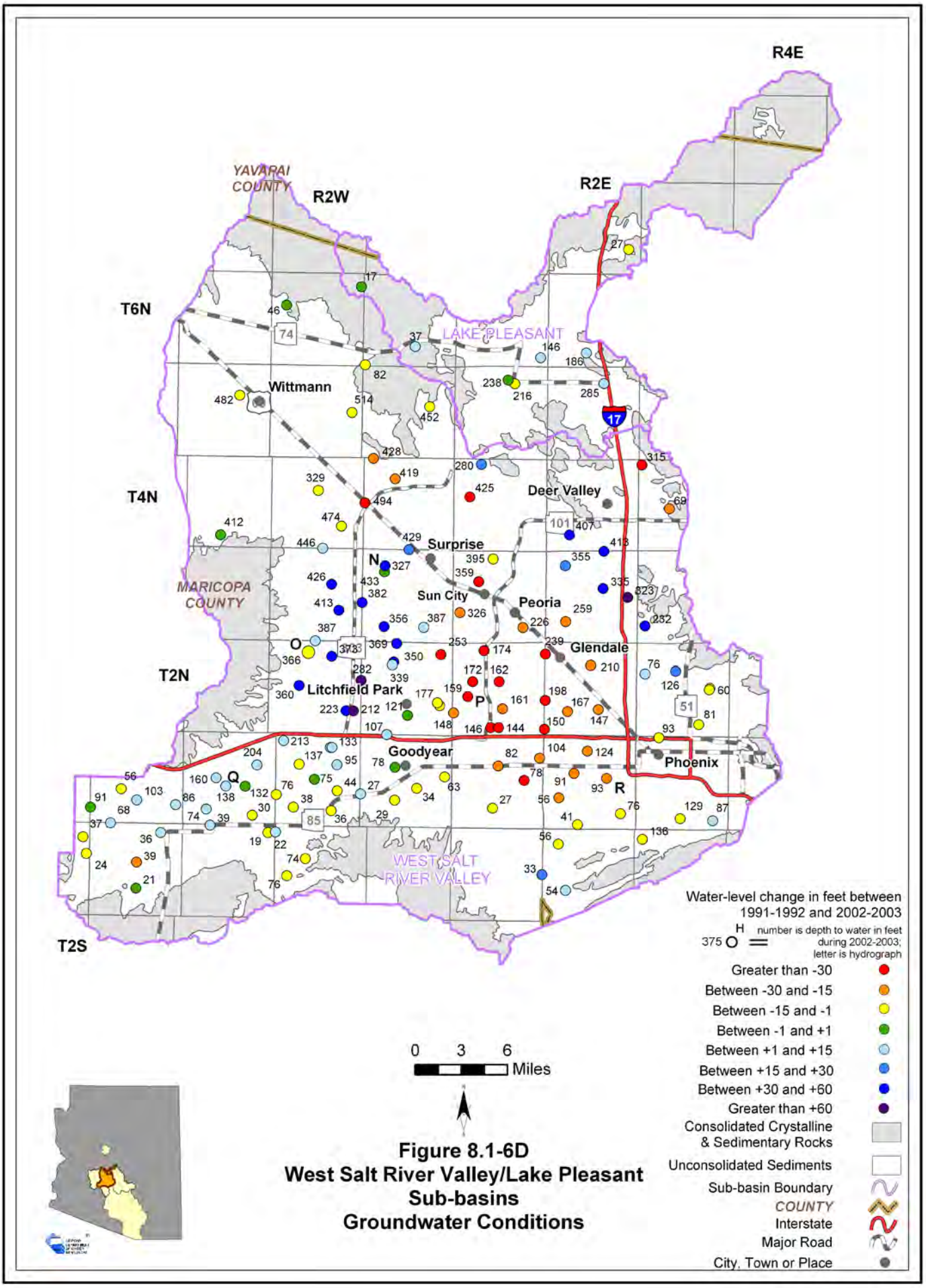


Figure 8.1-6D
West Salt River Valley/Lake Pleasant Sub-basins Groundwater Conditions

Figure 8.1-7
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

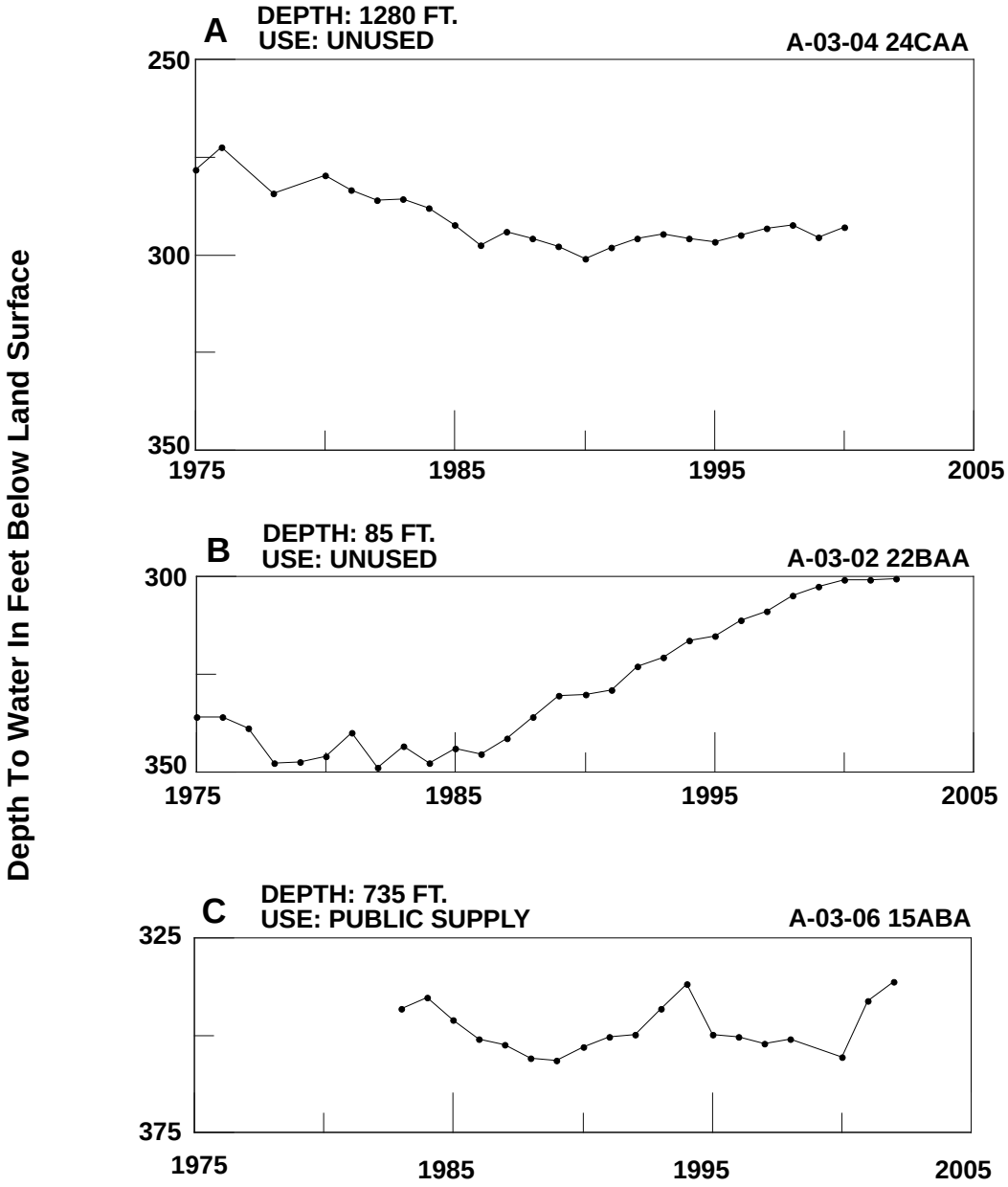


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

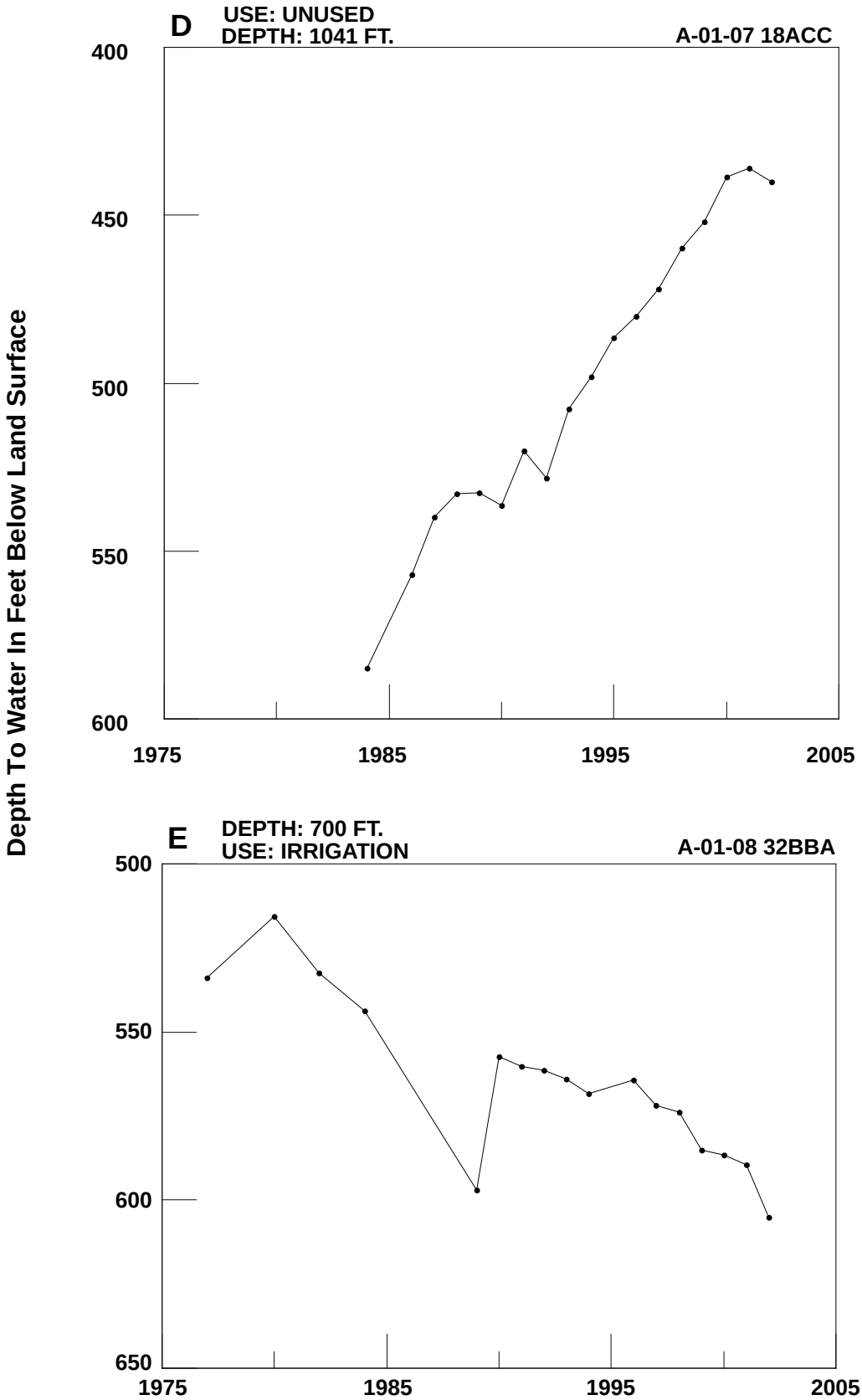


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

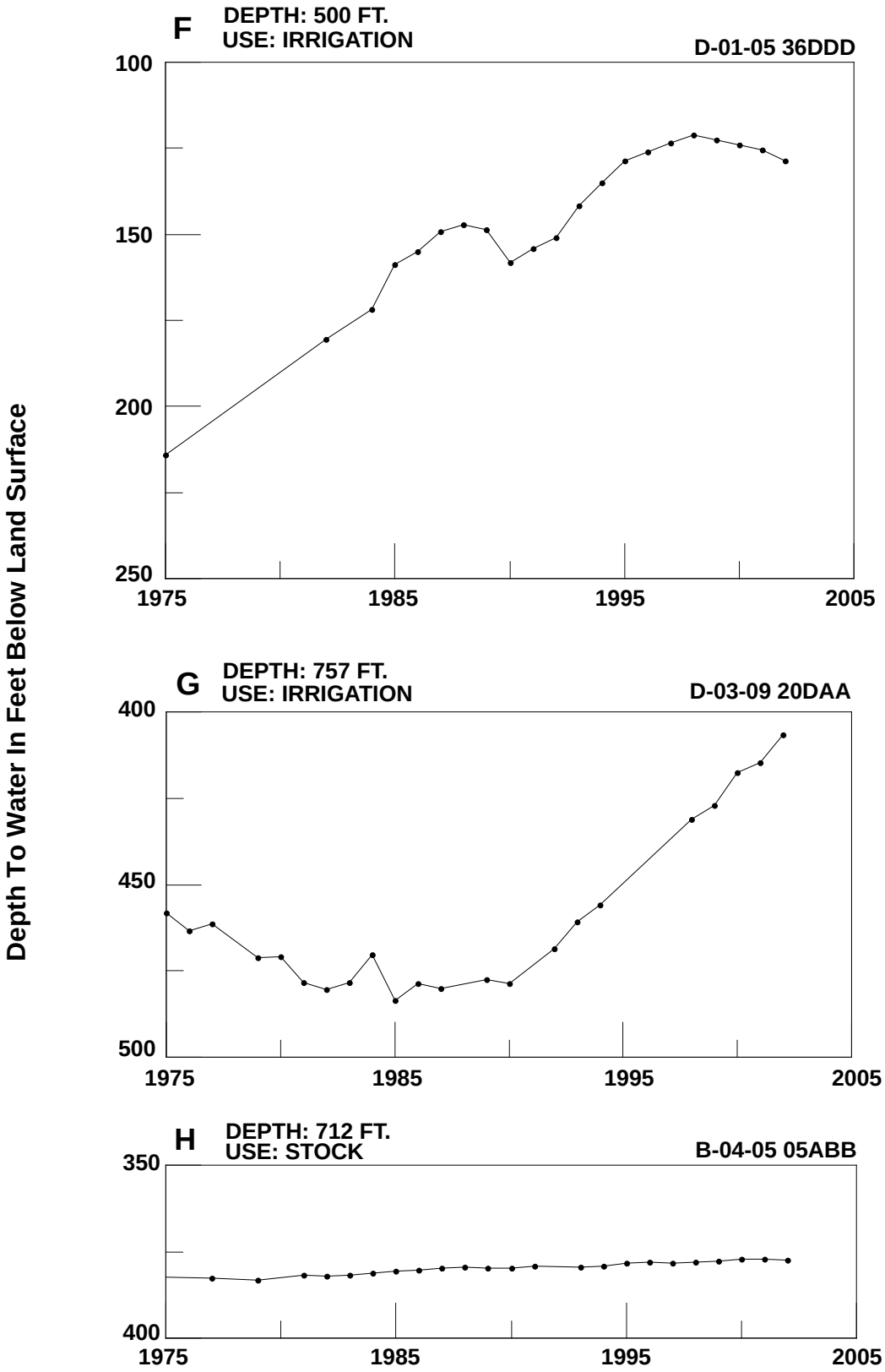


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

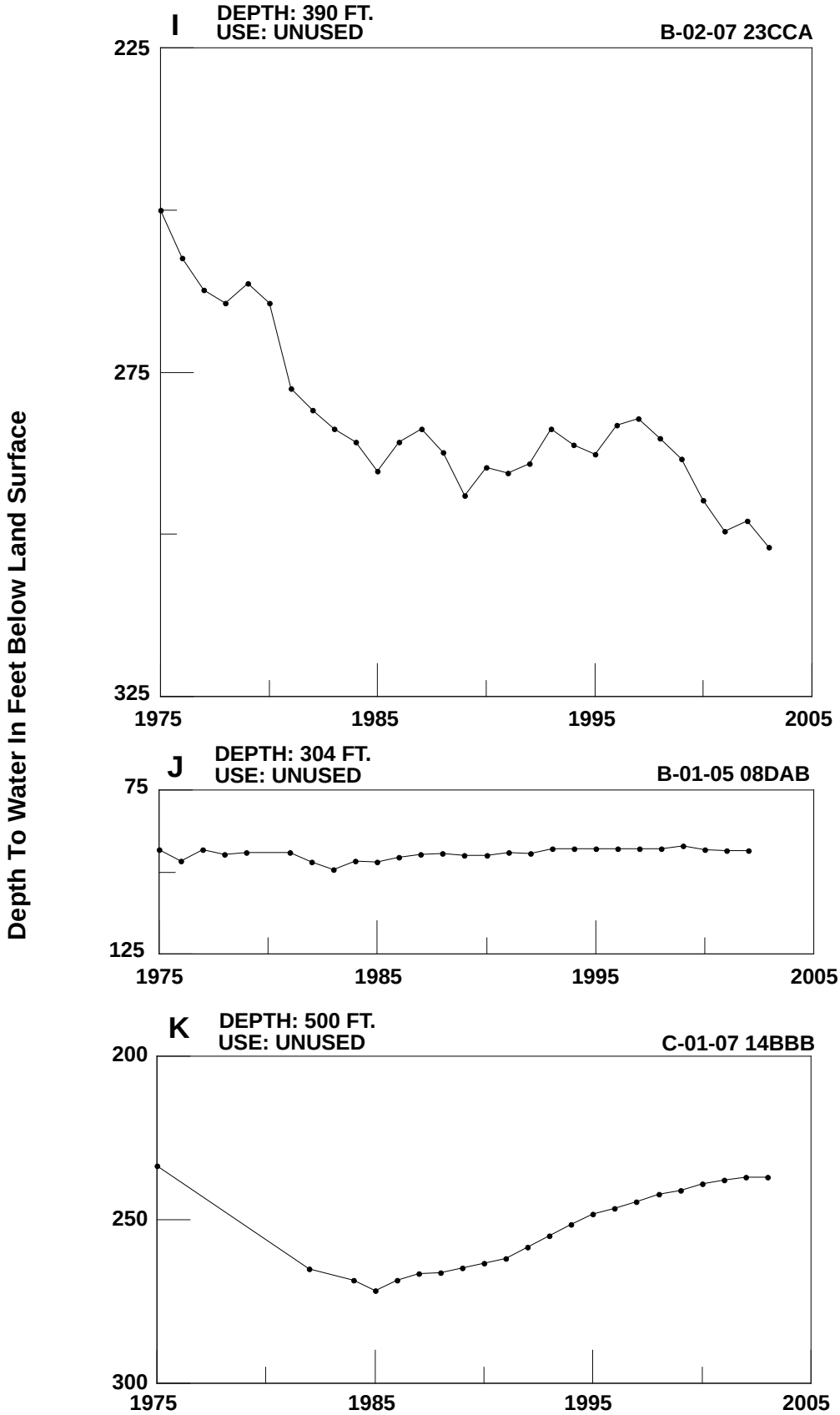


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

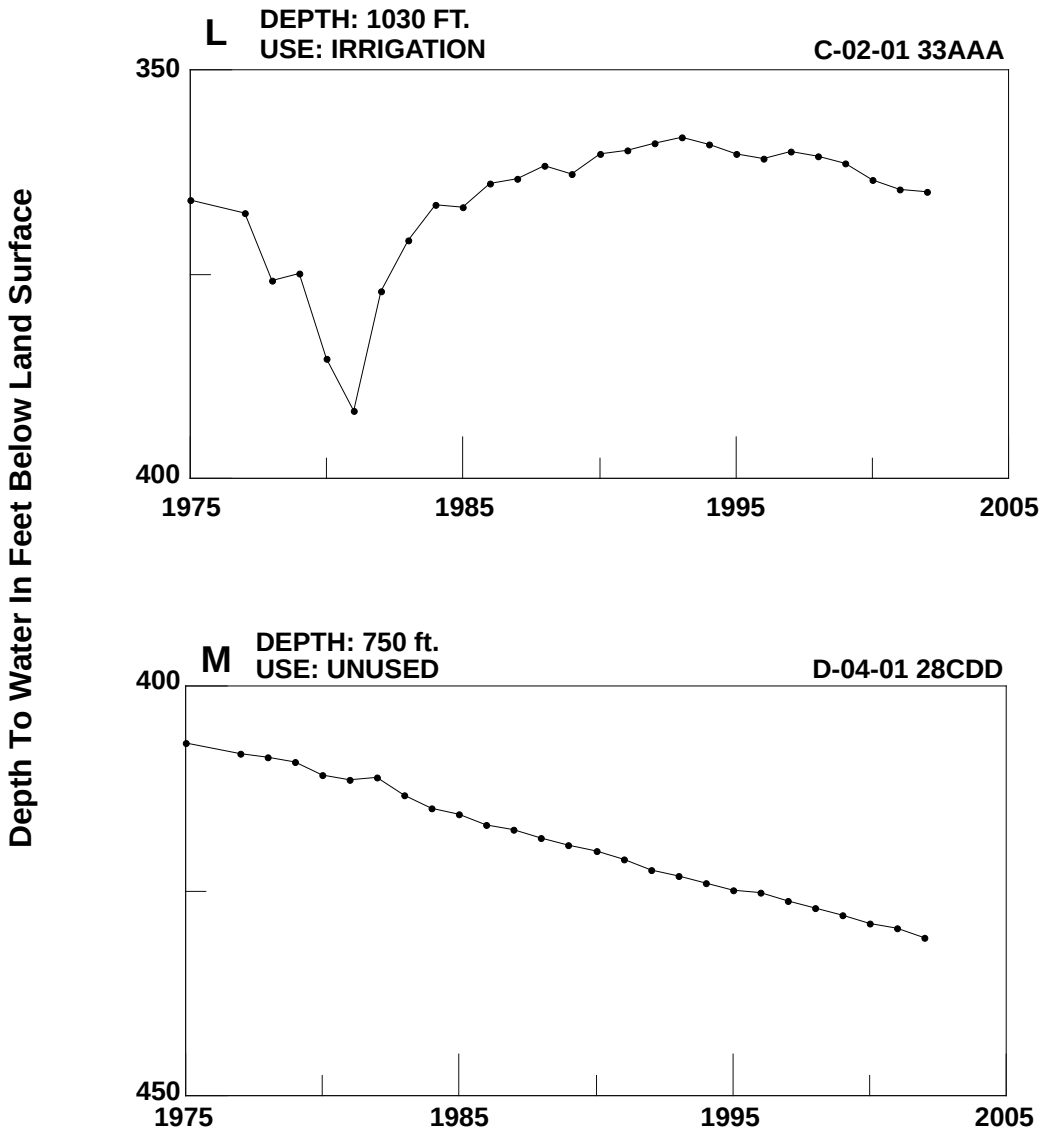


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

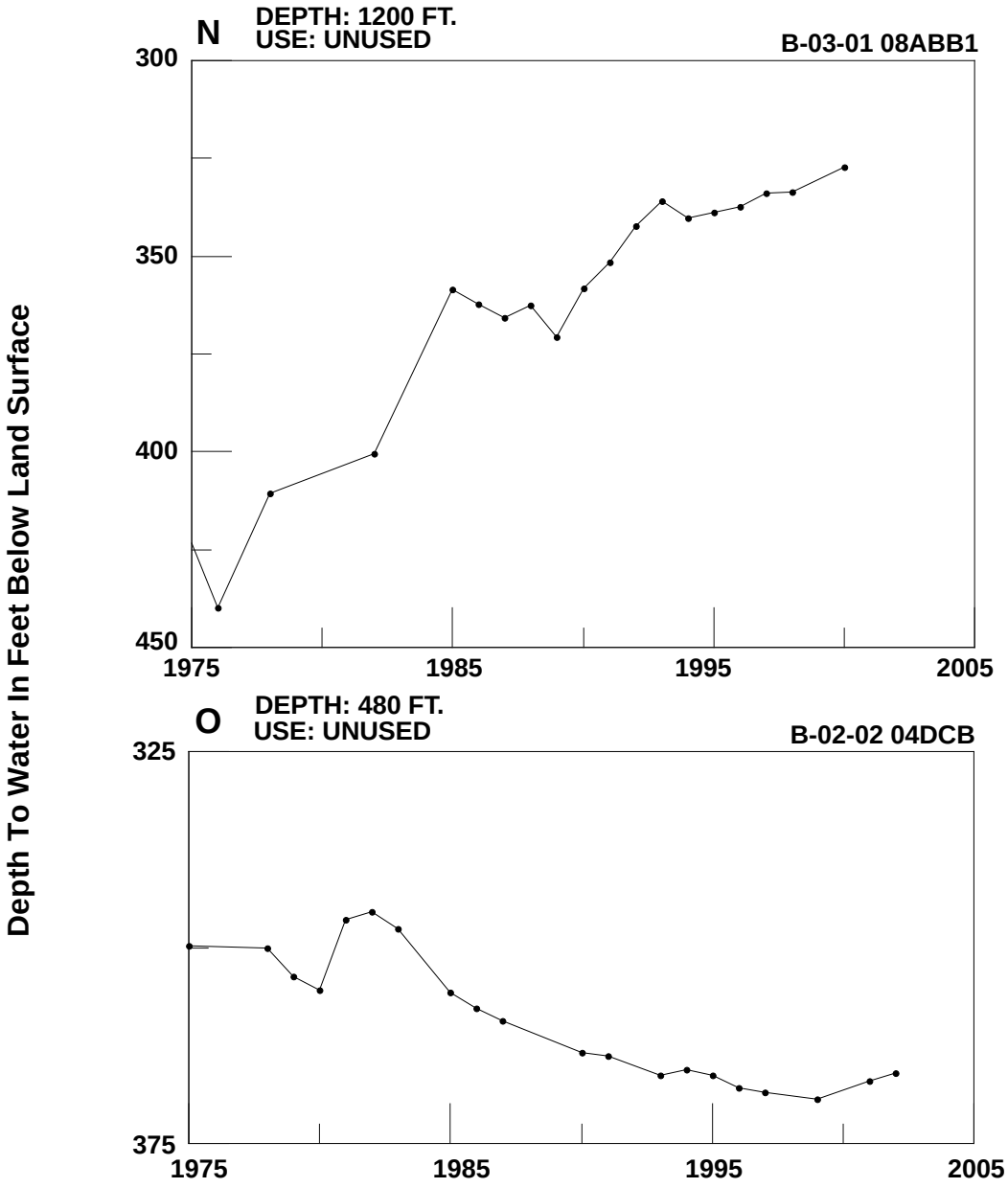
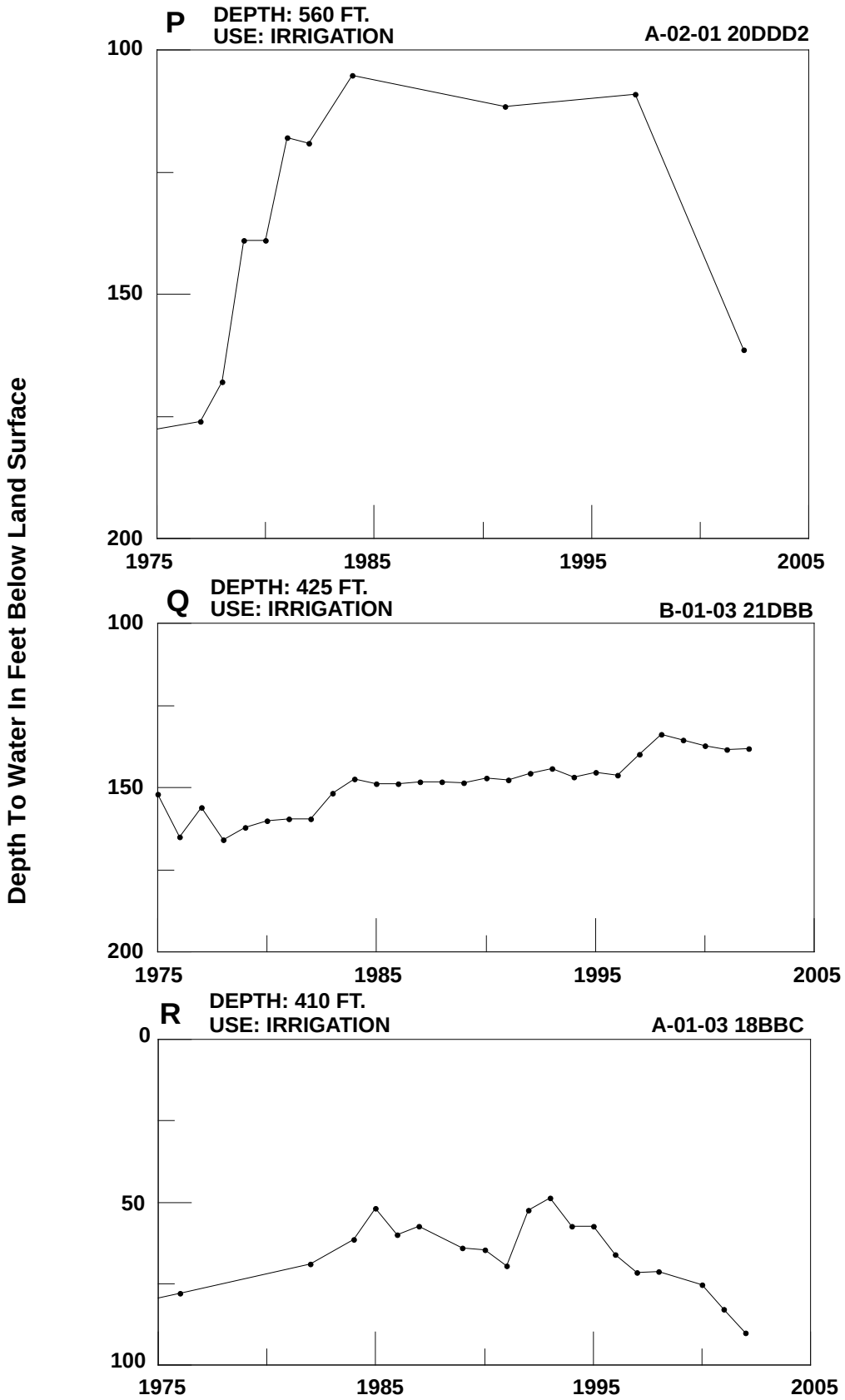


Figure 8.1-7 (cont)
Phoenix Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



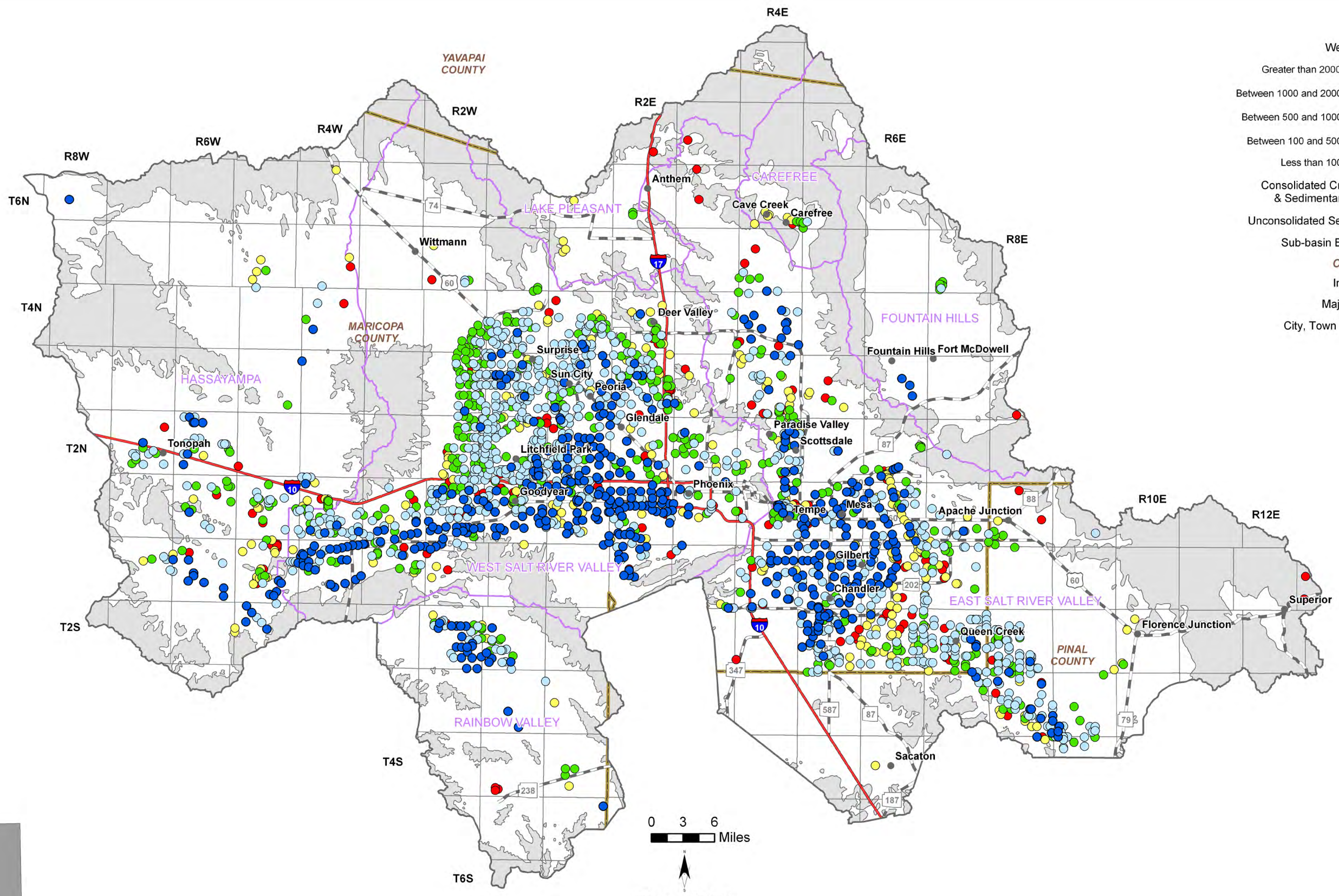


Figure 8.1-8
Phoenix AMA
Well Yields

Table 8.1-7 Recharge Sites in the Phoenix AMA

A. Underground Storage Facilities

FACILITY NAME	FACILITY NUMBER	PERMITTEE NAME	FACILITY TYPE	PERMITTED AF/YEAR	WATER SOURCE
AGUA FRIA	71-569776.0004	CAWCD	CONSTRUCTED	100,000	C
	71-569775.0004		MANAGED		C
ANTHEM (DESERT HILLS)	71-566962.0000	ARIZONA-AMERICAN WATER CO.	CONSTRUCTED	10,000	CE
ARROWHEAD	71-591934.0000	CITY OF GLENDALE	CONSTRUCTED	2,300	E
AVONDALE WETLANDS	71-565257.0001	CITY OF AVONDALE	CONSTRUCTED	15,000	CS
CAVE CREEK	71-595199.0000	CITY OF PHOENIX	CONSTRUCTED	8,961	E
CHANDLER HEIGHTS	71-588551.0001	CITY OF CHANDLER	CONSTRUCTED	2,240	E
CHANDLER INTEL	71-541455.0001	CITY OF CHANDLER	CONSTRUCTED	3,100	E
CHANDLER OCOTILLO ASR	71-583023.0004	CITY OF CHANDLER	CONSTRUCTED	11,200	E
CHANDLER TUMBLEWEED	71-560347.0000	CITY OF CHANDLER	CONSTRUCTED	11,200	E
EL MIRAGE	71-595207.0000	CITY OF EL MIRAGE	MANAGED	2,016	E
FOUNTAIN HILLS	71-591940.0000	FOUNTAIN HILLS SANT. DIST.	CONSTRUCTED	2,241	E
GILBERT NEELY WILDLIFE HABITAT	71-520379.0000	TOWN OF GILBERT	CONSTRUCTED	3,314	E
GILBERT RIPARIAN PRESERVE	71-564416.0000	TOWN OF GILBERT	CONSTRUCTED	4,369	CES
GILBERT SOUTH	71-595198.0000	CITY OF GILBERT	CONSTRUCTED	10,098	CE
GLENDALE AIRPORT	71-586730.0000	CITY OF GLENDALE	CONSTRUCTED	7,841	E
GOLD CANYON	71-591929.0000	GOLD CANYON SEWER CO.	CONSTRUCTED	1,120	E
GOODYEAR EFFLUENT - SAT	71-566367.0000	CITY OF GOODYEAR	CONSTRUCTED	3,360	E
GRUSP	71-516371.0000	SALT RIVER PROJECT	CONSTRUCTED	200,000	CES
HIEROGLYPHIC MTS.	71-584466.0001	CAWCD	CONSTRUCTED	35,000	C
KEN MCDONALD	71-563943.0001	CITY OF TEMPE	CONSTRUCTED	3,400	E
LAKE PLEASANT	71-205388.0000	LAKE PLEASANT SEWER CO.	CONSTRUCTED	67	E
MESA NWWRP	71-518105.0000	CITY OF MESA	CONSTRUCTED	8,963	E

Table 8.1-7 Recharge Sites in the Phoenix AMA (cont)

A. Underground Storage Facilities

FACILITY NAME	FACILITY NUMBER	PERMITTEE NAME	FACILITY TYPE	PERMITTED AF/YEAR	WATER SOURCE
GILBERT MUNICIPAL (ASR)	71-591935.0000	CITY OF GILBERT	CONSTRUCTED	2,240	E
NAUSP	71-588558.0003	SRP	CONSTRUCTED	75,000	CSE
NORTH GATEWAY	71-595208.0000	CITY OF PHOENIX	CONSTRUCTED	1,742	C
NORTH SCOTTSDALE	71-583022.0001	CITY OF SCOTTSDALE	CONSTRUCTED	3,642	C
OCOTILLO	71-546845.0002	OCOTILLO MGT GROUP	CONSTRUCTED	500	E
PEORIA WWTP - BEARDSLEY	71-552497.0002	CITY OF PEORIA	CONSTRUCTED	17,920	E
RED MOUNTAIN	71-535755.0001	CITY OF MESA	CONSTRUCTED	2,000	C
SUN CITY WEST	71-534362.0003	ARIZONA AMERICAN WATER CO.	CONSTRUCTED	5,600	E
SUN LAKES	71-560427.0001	PIMA UTILITIES	CONSTRUCTED	628	E
SMCFD	71-584469.0000	SUPERSTITION MOUNTAINS COMMUNITIES FACILITIES	CONSTRUCTED	2,352	E
SUPERSTITION MTNS	71-207702.000	CAWCD	CONSTRUCTED	56,500	C
SURPRISE (SOUTH PLANT)	71-562521.0002	CITY OF SURPRISE	CONSTRUCTED	8,066	E
TARTESSO	71-205381.0001	TOWN OF BUCKEYE	CONSTRUCTED	20,163	E
TONOPAH DESERT	71-593305.0002	CAWCD	CONSTRUCTED	150,000	C
TRAMONTO	71-591936.0002	CITY OF PHOENIX	CONSTRUCTED	1,935	C
VERRADO	71-207708.0006	ARIZONA-AMERICAN WATER CO.	CONSTRUCTED	500	E
WATER CAMPUS	71-560648.0002	CITY OF SCOTTSDALE	CONSTRUCTED	16,800	CE
WEST MARICOPA COMBINE	71-550601.0000	WEST MARICOPA COMBINE, INC.	MANAGED	25,000	C
WEST MARICOPA COMBINE	71-578112.0001	WEST MARICOPA COMBINE, INC.	MANAGED	25,000	C
WESTWORLD	71-574911.0002	CITY OF SCOTTSDALE	CONSTRUCTED	1,000	C

Table 8.1-7 Recharge Sites in the Phoenix AMA (cont)

B. Groundwater Savings Facilities

PERMITEE/FACILITY NAME	FACILITY NUMBER	PERMITTED AF/YEAR	WATER SOURCE
CAWCD @ CHANDLER HEIGHTS ID	72-534753	3,000	C
CAWCD @ QUEEN CREEK ID	72-534550.0003	28,000	C
GILA RIVER INDIAN IDD	72-211277.0000	37,520	C
LITCHFIELD PARK SERVICE COMPANY (LPSCO)	72-534978.0000	105,000	E
MARICOPA WATER DISTRICT	72-558246.0002	40,000	C
NEW MAGMA IDD	72-534888.0003	54,000	C
ROOSEVELT ID	72-572386.0001	30,000	E
ROOSEVELT WATER CONSERVATION DISTRICT (RWCD)	72-545695.0000	105,000	C,E
SRP	72-553166.0002	100,000	C
TONOPAH ID	72-534439.0003	15,000	C

Notes:
Gila River Indian IDD GSF is located in the Phoenix and Pinal AMAs. Permitted AF/Year shown here is for the Phoenix AMA only.
C - CAP
E - Effluent
S - Surface Water
CAWCD - Central Arizona Water Conservation District
ID - Irrigation District
IDD - Irrigation and Drainage District
SRP - Salt River Project

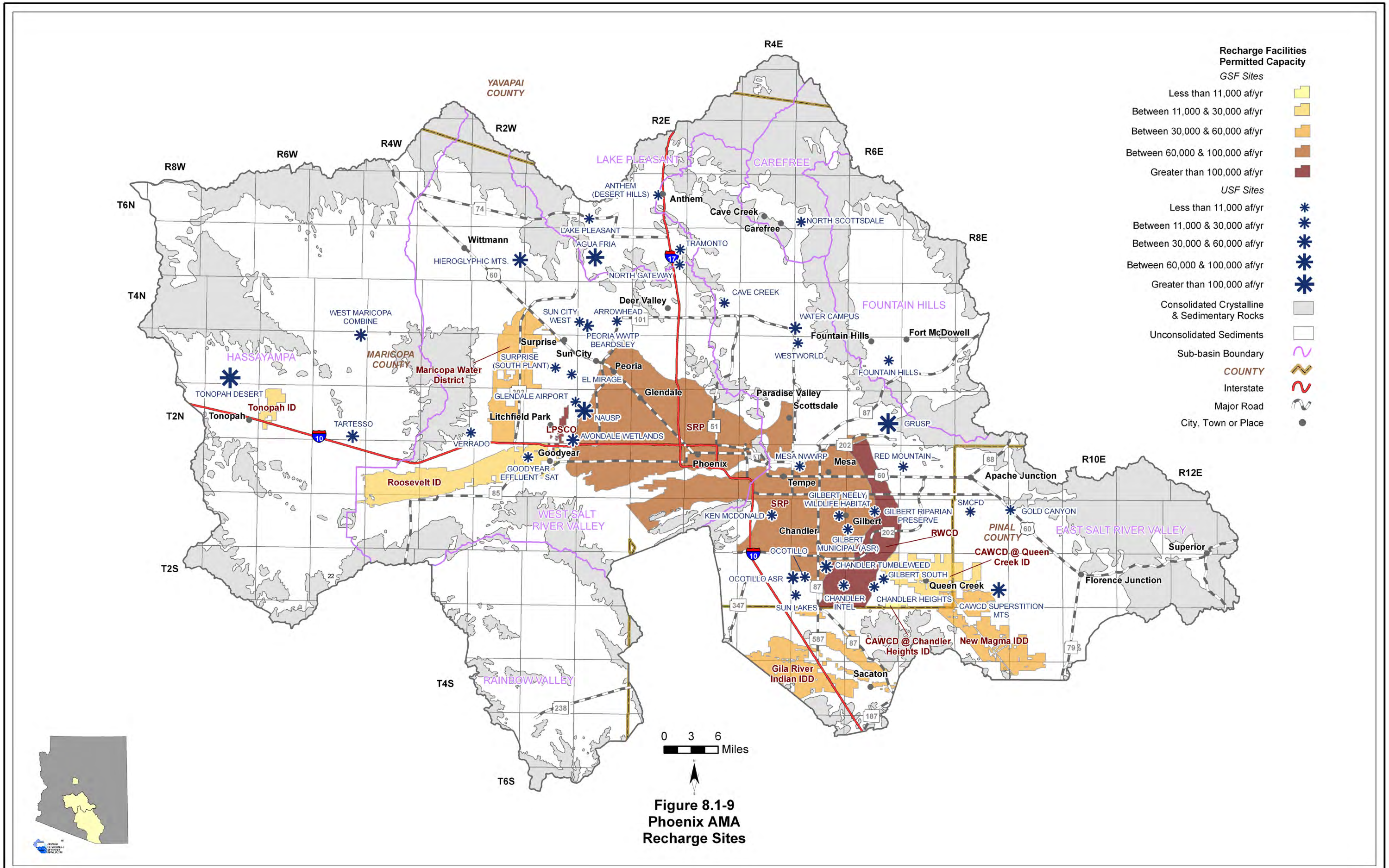


Figure 8.1-9
Phoenix AMA
Recharge Sites

8.1.7 Water Quality Exceedences and Contamination Sites in the Phoenix AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 8.1-8A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 8.1-8B. Figures 8.1-10 and 8.1-10A show the location of water quality occurrences keyed to Table 8.1-8. Figures 8.1-11 and 8.1-11A show the location of contamination sites with site information show in Table 8.1-9. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. 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 8.1-8A.
- One thousand five hundred and seventeen sites have parameter concentrations that have equaled or exceeded DWS.
- Frequently equaled or exceeded parameters include nitrate, fluoride, arsenic, manganese and organics
- Other parameters equaled or exceeded include cadmium, lead, radionuclides, selenium, beryllium, chromium, total dissolved solids, mercury and barium,

Lakes and Streams with impaired waters

- Refer to Table 8.1-8B.
- Water quality standards were equaled or exceeded in eight stream reaches and three lakes. The most common parameter equaled or exceeded was pesticides.
- One reach, Queen Creek - from headwaters to the mining discharge, is part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) Program. Sampling is ongoing at the site at this time.

Effluent Dependent Reaches

- Refer to Figure 8.1-10A
- There are four effluent dependent reaches in the AMA: Gila River, Salt River, Agua Fria River and Queen Creek.

Contamination Sites

- Refer to Figures 8.1-11 and 8.1-11A and Table 8.1-9
- There are 16 Voluntary Remediation Program sites, 12 Water Quality Assurance Revolving Fund sites, six active National Priority List sites and one Department of Defense Site.
- The most common contaminants are Volatile Organic Compounds (VOCs).

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	7 North	2 East	24	1	F
2	7 North	2 East	29	1	NO3
3	7 North	3 East	30	2	F, NO3
3	7 North	3 East	31	1	F
3	7 North	3 East	32	1	F
4	7 North	2 East	25	1	NO3
4	7 North	2 East	26	1	NO3
4	7 North	2 East	27	1	F
4	7 North	2 East	34	4	As, F, NO3
4	7 North	2 East	35	1	F
4	6 North	2 East	2	1	As, Pb
5	6 North	3 East	5	1	As, Mn
5	6 North	3 East	8	1	As, Mn
6	6 North	3 East	4	1	As
7	6 North	3 East	16	2	As, F
8	7 North	4 West	33	1	Mn
9	6 North	3 West	5	1	As
10	6 North	2 West	18	1	F
11	6 North	4 East	10	1	F
11	6 North	4 East	11	3	F, Rad
12	6 North	4 East	8	2	As, Rad
12	6 North	4 East	9	6	As, F, Hg, NO3, Pb, Rad
13	6 North	5 East	18	1	F
14	6 North	5 East	11	1	Mn
15	6 North	8 West	35	1	F
16	6 North	5 West	31	1	F
17	5 North	6 West	25	1	F
18	5 North	3 West	1	1	As
19	5 North	1 West	10	1	As
20	6 North	2 East	29	2	Cd
20	6 North	2 East	33	1	Cd
21	5 North	2 East	4	1	F
22	5 North	2 East	3	2	As, F
22	5 North	2 East	10	1	F
23	5 North	3 East	5	2	F
23	5 North	3 East	8	1	F
24	5 North	3 East	12	2	Organics
25	6 North	4 East	32	1	Rad
26	6 North	4 East	15	3	As, F, Rad
26	6 North	4 East	21	4	As, Rad
26	6 North	4 East	22	4	As, Pb, Rad
26	6 North	4 East	23	1	Rad
26	6 North	4 East	26	1	Rad
26	6 North	4 East	27	3	As, F, Rad
26	6 North	4 East	28	9	As, F, Rad
26	6 North	4 East	29	2	As, Rad
27	6 North	4 East	36	1	Rad
27	6 North	5 East	30	1	Rad
27	6 North	5 East	31	6	As, Rad
27	5 North	5 East	6	2	As, Pb
28	6 North	5 East	33	1	Rad

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
29	5 North	7 East	4	1	As
30	5 North	2 West	36	1	NO3
31	4 North	1 West	7	1	As
31	4 North	1 West	8	1	F
32	4 North	1 West	27	1	F
32	4 North	1 West	28	1	F
33	4 North	1 East	23	2	Organics
33	4 North	1 East	24	2	NO3, Organics
34	4 North	2 East	23	1	As
35	5 North	2 East	35	1	As
36	4 North	2 East	11	1	As
37	4 North	4 East	6	1	Mn
38	4 North	4 East	11	1	As
39	4 North	5 East	14	1	F
40	5 North	7 East	32	1	F
41	4 North	7 East	8	1	Mn
42	3 North	6 West	27	1	F
43	3 North	2 West	14	3	As, F
43	3 North	2 West	15	1	F
44	3 North	2 West	1	1	F, NO3
45	3 North	2 West	25	1	F
45	3 North	2 West	36	1	As, Pb
46	3 North	2 West	13	2	NO3, Organics
47	3 North	1 West	17	1	As
48	3 North	1 West	15	2	F, NO3
48	3 North	1 West	16	1	F
49	3 North	1 West	22	2	As, F
49	3 North	1 West	23	2	NO3
49	3 North	1 West	27	2	As, F
49	3 North	1 West	28	1	F
49	3 North	1 West	33	1	NO3
49	3 North	1 West	34	1	As
50	3 North	1 West	2	1	NO3
50	3 North	1 West	10	3	Cr, F
50	3 North	1 West	11	2	F, NO3
51	3 North	1 East	18	1	Organics
52	3 North	1 East	23	1	NO3
53	4 North	1 East	34	1	NO3
53	4 North	1 East	35	4	NO3, Organics
54	3 North	1 East	12	2	As, NO3, Se
55	3 North	1 East	25	2	Mn, NO3
56	3 North	1 East	13	2	As, NO3, Se
57	4 North	2 East	30	2	NO3, Organics
58	3 North	2 East	29	2	As, NO3
59	3 North	2 East	20	1	NO3
59	3 North	2 East	21	1	Be
59	3 North	2 East	22	1	NO3
60	3 North	2 East	16	1	NO3
61	3 North	2 East	4	1	As
62	3 North	2 East	13	1	NO3
63	3 North	3 East	30	1	Pb

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
64	3 North	4 East	16	1	As
65	3 North	4 East	23	1	Cr
65	3 North	4 East	25	1	Cr
66	3 North	5 East	27	1	Mn
66	3 North	5 East	28	1	As, F, Pb
67	3 North	6 East	15	1	As
68	3 North	6 East	23	5	NO3, TDS
69	3 North	6 East	13	1	Cr, Mn
69	3 North	7 East	18	1	As
70	2 North	7 West	5	1	F
71	2 North	7 West	28	1	F
72	2 North	7 West	14	2	As, F, Pb
73	2 North	7 West	23	2	F
73	2 North	7 West	25	3	F
73	2 North	7 West	26	5	As, F, Pb
73	2 North	7 West	27	1	F
74	2 North	7 West	36	3	F
75	2 North	2 West	20	2	As, Organics
75	2 North	2 West	21	1	As
75	2 North	2 West	28	1	As
76	2 North	6 West	16	2	F
76	2 North	6 West	17	1	As, F
76	2 North	6 West	19	1	As, F
76	2 North	6 West	20	3	F
76	2 North	6 West	21	3	F, NO3
76	2 North	6 West	29	1	As, F
76	2 North	6 West	30	1	F
77	2 North	6 West	4	2	F
77	2 North	6 West	5	3	As, F
77	2 North	6 West	8	1	F
77	2 North	6 West	9	4	F
78	2 North	6 West	28	3	As, F, NO3
79	2 North	6 West	23	1	F
79	2 North	6 West	24	1	F
80	2 North	5 West	7	1	F
81	2 North	6 West	32	4	F
81	1 North	6 West	6	1	As, F, Pb
82	2 North	2 West	23	1	As
82	2 North	2 West	27	1	As
83	2 North	2 West	1	1	F, NO3
83	2 North	2 West	11	2	As, NO3
83	2 North	2 West	14	2	As, NO3, Organics
84	2 North	2 West	24	1	As, NO3
84	2 North	2 West	26	1	NO3
84	2 North	2 West	36	1	NO3
84	2 North	1 West	18	2	F, NO3
84	2 North	1 West	19	1	Pb
84	2 North	1 West	30	1	NO3
84	2 North	1 West	31	1	F, NO3, TDS
85	2 North	1 West	6	1	NO3
86	2 North	1 West	5	1	F

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
87	2 North	1 West	8	1	As
88	2 North	1 West	28	1	NO3
89	2 North	1 West	3	1	Organics
90	2 North	1 West	15	1	As
91	2 North	1 West	13	1	NO3
92	3 North	1 East	31	1	Mn
93	2 North	1 East	20	1	Organics
93	2 North	1 East	29	3	NO3
94	2 North	1 East	8	1	Organics
94	2 North	1 East	9	1	NO3
94	2 North	1 East	17	2	NO3, Organics
95	3 North	1 East	34	1	NO3
95	2 North	1 East	3	1	Se
95	2 North	1 East	4	2	NO3
96	2 North	1 East	12	1	Se
97	2 North	1 East	24	1	NO3
97	2 North	2 East	19	1	NO3
97	2 North	2 East	30	1	NO3
98	2 North	2 East	6	1	NO3
99	2 North	2 East	17	1	As
100	2 North	2 East	20	1	As
100	2 North	2 East	21	1	NO3, Pb
100	2 North	2 East	22	58	Cr, Organics
100	2 North	2 East	26	28	Mn, NO3, Organics
100	2 North	2 East	27	19	As, Cr, Organics
100	2 North	2 East	28	2	NO3, Organics
100	2 North	2 East	34	1	Organics
100	2 North	2 East	35	6	Organics
100	2 North	2 East	36	6	NO3, Organics
101	3 North	2 East	26	1	NO3
102	2 North	3 East	19	1	NO3
103	2 North	3 East	17	1	NO3
103	2 North	3 East	20	11	Organics, Pb
104	2 North	3 East	15	2	Organics
104	2 North	3 East	22	7	As, F, Organics
104	2 North	3 East	26	1	F
104, 105	2 North	3 East	23	2	Organics
105	2 North	3 East	13	1	NO3
105	2 North	3 East	24	2	Organics
105	2 North	3 East	25	26	As, F, Mn, NO3, Organics
105	2 North	3 East	36	2	F, Mn, NO3
105	2 North	4 East	19	6	Organics
105	2 North	4 East	20	6	Organics
105	2 North	4 East	21	1	As, F, NO3
105	2 North	4 East	29	12	As, F, Mn, Organics
105	2 North	4 East	30	8	F, Hg, Mn, NO3, Organics
105	2 North	4 East	31	10	As, F, Mn, NO3, Organics, Pb
105	2 North	4 East	32	6	As, F, NO3, Organics
105	1 North	4 East	5	1	As, F, NO3
105	1 North	4 East	6	2	As, F, Mn, Organics
106	2 North	4 East	23	1	Se

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
106	2 North	4 East	27	1	NO3
107	2 North	4 East	11	5	As, Cr, NO3, Se
107	2 North	4 East	12	2	As, Se
107	2 North	4 East	14	3	As, Cr
108	2 North	4 East	25	1	NO3, Se
109	2 North	4 East	24	1	NO3
110	2 North	5 East	19	1	Organics
111	2 North	5 East	15	1	NO3
112	3 North	5 East	35	1	As
113	2 North	5 East	23	1	NO3
114	2 North	5 East	13	1	NO3
115	3 North	8 East	33	1	Mn
116	1 North	7 West	20	1	Organics
117	1 North	6 West	26	1	F
118	1 North	6 West	20	1	F
119	1 North	6 West	8	1	As, F
120	2 North	6 West	33	2	F
121	1 North	6 West	21	2	As, F
122	1 North	6 West	34	2	F
123	1 North	6 West	10	1	As, F
123	1 North	6 West	15	1	As, F
124	1 North	7 West	3	1	F
125	1 North	5 West	27	1	F
126	1 North	4 West	20	1	NO3
127	1 North	4 West	16	1	NO3
128	1 North	4 West	21	1	F
128	1 North	4 West	23	1	As, F
128	1 North	4 West	24	1	F
128	1 North	4 West	26	1	F, NO3, TDS
128	1 North	4 West	27	4	F, NO3, TDS
128	1 North	3 West	19	2	As, F, NO3, TDS
129	1 North	4 West	35	1	F
129	1 North	4 West	36	2	F, NO3, TDS
129	1 North	3 West	31	1	As
130	1 North	3 West	7	1	F, TDS
131	1 North	3 West	17	1	F
132	1 North	3 West	28	1	TDS
132	1 North	3 West	30	2	As, F, NO3
132	1 North	3 West	32	1	NO3, TDS
132	1 South	3 West	5	4	As, F, NO3, TDS
133	1 North	3 West	27	1	F, NO3, TDS
133	1 North	3 West	34	2	NO3, TDS
133	1 South	3 West	3	3	As, F, Mn, NO3, TDS
133	1 South	3 West	4	1	NO3
134	1 North	3 West	14	2	NO3
135	1 North	3 West	23	2	As, F
135	1 North	3 West	24	1	F, Mn, NO3, TDS
135	1 North	3 West	25	1	NO3
135	1 North	3 West	26	2	As, Ba, Be, Mn, NO3, Pb, TDS
136	1 North	3 West	13	1	As
136	1 North	2 West	17	3	NO3, TDS

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
136	1 North	2 West	18	3	NO3, TDS
136	1 North	2 West	19	1	TDS
136	1 North	2 West	20	1	NO3, TDS
137	1 North	2 West	29	3	NO3, TDS
137	1 North	2 West	32	4	As, F, NO3, TDS
137	1 South	2 West	5	3	As, NO3, Pb
137	1 South	2 West	6	3	F, NO3, TDS
137, 140	1 North	2 West	28	3	NO3, TDS
138, 141	1 North	2 West	10	2	NO3
138	1 North	2 West	8	1	F
138	1 North	2 West	9	3	As, NO3, Pb
138	1 North	2 West	15	2	NO3
138	1 North	2 West	16	1	F
139	2 North	2 West	33	3	NO3
139	2 North	2 West	34	1	As, F
139	1 North	2 West	3	1	NO3
140	1 North	2 West	21	3	As, F, NO3
140	1 North	2 West	22	2	As, F, NO3
140	1 North	2 West	26	1	TDS
140	1 North	2 West	27	2	NO3, TDS
141	1 North	2 West	2	4	F, NO3, Organics
141	1 North	2 West	11	3	As, F, NO3, Pb
141	1 North	2 West	12	1	As, F, TDS
141, 143	1 North	2 West	14	3	NO3, TDS
142	1 North	2 West	25	4	As, Cd, F, NO3, Pb
142	1 North	1 West	30	2	NO3, TDS
142, 143	1 North	1 West	19	3	As, NO3, Organics, Pb, TDS
143	1 North	2 West	13	4	As, NO3
143	1 North	2 West	23	1	NO3, TDS
143	1 North	2 West	24	2	As, NO3, TDS
143	1 North	1 West	7	2	NO3
143	1 North	1 West	17	1	NO3
143	1 North	1 West	18	4	NO3, TDS
144	1 North	1 West	5	1	NO3
145	1 North	1 West	29	3	F, TDS
146	1 North	1 West	10	4	NO3, Organics
146	1 North	1 West	15	7	NO3, Organics, Pb
146	1 North	1 West	21	1	NO3, TDS
146	1 North	1 West	22	1	NO3
147	1 North	1 West	3	1	Organics
147	1 North	1 West	4	2	NO3
148	1 North	1 West	27	1	F
149	2 North	1 West	24	1	NO3
149	2 North	1 West	25	1	NO3
149	2 North	1 West	26	1	Organics
149	2 North	1 West	34	1	As, Mn
149	2 North	1 West	36	4	NO3, Pb
149	2 North	1 East	30	1	Organics
149	1 North	1 West	1	2	NO3
150	1 North	1 West	24	1	NO3
151	1 North	1 East	30	2	NO3, TDS

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
152	1 North	1 East	17	1	NO3
153	1 North	1 East	22	1	TDS
153	1 North	1 East	28	1	As
153	1 North	1 East	32	1	Cd, TDS
154	2 North	1 East	32	2	NO3
154	2 North	1 East	34	1	NO3
154	1 North	1 East	2	1	NO3
154	1 North	1 East	3	2	NO3
154	1 North	1 East	4	2	NO3
154	1 North	1 East	9	1	NO3
154	1 North	1 East	10	2	Mn, NO3
154	1 North	1 East	11	3	Cd, Cu, Mn, NO3, Organics
154	1 North	1 East	16	1	NO3
155	1 North	1 East	23	1	As
156	1 North	1 East	1	1	Organics
156	1 North	1 East	12	2	Organics
156, 159	1 North	2 East	7	12	NO3, Organics
157	1 North	1 East	24	1	As
158	2 North	1 East	36	1	NO3, Pb
159	2 North	2 East	33	1	Organics
159	1 North	2 East	4	1	Organics
159	1 North	2 East	5	3	Organics
159	1 North	2 East	8	17	Mn, Organics
159	1 North	2 East	9	15	Organics
159	1 North	2 East	10	5	F, NO3, Organics
159	1 North	2 East	15	3	F, Organics
159, 161	1 North	2 East	11	3	Cr, Mn, Organics
160	1 North	2 East	27	1	NO3
160	1 North	2 East	28	1	NO3
160	1 North	2 East	33	1	NO3
161	1 North	2 East	1	2	Organics
161	1 North	2 East	12	5	NO3, Organics
161	1 North	2 East	13	3	Organics, Pb
161	1 North	2 East	24	3	Mn, Organics
161	1 North	3 East	5	1	Organics
161	1 North	3 East	7	14	Mn, Organics
161	1 North	3 East	8	16	As, Mn, Organics, Pb
161	1 North	3 East	17	1	Mn
161	1 North	3 East	18	7	Cr, Organics
161	1 North	3 East	19	5	As, Ba, Mn, Organics
162	2 North	3 East	32	1	Organics
163	1 North	3 East	22	1	As
163, 165	1 North	3 East	15	4	As, Mn, Organics
164	2 North	3 East	27	1	Organics
165	1 North	4 East	6	1	As, F, Mn, Organics
164	2 North	3 East	35	1	Organics
165	2 North	3 East	34	2	Organics
165	1 North	3 East	1	11	As, F, Organics
165	1 North	3 East	2	7	NO3, Organics
165	1 North	3 East	3	2	Organics
165	1 North	3 East	4	3	Organics

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
165	1 North	3 East	9	3	Organics
165	1 North	3 East	10	10	Organics
165	1 North	3 East	11	47	As, Mn, Organics
165	1 North	3 East	12	65	As, Cr, Mn, NO3, Organics
165	1 North	4 East	7	4	As, F, Organics
165, 166	1 North	3 East	14	4	Organics
166	1 North	3 East	13	15	As, Cu, Mn, Organics, Pb
166	1 North	3 East	24	9	As, Cd, Organics
166	1 North	4 East	17	2	Mn, Organics, Pb
166	1 North	4 East	18	53	As, Ba, Be, Cd, Cr, Cu, Mn, NO3, Organics, Pb
166	1 North	4 East	19	10	As, Ba, Cd, Hg, Mn, NO3, Organics, Pb
167	1 North	4 East	30	1	NO3
168	1 North	4 East	27	1	Se
169	2 North	4 East	35	1	As
170	1 North	4 East	1	1	Se
170	1 North	4 East	2	1	Pb
170	1 North	4 East	11	1	Pb
171	1 North	4 East	13	10	As, Be, Mn, NO3, Organics
171	1 North	4 East	14	4	As, Be, Mn, NO3
171	1 North	4 East	23	6	As, Be, Mn
171	1 North	4 East	24	2	Organics, Se, Tl
172	1 North	5 East	19	3	Organics, Se
172	1 North	5 East	30	2	NO3, Se, TDS
173	1 North	5 East	17	1	Se
173	1 North	5 East	18	1	As, Mn
174	1 North	5 East	9	1	Se
174	1 North	5 East	15	1	Pb
175	1 North	5 East	11	2	As, Se
175	1 North	5 East	13	1	As
175	1 North	5 East	14	1	Se
176	2 North	6 East	31	1	Mn
176	1 North	5 East	1	1	Se
176	1 North	6 East	6	2	Se
177	1 North	6 East	17	1	Se
178	2 North	6 East	27	4	As, Organics
178	2 North	6 East	28	1	As, Se
178	2 North	6 East	32	1	Se
178	2 North	6 East	33	1	As, Se
178	2 North	6 East	34	5	Organics
179	1 North	6 East	33	1	Se
180	1 North	6 East	9	1	NO3
180	1 North	6 East	10	1	Mn, NO3, Pb
181	1 North	6 East	23	1	F
181	1 North	6 East	24	1	As, F
181	1 North	6 East	26	1	F
181	1 North	6 East	35	1	As
182	1 North	6 East	12	1	As
183	1 North	7 East	30	1	F
184	1 North	7 East	26	1	As

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
185	1 North	7 East	24	3	As, Cd, Mn, Organics, Pb
186	1 North	8 East	4	2	NO3
186	1 North	8 East	10	1	Pb
187	1 North	8 East	15	2	NO3
188	1 North	8 East	1	1	NO3
189	1 South	7 West	22	1	F
190	1 South	7 West	12	1	F
190	1 South	7 West	13	1	F
190	1 South	6 West	18	1	F
191	1 South	7 West	24	1	F
191	1 South	6 West	19	2	As, F
192	1 South	6 West	31	1	F
193	1 South	6 West	16	1	F
193	1 South	6 West	17	2	As, F
193	1 South	6 West	21	2	As, F
194	1 South	6 West	27	1	F
195	1 South	6 West	28	1	F
196	1 South	6 West	14	1	F
196	1 South	6 West	23	2	F
197	1 South	6 West	25	1	F
197	1 South	6 West	35	1	F
198	1 South	5 West	21	3	F
198	1 South	5 West	28	2	F, NO3
198	1 South	5 West	32	1	F
198	1 South	5 West	33	1	NO3, TDS
199	1 South	5 West	34	2	F, TDS
200	1 South	5 West	2	1	Mn
200	1 South	5 West	3	9	Mn, Organics
201	1 South	5 West	12	1	NO3, Pb, TDS
201	1 South	5 West	13	4	F, NO3
201	1 South	5 West	24	1	NO3, TDS
201	1 South	4 West	7	1	TDS
201	1 South	4 West	18	1	NO3, TDS
201	1 South	4 West	19	2	NO3, TDS
201	1 South	4 West	20	3	As, NO3, TDS
201, 203	1 South	4 West	17	2	As, F, NO3, TDS
202	1 North	5 West	36	1	As, F
202	1 North	4 West	31	1	NO3
202	1 North	4 West	32	2	As, F, NO3, TDS
202	1 South	4 West	5	3	NO3, Organics
202	1 South	4 West	6	2	NO3
202	1 South	4 West	8	2	NO3
202, 204	1 North	4 West	33	4	As, NO3, TDS
203	1 South	4 West	10	2	F, Organics
203	1 South	4 West	11	5	As, F, NO3, TDS
203	1 South	4 West	15	3	As, F, NO3, TDS
203	1 South	4 West	16	2	As, F, NO3, TDS
204	1 North	4 West	34	3	NO3, TDS
204	1 South	4 West	1	4	F, NO3, TDS
204	1 South	4 West	2	2	F, NO3, TDS
204	1 South	4 West	3	3	F, NO3, TDS

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
204	1 South	4 West	4	2	As, F, NO3, TDS
204	1 South	4 West	9	1	TDS
205	1 South	4 West	24	1	TDS
206	1 South	4 West	12	1	TDS
206	1 South	3 West	6	4	NO3, TDS
206	1 South	3 West	7	5	As, NO3, TDS
207	1 South	3 West	9	2	NO3, TDS
208	1 North	3 West	35	4	As, F, NO3, TDS
208	1 North	3 West	36	1	NO3, TDS
208	1 South	3 West	1	2	As, Mn, NO3, TDS
208	1 South	3 West	2	2	NO3, TDS
208	1 South	3 West	11	1	As, TDS
208	1 South	3 West	12	1	As, TDS
209	1 South	3 West	23	1	F
210	1 South	3 West	25	2	F
210	1 South	2 West	19	2	F
210	1 South	2 West	30	1	F
211	1 South	2 West	16	2	F, NO3
212	1 North	1 West	36	1	Cd
212	1 South	1 West	1	1	TDS
213	1 South	1 East	2	2	NO3
213	1 South	1 East	3	1	Mn, TDS
214	1 North	1 East	36	2	NO3
214	1 North	2 East	30	1	Mn
214	1 North	2 East	31	1	NO3
214	1 North	2 East	32	1	NO3
214	1 South	1 East	1	1	TDS
215	1 South	2 East	10	2	As, NO3
216	1 North	2 East	34	1	As
216	1 South	2 East	1	1	NO3
217	1 South	2 East	23	1	As
218	1 South	3 East	6	2	As, F, Se
219	1 North	3 East	33	1	Pb
220	1 South	4 East	10	1	Se
221	1 South	5 East	19	1	Mn
221	1 South	5 East	30	1	As, NO3
222	1 South	5 East	29	1	As
223	1 South	5 East	8	1	As, Se
223	1 South	5 East	9	1	As
223	1 South	5 East	16	1	As, Se
224	1 South	5 East	21	1	As
225	1 South	5 East	15	1	Pb
225	1 South	5 East	22	1	As
226	1 South	5 East	34	1	NO3
227	1 North	5 East	25	1	Organics
227	1 North	5 East	34	1	Pb
227	1 North	5 East	35	6	Mn, Organics
227	1 South	5 East	2	5	As, Cr, F, Mn, Organics
227	1 South	5 East	10	1	TDS
228	1 South	5 East	23	1	Cd
228	1 South	5 East	24	1	Se

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
229	1 South	5 East	12	1	As
230	1 South	6 East	18	3	As, Cd, Cr, NO3, Pb, Se
231	1 South	6 East	29	1	Se
232	1 North	6 East	32	2	Pb, Se
232	1 South	6 East	5	1	Hg, Se
233	1 South	6 East	16	1	NO3
234	1 South	6 East	27	1	Organics
235	1 South	6 East	10	1	Cd
235	1 South	6 East	15	1	As
236	1 North	7 East	31	1	F
237	1 South	7 East	4	2	Mn, NO3
238	1 South	7 East	22	1	As, Mn
239	1 North	7 East	36	1	Mn
239	1 North	8 East	30	1	As
239	1 North	8 East	31	2	As
240	1 South	8 East	4	1	As
241	1 South	9 East	28	1	Hg
242	2 South	5 West	5	1	F
242	2 South	5 West	7	1	Cr, F
242	2 South	5 West	8	1	F
242	2 South	5 West	9	2	F, NO3, TDS
242	2 South	5 West	17	1	F
243	2 South	2 West	30	1	F
244	2 South	2 West	20	1	F
245	2 South	2 West	8	2	F
245	2 South	2 West	9	2	F
245	2 South	2 West	16	2	F
245	2 South	2 West	17	2	F
246	2 South	2 West	27	3	F
246	2 South	2 West	28	1	F
246	2 South	2 West	34	2	F
246	2 South	2 West	35	1	F, NO3
247	2 South	2 West	10	1	F
247	2 South	2 West	11	1	F
247	2 South	2 West	12	1	F
247	2 South	2 West	13	1	F
247	2 South	2 West	14	2	F, NO3
247	2 South	2 West	23	1	F
247	2 South	2 West	24	4	F
247	2 South	2 West	26	1	F
247	2 South	1 West	18	1	F, TDS
248	2 South	1 West	19	2	F
248	2 South	1 West	20	2	F
248	2 South	1 West	28	2	F
248	2 South	1 West	30	3	Cd, F, NO3, Pb
248	2 South	1 West	31	1	F
248	2 South	1 West	33	1	F
249	2 South	3 East	11	1	NO3, TDS
250	2 South	3 East	12	11	NO3, Organics
251	2 South	3 East	1	3	Mn, NO3, TDS
251	2 South	4 East	4	1	Mn

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
251	2 South	4 East	5	1	Mn
251	2 South	4 East	6	2	NO3
251	2 South	4 East	8	2	NO3, TDS
252	2 South	4 East	11	1	TDS
252	2 South	4 East	12	2	Pb, TDS
252	2 South	4 East	13	2	NO3, TDS
252	2 South	4 East	14	1	NO3, TDS
252	2 South	5 East	18	1	NO3, TDS
253	1 South	4 East	36	1	As
253	2 South	4 East	1	1	NO3, TDS
253	2 South	5 East	6	2	Mn, NO3, TDS
253	2 South	5 East	7	1	TDS
254	2 South	5 East	31	1	Cd, NO3
255	2 South	5 East	19	2	NO3, TDS
255	2 South	5 East	20	1	NO3, TDS
255	2 South	5 East	21	4	NO3
255	2 South	5 East	22	1	NO3
255	2 South	5 East	28	1	NO3
256	1 South	5 East	33	1	Be
256	2 South	5 East	3	1	NO3
256	2 South	5 East	4	3	NO3
256	2 South	5 East	9	3	NO3
256	2 South	5 East	10	1	NO3
256	2 South	5 East	16	1	NO3
256	2 South	5 East	17	2	NO3, TDS
257	1 South	5 East	35	1	Se
257	2 South	5 East	2	1	NO3
258	2 South	5 East	36	1	NO3
259	2 South	5 East	13	1	NO3
260	1 South	7 East	31	2	Cd, Cr
260	2 South	7 East	6	3	Cr, Organics
261	2 South	7 East	7	1	NO3
262	2 South	7 East	21	2	NO3
262	2 South	7 East	22	2	As, NO3
263	2 South	7 East	3	1	As
264	2 South	8 East	7	1	NO3
264	2 South	8 East	18	1	NO3
265	2 South	8 East	15	2	NO3
266	1 South	9 East	35	1	Cd
267	2 South	12 East	3	1	TDS
267	2 South	12 East	4	1	TDS
268	3 South	2 West	1	1	As, F, NO3
268	3 South	2 West	2	1	F
269	3 South	1 East	20	1	F
270	3 South	5 East	6	1	As
271	3 South	6 East	27	1	As
272	3 South	8 East	5	1	NO3
272	3 South	8 East	6	1	NO3
273	3 South	8 East	21	2	NO3
274	3 South	9 East	28	2	NO3, Pb
274	3 South	9 East	30	1	As

Table 8.1-8 Water Quality Exceedences in the Phoenix AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Sampling Sites	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
275	2 South	9 East	36	1	Be, Cd, Pb
275	2 South	10 East	31	2	Be, Cd, Pb
275	3 South	9 East	2	2	Be, Cd, Pb
276	5 South	1 West	5	1	NO3
277	4 South	1 East	28	1	Mn, Pb
278	4 South	5 East	15	2	F, NO3
279	4 South	5 East	11	1	NO3
280	4 South	9 East	5	1	NO3
281	4 South	9 East	3	1	Mn

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[3]	Parameter(s) Exceeding Use Standard[2]
a	Stream	Hassayampa River - Buckeye Canal to Gila River	NA	NA	FC	Pesticides
b	Stream	Gila River - Centennial Wash to Gillespie Dam	5.3	NA	A&W, Agl	Se, Bo
c	Stream	Gila River - Hassayampa River to Centennial Wash	7	NA	FC	Pesticides
d	Stream	Gila River - Waterman Wash to Hassyampa River	13.9	NA	FC	Pesticides
e	Stream	Gila River - Agua Fria River to Waterman Wash	11.9	NA	FC	Pesticides
f	Stream	Gila River - Salt River to Agua Fria River	3.7	NA	FC	Pesticides
g	Stream	Queen Creek from headwaters to mining discharge	8.8	NA	A&W	Cu
h	Lake	Cortez Park Lake	NA	2	A&W, PBC	Dissolved Oxygen, high pH
i	Lake	Chaparral Park Lake	NA	12	A&W, PBC	Dissolved Oxygen, E. coli
j	Lake	Alvord Lake	NA	27	A&W, PBC	Ammonia

Notes:

[1] Water quality samples collected between 1975 and 2004.

[2] As = Arsenic
Ba = Barium
Be = Beryllium
Bo = Boron
Cd = Cadmium
Cr = Chromium
Cu = Copper
F = Fluoride
Hg = Mercury
Mn = Manganese
Pb = Lead
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = radionuclides
TDS = Total Dissolved Solids
Tl = Thallium
Se = Selenium

[3] A&W = Aquatic and Wildlife
Agl = Irrigation of Crops
FC = Fish Consumption
PBC = Partial Body Contact

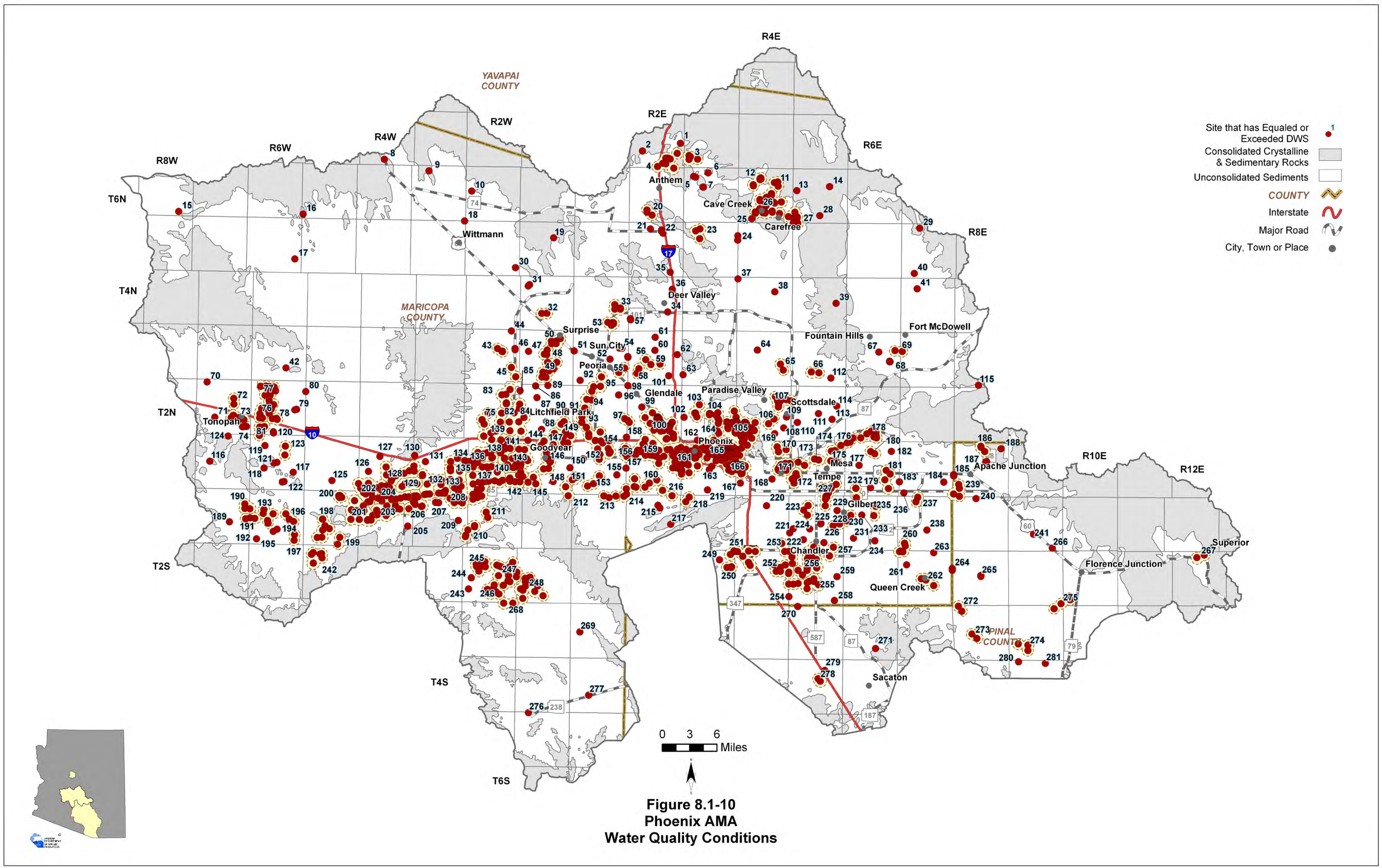


Figure 8.1-10
Phoenix AMA
Water Quality Conditions

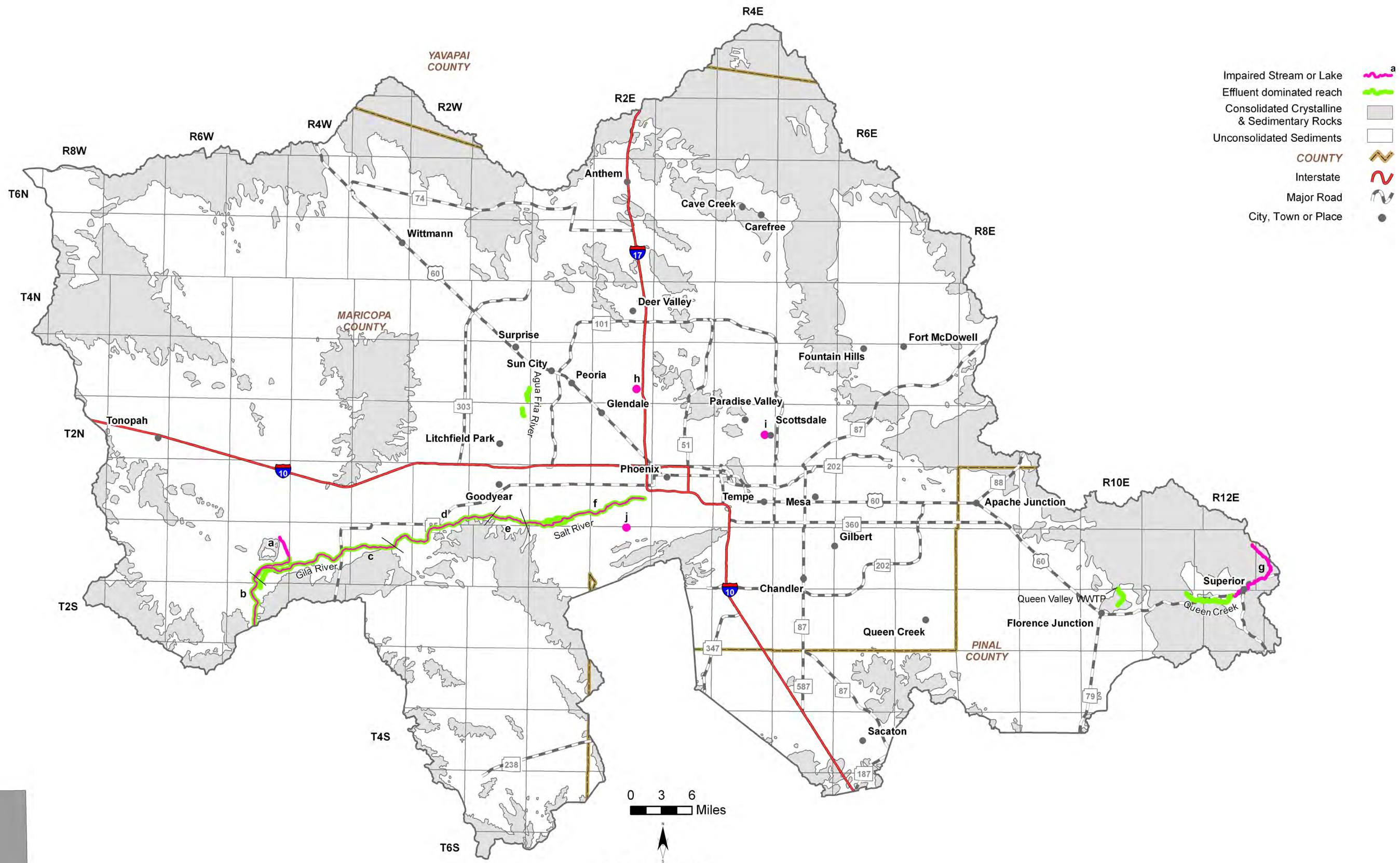


Figure 8.1-10A
Phoenix AMA
Impaired Lakes & Streams

Table 8.1-9 Contamination Sites in the Phoenix AMA

MAP KEY	SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites		
none	2052 N. 27th Avenue	Soil/Lead and Volatile Organic Compounds (VOCs)
m	Anderson Clayton - Phoenix Oil Mill	Soil/Mercury
j	APS 2nd Ave. MGP	Soil & Groundwater/Benzene, Polycyclic aromatic hydrocarbons (PAHs), Metals, and Petroleum hydrocarbons
none	APS Buckeye Service Center	Groundwater/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX); Methyl Tertiary-butyl ether (MTBE); and Gasoline additives
i	APS Grant Street Yard	Soil/Polycyclic aromatic hydrocarbons (PAHs) and Total Petroleum Hydrocarbons (TPH)
none	BHP Superior Northwest Study Area	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH) and Benzene, Toluene, Ethyl benzene, and Xylene (BTEX)
none	Citrus Road	Soil/Petroleum hydrocarbons
none	Clementine Mine	Soil/Aluminum iron manganese
f	Cummins Southwest	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH) and Benzo-anthracene
e	El Mirage Trap & Skeet	Soil/Lead
none	EPNG Gila Compressor Station	Soil & Groundwater/Chromium, Fluoride, Nitrite, Nitrate, Lead and Arsenic
s	Former Capitol Castings	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH) and Chlorinated Volatile Organic Compounds (CVOCs)
none	Former Puregro Unit 0776040 - Gilbert	Soil & Groundwater/Pesticides
u	Former Sanders Aviation	Soil/Toxaphene and other pesticides
g	Franklin Elementary School	Soil/Chlordane
q	Goodrich Turbomachinery Products (GTP)	Soil/Tetrachloroethene (PCE) Groundwater/Tetrachloroethene (PCE); 11-Dichloroethene (DCE); 11-Dichloroethane (DCA); cis-12-Dichloroethene (DCE)
v	Gould Electronics	Soil/Lead, Copper, Arsenic, Chromium and Cyanide
none	Great Western Silicon	Groundwater/Tetrachloroethene (PCE)
a	Honeywell Business Regional & General Aviation Facility	Soil/Chlorinated Volatile Organic Compounds (CVOCs) Groundwater/ Benzene, Toluene, Ethyl benzene, and Xylene (BTEX)
b	Honeywell Deer Valley Computer Park	Groundwater/Volatile Organic Compounds (VOCs) and Trichloroethene (TCE)
c	Honeywell Peoria Avenue	Groundwater/Dichloroethene (DCE) and Trichloroethene (TCE)

Table 8.1-9 Contamination Sites in the Phoenix AMA (cont)

MAP KEY	SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites		
o	IMC Magnetics Corp.	Soil/Arsenic, Cadmium and Nickel
x	Layton Lakes UFT Area	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl benzene, and Xylene (BTEX); Methyl Tertiary-butyl ether (MTBE); and Dichloroethane (DCA)
none	Maricopa County Sheriff's Shooting Range	Soil/Lead, Arsenic and Antimony
t	Marley Park - Section 16	Soil/Chlorinated pesticides
none	Marley Park Retention Basin	Soil/Organochlorine pesticides
none	Marley Park-Former Housing and Maintenance Areas	Soil/Petroleum hydrocarbons, Toxaphene, Dieldrin, Arsenic and Solid waste
n	McClintock/Rio Salado Pkwy Brownfield Redevelopment Area	Soil/To be determined
r	Motorola Mesa Center-GW	Groundwater/Tetrachloroethene (PCE)
none	Phoenix Mine	Soil/Lead and Arsenic
none	Planned Library Property	Soil/Total Petroleum Hydrocarbons (TPH), Polycyclic aromatic hydrocarbons (PAHs), Metals and Pesticides
w	Roy Ginning Co.	Soil/Hydraulic oil
d	Shea Plaza	Soils/Benzene, Toluene, Benzene, Toluene, Ethyl benzene, and Xylene (BTEX) and Hydrocarbons
k	Southwest Cooperative Wholesale	Soil & Groundwater/Pesticides, Metals, Hydrocarbons and Arsenic
l	SRP - Crosscut Facility	Soil & Groundwater/Solvent and Metals
h	Target Southwest Distribution Center	Soil/Gasoline and Diesel
p	U of A Cotton Center Washing Sump	Soil/Pesticides, Total Petroleum Hydrocarbons (TPH), Heavy metals, Arsenic and Chloroform dieldrin
none	West Phoenix Power Plant	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH); Benzene, Toluene, Ethyl benzene, and Xylene (BTEX); and Polycyclic aromatic hydrocarbons (PAHs)
none	Wigwam Blvd.	Soil/Petroleum hydrocarbons

Table 8.1-9 Contamination Sites in the Phoenix AMA (cont)

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Water Quality Assurance Revolving Fund (WQARF) Sites	
7th Ave and Bethany	Soil & Groundwater/Tetrachloroethene (PCE) and Trichloroethene (TCE)
16th Street and Camelback	Groundwater/Tetrachloroethene (PCE) and Dichloroethane (DCA)
56th and Earll	Groundwater/Trichloroethene (TCE) and Arsenic
Central and Camelback	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE), Dichloroethene (DCE) and Vinyl chloride
Cooper and Commerce	Soil/Arsenic Groundwater/Tetrachloroethene (PCE) and Trichloroethene (TCE)
East Washington Fluff	Soil/Lead, Cadmium, Arsenic and Polychlorinated Biphenyls (PCBs)
East Central Phoenix (ECP) Study Area[1]	Groundwater/Trichloroethene (TCE) and Tetrachloroethene (PCE)
Estes Lanfill	Soil/Arsenic, Lead and Thallium Groundwater/Vinyl chloride, Dichloroethene (DCE), Trichloroethene (TCE), Benzene, Bis(2-ethylhexyl)phthalate, Arsenic, Barium, Chromium, Lead and Manganese
South Mesa	Groundwater/Tetrachloroethene (PCE) and Trichloroethene (TCE)
West Central Phoenix (WCP) Study Area[2]	Soil & Groundwater/Tetrachloroethene (PCE) and Trichloroethene (TCE)
West Van Buren	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE), Dichloroethane (DCA), Dichloroethene (DCE) and Chromium
Western Avenue PCE	Groundwater/Perchloroethene
National Priority List (NPL) Superfund Sites	
19th Avenue Landfill	Delisted
Hassayampa Landfill	Soil/Volatile Organic Compounds, Heavy metals, Pesticides and Lime wastes Groundwater/Various Volatile Organic Compounds (VOCs) and toluene.
Indian Bend Wash-North	Groundwater/Trichloroethene (TCE)
Indian Bend Wash-South	Soil/Volatile Organic Compounds (VOCs), Cyanides, Acids, Chromium and Lead Groundwater/Volatile Organic Compounds (VOCs)
Motorola 52nd Street	Groundwater/Industrial solvents, Trichloroethene (TCE) and Trichloroethane (TCA)

Table 8.1-9 Contamination Sites in the Phoenix AMA (cont)

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Phoenix/Goodyear Airport - North	Soil & Groundwater/Trichloroethene (TCE) and Perchlorate
Phoenix/Goodyear Airport - South	Groundwater/Trichloroethene (TCE), Perchloroethene (PCE) and Chromium
Williams Air Force Base	Soil & Groundwater/Organic solvents, Paint strippers, Petroleum, Metal plating wastes, Hydraulic fluids, Pesticides and Radiological wastes
Department of Defense (DOD) Sites	
161st Air National Guard	Groundwater/Benzene, toluene, ethylbenzene and xylenes (BTEX).
Resource Conservation and Remediation Act Sites	
Honeywell Bull Incorporation	Groundwater/'Volatile Organic Compounds (VOCs), Trichloroethene (TCE)
Bean & Company	Groundwater/Pesticides
PureGro-Tolleson	Groundwater & Soil/Pesticides
Revlon	Groundwater & Soil/'Volatile Organic Compounds (VOCs), Metals
Chemresearch Company	Groundwater & Soil/Lead
Safety Kleen	Groundwater & Soil/Volatile Organic Compounds (VOCs), Mineral Spirits
Walbar	Groundwater/'Trichloroethene (TCE)
Motorola	Groundwater/Tetracholoroethene (PCE)
Dolphin Incorporation	Groundwater & Soil/Tetracholoroethene (PCE), Trichloroethane (TCA)

Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

[1] East Central Phoenix Study Area includes: 32nd Street and Indian School Road, 32nd Street and Indian School Road, 38th Street and Indian School Road, 40th Street and Indian School Road, 40th Street and Osborn Road, 48th Street and Indian School Road and 40th St and Grand Canal

[2] West Central Phoenix Study Area includes: Grand Avenue, North Canal Plume, North Plume and West Osborne Complex

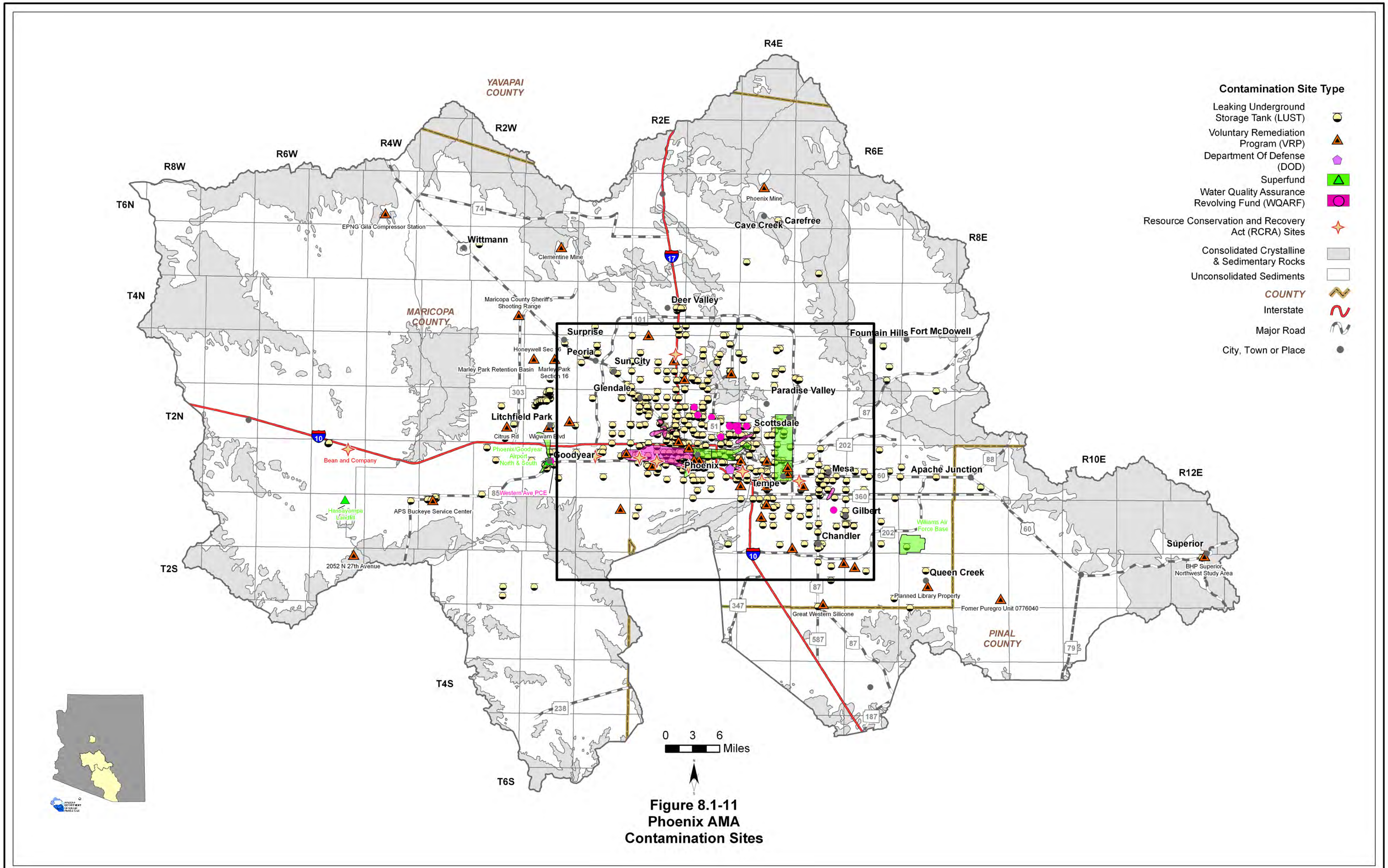


Figure 8.1-11
Phoenix AMA
Contamination Sites

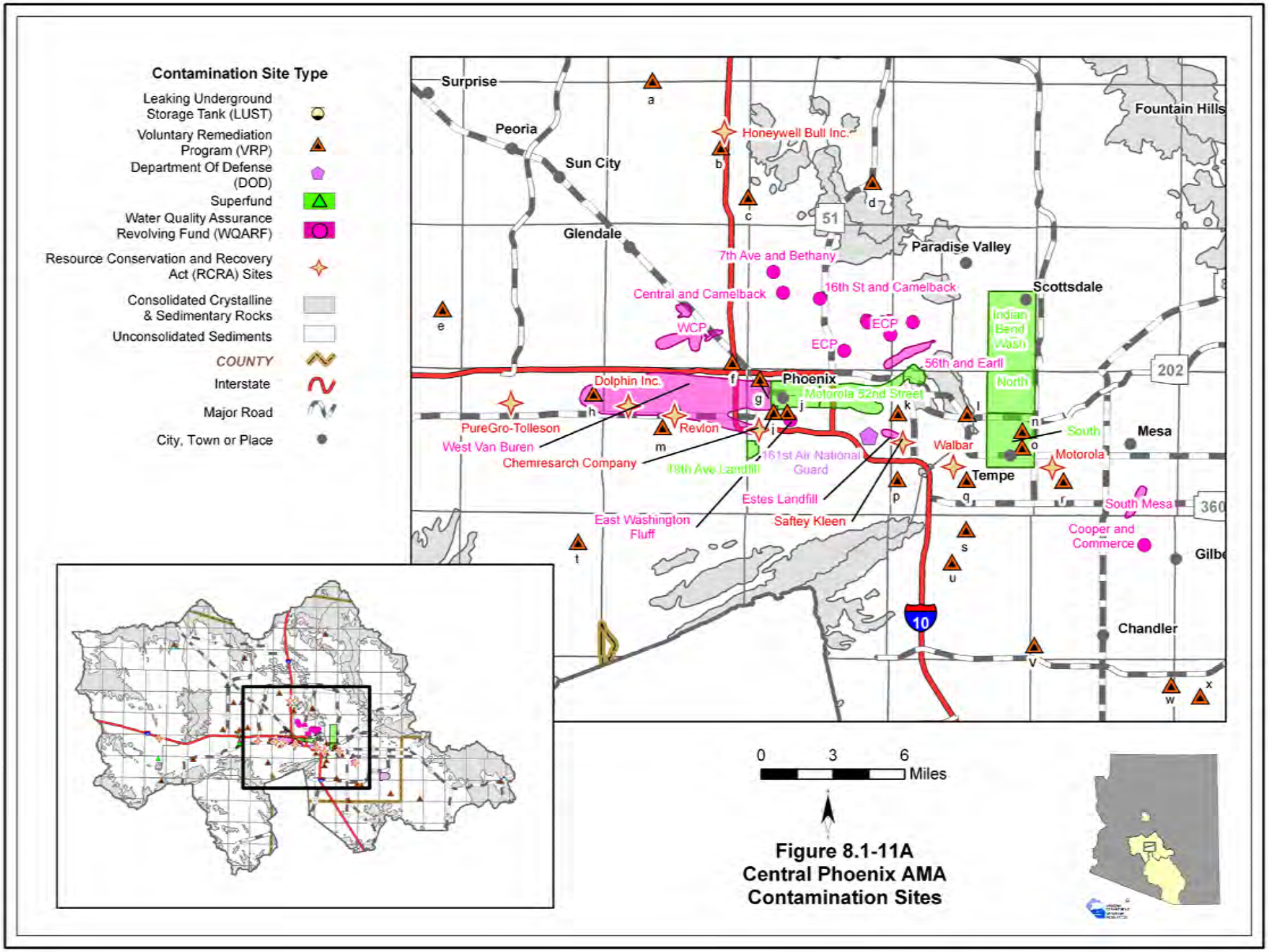


Figure 8.1-11A
Central Phoenix AMA
Contamination Sites

8.1.8 Cultural Water Demands in the Phoenix AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.1-10. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.1-11. Figure 8.1-12 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.1-10 and Figure 8.1-12.
- Population increased from 1,522,577 in 1980 to 3,081,380 in 2000 and projections suggest an increase to over 8,076,000 residents by 2050.
- Historically, agricultural water use has been the major demand in the Phoenix AMA; however, it has been steadily declining over time. At the same time, municipal and industrial demands are increasing. Average annual municipal demand in 2001-2003 increased by almost 36% over the previous decade.
- During 2001-2003 approximately 44% of the total AMA cultural water demand was municipal and 47% of the total demand was agricultural.
- The industrial sector accounted for approximately 9% of the total annual AMA water demand in the same time period.
- As of 2003 there were 11,874 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 10,472 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.1-11.
- 84 wastewater treatment facilities were identified in this AMA.
- The largest treatment facility in the planning area is the 91st Avenue Treatment Plant operated by the City of Phoenix. It serves over 1.2 million people.
- There are a wide range of effluent disposal methods in the AMA, with some of the most common being: discharge into an open water-course, golf course irrigation, permitted recharge, industrial reuse and crop irrigation.
- More than 315,000 acre-feet of effluent is treated/produced annually.
- Palo Verde Nuclear Power Plant reuses approximately 60,000 acre feet of effluent a year.

Table 8.1-10 Cultural Water Demands in the Phoenix AMA[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		4,202[5]	3,189[5]	1,785,000			956,000			ADWR (1994)
1972										
1973										
1974										
1975										
1976				1,473,000			1,073,000			
1977										
1978										
1979										
1980	1,522,577									
1981	1,585,003	966	335	1,278,000			980,000			
1982	1,647,429									
1983	1,709,855									
1984	1,772,282									
1985	1,887,682									
1986	1,966,536	1,051	1,336	1,119,400			1,198,000			ADWR (2008)
1987	2,056,746									
1988	2,097,754									
1989	2,188,690									
1990	2,184,180									
1991	2,233,109	1,041	2,065	229,900	100,500	531,400	524,000	72,900	760,100	
1992	2,310,285									
1993	2,374,117									
1994	2,436,644									
1995	2,605,239									
1996	2,683,352	2,633	2,212	259,600	102,800	504,200	682,800	96,100	764,300	
1997	2,791,047									
1998	2,872,587									
1999	2,992,223									
2000	3,081,380									
2001	3,202,949	1,981	1,335	306,000	115,700	461,200	716,600	97,900	637,800	
2002	3,274,713									
2003	3,373,356									
2010	4,314,046									
2020	5,454,382									
2030	6,468,276									
2040	7,348,138									
2050	8,076,472									
ADDITIONAL WELLS:[6]		**231**	**0**							
WELL TOTALS:		**12,105**	**10,472**							

Notes:
[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes Indian Demand
[3] Non-Groundwater supplies may include surface water, CAP, effluent, spill water or tail water.
[4] Agricultural demand includes use by small exempt irrigation rights.
[5] Includes all wells through 1980.
[6] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.

Table 8.1-11 Effluent Generation in the Phoenix AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Adobe Mountain School WWTF	AZ Dept of Corrections	Phoenix	NA	NA	NA											
ADOC Lewis Prison WWTF	AZ Dept of Corrections	Lewis Prison	NA	NA	NA											
Ameron Pipe WWTF	Private	Phoenix	NA	NA	NA											
Anderson Clayton & Company WWTF	Private	Phoenix	NA	NA	NA											
Arizona Factory Partnership	Private	Phoenix	NA	NA	NA											
Arizona Rendering	Arizona Rendering	Laveen	NA	NA							X			NA	NA	NA
Arrowhead Ranch WWRF	City of Glendale	Glendale	46,705	3,360				X			X		P	Advanced Treatment II with Nutrient Removal	NA	2004
Avondale WWTF	City of Avondale	Avondale	55,500	4,088	X									Advanced Treatment I	NA	2004
AZ Equest Center WWTF	Private	Goodyear	NA	NA	NA											
Black Canyon Federal Corrections WWTF	Federal Bureau of Prisons	Phoenix	NA	NA	NA											
BMSC WWTF	Black Mountain Sewer Corporation	Carefree	NA	NA	NA											
Buckeye WWTF	Buckeye ,Town of	Buckeye	15,119	448	X							X		Secondary	119	2004
Burger King WWTF	Private	Phoenix	NA	NA	NA											
Canyon Lake Marina	Private	Marina	NA	NA	X									NA	NA	NA
Canyon Trails WWTF	Private	Phoenix	NA	NA	NA											
Casa Blanca	Gila River Indian Tribe	NA	300	34							X			Secondary	NA	2004
Casitas Bonitas WWTF	American Public Service	Glendale	NA	NA	NA											
Cave Creek	Cave Creek, Town of	Cave Creek	3,650	134	X		X	X						Advanced Treatment I with Nutrient Removal	NA	2004
Cave Creek WWTP	City of Phoenix	Phoenix	169,000	1,893				X			P			Advanced Treatment I with Nutrient Removal	NA	2004
Chandler Heights	Chandler Heights SD	Chandler	500	NA			X				P			NA	NA	NA
City of Chandler, Airport Rec. Facility	City of Chandler	Chandler	90,000	8,401			X						P	Advanced Treatment II with Nutrient Removal	NA	2004
City of Goodyear 157th Ave WWTF	Goodyear, City of	Goodyear	15,000	2,800	X			X			P			Advanced Treatment I with Nutrient Removal	NA	2004
Corgett WRP	Goodyear, City of	Goodyear	4,100	448			X							Advanced Treatment I	NA	2004
Desert Gardens I - WWTF	Private	Glendale	NA	NA	NA											

Table 8.1-11 Effluent Generation in the Phoenix AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Desert Gardens II WWTF	Private	Glendale	NA	NA	NA											
Desert Oasis WWTF	Private	Surprise	NA	NA	NA											
Desert Vista WWTF	Pinal County - Desert Vista Sanitary District	Pinal	320	22			X							Advanced Treatment I	NA	2004
El Mirage WWTP	El Mirage, City of	El Mirage	32,000	672	P			X						Secondary	NA	2004
Fort McDowell Casino WWTP	Fort McDowell Yavapai Nation	Fort McDowell Yavapai Nation	NA	NA				X			X			NA	NA	NA
Fountain Hills WWTP	Fountain Hills	Fountain Hills	21,000	2,083				X			P		P	Advanced Treatment II with Nutrient Removal	NA	2004
Gilbert South WWRF	Mesa	Mesa	136,000	NA						X				NA	NA	NA
Gold Canyon Sewer Co. - WWTF	Arizona American-Apache Junction	Apache Junction	NA	345				X						NA	NA	2004
Guadalupe Collection System	Guadalupe, Town of	Guadalupe	5,709	NA						X				NA	234	NA
Henry's Choice WWTF	Private	Phoenix	NA	NA	NA											
Johnson Ranch Utilities1	Johnson Utilities	Queen Creek	NA	440				X			X			NA	NA	2004
Kyrene WW System	Tempe, City of	Tempe	79,304	4,256			X	X			P	X	X	Advanced Treatment II with Nutrient Removal	NA	2004
Lockheed Martin WWTF	Private	Goodyear	NA	NA	NA											
Lone Butte WWTF	Chandler Public Works	Chandler	45,000	6,721			X							Advanced Treatment I	NA	2004
Luke AFB WWTF	U.S. Department of Defense (Air Force)	Luke AFB	NA	330				X						NA	NA	2004
Lum Basin WRP	City of Goodyear	Goodyear	NA	NA							X			NA	NA	NA
Maricopa By Products WWTF	Private	Phoenix	NA	NA	NA											
Meadow Vista WWTF	Private	NA	NA	NA	NA											
Mesa Northwest WWRP	City of Mesa	Mesa	70,000	11,201	X						P			Advanced Treatment I	NA	2004
Motorola WWTF	NA	Chandler	NA	NA									P	NA	NA	NA
Neely WWTF	Gilbert, Town of	Gilbert	17,000	8,289			X	X	X		P			Secondary	8,500	2004
North Gateway WRP	City of Phoenix	Phoenix	NA	NA			X							NA	NA	NA
Ocotillo Reclamation Plant	City of Chandler	Chandler	90,000	6,721							P	X		Advanced Treatment II	NA	2004
Palo Verde Mobile Home Park	Private	Tonopah	NA	NA							X			NA	NA	NA
Paradise Peak West WWTF	Private	Phoenix	NA	NA	NA											
Peoria Beardsley WWTP	City of Peoria	Peroia	38,755	2,800							P			Advanced Treatment II	NA	2004
Peoria Jomax WWTP	City of Peoria	Peroia	87,340	NA			X				X			NA	NA	2004

Table 8.1-11 Effluent Generation in the Phoenix AMA

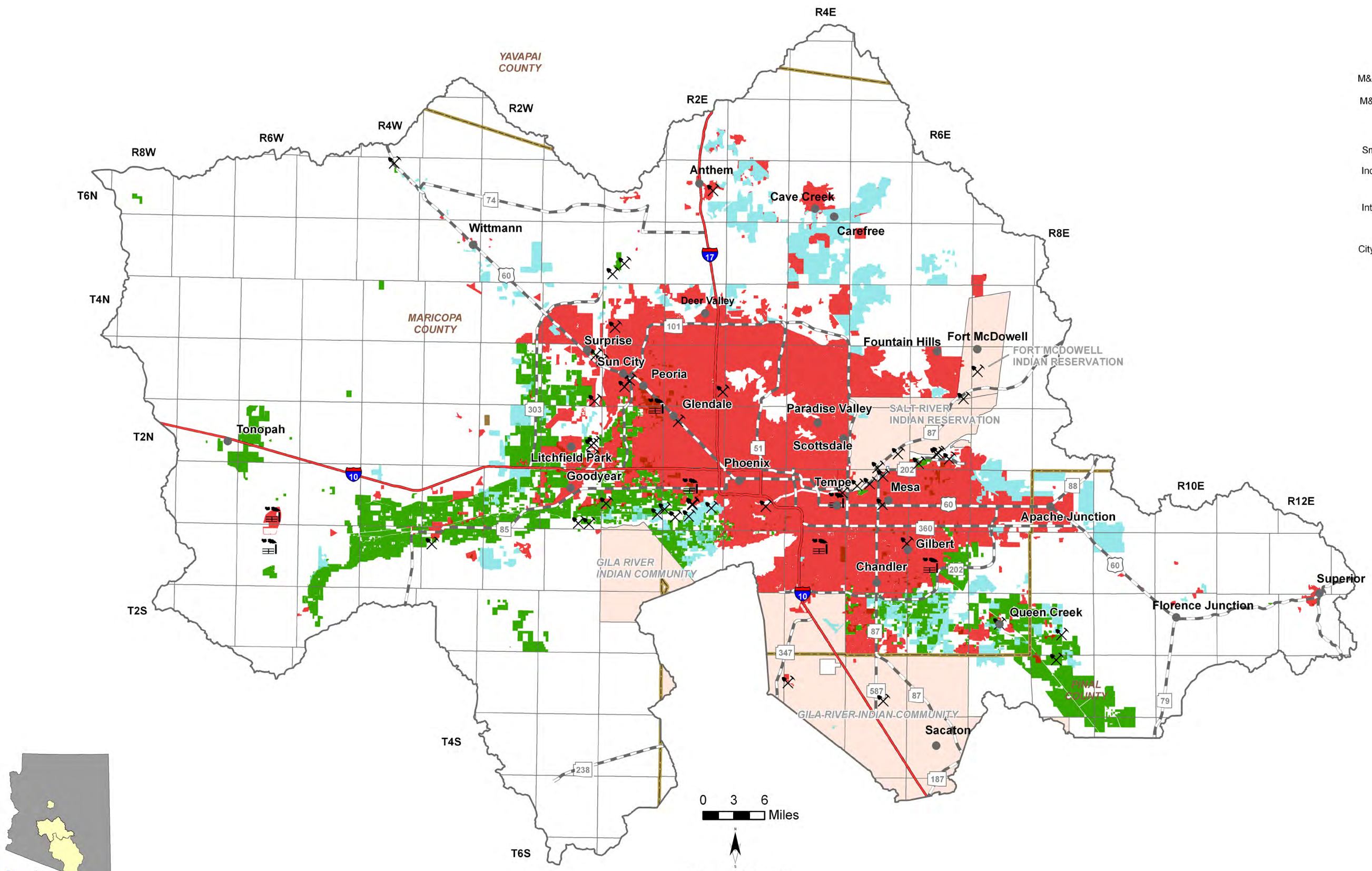
Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Peoria Twin Buttes WRP	City of Peoria	Peoria	310	246								X		Advanced Treatment I	NA	2004
Phoenix 91St Ave WWTP	City of Phoenix	Phoenix	1,238,000	138,892	X				X			X		Advanced Treatment I with Nutrient Removal	NA	2004
Phoenix 23rd Ave WWTP	City of Phoenix	Phoenix	NA	54,884	X		X							Advanced Treatment I	NA	2004
Phoenix Tallow Works WWTF	Private	Phoenix	NA	NA	NA											
Pioneer RV Park	Private	NA	NA	NA							X			NA	NA	NA
Pleasant Harbor WWTF	Private	Peoria	NA	NA				X						NA	NA	NA
Queen Valley WWTF	Queen Valley S.D.	Queen Valley	1,676	45	X									Secondary	NA	2004
Quintero WWTF	Private	Perioa	NA	NA	NA											
Rainbow Valley	Rainbow Valley S.D.	Goodyear	700	NA			X							NA	NA	NA
Ranch 160	Private	NA	NA	NA	NA											
Rio Verde WWTF	Rio Verde Utilities	Maricopa	NA	NA	NA											
Rip Griffin Truck Stop	Private	NA	NA	NA							X			NA	NA	NA
Roadrunner WWTP	Salt River Pima-Maricopa Indian Community	Salt River Pima-Maricopa Indian Community	NA	NA		X					X			NA	NA	NA
Ruth Fisher School	Private	Tonopah	NA	NA		X								NA	NA	NA
Sacaton Flats	Gila River Tribe	Gila River Community	1,000	NA							X			NA	NA	NA
Scottsdale Water Campus	City of Scottsdale	Scottsdale	100,000	13,441				X					P	Advanced Treatment II with Nutrient Removal	NA	2004
Scottsdale-Gainey Ranch WRF	City of Scottsdale	Scottsdale	12,000	1,344			X	X			X			Advanced Treatment II with Nutrient Removal	NA	2004
Southeast Mesa WRP	City of Mesa	Mesa	35,000	8,961	X		X				P			Advanced Treatment I	NA	2004
St. John's Mission	St. John's Mission	Laveen	NA	NA	NA											
Sun City West WWTP 1	Arizona American- Sun City West	Sun City West	NA	2,421	X						P			NA	NA	2004
Sun Lakes WWTP 1	Pima Utilities	Sun Lakes	NA	1,149				X			P			NA	NA	2004
Superior WWTF	Superior Sanitary Distric	Superior	3,319	204	X									Secondary with Nutrient Removal	NA	2004
Superstition Mtn WWTF	Superstition Mtn Community	Superstition	42,560	1,341							P		X	Advanced Treatment I	NA	2004
Surprise WRF	City of Surprise	Surprise	35,000	4,256			X							Secondary	NA	2004

Table 8.1-11 Effluent Generation in the Phoenix AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Taliesen West WWTF	Frank Lloyd Wright Foundation	Scottsdale	NA	NA		X					X			NA	NA	NA
The Links Estates @ Queen Creek	Private	Queen Creek	NA	NA	NA											
Tolleson WWTF	City of Tolleson	Tolleson	4,970	14,561	X							X		Advanced Treatment I	NA	2004
Tortilla Flat Campground	US Forest Service	Tortilla Flat	NA	NA			X							NA	NA	NA
Tortilla Flat Resort	Private	Tortilla Flat	NA	NA	NA											
Vee Quiva WWTF	Gila River Indian Community	Gila River Indian Community	NA	NA		X								NA	NA	NA
Victory Acres WWTP	Salt River Pima-Maricopa Indian Community	Salt River Pima-Maricopa Indian Community	NA	NA		X					X			NA	NA	NA
West Glendale WWTF	City of Glendale	Glendale	70,000	7,841							P		X	Advanced Treatment I	NA	2004
Wild Horse Pass	Gila River Indian Tribe	Gila River Indian Tribe	NA	NA	NA											
Total			**2,566,837**	**315,074**											**8,853**	

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, Maricopa Association of Government's (MAG's) Section 208 Water Quality Management Plan Update (2002), ADEQ's AZURITE Facility website, ADWR Annual Water Withdrawal and Use Reports (2004)

Note: Other category includes vadose zone injection wells permitted under the ADWR Recharge Program
P=Permitted Underground Recharge Facility
WWTF=Wastewater Treatment Facility
WWRF=Wastewater Reclamation Facility
WWTP=Wastewater Treatment Plant
WRP=Water Reclamation Facility



Primary Data Source: USGS National Gap Analysis Program, 2004

Figure 8.1-12
Phoenix AMA
Cultural Water Demand

8.1.9 Assured Water Supply Determinations in the Phoenix AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination, subdivision water provider and Central Arizona Groundwater Replenishment District (CAGRD) membership status are shown in Table 8.1-12A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.1-12D with date of application, date the designation was issued and projected or annual estimated demand. Figures 8.1-13A and 8.1-13B show the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Assured Water Supply Records

- See Table 8.1-12
- As of February 2008, 1,387 subdivisions with a total of 718,006 lots have been reviewed for an assured water supply determination. 86% of the determinations were in Maricopa County.
- 237,079 lots in 1,118 subdivisions received a Certificate of Assured Water Supply, 22,012 lots in 208 subdivisions received a Water Adequacy Report and 458,921 lots in 61 developments received an Analysis of Assured Water Supply.
- Of the 1,118 subdivisions with a Certificate of Assured Water Supply, 765 are CAGRD members.
- There are 15 designated providers with a total projected or estimated annual water use of 950,555 acre-feet.

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
1	Castle Well Owners	Maricopa	6 North	3 West	16	7	27-200046.0000	9/22/93	NA	N
2	Litchfield Vista Views	Maricopa	6 North	3 West	18	83	27-200182.0000	11/1/93	Valley Utilities	N
3	Warrick Property	Maricopa	6 North	3 West	28	75	27-700392.0000	5/8/08	Circle City	Y
4	Circle City #1	Maricopa	6 North	3 West	33	NA	27-200054.0000	8/2/88	NA	N
5	Circle City Tract 1	Maricopa	6 North	3 West	33	4	27-200055.0000	3/9/83	Consolidated Water Utility	N
5	Circle City Tract I	Maricopa	6 North	3 West	33	5	27-200056.0000	7/21/81	Consolidated Water Utility	N
5	Circle City Tract I	Maricopa	6 North	3 West	33	5	27-200057.0000	7/20/81	Consolidated Water Utility	N
6	Lake Pleasant Association	Maricopa	6 North	1 East	29	350	27-200174.0000	6/27/86	NA	N
7	Anthem - Phase 1.C. (Unit 57 & Unit61)	Maricopa	6 North	2 East	10	167	27-401750.0000	6/14/05	Arizona American Water Co - Anthem	N
7	Arroyo Vista, Units 4-10	Maricopa	6 North	2 East	10	291	27-402115.0000	11/27/06	Arizona American Water Co - Anthem	N
8	Anthem Phase 1E - Freeway Mixed-Use	Maricopa	6 North	2 East	22	1243	27-401173.0000	4/28/04	Arizona American Water Co - Anthem	N
9	Anthem Phase 3.a. (Units 73, 75A & 75B)	Maricopa	6 North	2 East	27	122	27-401777.0000	8/25/05	Arizona American Water Co - Anthem	N
9	Anthem Phase 3.a, Unit 77	Maricopa	6 North	2 East	27	202	27-401882.0000	12/12/05	Arizona American Water Co - Anthem	N
10	Anthem Phase 2a. MPC III Phase 1/ MPC IV Phase I	Maricopa	6 North	2 East; 3 East	13, 23 & 24;18 & 19	1299	27-400520.0000	1/2/02	Arizona American Water Co - Anthem	N
10	Anthem Phase 2.B. - MPC IV Phase II / MPC IV Phas	Maricopa	6 North	2 East; 3 East	13, 23 & 24;18 & 19	2024	27-400753.0000	3/11/03	Arizona American Water Co - Anthem	N
11	Anthem - Phase 1.b	Maricopa	6 North	2 East	3, 14, 15,18, 22, 23 & 2	3932	27-300572.0000	3/24/99	Arizona American Water Co - Anthem	N
12	Anthem Phase 1.a., fka Villages at Desert Hills -- phase1, The	Maricopa	6 North	2 East	13-15, 22 & 23	1253	27-300387.0000	6/23/98	Arizona American Water Co - Anthem	N
13	Anthem - Phase 1.a.	Maricopa	6 North	2 East	14, 22 & 23	565	27-400008.0000	2/22/97	Arizona American Water Co - Anthem	N
14	Anthem Phase 1-D	Maricopa	6 North	2 East	15 & 22	693	27-400608.0000	1/29/02	Arizona American Water Co - Anthem	N
15	Anthem Phase 3.a (Unit 71)	Maricopa	6 North	2 East	22 & 27	73	27-401805.0000	10/5/05	Arizona American Water Co - Anthem	N
18	Cahava Springs	Maricopa	6 North	3 East	13	947	27-200015.0000	11/14/89	Cave Creek Water Co	N
19	Anthem Phase 2.B. - MPC III Phase II/MPC IV Phase II (Units 40 & 42)	Maricopa	6 North	3 East	18	135	27-401316.0000	7/21/04	Arizona American Water Co - Anthem	N
19	Anthem Phase 2.B. - MPC III Phase II / MPC IV Phase II (Unit 44)	Maricopa	6 North	3 East	18	69	27-401426.0000	3/23/05	Arizona American Water Co - Anthem	N
19	Anthem Phase 2.B Unit 48	Maricopa	6 North	3 East	18	38	27-401578.0000	5/19/05	Arizona American Water Co - Anthem	N
20	Desert Hills Equestrian Estates	Maricopa	6 North	3 East	19	56	27-700368.0000	9/6/07	Arizona American Water Co - Anthem	N
21	Apache Peak Ranch	Maricopa	6 North	3 East	28	28	27-300034.0000	7/26/95	Desert Hills Water Co	Y
21	Joy Ranch	Maricopa	6 North	3 East	28	30	27-300562.0000	7/20/00	Desert Hills Water Co	N
22	Desert Hills Estates	Maricopa	6 North	3 East	29	158	27-200092.0000	7/13/87	Desert Hills Water Co	N
22	Estates North	Maricopa	6 North	3 East	29	24	27-200113.0000	5/17/95	Desert Hills Water Co	N
22	Estates North Unit II	Maricopa	6 North	3 East	29	23	27-300074.0000	6/10/96	Desert Hills Water Co	Y
22	Cielo Grande at Desert Hills	Maricopa	6 North	3 East	29	73	27-401768.0000	11/21/06	Desert Hills Water Co	Y
23	Apache Peak III	Maricopa	6 North	3 East	33	32	27-400502.0000	4/26/01	Desert Hills Water Co	Y
24	Anthem Phase 2A Unit 91and School Site	Maricopa	6 North	3 East; 2 East	19;24	14	27-401535.0000	5/3/05	Arizona American Water Co - Anthem	N
25	Continental Mountain Estates	Maricopa	6 North	4 East	14	70	27-200077.0000	10/31/81	Cave Creek Water Co	N
26	Arrisona at Rockaway Valley	Maricopa	6 North	4 East	16	34	27-200004.0000	4/21/93	Cave Creek Water Co	N
26	Hidden Springs	Maricopa	6 North	4 East	16	72	27-200142.0000	2/13/95	Cave Creek Water Co	N
26	Camino De La Cruz	Maricopa	6 North	4 East	16	16	27-300154.0000	7/2/96	Cave Creek Water Co	N
27	Cahava Springs	Maricopa	6 North	4 East	18	947	27-200016.0000	11/14/89	Cave Creek Water Co	N
28	Mesquite Ranch	Maricopa	6 North	4 East	21	16	27-400601.0000	1/7/02	Cave Creek Water Co	N
29	Crossings, The, II	Maricopa	6 North	4 East	26	27	27-200083.0000	8/3/95	Cave Creek Water Co	N
29	Estates at Carefree	Maricopa	6 North	4 East	26	NA	27-200114.0000	2/13/86	Carefree Water Co	N
29	Estates at Carefree	Maricopa	6 North	4 East	26	28	27-200115.0000	3/31/88	Carefree Water Co	N
29	Tranquil Vistas Estates	Maricopa	6 North	4 East	26	28	27-200355.0000	4/8/88	Carefree Water Co	N
29	Tranquil Place	Maricopa	6 North	4 East	26	14	27-300038.0000	11/22/95	Carefree Water Co	N
29	Vista Montana	Maricopa	6 North	4 East	26	7	27-300050.0000	7/24/96	Cave Creek Water Co	N
29	Crossings, IV	Maricopa	6 North	4 East	26	12	27-300276.0000	10/16/97	Cave Creek Water Co	N
30	Las Lomas	Maricopa	6 North	4 East	27	25	27-300018.0000	5/22/95	Cave Creek Water Co	N
30	Black Mountain Shadows	Maricopa	6 North	4 East	27	41	27-300046.0000	8/28/95	Cave Creek Water Co	N
30	Villas at Cave Creek(AKA Las Lomas)	Maricopa	6 North	4 East	27	25	27-300126.0000	5/16/96	Cave Creek Water Co	N
30	Black Mountain Shadows	Maricopa	6 North	4 East	27	41	27-400026.0000	5/12/99	Cave Creek Water Co	N
30	Stagecoach Village	Maricopa	6 North	4 East	27	70	27-500002.0000	12/1/06	Cave Creek Water Co	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
30	Sonoran Villas Condominiums	Maricopa	6 North	4 East	27	15	27-500053.0000	12/11/06	Cave Creek Water Co	N
30	Estates At Shimaa-Ni	Maricopa	6 North	4 East	27	72	27-700370.0000	11/16/07	Cave Creek Water Co	Y
30	Cave Creek Promenade	Maricopa	6 North	4 East	27	43	27-700413.0000	11/15/07	Cave Creek Water Co	Y
34	Adobe Hill	Maricopa	6 North	4 East	28	24	27-200001.0000	2/13/95	Cave Creek Water Co	N
34	Rancho Villas #2	Maricopa	6 North	4 East	28	80	27-200284.0000	5/15/86	Cave Creek Water Co	N
34	Rancho Villas Unit Two Tract "A"	Maricopa	6 North	4 East	28	26	27-300179.0000	12/20/96	Cave Creek Water Co	N
34	Rancho Manana Resort, Lots 3 & 5	Maricopa	6 North	4 East	28	50	27-300243.0000	6/24/97	Cave Creek Water Co	N
34	Rancho Manana Resort, Lot 2	Maricopa	6 North	4 East	28	56	27-300313.0000	8/25/97	Cave Creek Water Co	N
34	Knolls, The	Maricopa	6 North	4 East	28	69	27-400181.0000	2/10/00	Cave Creek Water Co	N
34	Rancho Tuscana	Maricopa	6 North	4 East	28	46	27-401831.0000	9/9/05	Cave Creek Water Co	N
34	Cave Creek Resort and Casitas	Maricopa	6 North	4 East	28	252	27-402145.0000	7/26/06	Cave Creek Water Co	N
34	Rancho Verde Del Rio	Maricopa	6 North	4 East	28	12	27-700317.0000	6/9/07	Cave Creek Water Co	Y
35	Desert Creek	Maricopa	6 North	4 East	29	14	27-300209.0000	6/24/97	Cave Creek Water Co	N
36	Highlands at Canyon Ridge	Maricopa	6 North	4 East	32	12	27-401339.0000	12/9/04	Cave Creek Water Co	N
37	Stagecoach Pass Estates	Maricopa	6 North	4 East	33	45	27-401209.0000	4/6/04	Cave Creek Water Co	N
37	The Village At Surrey Hills	Maricopa	6 North	4 East	33	45	27-401997.0000	3/21/06	Cave Creek Water Co	N
37	Hidden Valley	Maricopa	6 North	4 East	33	8	27-402269.0000	9/27/06	Cave Creek Water Co	N
38	Hidden Canyon	Maricopa	6 North	4 East	33	63	27-700421.0000	4/11/08	Cave Creek Water Co	Y
39	Hawksnest	Maricopa	6 North	4 East	34	20	27-200140.0000	8/15/88	Cave Creek Water Co	N
39	Ridgeview Estates	Maricopa	6 North	4 East	34	43	27-200287.0000	2/13/95	Cave Creek Water Co	N
39	Villa del Sol	Maricopa	6 North	4 East	34	12	27-200379.0000	3/10/87	Carefree Water Co	N
39	Nighthawk on Black Mountain	Maricopa	6 North	4 East	34	9	27-400963.0000	10/8/04	Cave Creek Water Co	N
39	Carefree Views	Maricopa	6 North	4 East	34	9	27-402212.0000	8/23/06	Cave Creek Water Co	N
40	Carefree Desert Condos	Maricopa	6 North	4 East	35	25	27-200023.0000	3/24/86	Carefree Water Co	N
40	Carefree Desert Condos	Maricopa	6 North	4 East	35	25	27-200024.0000	12/22/86	Carefree Water Co	N
40	Carefree Palms	Maricopa	6 North	4 East	35	12	27-200038.0000	8/3/84	Carefree Water Co	N
40	Carefree Village Development	Maricopa	6 North	4 East	35	52	27-200040.0000	3/24/86	Carefree Water Co	N
40	Colina of Carefree	Maricopa	6 North	4 East	35	19	27-200071.0000	9/12/84	Carefree Water Co	N
40	Colony at Carefree, The	Maricopa	6 North	4 East	35	36	27-200073.0000	3/26/82	Carefree Water Co	N
40	Doublegate Condominiums	Maricopa	6 North	4 East	35	14	27-200105.0000	10/13/81	Carefree Water Co	N
40	Las Vistas	Maricopa	6 North	4 East	35	38	27-200179.0000	2/22/82	Carefree Water Co	N
40	Vista del Norte	Maricopa	6 North	4 East	35	11	27-200389.0000	1/27/83	Carefree Water Co	N
40	Montacino Carefree	Maricopa	6 North	4 East	35	25	27-400711.0000	8/14/02	Cave Creek Water Co	N
40	Clarendon Estates	Maricopa	6 North	4 East	35	11	27-401176.0000	4/20/04	Cave Creek Water Co	N
40	Happy Hollow Villas	Maricopa	6 North	4 East	35	22	27-401641.0000	6/3/05	Carefree Water Co	Y
40	Tranquil Trail Estates	Maricopa	6 North	4 East	35	11	27-401711.0000	5/25/05	Carefree Water Co	Y
40	Granada Villas	Maricopa	6 North	4 East	35	24	27-402111.0000	6/20/06	Carefree Water Co	Y
41	Carefree Airport Condominiums	Maricopa	6 North	4 East	36	100	27-200022.0000	11/13/81	Carefree Water Co	N
41	Forest Greens	Maricopa	6 North	4 East	36	72	27-200118.0000	12/16/97	Carefree Water Co	N
41	Carefree Inn dba Villas At Carefree Inn	Maricopa	6 North	4 East	36	24	27-300232.0000	3/6/97	Carefree Water Co	N
41	Stagecreek Estates	Maricopa	6 North	4 East	36	31	27-402199.0000	12/11/06	Carefree Water Co	Y
41	Sun Rock Estates	Maricopa	6 North	4 East	36	7	27-500059.0000	12/18/06	Carefree Water Co	Y
42	Quarter Circle One Ranch #1,2	Maricopa	6 North	4 East	22 & 27	172	27-200265.0000	12/9/81	Cave Creek Water Co	N
43	Quarter Circle One Ranch	Maricopa	6 North	4 East	23 & 26	49	27-200264.0000	11/4/82	Cave Creek Water Co	N
44	Ocotillo Ridge Estates	Maricopa	6 North	4 East	23, 24 & 26	38	27-300298.0000	12/15/97	Cave Creek Water Co	N
45	Rancho Manana	Maricopa	6 North	4 East	28 & 29	107	27-200278.0000	8/6/87	Cave Creek Water Co	N
46	Vanier-Carefree	Maricopa	6 North	4 East	34 & 35	4	27-200374.0000	8/9/88	Carefree Water Co	N
46	Villa del Sol	Maricopa	6 North	4 East	34 & 35	12	27-200378.0000	6/11/82	Carefree Water Co	N
48	Carefree Hills	Maricopa	6 North	5 East	28	52	27-200033.0000	9/22/80	NA	N
50	Carefree East #3	Maricopa	6 North	5 East	32	246	27-200028.0000	12/7/82	Carefree Water Co	N
51	Desert Mountain Develop. #2	Maricopa	6 North	5 East	16, 20, 21, 28 & 29	NA	27-200096.0000	2/2/88	NA	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
52	Lone Mountain	Maricopa	6 North	5 East	19, 20 , 29 & 30	47	27-200183.0000	9/2/80	NA	N
53	Desert Mountain	Maricopa	6 North	5 East	20 & 29	NA	27-200094.0000	8/9/88	NA	N
54	Carefree East #2	Maricopa	6 North	5 East	28 & 32	184	27-200026.0000	9/15/81	Carefree Water Co	N
55	Carefree Heights Estates	Maricopa	6 North	5 East	28 & 33	33	27-200032.0000	8/4/95	NA	N
55	Carefree Hills	Maricopa	6 North	5 East	28 & 33	109	27-200034.0000	7/21/81	NA	N
55	Carefree Hills #2	Maricopa	6 North	5 East	28 & 33	NA	27-200035.0000	1/28/81	NA	N
56	Desert Mountain #1	Maricopa	6 North	5 East	28, 29, 30, 31 & 32	NA	27-200095.0000	4/7/86	NA	N
57	Carefree East #1	Maricopa	6 North	5 East	29 & 32	76	27-200025.0000	9/15/81	Carefree Water Co	N
58	Alexandra Pointe Rural Subdivision	Maricopa	5 North	2 West	25	10	27-401793.0000	10/4/05	Saguaro Acres Association	Y
64	Vida Del Sol Estates	Maricopa	5 North	3 West	25	122	27-300223.0000	7/17/97	Beardsley Water Co	N
65	Trail of Light	Maricopa	5 North	3 West	26	50	27-401717.0000	1/12/06	Beardsley Water Co	Y
66	Peak View Ranch	Maricopa	5 North	3 West	27	93	27-400733.0000	1/6/03	Beardsley Water Co	Y
66	Peak View Ranch Unit 2 & 3	Maricopa	5 North	3 West	27	235	27-401549.0000	10/17/05	Beardsley Water Co	Y
67	Patton Place Estates	Maricopa	5 North	3 West	29	92	27-400591.0000	12/18/01	Beardsley Water Co	Y
67	Patton Place Estates Unit III	Maricopa	5 North	3 West	29	30	27-400867.0000	5/7/03	Beardsley Water Co	Y
67	Patton Place Estates Unit 4	Maricopa	5 North	3 West	29	45	27-400940.0000	12/31/03	Beardsley Water Co	Y
67	Patton Place Estates Unit V	Maricopa	5 North	3 West	29	45	27-401041.0000	1/27/04	Beardsley Water Co	Y
68	Patton Place Estates Unit 6	Maricopa	5 North	3 West	20 & 29	130	27-401550.0000	3/21/05	Beardsley Water Co	Y
69	Whispering Ranch #4	Maricopa	5 North	4 West	4, 7, 30 & 31	93	27-200404.0000	9/26/94	NA	N
70	Whispering Ranch #3	Maricopa	5 North	4 West	6, 17, 18, 20, 23 & 31	NA	27-200403.0000	5/15/90	NA	N
71	Whispering Ranch #2	Maricopa	5 North	4 West	8, 17, 20 & 29	NA	27-200402.0000	7/17/89	NA	N
72	Whispering Ranch	Maricopa	5 North	4 West	8, 17, 20, 29, 30 & 31	19	27-300327.0000	7/25/97	NA	N
73	Whispering Ranch	Maricopa	5 North	4 West	17, 18, 19, 20, 29, 30 &	NA	27-200401.0000	4/19/89	NA	N
74	Tierra Del Rio	Maricopa	5 North	1 East	32	1972	27-401791.0000	5/2/06	Arizona American Water Co - Agua Fria	Y
75	Sierra Vista Unit II	Maricopa	5 North	2 East	1	15	27-400276.0000	4/14/00	Cave Creek Water Co	N
76	Sierra Vista Unit I	Maricopa	5 North	3 East	1	35	27-300564.0000	4/20/98	Cave Creek Water Co	N
76	Sierra Vista Unit II	Maricopa	5 North	3 East	1	55	27-300565.0000	4/20/99	Cave Creek Water Co	N
77	Black Mountain Estates	Maricopa	5 North	3 East	4	397	27-200009.0000	3/10/87	Cave Creek Water Co	N
78	Softwinds Desert View Estates	Maricopa	5 North	3 East	6	17	27-400261.0000	8/30/00	Desert Hills Water Co	Y
79	Boulders Carefree, The #06	Maricopa	5 North	4 East	2	30	27-200012.0000	11/3/80	Carefree Water Co	N
79	Boulders, The #9	Maricopa	5 North	4 East	2	14	27-200013.0000	8/4/95	Carefree Water Co	N
80	Black Mountain Foothills	Maricopa	5 North	4 East	3	41	27-200010.0000	11/3/80	Carefree Water Co	N
80	Boulders Carefree, The #05	Maricopa	5 North	4 East	3	49	27-200011.0000	11/10/80	Carefree Water Co	N
80	Carefree Grand View Estates #2	Maricopa	5 North	4 East	3	18	27-200030.0000	9/22/95	Carefree Water Co	N
80	Carefree Grande View Ests #1,2	Maricopa	5 North	4 East	3	40	27-200031.0000	11/3/80	Carefree Water Co	N
81	Carefree Foothills	Maricopa	5 North	4 East	4	76	27-200029.0000	7/22/95	Cave Creek Water Co	N
81	Carefree Mountain Estates #1	Maricopa	5 North	4 East	4	47	27-200036.0000	2/11/93	Cave Creek Water Co	N
81	Carefree Mountain Estates #2	Maricopa	5 North	4 East	4	25	27-200037.0000	3/10/94	Cave Creek Water Co	N
81	Carefree Sentinel Rock Estates	Maricopa	5 North	4 East	4	137	27-200039.0000	9/23/81	Cave Creek Water Co	N
81	Lost Acres Estates	Maricopa	5 North	4 East	4	15	27-200187.0000	12/16/93	Cave Creek Water Co	N
81	Summit, The/Carefree	Maricopa	5 North	4 East	4	7	27-300089.0000	1/3/97	Cave Creek Water Co	N
81	Los Gemelos	Maricopa	5 North	4 East	4	18	27-300092.0000	5/1/96	Cave Creek Water Co	N
81	Los Reales at Carefree	Maricopa	5 North	4 East	4	18	27-300184.0000	9/24/96	Cave Creek Water Co	N
81	Canyon Crossings	Maricopa	5 North	4 East	4	13	27-400093.0000	12/1/99	Cave Creek Water Co	N
81	Carefree Ironwood Estates	Maricopa	5 North	4 East	4	25	27-400464.0000	2/12/01	Cave Creek Water Co	N
82	Desert Enclave	Maricopa	5 North	4 East	5	11	27-300250.0000	6/24/97	Cave Creek Water Co	N
82	Cave Creek South Forty	Maricopa	5 North	4 East	5	15	27-400069.0000	6/29/99	Cave Creek Water Co	N
83	Estado De Cholla	Maricopa	5 North	4 East	6	83	27-300467.0000	5/18/99	Cave Creek Water Co	N
83	Las Ventanas	Maricopa	5 North	4 East	6	25	27-400304.0000	3/27/02	Cave Creek Water Co	N
86	Desert Foothills Acres	Maricopa	5 North	4 East	21	54	27-200091.0000	10/26/81	NA	N
87	Eagle Ranch Estates	Maricopa	5 North	4 East	23	122	27-200110.0000	10/3/80	NA	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
87	Lone Mountain Vista #1	Maricopa	5 North	4 East	23	160	27-200184.0000	10/13/83	NA	N
88	Vista Norte	Maricopa	5 North	4 East	28	65	27-200386.0000	5/11/81	NA	N
89	Canyon Ridge Estates	Maricopa	5 North	4 East	4 & 5	107	27-300408.0000	3/10/98	Cave Creek Water Co	N
89	Black Mountain Estates at Carefree	Maricopa	5 North	4 East	4 & 5	22	27-402081.0000	3/19/07	Cave Creek Water Co	N
90	Canyon Creek Estates	Maricopa	5 North	5 East	4	23	27-300444.0000	5/29/98	Cave Creek Water Co	N
91	Desert Ranch	Maricopa	5 North	5 East	5, 6, 7 & 8	NA	27-200097.0000	5/28/82	NA	N
91	Desert Ranch	Maricopa	5 North	5 East	5, 6, 7 & 8	NA	27-200098.0000	10/25/84	NA	N
91	Desert Ranch	Maricopa	5 North	5 East	5, 6, 7 & 8	606	27-200099.0000	5/8/87	NA	N
91	Desert Ranch	Maricopa	5 North	5 East	5, 6, 7 & 8	1097	27-200100.0000	6/23/88	NA	N
91	Desert Ranch #1	Maricopa	5 North	5 East	5, 6, 7 & 8		27-200101.0000	1/10/84	NA	N
93	Granite Mountain Ranch	Maricopa	5 North	6 East	19	100	27-400070.0000	3/23/00	NA	N
94	Vista Verde Unit One	Maricopa	5 North	6 East	25 & 36	185	27-401799.0000	11/15/05	Rio Verde utilities	Y
95	Rio Mountain Estates	Maricopa	5 North	6 East	29	109	27-400347.0000	10/10/01	NA	Y
97	Tonto Verde #4	Maricopa	5 North	6 East; 7 East	36; 31	82	27-300151.0000	8/14/96	Rio Verde utilities	Y
98	Tonto Verde #5	Maricopa	5 North	7 East	31	42	27-300324.0000	9/10/97	Rio Verde utilities	Y
98	Tonto Verde #6	Maricopa	5 North	7 East	31	62	27-300473.0000	8/27/98	Rio Verde utilities	Y
98	Tonto Verde #7	Maricopa	5 North	7 East	31	157	27-400016.0000	6/10/99	Rio Verde utilities	Y
98	Tonto Verde #8	Maricopa	5 North	7 East	31	63	27-400184.0000	1/19/00	Rio Verde utilities	Y
98	Tonto Verde Unit Nine	Maricopa	5 North	7 East	31	96	27-400364.0000	8/29/00	Rio Verde utilities	Y
98	Tonto Verde Unit Nine & Tonto Verde Unit Ten	Maricopa	5 North	7 East	31	76	27-400851.0000	5/15/03	Rio Verde utilities	Y
99	Coldwater Ranch	Maricopa	4 North	1 West	1	599	27-401470.0000	12/1/04	Arizona American Water Co - Agua Fria	Y
100	Rancho Cabrillo Parcels A, B, D, & F	Maricopa	4 North	1 West	3	708	27-400922.0000	8/18/04	Arizona American Water Co - Agua Fria	Y
100	Rancho Cabrillo Parcel E	Maricopa	4 North	1 West	3	156	27-401797.0000	12/5/05	Arizona American Water Co - Agua Fria	Y
101	Dos Rios Unit One and Unit Two	Maricopa	4 North	1 West	12	432	27-401301.0000	10/13/04	Arizona American Water Co - Agua Fria	Y
102	Crossriver Units 1-8	Maricopa	4 North	1 West	13	699	27-401268.0000	7/22/04	Arizona American Water Co - Agua Fria	Y
103	Rancho Silverado Units 1 and 2	Maricopa	4 North	1 West	13 & 14	260	27-401272.0000	7/22/04	Arizona American Water Co - Agua Fria	Y
104	Rio Sierra	Maricopa	4 North	1 West	13 & 24	280	27-401271.0000	7/21/04	Arizona American Water Co - Agua Fria	Y
105	Unit J - La Quinta at Corte Bella Country Club	Maricopa	4 North	1 West	14	78	27-401729.0000	6/3/05	Arizona American Water Co - Agua Fria	Y
105	Sundero	Maricopa	4 North	1 West	14	68	27-401742.0000	8/4/05	Arizona American Water Co - Agua Fria	Y
106	Phase 1 Pleasant Valley Country Club	Maricopa	4 North	1 West	14 & 15	615	27-400793.0000	1/24/03	Arizona American Water Co - Agua Fria	Y
107	Sun City West #51	Maricopa	4 North	1 West	15	459	27-200321.0000	2/8/93	Arizona American Water Co - Sun City West	N
108	Phase 2, Corte Bella Country Club	Maricopa	4 North	1 West	14 & 15	876	27-401005.0000	2/2/04	Arizona American Water Co - Agua Fria	Y
109	Corte Bella Country Club, Phase 3	Maricopa	4 North	1 West	15	299	27-401723.0000	6/16/05	Arizona American Water Co - Agua Fria	Y
111	Sun City West Units 55A,57,58,59	Maricopa	4 North	1 West	17	1080	27-200324.0000	9/16/94	Arizona American Water Co - Sun City West	N
111	Fitzpatrick Ranch Unit I	Maricopa	4 North	1 West	17	15	27-401683.0000	6/3/05	Arizona American Water Co - Sun City West	Y
111	Fitzpatrick Ranch Unit II	Maricopa	4 North	1 West	17	15	27-401880.0000	11/29/05	Arizona American Water Co - Sun City West	Y
111	Fitzpatrick Ranch Unit III	Maricopa	4 North	1 West	17	15	27-402142.0000	8/28/06	Arizona American Water Co - Sun City West	Y
112	Del Webb Grand Ave Prop - Area 2	Maricopa	4 North	1 West	19	2742	27-200088.0000	5/30/95	Arizona American Water Co - Agua Fria	N
112	Del Webb's Sun City Grand Desert Sage II	Maricopa	4 North	1 West	19	313	27-300442.0000	9/25/98	Arizona American Water Co - Agua Fria	
113	Del Webb Grand Ave Prop - Area 1	Maricopa	4 North	1 West	19, 20, 28-32	5833	27-200086.0000	5/30/95	Arizona American Water Co - Agua Fria	N
114	Park Place	Maricopa	4 North	1 West	28	5	27-200217.0000	9/21/93	Arizona American Water Co - Sun City	N
115	The Village at Sun City Grand Condominium, Phases	Maricopa	4 North	1 West	29	252	27-400992.0000	9/24/03	Arizona American Water Co - Agua Fria	Y
116	Del Webb's Sun City Grand Ironwood/Pk Pl	Maricopa	4 North	1 West	20 & 29	317	27-400329.0000	3/2/01	Arizona American Water Co - Agua Fria	N
117	Kingswood Park #1	Maricopa	4 North	1 West	31 & 32	2268	27-200150.0000	10/29/87	NA	N
118	Kingswood Parke #1 Parcel 18, 19	Maricopa	4 North	1 West	32	128	27-200152.0000	11/25/94	Arizona American Water Co - Agua Fria	N
118	Kingswood Park Parcel 01-05, 07	Maricopa	4 North	1 West	32	541	27-300029.0000	7/27/95	Arizona American Water Co - Agua Fria	N
118	Kingswood Parke Parcels 15,17,18,19 & A Portion Of 16	Maricopa	4 North	1 West	32	233	27-300030.0000	7/26/95	Arizona American Water Co - Agua Fria	N
118	Kingswood Parke #1 Parcels 8-11,12A,13	Maricopa	4 North	1 West	32	394	27-300104.0000	6/21/96	Arizona American Water Co - Agua Fria	N
119	Sun Village	Maricopa	4 North	1 West	33	3054	27-200330.0000	2/15/89	NA	N
119	Sun Village #1	Maricopa	4 North	1 West	33		27-200331.0000	7/8/86	NA	N
119	Parke Row	Maricopa	4 North	1 West	33	85	27-300251.0000	11/20/97	Arizona American Water Co - Agua Fria	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
119	Litchfield Subdivision	Maricopa	4 North	1 West	33	142	27-300291.0000	6/5/98	Arizona American Water Co - Agua Fria	Y
119	Park Place Condominium	Maricopa	4 North	1 West	33	258	27-401557.0000	3/14/05	Arizona American Water Co - Agua Fria	Y
119	Bellazano	Maricopa	4 North	1 West	33	444	27-500042.0000	3/20/07	Arizona American Water Co - Agua Fria	Y
119	Sun City West Units 53-56	Maricopa	4 North	1 West	33	1116	27-200323.0000	12/29/93	Arizona American Water Co - Sun City West	N
120	Pinnacle West Ranch/Citrus West	Maricopa	4 North	2 West	10	54	27-300015.0000	5/16/97	Beardsley Water Co	Y
121	Rio Rancho Estates North parcels 1, 2 & 5, South, Parcel 6	Maricopa	4 North	2 West	3 & 10	618	27-401762.0000	5/8/08	Beardsley Water Co	Y
122	Harold Yingling	Maricopa	4 North	2 West	14	8	27-200139.0000	5/6/92	NA	N
124	Austin Ranch West Parcels, 1-6	Maricopa	4 North	2 West	15	1198	27-402121.0000	6/13/07	Beardsley Water Co	Y
125	Del Webb Grand Ave Prop - Area 2	Maricopa	4 North	2 West	23, 24, 25, 26 & 36		27-200089.0000	5/30/95	Arizona American Water Co - Agua Fria	N
126	Del Webb Grand Ave Prop - Area 1	Maricopa	4 North	2 West	24, 25 & 36		27-200087.0000	5/30/85	Arizona American Water Co - Agua Fria	N
127	Desert Mesa II	Maricopa	4 North	2 West	25	17	27-400498.0000	10/9/01	Arizona American Water Co - Agua Fria	N
128	Del Webb's Sun City Grand, Phase IV Unit 106	Maricopa	4 North	2 West	25	50	27-400530.0000	11/29/01	Arizona American Water Co - Agua Fria	N
128	Del Webb's Sun City Grand, Phase IV, Unit 104	Maricopa	4 North	2 West	25	35	27-400550.0000	11/29/01	Arizona American Water Co - Agua Fria	N
129	Del Webb's Sun City Grand, Phase IV, Unit 107	Maricopa	4 North	2 West	26 & 27	412	27-400546.0000	11/29/01	Arizona American Water Co - Agua Fria	N
130	Arizona Traditions I	Maricopa	4 North	2 West	34	26	27-300100.0000	6/6/96	Arizona American Water Co - Agua Fria	Y
130	Arizona Traditions II & III	Maricopa	4 North	2 West	34	106	27-300101.0000	6/6/96	Arizona American Water Co - Agua Fria	Y
130	Arizona Traditions IV - VII	Maricopa	4 North	2 West	34	398	27-300177.0000	4/25/97	Arizona American Water Co - Agua Fria	Y
130	Arizona Traditions North Parcel XVI	Maricopa	4 North	2 West	34	129	27-400641.0000	6/10/02	Arizona American Water Co - Agua Fria	Y
130	Arizona Traditions North Parcel XV	Maricopa	4 North	2 West	34	244	27-400764.0000	1/6/03	Arizona American Water Co - Agua Fria	Y
130	Bell Pointe 1	Maricopa	4 North	2 West	34	405	27-400939.0000	9/17/03	Arizona American Water Co - Agua Fria	Y
130	Arizona Traditions North Parcel XIV	Maricopa	4 North	2 West	34	240	27-401177.0000	2/25/04	Arizona American Water Co - Agua Fria	Y
131	Happy Trails Resort	Maricopa	4 North	2 West	35		27-200137.0000	1/18/85	Arizona American Water Co - Sun City	N
131	Happy Trails Resorts #2	Maricopa	4 North	2 West	35	57	27-200138.0000	1/31/89	NA	N
131	Arizona Traditions VIII-X	Maricopa	4 North	2 West	35	263	27-300402.0000	1/27/98	Arizona American Water Co - Agua Fria	Y
131	Arizona Traditions Parcel XI	Maricopa	4 North	2 West	35	108	27-300529.0000	1/25/99	Arizona American Water Co - Agua Fria	Y
131	Arizona Traditions XII & XIII	Maricopa	4 North	2 West	35	267	27-400282.0000	9/11/00	Arizona American Water Co - Agua Fria	Y
131	Arizona Traditions North Parcel XIII	Maricopa	4 North	2 West	35	128	27-400544.0000	12/7/01	Arizona American Water Co - Agua Fria	Y
132	Kingswood Park #1	Maricopa	4 North	2 West	36	2268	27-200151.0000	10/29/87	NA	N
133	Bell West Ranch	Maricopa	4 North	2 West	36	1068	27-300537.0000	2/5/99	Arizona American Water Co - Agua Fria	Y
136	Sun City Festival, Phase 1	Maricopa	4 North	4 West	13, 22, 23, 24, 25 & 26	3473	27-401140.0000	11/23/04	Town of Buckeye	Y
137	Festival Foothills	Maricopa	4 North	4 West	24 & 25	819	27-401959.0000	5/9/06	Town of Buckeye	Y
139	Pleasant View Estates	Maricopa	4 North	1 East	9	38	27-200235.0000	1/12/95	Sunrise Water Co	N
139	Sunrise #5	Maricopa	4 North	1 East	9		27-200334.0000	3/7/84	Sunrise Water Co	N
139	Sunrise #5, Phase II	Maricopa	4 North	1 East	9	40	27-200335.0000	11/28/88	Sunrise Water Co	N
139	Sunrise #6 & #7	Maricopa	4 North	1 East	9	59	27-200336.0000	2/3/95	Sunrise Water Co	N
139	Treasure Canyon	Maricopa	4 North	1 East	9	60	27-200356.0000	12/12/94	Sunrise Water Co	N
139	Treasure Canyon II	Maricopa	4 North	1 East	9	23	27-300201.0000	2/10/97	Sunrise Water Co	N
139	Camino De Oro Ranch	Maricopa	4 North	1 East	9	24	27-400522.0000	11/29/01	Sunrise Water Co	N
139	Melton Ranch II	Maricopa	4 North	1 East	9	31	27-401412.0000	1/21/05	Sunrise Water Co	Y
140	La Caille	Maricopa	4 North	1 East	10	12	27-200159.0000	6/3/95	Sunrise Water Co	N
140	Summit at Sunrise Mountain	Maricopa	4 North	1 East	10	16	27-300541.0000	12/28/98	Sunrise Water Co	Y
140	Ventana Picachos	Maricopa	4 North	1 East	10	52	27-401590.0000	1/11/06	Sunrise Water Co	Y
141	Calle Lejos Estates	Maricopa	4 North	1 East	11	56	27-200017.0000	9/8/94	Sunrise Water Co	N
141	Eagle Canyon	Maricopa	4 North	1 East	11	71	27-300231.0000	4/7/98	Sunrise Water Co	N
141	Calle Lejos Estates	Maricopa	4 North	1 East	11	56	27-300265.0000	3/21/97	Sunrise Water Co	N
141	Silver Crest at Treasure Canyon	Maricopa	4 North	1 East	11	59	27-300492.0000	4/27/00	Sunrise Water Co	N
141	Clearview Estates	Maricopa	4 North	1 East	11	55	27-300554.0000	2/18/99	Sunrise Water Co	Y
141	Eagle Canyon	Maricopa	4 North	1 East	11	71	27-300555.0000	3/18/99	Sunrise Water Co	Y
141	Silver Crest at Treasure Canyon	Maricopa	4 North	1 East	11	59	27-400264.0000	6/10/98	Sunrise Water Co	N
141	Starlight Canyon	Maricopa	4 North	1 East	11	18	27-400611.0000	6/25/02	Sunrise Water Co	Y
141	Silver Canyon Ranch Unit I and Unit II	Maricopa	4 North	1 East	11	47	27-401757.0000	6/26/06	Sunrise Water Co	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
141	Eagle Ridge Estates	Maricopa	4 North	1 East	11	6	27-401974.0000	3/15/06	Sunrise Water Co	Y
141	Mountain Ridge Views	Maricopa	4 North	1 East	11	9	27-402091.0000	6/14/07	Sunrise Water Co	Y
141	Caballos Del Rio	Maricopa	4 North	1 East	11	38	27-700371.0000	1/8/08	Sunrise Water Co	Y
142	Patrick Acres	Maricopa	4 North	1 East	14	9	27-200220.0000	5/18/94	Sunrise Water Co	N
142	Pinnacle Ranch	Maricopa	4 North	1 East	14	48	27-200234.0000	12/12/94	Sunrise Water Co	N
142	Sunrise #8	Maricopa	4 North	1 East	14	60	27-200337.0000	5/11/95	Sunrise Water Co	N
142	Campanos Estates	Maricopa	4 North	1 East	14	16	27-402252.0000	10/17/06	Sunrise Water Co	Y
143	Citrus Garden Estates	Maricopa	4 North	1 East	15	48	27-200058.0000	3/10/87	Rose Valley Water Co	N
143	Starlight Estates III	Maricopa	4 North	1 East	15	16	27-200317.0000	5/8/95	Sunrise Water Co	N
143	Starlight Estates, Inc.	Maricopa	4 North	1 East	15	19	27-200318.0000	7/17/84	Sunrise Water Co	N
143	Salida Del Sol	Maricopa	4 North	1 East	15	26	27-300504.0000	12/7/98	Sunrise Water Co	Y
143	Salida Del Sol	Maricopa	4 North	1 East	15	26	27-400045.0000	12/7/98	Sunrise Water Co	N
143	Cantera Gates	Maricopa	4 North	1 East	15	9	27-400130.0000	1/5/00	Rose Valley Water Co	Y
143	Hunter Field Estates	Maricopa	4 North	1 East	15	22	27-400241.0000	10/18/00	Rose Valley Water Co	Y
144	Sun City West #52	Maricopa	4 North	1 East	16	622	27-200322.0000	8/17/93	Arizona American Water Co - Sun City	N
145	Unnamed property, Maricopa Co.,91st/DVR	Maricopa	4 North	1 East	21	424	27-200366.0000	6/20/95	Rose Valley Water Co	N
145	Dove Valley Ranch, Parcel 3	Maricopa	4 North	1 East	21	638	27-300188.0000	1/3/97	Rose Valley Water Co	Y
145	Dove Valley Ranch, Parcel 5	Maricopa	4 North	1 East	21	148	27-300219.0000	6/24/97	Rose Valley Water Co	Y
145	Dove Valley Ranch, Parcel 2E	Maricopa	4 North	1 East	21	79	27-300595.0000	2/22/99	Rose Valley Water Co	N
145	Dove Valley Ranch, Parcels 3B, 3C, 3F	Maricopa	4 North	1 East	21	294	27-400035.0000	5/12/99	Rose Valley Water Co	N
145	Peoria Mountain Vistas	Maricopa	4 North	1 East	21	148	27-400059.0000	4/12/99	Rose Valley Water Co	N
146	Deer Village	Maricopa	4 North	1 East	22	387	27-300061.0000	2/14/97	Rose Valley Water Co	Y
146	Dove Valley Ranch, Parcel 6	Maricopa	4 North	1 East	22	257	27-300172.0000	2/10/97	Rose Valley Water Co	Y
146	Silverton, Parcels 1, 2 & 3	Maricopa	4 North	1 East	22	179	27-300186.0000	12/20/96	New River Utility Co	Y
146	Deer Village II Parcels 4A and 4B	Maricopa	4 North	1 East	22	148	27-300189.0000	4/17/97	Rose Valley Water Co	Y
146	Sunrise at Desert Mountain	Maricopa	4 North	1 East	22	99	27-300193.0000	4/8/97	New River Utility Co	Y
146	Silverton Unit II	Maricopa	4 North	1 East	22	162	27-400032.0000	6/16/99	New River Utility Co	Y
147	Riverstone Estates	Maricopa	4 North	1 East	23	101	27-401624.0000	4/11/05	New River Utility Co	Y
148	New River Commerce Park	Maricopa	4 North	1 East	26	13	27-400076.0000	1/5/00	New River Utility Co	Y
148	Fletcher Heights Parcel 21	Maricopa	4 North	1 East	26	110	27-400652.0000	6/20/02	New River Utility Co	Y
149	Canyon Ridge West	Maricopa	4 North	1 East	31	367	27-300530.0000	6/22/99	Arizona American Water Co - Sun City	Y
149	Canyon Ridge West Parcel 5	Maricopa	4 North	1 East	31	152	27-401138.0000	4/1/04	Arizona American Water Co - Agua Fria	Y
149	The Village at Canyon Ridge West	Maricopa	4 North	1 East	31	185	27-401599.0000	7/18/05	Arizona American Water Co - Agua Fria	Y
150	Stonebrook	Maricopa	4 North	1 East	33	164	27-200320.0000	2/7/94	Arizona American Water Co - Agua Fria	N
151	Riverwalk	Maricopa	4 North	1 East	11 & 14	51	27-700327.0000	7/9/07	Sunrise Water Co	Y
152	Fletcher Heights, Phase I,II,III:A&B	Maricopa	4 North	1 East	14, 22 & 23	2986	27-300237.0000	5/1/97	New River Utility Co	N
154	Westbrook Village	Maricopa	4 North	1 East	27 & 28	214	27-200399.0000	11/10/82	City of Peoria	N
161	Anthem-Phase 1.c. (Jacka)	Maricopa	4 North	2 East	10, 14 & 15	1294	27-400301.0000	11/21/00	Arizona American Water Co - Anthem	N
163	Quail Creek	Maricopa	4 North	4 East	1	3000	27-200261.0000	6/10/82	NA	N
164	Pinnacle Peak Courts	Maricopa	4 North	4 East	11	243	27-200230.0000	7/21/81	NA	N
165	La Vida	Maricopa	4 North	4 East	13	62	27-200163.0000	8/14/80	NA	N
165	La Vida #2	Maricopa	4 North	4 East	13	83	27-200164.0000	7/20/81	NA	N
166	Pinnacle Peak Greens	Maricopa	4 North	4 East	14	305	27-200231.0000	7/21/81	NA	N
168	Pinnacle Peak Heights #5	Maricopa	4 North	5 East	17	47	27-200232.0000	6/8/81	NA	N
168	Pinnacle Peak Heights #6	Maricopa	4 North	5 East	17	15	27-200233.0000	6/8/81	NA	N
170	Highlands at Pinnacle Peak,The	Maricopa	4 North	5 East	5 & 6	826	27-200143.0000	6/5/81	NA	N
171	Verde Village	Maricopa	4 North	7 East	6	19	27-400106.0000	6/29/99	Rio Verde utilities	Y
172	Rio Verde Estates	Maricopa	4 North	7 East	7	30	27-300399.0000	4/20/98	Rio Verde utilities	Y
174	Sun Ridge (The Cliffs-The Sprg	Maricopa	3 North	1 West	1	360	27-200328.0000	8/18/92	City of El Mirage	N
175	Cottonwood Estates #1	Maricopa	3 North	1 West	2	12	27-200080.0000	10/3/95	City of El Mirage	N
175	Hidden Royal Acres	Maricopa	3 North	1 West	2	48	27-200141.0000	3/13/85	City of El Mirage	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
175	Fox Hill Run	Maricopa	3 North	1 West	2	100	27-300103.0000	5/1/96	City of El Mirage	N
175	Sunrize at Surprise	Maricopa	3 North	1 West	2	16	27-300235.0000	1/7/97	City of El Mirage	N
176	Villages at West Point	Maricopa	3 North	1 West	3	427	27-300202.0000	12/16/96	Arizona American Water Co - Agua Fria	N
176	Villages at West Point	Maricopa	3 North	1 West	3	427	27-300203.0000	3/6/97	Arizona American Water Co - Agua Fria	N
176	Homes by Dave Brown at West Point	Maricopa	3 North	1 West	3	491	27-300204.0000	12/16/96	Arizona American Water Co - Agua Fria	Y
176	Dave Brown at West Point	Maricopa	3 North	1 West	3	491	27-300205.0000	3/6/97	Arizona American Water Co - Agua Fria	N
176	Dave Brown at West Point-Model Comple»	Maricopa	3 North	1 West	3	17	27-300207.0000	12/16/96	Arizona American Water Co - Agua Fria	N
176	Kaufman & Broad at West Point	Maricopa	3 North	1 West	3	180	27-300227.0000	3/7/97	Arizona American Water Co - Agua Fria	Y
176	Ryland Homes at West Point & Ryland Home	Maricopa	3 North	1 West	3	226	27-300228.0000	11/15/96	Arizona American Water Co - Agua Fria	N
176	U.S. Home @ West Point Towne Center	Maricopa	3 North	1 West	3	281	27-300356.0000	12/15/97	Arizona American Water Co - Agua Fria	Y
177	Mountain Vista Ranch Parcel 10	Maricopa	3 North	1 West	6	177	27-200409.0000	6/6/96	NA	N
177	Mountain Vista Ranch Parcels 7 & 8	Maricopa	3 North	1 West	6	355	27-200410.0000	9/12/96	NA	N
177	Mountain Vista Ranch Parcel 06	Maricopa	3 North	1 West	6	266	27-300137.0000	6/6/96	NA	N
178	Greenway Parc Phase I and II	Maricopa	3 North	1 West	7	565	27-300582.0000	4/26/99	Arizona American Water Co - Agua Fria	Y
178	Greenway Parc at Surprise Three	Maricopa	3 North	1 West	7	78	27-400058.0000	7/16/99	Arizona American Water Co - Agua Fria	N
178	Legacy Parc	Maricopa	3 North	1 West	7	1031	27-400079.0000	12/1/99	Arizona American Water Co - Agua Fria	N
178	Tash Property	Maricopa	3 North	1 West	7	251	27-400404.0000	11/29/01	Arizona American Water Co - Agua Fria	Y
179	Fifth (5th) Avenue Subdivision	Maricopa	3 North	1 West	11	30	27-300125.0000	5/28/96	City of El Mirage	N
180	Montana Blanca Estates	Maricopa	3 North	1 West	13	153	27-300187.0000	11/16/98	City of El Mirage	N
181	Pueblo Futuro Subdivision	Maricopa	3 North	1 West	13	119	27-300270.0000	7/2/97	City of El Mirage	N
181	Arizona Brisas - Phase One	Maricopa	3 North	1 West	13	454	27-300491.0000	12/16/98	City of El Mirage	N
181	Arizona Brisas - Phase Two	Maricopa	3 North	1 West	13	211	27-300495.0000	12/16/98	City of El Mirage	N
181	Arizona Brisas - Phase Three	Maricopa	3 North	1 West	13	275	27-300496.0000	12/16/98	City of El Mirage	N
181	Sundial Units I and II	Maricopa	3 North	1 West	13	1018	27-400012.0000	5/12/99	City of El Mirage	N
182	Greer Ranch South	Maricopa	3 North	1 West	19	677	27-400980.0000	1/27/04	Arizona American Water Co - Agua Fria	Y
182	Greer Ranch North	Maricopa	3 North	1 West	19	878	27-401394.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
183	Desert Mirage Acres	Maricopa	3 North	1 West	23	10	27-300109.0000	7/10/96	City of El Mirage	N
184	Pueblo El Mirage R.V. Resort	Maricopa	3 North	1 West	24	2135	27-200258.0000	1/8/85	City of El Mirage	N
185	Agua Fria Ranch	Maricopa	3 North	1 West	25	783	27-400795.0000	12/16/02	Arizona American Water Co - Agua Fria	Y
186	Twelve Oaks Estates	Maricopa	3 North	1 West	30	130	27-401040.0000	1/27/04	Arizona American Water Co - Agua Fria	Y
186	Twelve Oaks Estates II	Maricopa	3 North	1 West	30	164	27-402233.0000	12/5/06	Arizona American Water Co - Agua Fria	Y
188	Woolf Crossing	Maricopa	3 North	1 West	31	656	27-402089.0000	10/16/06	Arizona American Water Co - Agua Fria	Y
190	Northwest Ranch	Maricopa	3 North	2 West	1	957	27-300535.0000	3/31/99	Arizona American Water Co - Agua Fria	Y
190	Surprise Farms - 1A South	Maricopa	3 North	2 West	1	605	27-400269.0000	8/10/00	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms - 1B North	Maricopa	3 North	2 West	2	435	27-400270.0000	8/10/00	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 3, Parcel 6	Maricopa	3 North	2 West	2	118	27-401391.0000	10/5/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2, Parcel 4	Maricopa	3 North	2 West	2	134	27-401405.0000	10/5/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2, Parcel 6	Maricopa	3 North	2 West	2	138	27-401406.0000	10/5/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2, Parcel 5	Maricopa	3 North	2 West	2	110	27-401407.0000	10/29/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2, Parcel 2	Maricopa	3 North	2 West	2	129	27-401408.0000	10/5/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2, Parcel 3	Maricopa	3 North	2 West	2	103	27-401409.0000	10/29/04	Arizona American Water Co - Agua Fria	Y
191	Surprise Farms Phase 2 Parcel 1	Maricopa	3 North	2 West	2	110	27-401410.0000	11/17/04	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms - 1B South	Maricopa	3 North	2 West	3	636	27-400268.0000	8/10/00	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 3 Parcel 1	Maricopa	3 North	2 West	3	155	27-401386.0000	10/14/04	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 3 - Parcel 2	Maricopa	3 North	2 West	3	92	27-401387.0000	10/5/04	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 3 - Parcel 3	Maricopa	3 North	2 West	3	73	27-401388.0000	10/14/04	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 3 - Parcel 4	Maricopa	3 North	2 West	3	134	27-401389.0000	10/14/04	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 4 - Parcel 6	Maricopa	3 North	2 West	3	81	27-401566.0000	1/19/05	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 4 - Parcel 5	Maricopa	3 North	2 West	3	82	27-401567.0000	1/19/05	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 4 - Parcel 4	Maricopa	3 North	2 West	3	119	27-401568.0000	1/19/05	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 4 - Parcel 3	Maricopa	3 North	2 West	3	86	27-401569.0000	1/19/05	Arizona American Water Co - Agua Fria	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
192	Surprise Farms Phase 4 - Parcel 2	Maricopa	3 North	2 West	3	76	27-401570.0000	1/19/05	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 4 - Parcel 1	Maricopa	3 North	2 West	3	77	27-401571.0000	1/19/05	Arizona American Water Co - Agua Fria	Y
192	Surprise Farms Phase 5	Maricopa	3 North	2 West	3	419	27-402150.0000	7/26/06	Arizona American Water Co - Agua Fria	Y
193	Sierra Montana Parcel 7	Maricopa	3 North	2 West	11	140	27-401604.0000	2/14/05	Arizona American Water Co - Agua Fria	Y
193	Sierra Montana Parcels 12 & 14	Maricopa	3 North	2 West	11	356	27-401124.0000	12/26/03	Arizona American Water Co - Agua Fria	Y
194	Sarah Ann Ranch	Maricopa	3 North	2 West	14	960	27-401205.0000	7/29/04	Arizona American Water Co - Agua Fria	Y
195	Sycamore Farms Parcel 13	Maricopa	3 North	2 West	24	250	27-401521.0000	5/3/05	Arizona American Water Co - Agua Fria	Y
195	Sycamore Farms Parcel 11	Maricopa	3 North	2 West	24	168	27-700217.0000	8/24/07	Arizona American Water Co - Agua Fria	Y
196	Zanjero Pass Parcels 1-3, Phases 2-4 & Parcel 4, Phase 1	Maricopa	3 North	2 West	26	187	27-401932.0000	3/8/06	Arizona American Water Co - Agua Fria	Y
197	Ramola of Arizona Grapefruit	Maricopa	3 North	2 West	27	300	27-200273.0000	8/19/83	Arizona American Water Co - Agua Fria	N
197	Cortessa Parcel 1	Maricopa	3 North	2 West	27	109	27-401321.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 2	Maricopa	3 North	2 West	27	126	27-401322.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 3	Maricopa	3 North	2 West	27	113	27-401323.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 4	Maricopa	3 North	2 West	27	99	27-401324.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcels 5, 6, 9, 12, 13, 14 & 15	Maricopa	3 North	2 West	27	785	27-401325.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 7	Maricopa	3 North	2 West	27	101	27-401326.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 10	Maricopa	3 North	2 West	27	78	27-401328.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
197	Cortessa Parcel 18	Maricopa	3 North	2 West	27	29	27-401332.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
199	Cortessa Parcel 8	Maricopa	3 North	2 West	27	113	27-401327.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
199	Cortessa Parcel 11	Maricopa	3 North	2 West	27	131	27-401329.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
199	Cortessa Parcel 16	Maricopa	3 North	2 West	27	36	27-401330.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
199	Cortessa Parcel 17	Maricopa	3 North	2 West	27	12	27-401331.0000	1/5/05	Arizona American Water Co - Agua Fria	Y
200	Sonoran Ridge Estates Unit 1	Maricopa	3 North	2 West	33	33	27-400327.0000	9/7/00	Water Utility of Greater Buckeye	Y
200	Sonoran Ridge Estates Unit 2	Maricopa	3 North	2 West	33	36	27-400506.0000	9/21/01	Water Utility of Greater Buckeye	Y
200	Sonoran Ridge Estates Unit 3	Maricopa	3 North	2 West	33	96	27-400731.0000	12/16/02	Water Utility of Greater Buckeye	Y
201	White Tank Foothills	Maricopa	3 North	2 West	34	1286	27-401563.0000	5/9/05	Arizona American Water Co - Agua Fria	Y
202	Crystal Springs Estates Unit I	Maricopa	3 North	2 West	35	72	27-200084.0000	9/25/94	Arizona American Water Co - Agua Fria	N
203	Surprise Farms - 1A North	Maricopa	3 North	2 West	1 & 2	398	27-400267.0000	8/10/00	Arizona American Water Co - Agua Fria	Y
204	Sierra Montana Phase 1	Maricopa	3 North	2 West	10 & 11	1396	27-400676.0000	7/10/02	Arizona American Water Co - Agua Fria	Y
204	Sierra Montana Phase 2	Maricopa	3 North	2 West	10 & 11	693	27-400879.0000	4/24/03	Arizona American Water Co - Agua Fria	Y
206	Trillium - Phase II	Maricopa	3 North	4 West	7 & 18	2755	27-500049.0000	12/26/06	Town of Buckeye	Y
207	Trillium - Phase I	Maricopa	3 North	4 West	7, 8, 17 & 18	4266	27-402095.0000	12/11/06	Town of Buckeye	Y
209	Belmont Ranches	Maricopa	3 North	7 West	33, 34, 35 & 36	62	27-200008.0000	6/7/93	NA	N
211	Citrus Point	Maricopa	3 North	1 East	6	332	27-300474.0000	1/21/99	Arizona American Water Co - Sun City	Y
211	Sun City Manor	Maricopa	3 North	1 East	6	140	27-402236.0000	11/28/06	Arizona American Water Co - Sun City	Y
213	Youngtown Gardens Condominiums	Maricopa	3 North	1 East	18	126	27-400240.0000	2/24/00	Arizona American Water Co - Sun City	Y
215	Riverwalk Village-Phase I, Phase II and Phase III-Retail	Maricopa	3 North	1 East	29	210	27-700291.0000	5/18/07	Arizona American Water Co - Sun City	Y
241	Goldfield Ranch	Maricopa	3 North	7 East	9, 10 & 15	532	27-200125.0000	4/29/88	NA	N
242	Sarival Farms Phase I	Maricopa	2 North	1 West	6	14	27-400525.0000	1/22/02	Adaman Mutual Water Company	Y
243	Sarival Farms Phase 2	Maricopa	2 North	1 West	6	18	27-400670.0000	11/5/02	Adaman Mutual Water Company	Y
244	Dybeth	Maricopa	2 North	1 West	10	694	27-200107.0000	2/16/89	Valley Utilities	N
245	Vista Camello	Maricopa	2 North	1 West	10	9	27-200385.0000	12/17/93	NA	N
246	Dreaming Summit Unit 1, Parcel 1(part)	Maricopa	2 North	1 West	10	120	27-400283.0000	7/25/00	Valley Utilities	Y
246	Dreaming Summit Unit 1, Parcel 2	Maricopa	2 North	1 West	10	162	27-400284.0000	7/20/00	Valley Utilities	Y
246	Dreaming Summit Unit 1, Parcel 3	Maricopa	2 North	1 West	10	89	27-400285.0000	7/25/00	Valley Utilities	Y
246	Dreaming Summit Unit 1, Parcel 4(part) 1	Maricopa	2 North	1 West	10	154	27-400286.0000	7/25/00	Valley Utilities	Y
246	Luke Ranch Estates	Maricopa	2 North	1 West	10	38	27-400924.0000	1/27/04	Valley Utilities	Y
247	Bethany Estates	Maricopa	2 North	1 West	11	62	27-400624.0000	5/11/02	Valley Utilities	Y
247	Dysart Ranch	Maricopa	2 North	1 West	11	28	27-400704.0000	2/11/03	Valley Utilities	Y
247	Capistrano North	Maricopa	2 North	1 West	11	112	27-401183.0000	3/30/04	Valley Utilities	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
247	Capistrano South	Maricopa	2 North	1 West	11	50	27-401184.0000	3/30/04	Valley Utilities	Y
247	Dysart Village	Maricopa	2 North	1 West	11	39	27-401281.0000	10/29/04	Valley Utilities	Y
247	Capistrano South	Maricopa	2 North	1 West	11	51	27-401413.0000	8/30/04	Valley Utilities	Y
247	Riverside Estates	Maricopa	2 North	1 West	11	80	27-401847.0000	12/8/05	Valley Utilities	Y
247	Falcon View	Maricopa	2 North	1 West	11	64	27-402093.0000	8/11/06	Valley Utilities	Y
247	Maryland Estates	Maricopa	2 North	1 West	11	49	27-700300.0000	9/20/07	Valley Utilities	Y
248	Dycam	Maricopa	2 North	1 West	14	28	27-200108.0000	6/12/89	NA	N
248	Los Cerros	Maricopa	2 North	1 West	14	24	27-200186.0000	1/2/81	Valley Utilities	N
248	New Village Homes	Maricopa	2 North	1 West	14	107	27-200208.0000	2/17/89	Tierra Buena Water Co	N
248	Litchfield Vista Views III	Maricopa	2 North	1 West	14	76	27-300310.0000	8/15/97	Tierra Buena Water Co	Y
248	Wigwam Creek North Phase 2B	Maricopa	2 North	1 West	14	21	27-400794.0000	3/11/03	Litchfield Park Service Co	Y
248	Colter Commons	Maricopa	2 North	1 West	14	29	27-400837.0000	6/27/03	Litchfield Park Service Co	Y
249	Litchfield Ridge	Maricopa	2 North	1 West	15		27-200181.0000	10/21/88	Valley Utilities	N
249	Dreaming Summit Unit 2B, Parcel 1	Maricopa	2 North	1 West	15	158	27-400255.0000	6/19/00	Litchfield Park Service Co	Y
249	Dreaming Summit Unit 2B, Parcels 2 & 3	Maricopa	2 North	1 West	15	282	27-400256.0000	6/19/00	Litchfield Park Service Co	Y
249	Veranda	Maricopa	2 North	1 West	15	97	27-400299.0000	11/16/00	Litchfield Park Service Co	Y
249	Dreaming Summit Unit 3A Par 1-5, Unit 3B Par 1-3	Maricopa	2 North	1 West	15	441	27-400487.0000	8/9/01	Litchfield Park Service Co	Y
249	Veranda II	Maricopa	2 North	1 West	15	49	27-400743.0000	12/5/02	Litchfield Park Service Co	Y
249	Veranda Commons	Maricopa	2 North	1 West	15	7	27-401989.0000	3/6/06	Litchfield Park Service Co	Y
249	Camelback Place at Dysart	Maricopa	2 North	1 West	15	7	27-402257.0000	12/4/06	Litchfield Park Service Co	Y
250	The Villas at Litchfield Park	Maricopa	2 North	1 West	21	58	27-401534.0000	12/23/04	Litchfield Park Service Co	Y
250	Awenasa	Maricopa	2 North	1 West	21	196	27-500097.0000	4/9/07	Litchfield Park Service Co	Y
251	Wigwam Creek-Phase I,Parcels3,4,6,8,9,12	Maricopa	2 North	1 West	23	539	27-400410.0000	11/13/00	Litchfield Park Service Co	Y
251	Wigwam Creek-Phase I,Parcels1,2,5,7,10	Maricopa	2 North	1 West	23	518	27-400411.0000	7/30/01	Litchfield Park Service Co	Y
251	Wigwam Creek Parcel 11	Maricopa	2 North	1 West	23	112	27-400706.0000	8/15/02	Litchfield Park Service Co	Y
251	Wigwam Creek Parcel 12	Maricopa	2 North	1 West	23	94	27-400707.0000	7/26/02	Litchfield Park Service Co	Y
251	Monument Point Business Park	Maricopa	2 North	1 West	23	21	27-700320.0000	8/24/07	Litchfield Park Service Co	Y
252	Litchfield Park Subdivision 4B	Maricopa	2 North	1 West	27	6	27-401873.0000	4/20/06	Litchfield Park Service Co	Y
252	Coldwater Station	Maricopa	2 North	1 West	27	22	27-500037.0000	12/6/06	Litchfield Park Service Co	Y
253	Sunrise at Palm Valley	Maricopa	2 North	1 West	28	397	27-300447.0000	8/27/98	Litchfield Park Service Co	Y
253	Palm Valley Phase 3A	Maricopa	2 North	1 West	28	310	27-300481.0000	11/10/98	Litchfield Park Service Co	Y
253	Palm Valley Phase 2, Parcel 5	Maricopa	2 North	1 West	28	84	27-400125.0000	11/12/99	Litchfield Park Service Co	Y
253	Palm Valley Phase 3B	Maricopa	2 North	1 West	28	348	27-400249.0000	5/15/00	Litchfield Park Service Co	Y
253	Litchfield Park Villas, A Condominium	Maricopa	2 North	1 West	28	46	27-401594.0000	1/13/05	Litchfield Park Service Co	Y
254	PebbleCreek Golf Resort #6	Maricopa	2 North	1 West	29	NA	27-200221.0000	2/8/93	Litchfield Park Service Co	N
254	Pebblecreek Unit 25	Maricopa	2 North	1 West	29	22	27-300550.0000	7/16/99	Litchfield Park Service Co	Y
255	Pebblecreek Unit 26,27,28,29 & 30	Maricopa	2 North	1 West	30	538	27-400185.0000	2/17/00	Litchfield Park Service Co	Y
256	Palm Valley Phase VIII, North Parcel	Maricopa	2 North	1 West	31	382	27-401871.0000	12/6/05	Litchfield Park Service Co	Y
257	Goodyear Planned Regional Center, Parcels 9, 10 &	Maricopa	2 North	1 West	32	383	27-400870.0000	5/5/03	Litchfield Park Service Co	Y
257	Rio Paseo Parcels 7 & 8	Maricopa	2 North	1 West	32	312	27-401565.0000	8/22/05	Litchfield Park Service Co	Y
258	The Market at Estrella Falls & Estrella Falls Regional Shopping Center	Maricopa	2 North	1 West	32	17	27-700438.0000	3/17/08	Litchfield Park Service Co	Y
259	Palm Valley Phase 2, Parcel 10	Maricopa	2 North	1 West	33	115	27-400472.0000	5/22/01	Litchfield Park Service Co	Y
259	Palm Valley Phase 2, Parcel 1A	Maricopa	2 North	1 West	33	36	27-400473.0000	5/22/01	Litchfield Park Service Co	N
259	Palm Valley Phase 2, Parcel 6	Maricopa	2 North	1 West	33	49	27-400474.0000	5/22/01	Litchfield Park Service Co	Y
259	The Cottages at Palm Valley	Maricopa	2 North	1 West	33	84	27-401524.0000	12/23/04	Litchfield Park Service Co	Y
259	Camelot at Palm Valley	Maricopa	2 North	1 West	33	128	27-401915.0000	1/4/06	Litchfield Park Service Co	Y
260	Palm Valley Phase 1, Parcels 1,9,20,21	Maricopa	2 North	1 West	34	343	27-200213.0000	6/29/94	Litchfield Park Service Co	N
260	Palm Valley Phase 1, Parcels 7,18,19,22	Maricopa	2 North	1 West	34	503	27-200214.0000	2/25/94	Litchfield Park Service Co	N
260	Palm Valley Phase 1, Parcel 4	Maricopa	2 North	1 West	34	95	27-300195.0000	3/12/97	Litchfield Park Service Co	Y
260	Parcel 17A @Palm Valley - Phase One	Maricopa	2 North	1 West	34	123	27-400177.0000	3/21/00	Litchfield Park Service Co	Y
260	Parcel 17B @Palm Valley - Phase One	Maricopa	2 North	1 West	34	123	27-400178.0000	2/10/00	Litchfield Park Service Co	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
261	Dreaming Summit Unit 2A, Parcels 1,2,3	Maricopa	2 North	1 West	10 & 15	390	27-400254.0000	6/13/00	Litchfield Park Service Co	Y
262	Wigwam Creek	Maricopa	2 North	1 West	11 & 14	1343	27-400233.0000	5/4/00	Litchfield Park Service Co	N
262	Wigwam Creek North Phase 2	Maricopa	2 North	1 West	11 & 14	831	27-400528.0000	6/3/02	Litchfield Park Service Co	Y
263	Palm Valley Phase IX	Maricopa	2 North	1 West	16 & 17	218	27-700369.0000	12/20/07	Litchfield Park Service Co	Y
264	The Village at Litchfield Park	Maricopa	2 North	1 West	20 & 21	322	27-400540.0000	10/15/01	Litchfield Park Service Co	Y
265	PebbleCreek Golf Resort #11, 12, 14-24	Maricopa	2 North	1 West	28 & 29	1007	27-200222.0000	5/30/95	Litchfield Park Service Co	N
266	Palm Valley Phase II, Parcel 1	Maricopa	2 North	1 West	28 & 33	302	27-400541.0000	10/25/01	Litchfield Park Service Co	Y
266	Palm Valley Phase II Parcel 2	Maricopa	2 North	1 West	28 & 33	105	27-400689.0000	7/24/02	Litchfield Park Service Co	Y
266	Palm Valley Phase II Parcel 7	Maricopa	2 North	1 West	28 & 33	67	27-400690.0000	7/24/02	Litchfield Park Service Co	Y
266	Palm Valley Phase II, Parcel 24	Maricopa	2 North	1 West	28 & 33	53	27-400693.0000	7/24/02	Litchfield Park Service Co	Y
266	Palm Valley Phase II Parcel 2	Maricopa	2 North	1 West	28 & 33	105	27-401028.0000	10/29/03	Litchfield Park Service Co	Y
267	PebbleCreek Golf Resort #1-5,7	Maricopa	2 North	1 West	29 & 30	NA	27-200223.0000	1/14/93	Litchfield Park Service Co	N
268	Clearwater Farms #2	Maricopa	2 North	2 West	2	147	27-200060.0000	5/20/82	Arizona American Water Co - Agua Fria	N
268	Clearwater Farms #2	Maricopa	2 North	2 West	2	NA	27-200061.0000	5/5/84	Arizona American Water Co - Agua Fria	N
268	Clearwater Mountain Estates	Maricopa	2 North	2 West	2	18	27-200068.0000	3/14/91	Arizona American Water Co - Agua Fria	N
268	Clearwater Mountain Estates	Maricopa	2 North	2 West	2	7	27-200069.0000	3/22/94	Arizona American Water Co - Agua Fria	N
269	Clearwater Farms #3,4	Maricopa	2 North	2 West	3	303	27-200063.0000	4/22/82	Arizona American Water Co - Agua Fria	N
269	Surprise Farms Phase 3 - Parcel 5	Maricopa	2 North	2 West	3	45	27-401390.0000	10/14/04	Arizona American Water Co - Agua Fria	Y
270	Clearwater Farms #3	Maricopa	2 North	2 West	10	112	27-200062.0000	8/25/84	Arizona American Water Co - Agua Fria	N
270	Clearwater Farms #4	Maricopa	2 North	2 West	10		27-200064.0000	3/21/88	Arizona American Water Co - Agua Fria	N
270	Clearwater Farms #5	Maricopa	2 North	2 West	10	30	27-200065.0000	3/31/88	Arizona American Water Co - Agua Fria	N
270	Clearwater Farms #6	Maricopa	2 North	2 West	10	29	27-200066.0000	6/13/90	Arizona American Water Co - Agua Fria	N
270	Clearwater Farms #8	Maricopa	2 North	2 West	10	68	27-200067.0000	12/12/94	Arizona American Water Co - Agua Fria	N
271	Montana Farms	Maricopa	2 North	2 West	11	19	27-400041.0000	5/27/99	Arizona American Water Co - Agua Fria	Y
271	Montana Farms II	Maricopa	2 North	2 West	11	33	27-400512.0000	9/13/01	Arizona American Water Co - Agua Fria	Y
271	Tara Estates	Maricopa	2 North	2 West	11	23	27-401039.0000	1/27/04	Arizona American Water Co - Agua Fria	Y
272	Russell Ranch	Maricopa	2 North	2 West	15	493	27-400414.0000	7/23/01	Arizona American Water Co - Agua Fria	Y
272	Cottonwood Estates	Maricopa	2 North	2 West	15	50	27-400734.0000	3/26/04	Arizona American Water Co - Agua Fria	Y
272	Savannah	Maricopa	2 North	2 West	15	319	27-401146.0000	4/28/04	Arizona American Water Co - Agua Fria	Y
273	Jackrabbit Estates	Maricopa	2 North	2 West	16	364	27-401546.0000	1/24/05	Arizona American Water Co - Agua Fria	Y
274	Beautiful Arizona Estates	Maricopa	2 North	2 West	17	19	27-200005.0000	9/25/94	Arizona Water Co - White Tanks	N
274	Beautiful Arizona Estates	Maricopa	2 North	2 West	17	12	27-200006.0000	3/24/95	Arizona Water Co - White Tanks	N
275	Verrado Parcel 4.613	Maricopa	2 North	2 West	19	42	27-400819.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
275	Verrado Parcel 4.624	Maricopa	2 North	2 West	19	5	27-401026.0000	1/6/04	Arizona American Water Co - Agua Fria	Y
275	Verrado Parcel 4.501	Maricopa	2 North	2 West	19	41	27-401249.0000	8/5/04	Arizona American Water Co - Agua Fria	Y
275	Verrado Parcel 4.503	Maricopa	2 North	2 West	19	43	27-401250.0000	8/18/04	Arizona American Water Co - Agua Fria	Y
275	Verrado Parcel 4.504	Maricopa	2 North	2 West	19	17	27-401251.0000	8/5/04	Arizona American Water Co - Agua Fria	Y
276	Verrado Parcel 4.616	Maricopa	2 North	2 West	19	60	27-401428.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
276	Verrado Parcel 4.505	Maricopa	2 North	2 West	19	80	27-401429.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
276	Verrado Parcel 4.506	Maricopa	2 North	2 West	19	21	27-401758.0000	8/4/05	Arizona American Water Co - Agua Fria	Y
276	Verrado, Parcel 4.625	Maricopa	2 North	2 West	19	43	27-402033.0000	7/31/06	Arizona American Water Co - Agua Fria	Y
276	Verrado Parcel 4.502	Maricopa	2 North	2 West	19	48	27-402034.0000	8/15/06	Arizona American Water Co - Agua Fria	Y
277	Verrado Parcel 5.601	Maricopa	2 North	2 West	9; and 2 North 3 West 2	46	27-401252.0000	8/5/04	Arizona American Water Co - Agua Fria	Y
277	Verrado Parcel 5.602	Maricopa	2 North	2 West	9; and 2 North 3 West 2	10	27-401253.0000	8/18/04	Arizona American Water Co - Agua Fria	Y
278	Litchfield Heights Unit I	Maricopa	2 North	2 West	20	12	27-300252.0000	10/20/97	Arizona Water Co - White Tanks	
278	Litchfield Heights Unit II	Maricopa	2 North	2 West	20	16	27-300539.0000	11/17/98	Arizona Water Co - White Tanks	Y
278	Litchfield Heights Unit III	Maricopa	2 North	2 West	20	19	27-300597.0000	2/2/99	Arizona Water Co - White Tanks	Y
278	Litchfield Heights Unit IV	Maricopa	2 North	2 West	20	20	27-400024.0000	2/25/99	Arizona Water Co - White Tanks	Y
278	Verrado parcel 4.411	Maricopa	2 North	2 West	20	24	27-402165.0000	8/18/06	Arizona American Water Co - Agua Fria	Y
279	Verrado, Parcel 4.421	Maricopa	2 North	2 West	20	39	27-402099.0000	7/10/06	Arizona American Water Co - Agua Fria	Y
279	Verrado, Parcel 4.422	Maricopa	2 North	2 West	20	19	27-402100.0000	7/10/06	Arizona American Water Co - Agua Fria	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
279	Verrado, Parcel 4.423	Maricopa	2 North	2 West	20	34	27-402101.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.424	Maricopa	2 North	2 West	20	12	27-402102.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.425	Maricopa	2 North	2 West	20	33	27-402103.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.426	Maricopa	2 North	2 West	20	41	27-402104.0000	7/5/06	Arizona American Water Co - Agua Fria	Y
279	Verrado, Parcel 4.427	Maricopa	2 North	2 West	20	24	27-402105.0000	7/5/06	Arizona American Water Co - Agua Fria	Y
279	Verrado, Parcel 4.428	Maricopa	2 North	2 West	20	33	27-402106.0000	7/5/06	Arizona American Water Co - Agua Fria	Y
279	Verrado, Parcel 4.429	Maricopa	2 North	2 West	20	34	27-402107.0000	7/18/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.409	Maricopa	2 North	2 West	20	23	27-402163.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.410	Maricopa	2 North	2 West	20	31	27-402164.0000	8/18/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.412	Maricopa	2 North	2 West	20	42	27-402166.0000	8/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.413	Maricopa	2 North	2 West	20	29	27-402167.0000	8/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.414	Maricopa	2 North	2 West	20	40	27-402168.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.415	Maricopa	2 North	2 West	20	43	27-402169.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.416	Maricopa	2 North	2 West	20	21	27-402170.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.417	Maricopa	2 North	2 West	20	32	27-402171.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.418	Maricopa	2 North	2 West	20	36	27-402172.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.401	Maricopa	2 North	2 West	20	20	27-402175.0000	9/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.402	Maricopa	2 North	2 West	20	40	27-402176.0000	9/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.403	Maricopa	2 North	2 West	20	26	27-402177.0000	9/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.404	Maricopa	2 North	2 West	20	52	27-402178.0000	9/21/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.405	Maricopa	2 North	2 West	20	29	27-402179.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.406	Maricopa	2 North	2 West	20	42	27-402180.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.407	Maricopa	2 North	2 West	20	19	27-402181.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
279	Verrado Parcel 4.408	Maricopa	2 North	2 West	20	52	27-402182.0000	9/11/06	Arizona American Water Co - Agua Fria	Y
280	Camelback Garden Farms	Maricopa	2 North	2 West	21	64	27-400322.0000	1/28/02	Arizona Water Co - White Tanks	Y
281	Sedella	Maricopa	2 North	2 West	22	1168	27-402152.0000	10/2/06	Arizona American Water Co - Agua Fria	Y
282	Palm Valley Phase V, Parcels 1-22	Maricopa	2 North	2 West	24	1695	27-401395.0000	11/19/04	Litchfield Park Service Co	Y
282	Palm Valley Phase VI Perimeter West	Maricopa	2 North	2 West	24	35	27-700230.0000	7/24/07	Litchfield Park Service Co	Y
283	Litchfield Farms	Maricopa	2 North	2 West	28	43	27-400574.0000	1/28/02	Arizona Water Co - White Tanks	Y
283	Litchfield Farms II Unit B	Maricopa	2 North	2 West	28	98	27-400575.0000	1/4/02	Arizona Water Co - White Tanks	Y
283	Litchfield Farms II Unit A	Maricopa	2 North	2 West	28	94	27-400576.0000	1/3/02	Arizona Water Co - White Tanks	Y
284	Verrado Parcel 4.604	Maricopa	2 North	2 West	30	13	27-400812.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.605	Maricopa	2 North	2 West	30	56	27-400813.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.608	Maricopa	2 North	2 West	30	36	27-400814.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.609	Maricopa	2 North	2 West	30	51	27-400815.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.612	Maricopa	2 North	2 West	30	55	27-400818.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.615	Maricopa	2 North	2 West	30	39	27-400821.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.601	Maricopa	2 North	2 West	30	27	27-400824.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.602	Maricopa	2 North	2 West	30	44	27-400825.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.606	Maricopa	2 North	2 West	30	46	27-400826.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
284	Verrado Parcel 4.610 (2nd submittal)	Maricopa	2 North	2 West	30	51	27-400975.0000	8/27/03	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.623	Maricopa	2 North	2 West	30	34	27-401334.0000	10/19/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.801	Maricopa	2 North	2 West	30	108	27-401420.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.905	Maricopa	2 North	2 West	30	34	27-401430.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.904	Maricopa	2 North	2 West	30	45	27-401431.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.903	Maricopa	2 North	2 West	30	61	27-401432.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.902	Maricopa	2 North	2 West	30	52	27-401433.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.901	Maricopa	2 North	2 West	30	55	27-401434.0000	11/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.802	Maricopa	2 North	2 West	30	38	27-401508.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.803	Maricopa	2 North	2 West	30	11	27-401509.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.804	Maricopa	2 North	2 West	30	50	27-401510.0000	12/9/04	Arizona American Water Co - Agua Fria	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
285	Verrado Parcel 4.808	Maricopa	2 North	2 West	30	19	27-401514.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.809	Maricopa	2 North	2 West	30	49	27-401515.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.810	Maricopa	2 North	2 West	30	25	27-401516.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.811	Maricopa	2 North	2 West	30	52	27-401517.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 3.202	Maricopa	2 North	2 West	30	37	27-401703.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 4.805	Maricopa	2 North	2 West	30 & 31	72	27-401763.0000	7/7/05	Arizona American Water Co - Agua Fria	Y
285	Verrado Parcel 3.209	Maricopa	2 North	2 West	30	36	27-401710.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 4.805	Maricopa	2 North	2 West	30 & 31	87	27-401511.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 4.806	Maricopa	2 North	2 West	30 & 31	39	27-401512.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 4.807	Maricopa	2 North	2 West	30 & 31	87	27-401513.0000	12/9/04	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 3.203	Maricopa	2 North	2 West	30 & 31	58	27-401704.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 3.204	Maricopa	2 North	2 West	30 & 31	50	27-401705.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
286	Verrado Parcel 3.207	Maricopa	2 North	2 West	30 & 31	22	27-401708.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
287	Verrado Parcel 5.804	Maricopa	2 North	2 West	0; and 2 North 3 West 2	36	27-400960.0000	9/8/03	Arizona American Water Co - Agua Fria	Y
287	Verrado Parcel 3.101	Maricopa	2 North	2 West	0; and 2 North 3 West 2	109	27-401575.0000	4/4/05	Arizona American Water Co - Agua Fria	Y
287	Verrado Parcel 3.201	Maricopa	2 North	2 West	0; and 2 North 3 West 2	38	27-401702.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.401	Maricopa	2 North	2 West	31	12	27-401691.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.402	Maricopa	2 North	2 West	31	17	27-401692.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.403	Maricopa	2 North	2 West	31	30	27-401693.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.404	Maricopa	2 North	2 West	31	40	27-401694.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.405	Maricopa	2 North	2 West	31	73	27-401695.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.406	Maricopa	2 North	2 West	31	32	27-401696.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.407	Maricopa	2 North	2 West	31	14	27-401697.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.409	Maricopa	2 North	2 West	31	18	27-401698.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.410	Maricopa	2 North	2 West	31	14	27-401699.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.411	Maricopa	2 North	2 West	31	14	27-401700.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.412	Maricopa	2 North	2 West	31	27	27-401701.0000	7/11/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.205	Maricopa	2 North	2 West	31	51	27-401706.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.206	Maricopa	2 North	2 West	31	43	27-401707.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.208	Maricopa	2 North	2 West	31	62	27-401709.0000	7/12/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.303	Maricopa	2 North	2 West	31	48	27-401769.0000	8/26/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.304	Maricopa	2 North	2 West	31	17	27-401770.0000	8/26/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.308	Maricopa	2 North	2 West	31	82	27-401771.0000	8/25/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.301	Maricopa	2 North	2 West	31	78	27-401844.0000	11/30/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.306	Maricopa	2 North	2 West	31	43	27-401845.0000	11/30/05	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 3.311	Maricopa	2 North	2 West	31	14	27-401846.0000	11/18/05	Arizona American Water Co - Agua Fria	Y
288	Verrado, Parcel 2.102	Maricopa	2 North	2 West	31	56	27-402031.0000	6/16/06	Arizona American Water Co - Agua Fria	Y
288	Verrado, Parcel 2.101	Maricopa	2 North	2 West	31	46	27-402032.0000	6/16/06	Arizona American Water Co - Agua Fria	Y
288	Verrado, Parcel 2.202	Maricopa	2 North	2 West	31	18	27-402126.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado, Parcel 2.203	Maricopa	2 North	2 West	31	15	27-402127.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado, Parcel 2.204	Maricopa	2 North	2 West	31	12	27-402128.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.205	Maricopa	2 North	2 West	31	54	27-402129.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.207	Maricopa	2 North	2 West	31	38	27-402130.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.206	Maricopa	2 North	2 West	31	21	27-402131.0000	8/28/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.208	Maricopa	2 North	2 West	31	14	27-402132.0000	8/28/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.209	Maricopa	2 North	2 West	31	17	27-402133.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.210	Maricopa	2 North	2 West	31	48	27-402134.0000	8/18/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.301	Maricopa	2 North	2 West	31	24	27-402153.0000	8/15/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.302	Maricopa	2 North	2 West	31	36	27-402154.0000	8/15/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.304	Maricopa	2 North	2 West	31	18	27-402155.0000	8/15/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.305	Maricopa	2 North	2 West	31	6	27-402156.0000	8/22/06	Arizona American Water Co - Agua Fria	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
288	Verrado Parcel 2.306	Maricopa	2 North	2 West	31	36	27-402157.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.307	Maricopa	2 North	2 West	31	29	27-402158.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
288	Verrado Parcel 2.308	Maricopa	2 North	2 West	31	10	27-402159.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
290	Paloma Vista	Maricopa	2 North	2 West	33	648	27-402117.0000	7/6/06	Arizona Water Co - White Tanks	Y
291	Verrado Parcel 4.603	Maricopa	2 North	2 West	19 & 30	65	27-400811.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
291	Verrado Parcel 4.614	Maricopa	2 North	2 West	19 & 30	40	27-400820.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
291	Verrado Parcel 4.607	Maricopa	2 North	2 West	19 & 30	42	27-400827.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
291	Verrado Parcel 4.611 (2nd submittal)	Maricopa	2 North	2 West	19 & 30	48	27-400976.0000	8/27/03	Arizona American Water Co - Agua Fria	Y
292	Pebblecreek Unit 26,27,28,29 & 30	Maricopa	2 North	2 West; 1 West	25 & 26; 31	538	27-400185.0000	2/17/00	Litchfield Park Service Co	Y
293	Pebblecreek Units 31 thru 65	Maricopa	2 North	2 West; 3 West	25 & 36;30 & 31	3618	27-400287.0000	2/7/01	Litchfield Park Service Co	Y
295	Verrado Parcel 5.703	Maricopa	2 North	2 West; 3 West	30;24 & 25	53	27-400823.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
296	Verrado Parcel 5.702	Maricopa	2 North	2 West; 3 West	30;25	47	27-400822.0000	1/13/03	Arizona American Water Co - Agua Fria	Y
297	Verrado Parcel 5.603	Maricopa	2 North	2 West	9; and 2 North 3 West 2	35	27-401254.0000	8/5/04	Arizona American Water Co - Agua Fria	Y
298	Verrado Parcel 5.704	Maricopa	2 North	3 West	24	20	27-401025.0000	1/6/04	Arizona American Water Co - Agua Fria	Y
298	Verrado Parcel 5.604	Maricopa	2 North	3 West	24	14	27-401342.0000	9/20/04	Arizona American Water Co - Agua Fria	Y
298	Verrado Parcel 5.707	Maricopa	2 North	3 West	24	38	27-401396.0000	10/19/04	Arizona American Water Co - Agua Fria	Y
299	Verrado Parcel 5.502	Maricopa	2 North	3 West	24	32	27-402123.0000	10/4/06	Arizona American Water Co - Agua Fria	Y
299	Verrado Parcel 5.503	Maricopa	2 North	3 West	24	29	27-402124.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
299	Verrado Parcel 5.505	Maricopa	2 North	3 West	24	64	27-402125.0000	8/11/06	Arizona American Water Co - Agua Fria	Y
299	Verrado Parcel 5.504	Maricopa	2 North	3 West	24	10	27-402162.0000	8/22/06	Arizona American Water Co - Agua Fria	Y
299	Verrado Parcel 5.420	Maricopa	2 North	3 West	24	61	27-700318.0000	7/3/07	Arizona American Water Co - Agua Fria	Y
300	Verrado Parcel 5.801	Maricopa	2 North	3 West	24 & 25	56	27-400970.0000	9/8/03	Arizona American Water Co - Agua Fria	Y
300	Verrado Parcel 5.701	Maricopa	2 North	3 West	24 & 25	15	27-401000.0000	10/28/03	Arizona American Water Co - Agua Fria	Y
301	Verrado Parcel 5.803	Maricopa	2 North	3 West	25	25	27-400959.0000	2/17/04	Arizona American Water Co - Agua Fria	Y
301	Verrado Parcel 5.802	Maricopa	2 North	3 West	25	45	27-401094.0000	1/8/04	Arizona American Water Co - Agua Fria	Y
302	Fireside at Sienna Hills, Parcels 1-6 South Parcels 1-2,3A,3B 5,6,7B,8-10,11A-C, 12 North	Maricopa	2 North	3 West	36	1029	27-500015.0000	8/6/07	Arizona American Water Co - Agua Fria	Y
303	Anthem at Sun Valley South, Units 3, 5, 7, 9, 11, 13, 15 & 17	Maricopa	2 North	4 West	9 & 10	965	27-402230.0000	4/11/08	Town of Buckeye	Y
304	Tartesso Unit 1, Parcel 1.10	Maricopa	2 North	4 West	9 & 20	84	27-401168.0000	6/28/04	Town of Buckeye	Y
311	West Phoenix Estates #4,6	Maricopa	2 North	7 West	10, 11 & 14	128	27-200395.0000	6/11/97	Water Utility of Greater Tonopah	N
313	Elianto Village 4	Maricopa	2 North	4 West	17 & 18	3695	27-401977.0000	8/14/06	Town of Buckeye	Y
314	Elianto Village 1	Maricopa	2 North	4 West	22, 27 & 28	1745	27-401943.0000	8/7/06	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.3	Maricopa	2 North	4 West	29	112	27-401163.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.4	Maricopa	2 North	4 West	29	89	27-401164.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.5	Maricopa	2 North	4 West	29	77	27-401165.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.6	Maricopa	2 North	4 West	29	86	27-401166.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.9	Maricopa	2 North	4 West	29	91	27-401167.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.11	Maricopa	2 North	4 West	29	132	27-401169.0000	6/28/04	Town of Buckeye	Y
315	Tartesso Unit 1, Parcel 1.12	Maricopa	2 North	4 West	29	95	27-401170.0000	6/28/04	Town of Buckeye	Y
316	Tartesso Unit 2, Parcel 2.16	Maricopa	2 North	4 West	19 & 30	87	27-401452.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.3	Maricopa	2 North	4 West	30	147	27-401442.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.4	Maricopa	2 North	4 West	30	124	27-401443.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.6	Maricopa	2 North	4 West	30	120	27-401444.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.7	Maricopa	2 North	4 West	30	94	27-401445.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.8	Maricopa	2 North	4 West	30	114	27-401446.0000	3/17/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.9	Maricopa	2 North	4 West	30	191	27-401447.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.10	Maricopa	2 North	4 West	30	98	27-401448.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.11	Maricopa	2 North	4 West	30	136	27-401449.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.13	Maricopa	2 North	4 West	30	93	27-401450.0000	3/18/05	Town of Buckeye	Y
317	Tartesso Unit 2, Parcel 2.17	Maricopa	2 North	4 West	30	92	27-401453.0000	3/21/05	Town of Buckeye	Y
318	Tartesso Unit 2, Parcel 2.15	Maricopa	2 North	4 West	0; and 2 North 5 West 2	130	27-401451.0000	3/21/05	Town of Buckeye	Y
318	Tartesso Unit 2, Parcel 2.18	Maricopa	2 North	4 West	0; and 2 North 5 West 2	87	27-401454.0000	3/21/05	Town of Buckeye	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
318	Tartesso Unit 2, Parcel 2.19	Maricopa	2 North	4 West	0; and 2 North 5 West 2	79	27-401455.0000	3/17/05	Town of Buckeye	Y
318	Tartesso Unit 2, Parcel 2.21	Maricopa	2 North	4 West	0; and 2 North 5 West 2	79	27-401457.0000	3/18/05	Town of Buckeye	Y
318	Tartesso Unit 2, Parcel 2.22	Maricopa	2 North	4 West	0; and 2 North 5 West 2	94	27-401458.0000	3/18/05	Town of Buckeye	Y
318	Tartesso Unit 2, Parcel 2.23	Maricopa	2 North	4 West	0; and 2 North 5 West 2	156	27-401459.0000	3/17/05	Town of Buckeye	Y
319	Tartesso Unit 2, Parcel 2.25	Maricopa	2 North	5 West	24 & 25	94	27-401460.0000	3/18/05	Town of Buckeye	Y
320	Tartesso Unit 2, Parcel 2.20	Maricopa	2 North	5 West	25	87	27-401456.0000	3/18/05	Town of Buckeye	Y
320	Tartesso Unit 2, parcel 2.26	Maricopa	2 North	5 West	25	118	27-401461.0000	3/21/05	Town of Buckeye	Y
320	Tartesso Unit 2, Parcel 2.27	Maricopa	2 North	5 West	25	139	27-401462.0000	3/21/05	Town of Buckeye	Y
320	Tartesso Unit 2, Parcel 2.28	Maricopa	2 North	5 West	25	105	27-401463.0000	3/18/05	Town of Buckeye	Y
320	Tartesso Unit 2, Parcel 2.29	Maricopa	2 North	5 West	25	145	27-401464.0000	3/18/05	Town of Buckeye	Y
321	Country Meadows #9	Maricopa	2 North	1 East	6	265	27-200082.0000	2/11/82	NA	N
330	Lincoln at Tatum Subdivision	Maricopa	2 North	4 East	8	7	27-300063.0000	6/19/96	Arizona American Water Company - Paradise Valley	Y
330	La Posada Property	Maricopa	2 North	4 East	8	102	27-401479.0000	2/25/05	Arizona American Water Co - Agua Fria	Y
330	La Posada Property	Maricopa	2 North	4 East	8	22	27-401756.0000	10/11/05	Arizona American Water Company - Paradise Valley	Y
332	Rancho Valencia	Maricopa	2 North	4 East	10	7	27-402193.0000	9/21/06	Arizona American Water Company - Paradise Valley	Y
333	Lincoln Place	Maricopa	2 North	4 East	11	56	27-300112.0000	5/20/96	Arizona American Water Company - Paradise Valley	Y
333	Paradise View Villas Condominiums	Maricopa	2 North	4 East	11	52	27-400784.0000	12/5/02	Arizona American Water Company - Paradise Valley	Y
333	Corriente Condominiums	Maricopa	2 North	4 East	11	192	27-401838.0000	10/26/06	Arizona American Water Company - Paradise Valley	Y
335	Invergordon Manor	Maricopa	2 North	4 East	15	10	27-402200.0000	9/21/06	Arizona American Water Company - Paradise Valley	Y
337	Judson Estates	Maricopa	2 North	4 East	3 & 10	32	27-400403.0000	3/14/01	Arizona American Water Company - Paradise Valley	Y
342	Sossaman Estates, Phase A	Maricopa	2 North	7 East	7 & 18	113	27-402278.0000	1/17/07	Queen Creek Water Co	Y
344	Legacy Parc	Maricopa	1 North	1 West	34	56	27-400075.0000	10/1/99	Litchfield Park Service Co	
345	Palm Valley Phase VIII, South Parcel	Maricopa	1 North	1 West	6 & 31	817	27-401851.0000	4/5/06	Litchfield Park Service Co	Y
346	Canada Village	Maricopa	1 North	2 West	3	134	27-200018.0000	11/10/80	Arizona Water Co - White Tanks	N
347	EDC Estates	Maricopa	1 North	2 West	4	8	27-400212.0000	3/13/00	Arizona Water Co - White Tanks	Y
348	Parkman Ranch	Maricopa	1 North	2 West	4	633	27-400440.0000	8/13/01	Arizona Water Co - White Tanks	Y
349	Jackrabbit Trails	Maricopa	1 North	2 West	5	347	27-400439.0000	9/25/01	Arizona Water Co - White Tanks	Y
349	Blue Horizon Villages, Parcel No's 1-4	Maricopa	1 North	2 West	8	309	27-400422.0000	3/14/01	Arizona Water Co - White Tanks	N
351	Blue Horizons	Maricopa	1 North	2 West	08	1977	27-401663.0000	8/8/05	Arizona Water Co - White Tanks	Y
352	Vista de Montana	Maricopa	1 North	2 West	9	1100	27-400926.0000	8/8/03	Arizona Water Co - White Tanks	Y
353	Hilyuri Arabians	Maricopa	1 North	2 West	15	4	27-200144.0000	2/9/84	NA	N
354	Primrose Estates	Maricopa	1 North	2 West	17	54	27-300206.0000	2/12/97	Water Utility of Greater Buckeye	N
355	Perryville Broadway	Maricopa	1 North	2 West	21	1025	27-401923.0000	7/31/06	Town of Buckeye	Y
356	Cottonwood	Maricopa	1 North	2 West	16 & 21	999	27-401779.0000	3/21/06	Town of Buckeye	Y
359	Sundance Parcel 2	Maricopa	1 North	3 West	9	309	27-400742.0000	9/27/02	Town of Buckeye	Y
360	Acacia Crossing	Maricopa	1 North	3 West	9	241	27-401034.0000	1/8/04	Town of Buckeye	Y
361	Sundance Parcel 7	Maricopa	1 North	3 West	9	242	27-401532.0000	2/22/05	Town of Buckeye	Y
362	Sundance Parcel 36	Maricopa	1 North	3 West	9 & 15	252	27-400602.0000	8/15/02	Town of Buckeye	Y
363	Sundance Parcel 13	Maricopa	1 North	3 West	10	103	27-400588.0000	6/24/02	Town of Buckeye	Y
363	Sundance Parcel 29	Maricopa	1 North	3 West	10	90	27-400590.0000	6/24/02	Town of Buckeye	Y
363	Sundance Parcel 21	Maricopa	1 North	3 West	10	101	27-400721.0000	7/26/02	Town of Buckeye	Y
363	Sundance Cove	Maricopa	1 North	3 West	10	114	27-401279.0000	9/14/04	Town of Buckeye	Y
363	Sundance Cove	Maricopa	1 North	3 West	10	80	27-401290.0000	9/3/04	Town of Buckeye	Y
363	Sundance Cove II	Maricopa	1 North	3 West	10	124	27-401960.0000	8/28/06	Town of Buckeye	Y
364	Sundance Parcel 15	Maricopa	1 North	3 West	10	230	27-401282.0000	4/29/04	Town of Buckeye	Y
365	Sundance Parcel 12	Maricopa	1 North	3 West	10	63	27-400586.0000	6/24/02	Town of Buckeye	Y
365	Sundance Parcel 28A	Maricopa	1 North	3 West	10	104	27-400589.0000	6/24/02	Town of Buckeye	Y
365	Sundance Parcel 14	Maricopa	1 North	3 West	10	87	27-400747.0000	12/5/02	Town of Buckeye	Y
365	Sundance Parcel 15	Maricopa	1 North	3 West	10	237	27-400748.0000	11/22/02	Town of Buckeye	Y
365	Sundance Parcel 24	Maricopa	1 North	3 West	10	43	27-400749.0000	11/22/02	Town of Buckeye	Y
365	Sundance Parcel 28B	Maricopa	1 North	3 West	10	174	27-400750.0000	3/28/03	Town of Buckeye	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
366	Sundance Parcel 18	Maricopa	1 North	3 West	11	108	27-400719.0000	8/15/02	Town of Buckeye	Y
366	Sundance Parcel 20	Maricopa	1 North	3 West	11	106	27-400720.0000	8/15/02	Town of Buckeye	Y
366	Sundance Parcel 19	Maricopa	1 North	3 West	11	236	27-400855.0000	5/1/03	Town of Buckeye	Y
366	Sundance Parcel 20A	Maricopa	1 North	3 West	11	33	27-400856.0000	5/7/03	Town of Buckeye	Y
366	Sundance Parcel 16	Maricopa	1 North	3 West	11	136	27-400888.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 17	Maricopa	1 North	3 West	11	117	27-400889.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 22	Maricopa	1 North	3 West	11	157	27-400890.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 23a	Maricopa	1 North	3 West	11	161	27-400891.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 23b	Maricopa	1 North	3 West	11	50	27-400892.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 25	Maricopa	1 North	3 West	11	112	27-400893.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 26	Maricopa	1 North	3 West	11	111	27-400894.0000	10/29/03	Town of Buckeye	Y
366	Sundance Parcel 27	Maricopa	1 North	3 West	11	177	27-400895.0000	10/29/03	Town of Buckeye	Y
366	Windmill Village	Maricopa	1 North	3 West	11	513	27-401008.0000	10/7/04	Town of Buckeye	Y
367	Sundance Parcel 22	Maricopa	1 North	3 West	11	150	27-401283.0000	5/3/04	Town of Buckeye	Y
367	Sundance Parcel 23B	Maricopa	1 North	3 West	11	54	27-401359.0000	8/23/04	Town of Buckeye	Y
367	Sundance Parcel 16	Maricopa	1 North	3 West	11	132	27-401503.0000	12/9/04	Town of Buckeye	Y
367	Sundance Parcel 23A	Maricopa	1 North	3 West	11	156	27-401504.0000	11/23/04	Town of Buckeye	Y
367	Sundance Parcel 17	Maricopa	1 North	3 West	11	114	27-401505.0000	11/23/04	Town of Buckeye	Y
368	Sundance Parcel 46B	Maricopa	1 North	3 West	13	126	27-401486.0000	8/30/05	Town of Buckeye	Y
368	Sundance Parcel 45C	Maricopa	1 North	3 West	13	46	27-401679.0000	8/26/05	Town of Buckeye	Y
368	Sundance Parcel 10	Maricopa	1 North	3 West	13	25	27-401680.0000	8/26/05	Town of Buckeye	Y
368	Sundance Parcel 47	Maricopa	1 North	3 West	13	11	27-401681.0000	8/26/05	Town of Buckeye	Y
368	Sundance Parcel 49A	Maricopa	1 North	3 West	13	81	27-401682.0000	8/26/05	Town of Buckeye	Y
368	Sundance Parcel 48	Maricopa	1 North	3 West	13	249	27-401808.0000	8/30/05	Town of Buckeye	Y
369	Sundance Parcel 45A	Maricopa	1 North	3 West	14	70	27-401161.0000	3/26/04	Town of Buckeye	Y
369	Sundance Parcels 34b and 43	Maricopa	1 North	3 West	14	220	27-401237.0000	9/20/04	Town of Buckeye	Y
369	Coyote Ridge	Maricopa	1 North	3 West	14	264	27-402013.0000	5/18/06	Town of Buckeye	Y
370	Sundance Parcel 46A	Maricopa	1 North	3 West	13 & 14	128	27-401482.0000	8/31/05	Town of Buckeye	Y
371	Sundance Parcel 40	Maricopa	1 North	3 West	14	213	27-400570.0000	3/1/02	Town of Buckeye	Y
371	Sundance Parcel 41	Maricopa	1 North	3 West	14	61	27-400916.0000	2/2/04	Town of Buckeye	Y
371	Sundance Parcel 42	Maricopa	1 North	3 West	14	150	27-400917.0000	2/2/04	Town of Buckeye	Y
371	Sundance Parcel 45B	Maricopa	1 North	3 West	14	40	27-401485.0000	12/6/04	Town of Buckeye	Y
372	Sundance Parcel 37B	Maricopa	1 North	3 West	15	213	27-400569.0000	2/8/02	Town of Buckeye	Y
372	Sundance Parcel 31	Maricopa	1 North	3 West	15	310	27-400806.0000	3/13/03	Town of Buckeye	Y
372	Sundance Parcel 38	Maricopa	1 North	3 West	15	49	27-401162.0000	3/26/04	Town of Buckeye	Y
372	Sundance Parcel 32	Maricopa	1 North	3 West	15	87	27-401497.0000	10/19/04	Town of Buckeye	Y
373	Sundance Parcel 37A	Maricopa	1 North	3 West	15	188	27-400585.0000	6/24/02	Town of Buckeye	Y
373	Sundance Parcel 32	Maricopa	1 North	3 West	15	85	27-400941.0000	10/29/03	Town of Buckeye	Y
373	Sundance Parcel 33	Maricopa	1 North	3 West	15	36	27-400942.0000	10/29/03	Town of Buckeye	Y
373	Sundance Parcel 35	Maricopa	1 North	3 West	15	44	27-400943.0000	10/29/03	Town of Buckeye	Y
374	Watson Estates Parcels 1 - 10	Maricopa	1 North	3 West	16	868	27-401788.0000	1/12/06	Valencia Water Co	Y
374	Anderson Parc	Maricopa	1 North	3 West	16	242	27-401886.0000	3/15/06	Valencia Water Co	Y
374	Desert Moon Estates	Maricopa	1 North	3 West	16	739	27-402056.0000	6/14/06	Valencia Water Co	Y
375	The Village at Sundance Phase 1,2 & 3	Maricopa	1 North	3 West	17	615	27-401993.0000	5/18/06	Valencia Water Co	Y
376	Westpark Phase 1, Parcel 3N	Maricopa	1 North	3 West	18	89	27-401273.0000	8/18/04	Valencia Water Co	Y
376	Westpark Phase 1, Parcel 4S	Maricopa	1 North	3 West	18	90	27-401274.0000	9/20/04	Valencia Water Co	Y
376	Westpark Phase 1, Parcel 3S	Maricopa	1 North	3 West	18	73	27-401275.0000	8/18/04	Valencia Water Co	Y
376	Westpark Phase 1, parcel 4N	Maricopa	1 North	3 West	18	132	27-401276.0000	8/18/04	Valencia Water Co	Y
377	Northwood Park Estates	Maricopa	1 North	3 West	19	43	27-200210.0000	3/1/93	Valencia Water Co	N
377	Northwood Park Estates	Maricopa	1 North	3 West	19	69	27-200211.0000	6/27/94	Valencia Water Co	N
377	Westpark Phase 1, Parcel 2N	Maricopa	1 North	3 West	19	74	27-401192.0000	4/7/04	Valencia Water Co	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
377	Westpark Phase 1, Parcel 2S	Maricopa	1 North	3 West	19	53	27-401193.0000	4/7/04	Valencia Water Co	Y
377	Westpark Phase 1, Parcel 15N	Maricopa	1 North	3 West	19	62	27-401194.0000	4/15/04	Valencia Water Co	Y
377	Westpark Phase 1, Parcel 17S	Maricopa	1 North	3 West	19	97	27-401195.0000	6/15/04	Valencia Water Co	
377	Westpark Phase 1, Parcel 16S	Maricopa	1 North	3 West	19	93	27-401197.0000	4/29/04	Valencia Water Co	Y
377	Westpark Phase 1, Parcel 16N	Maricopa	1 North	3 West	19	75	27-401198.0000	4/29/04	Valencia Water Co	Y
377	Westpark Phase 1, Parcel 17N	Maricopa	1 North	3 West	19	144	27-401199.0000	4/29/04	Valencia Water Co	Y
377	Westpark Phase 1, Parcel 15S	Maricopa	1 North	3 West	19	38	27-401200.0000	6/8/04	Valencia Water Co	Y
378	Westpark Phase 2, Parcels 13 & 14	Maricopa	1 North	3 West	9; and 1 North 4 West 2	214	27-401626.0000	3/28/05	Town of Buckeye	Y
379	Rancho Vista	Maricopa	1 North	3 West	20	264	27-400461.0000	8/17/01	Valencia Water Co	N
379	Estrella Vista	Maricopa	1 North	3 West	20	535	27-400752.0000	8/27/02	Valencia Water Co	Y
380	Apache Farms	Maricopa	1 North	3 West	21	277	27-401914.0000	5/23/06	Valencia Water Co	Y
380	Tyler Ranch	Maricopa	1 North	3 West	21	306	27-401933.0000	3/15/06	Valencia Water Co	Y
380	San Madera	Maricopa	1 North	3 West	21	489	27-402078.0000	6/4/07	Valencia Water Co	Y
381	Siesta Lago Estates	Maricopa	1 North	3 West	22	122	27-401938.0000	6/9/06	Town of Buckeye	Y
382	Ventana Ranch	Maricopa	1 North	3 West	27	963	27-402143.0000	4/2/07	Town of Buckeye	Y
383	Montana Vista	Maricopa	1 North	3 West	28	283	27-400864.0000	7/15/03	Valencia Water Co	Y
383	Riata West	Maricopa	1 North	3 West	28	889	27-400874.0000	2/25/04	Valencia Water Co	Y
383	Sonoran Vista	Maricopa	1 North	3 West	28	543	27-400997.0000	11/24/03	Valencia Water Co	N
383	Vista Bonita	Maricopa	1 North	3 West	28	275	27-500087.0000	5/18/07	Valencia Water Co	Y
384	Dove Cove Estates	Maricopa	1 North	3 West	29	345	27-400423.0000	3/30/01	Valencia Water Co	Y
384	Miller Manor Phase 1	Maricopa	1 North	3 West	29	105	27-400923.0000	8/13/03	Valencia Water Co	Y
384	Miller Manor Phase 2 and Phase 3	Maricopa	1 North	3 West	29	165	27-401285.0000	9/20/04	Valencia Water Co	Y
384	Crystal Vista	Maricopa	1 North	3 West	29	311	27-402069.0000	8/7/06	Valencia Water Co	Y
384	Mystic Vista	Maricopa	1 North	3 West	29	556	27-402261.0000	11/24/06	Valencia Water Co	Y
385	Copper Falls	Maricopa	1 North	3 West	30	641	27-402043.0000	10/2/06	Valencia Water Co	Y
390	Sunset Point	Maricopa	1 North	3 West	31	408	27-400374.0000	9/11/00	Valencia Water Co	Y
391	Sunset Point II	Maricopa	1 North	3 West	31	304	27-400974.0000	10/20/03	Valencia Water Co	Y
391	Buckeye 320, Phase 1	Maricopa	1 North	3 West	31	311	27-401127.0000	2/26/04	Valencia Water Co	Y
391	Miller Park	Maricopa	1 North	3 West	31	96	27-401945.0000	2/17/06	Valencia Water Co	Y
391	Miller Buckeye 80	Maricopa	1 North	3 West	31	286	27-402160.0000	9/21/06	Valencia Water Co	Y
392	Blue Hills	Maricopa	1 North	3 West	31	229	27-401598.0000	3/2/05	Valencia Water Co	Y
393	Valencia	Maricopa	1 North	3 West	32	6	27-200371.0000	12/19/88	Valencia Water Co	N
393	Buckeye Park	Maricopa	1 North	3 West	32	117	27-400265.0000	4/21/00	Valencia Water Co	Y
394	Blue Hills	Maricopa	1 North	3 West	31 & 32	470	27-400421.0000	3/14/01	Valencia Water Co	
395	Cotton Meadows	Maricopa	1 North	3 West	28 & 33	877	27-401981.0000	7/6/06	Valencia Water Co	Y
400	Westwind, Parcels 1-B, 1-C & 1-D	Maricopa	1 North	4 West	21	242	27-402029.0000	3/19/07	Water Utility of Greater Buckeye	Y
400	Westwind, parcels 1-A & 1-E	Maricopa	1 North	4 West	21	143	27-402112.0000	3/19/07	Water Utility of Greater Buckeye	Y
401	Westpark Phase 2 Parcels 7, 8, 19, and 20N	Maricopa	1 North	4 West	13 & 24	447	27-402138.0000	10/19/07	Town of Buckeye	Y
402	Westpark Phase 2, Parcels 18S & 20S	Maricopa	1 North	4 West	24	226	27-401795.0000	11/15/05	Town of Buckeye	Y
403	Vista Del Sol	Maricopa	1 North	4 West	25	540	27-402083.0000	10/19/07	Town of Buckeye	Y
404	Farallon	Maricopa	1 North	4 West	36	902	27-401860.0000	5/7/06	Town of Buckeye	Y
405	West Phoenix Estates #10,11,12	Maricopa	1 North	4 West	1 & 6	262	27-200396.0000	6/20/95	Water Utility of Greater Buckeye	
406	Montana Vista	Maricopa	1 North	5 West	1	52	27-402087.0000	10/2/06	Water Utility of Greater Buckeye	Y
408	Phoenix Valley West #1,2	Maricopa	1 North	5 West	4, 6 & 7	579	27-200227.0000	4/22/82	NA	N
409	Butterfield Stagecoach Farms	Maricopa	1 North	5 West	8, 9, 16 & 17	36	27-300150.0000	11/19/96	NA	N
411	Dixie Park	Maricopa	1 North	5 West	28	12	27-200104.0000	1/4/81	NA	N
415	Buckeye Ranch	Maricopa	1 North	6 West	13	201	27-300290.0000	11/17/98	Water Utility of Greater Tonopah	Y
416	Villa Rica	Maricopa	1 North	1 East	3	132	27-300032.0000	8/4/95	City of Tolleson	Y
417	Concord Sundancer Condominiums	Maricopa	1 North	1 East	4		27-200076.0000	5/29/85	City of Tolleson	N
417	Parkview Casitas	Maricopa	1 North	1 East	4		27-200219.0000	6/26/85	City of Tolleson	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
417	Camino Vista	Maricopa	1 North	1 East	4	18	27-401664.0000	8/31/05	City of Tolleson	Y
419	Coldwater Industrial Park	Maricopa	1 North	1 East	9	105	27-200070.0000	11/15/83	City of Tolleson	N
419	Mercy Manor	Maricopa	1 North	1 East	9	10	27-300551.0000	3/12/99	City of Tolleson	Y
420	Tolleson Meadows	Maricopa	1 North	1 East	10	173	27-401755.0000	10/6/05	City of Tolleson	Y
421	Three Rivers Units 1 & 2	Maricopa	1 North	1 East	28	118	27-400338.0000	4/17/01	NA	N
421	Terra Ranchette Estates	Maricopa	1 North	1 East	30	23	27-200343.0000	8/16/85	Rigby Water Co	N
428	Tonto Forest Estates	Maricopa	1 North	7 East	1	52	27-400807.0000	11/15/02	Arizona Water Co - Apache Junction	Y
428	The Enclave at Tonto Forest Estates	Maricopa	1 North	7 East	1	29	27-401967.0000	5/7/07	Arizona Water Co - Apache Junction	Y
429	Encanto Este	Maricopa	1 North	7 East	11	21	27-401678.0000	6/21/06	Arizona Water Co - Apache Junction	Y
429	Vista Montana	Maricopa	1 North	7 East	11	20	27-402223.0000	11/6/06	Arizona Water Co - Apache Junction	Y
430	Meridian Hills, Units 1-3	Maricopa	1 North	7 East	13	451	27-300078.0000	5/13/96	Arizona Water Co - Apache Junction	Y
430	University East	Maricopa	1 North	7 East	13	170	27-300300.0000	9/4/97	Arizona Water Co - Apache Junction	Y
430	Camberley Place	Maricopa	1 North	7 East	13	128	27-300465.0000	10/20/98	Arizona Water Co - Apache Junction	Y
430	Adobe Estates	Pinal	1 North	7 East	13	123	27-300570.0000	12/15/99	Arizona Water Co - Apache Junction	Y
430	Salerno Ranch	Maricopa	1 North	7 East	13	134	27-400251.0000	12/12/00	Arizona Water Co - Apache Junction	Y
431	Sagewood	Maricopa	1 North	7 East	14	34	27-400156.0000	12/14/00	Arizona Water Co - Apache Junction	Y
431	Sagewood Unit Two	Maricopa	1 North	7 East	14	33	27-400157.0000	12/14/00	Arizona Water Co - Apache Junction	Y
431	Superstition Heights	Maricopa	1 North	7 East	14	77	27-400182.0000	4/27/00	Arizona Water Co - Apache Junction	Y
431	Adobe Meadows	Maricopa	1 North	7 East	14	32	27-401537.0000	1/19/05	Arizona Water Co - Apache Junction	Y
432	Desert Vista Estates	Maricopa	1 North	7 East	15	72	27-200103.0000	11/23/81	NA	N
432	Superstition View	Maricopa	1 North	7 East	15	136	27-200340.0000	12/28/82	NA	N
435	Cherokee Mobile Estates #3	Maricopa	1 North	7 East	21	76	27-200051.0000	8/14/80	NA	N
436	Saguaro East	Maricopa	1 North	7 East	22	11	27-200306.0000	5/10/83	NA	N
437	Merrill Ranch	Maricopa	1 North	7 East	23	79	27-400158.0000	4/27/00	Arizona Water Co - Apache Junction	Y
438	Signal Butte Manor II	Maricopa	1 North	7 East	24	237	27-400136.0000	1/19/00	Arizona Water Co - Apache Junction	Y
438	Signal Butte Manor III	Maricopa	1 North	7 East	24	78	27-400462.0000	8/24/01	Arizona Water Co - Apache Junction	Y
439	Parkwood East	Maricopa	1 North	7 East	25	322	27-300381.0000	7/9/98	Arizona Water Co - Apache Junction	Y
439	Parkwood East II	Maricopa	1 North	7 East	25	178	27-300383.0000	7/10/98	Arizona Water Co - Apache Junction	Y
439	Signal Butte Manor	Maricopa	1 North	7 East	25	121	27-300571.0000	5/17/99	Arizona Water Co - Apache Junction	Y
439	Silverwood Units I & II	Maricopa	1 North	7 East	25	129	27-400077.0000	8/22/00	Arizona Water Co - Apache Junction	Y
440	Coralbell Estates	Maricopa	1 North	7 East	27	12	27-200079.0000	2/6/81	NA	N
440	Superstition Country #5	Maricopa	1 North	7 East	27	99	27-200338.0000	2/6/81	NA	N
440	Superstition Country V, Unit 4	Maricopa	1 North	7 East	27	18	27-200339.0000	6/1/83	NA	N
444	Superstition Mountain Estates	Pinal	1 North	8 East	15	20	27-401856.0000	3/8/06	Arizona Water Co - Apache Junction	Y
445	Idaho Creek Villas	Pinal	1 North	8 East	17	244	27-401255.0000	9/23/04	Arizona Water Co - Apache Junction	Y
446	Lost Dutchman Gardens	Maricopa	1 North	8 East	18	35	27-400159.0000	4/14/00	Arizona Water Co - Apache Junction	Y
446	Ironwood Trails	Pinal	1 North	8 East	18	18	27-402018.0000	4/25/06	Arizona Water Co - Apache Junction	Y
447	Renaissance Park-Apache Junction	Pinal	1 North	8 East	20	140	27-300319.0000	9/4/97	Arizona Water Co - Apache Junction	Y
447	Sierra Entrada Garden Homes, Unit II	Maricopa	1 North	8 East	20	8	27-400040.0000	10/6/99	Arizona Water Co - Apache Junction	Y
447	Sierra Entrada Garden Homes Unit 4	Pinal	1 North	8 East	20	15	27-401057.0000	5/18/04	Arizona Water Co - Apache Junction	Y
447	The Village @ Ironwood Townhomes	Pinal	1 North	8 East	20	29	27-402281.0000	2/26/07	Arizona Water Co - Apache Junction	Y
448	Broadway San Marcos Subdivision	Pinal	1 North	8 East	20	84	27-401858.0000	8/1/06	Arizona Water Co - Apache Junction	Y
449	Broadway Homes	Pinal	1 North	8 East	24	11	27-300171.0000	10/7/96	Arizona Water Co - Apache Junction	Y
449	Arroyo Vista Estates	Pinal	1 North	8 East	24	26	27-401623.0000	4/12/05	Arizona Water Co - Apache Junction	Y
450	Ironwood & Southern	Pinal	1 North	8 East	29	562	27-300293.0000	8/7/97	Arizona Water Co - Apache Junction	N
450	Ironwood Cove II	Pinal	1 North	8 East	29	34	27-300415.0000	5/21/98	Arizona Water Co - Apache Junction	Y
450	San Marcos Crossing	Pinal	1 North	8 East	29	28	27-401056.0000	3/24/04	Arizona Water Co - Apache Junction	Y
450	Monterey Casitas	Pinal	1 North	8 East	29	10	27-401621.0000	5/6/05	Arizona Water Co - Apache Junction	Y
450	Lantana Villas	Pinal	1 North	8 East	29	24	27-401955.0000	2/28/06	Arizona Water Co - Apache Junction	Y
451	Renaissance Point	Pinal	1 North	8 East	30	215	27-300107.0000	2/3/97	Arizona Water Co - Apache Junction	Y
451	Renaissance Point - Parcel 1, Phase 1	Pinal	1 North	8 East	30	76	27-300108.0000	7/9/96	Arizona Water Co - Apache Junction	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
451	Renaissance Point - Parcel 1, Phase 2	Pinal	1 North	8 East	30	6	27-300145.0000	7/22/96	Arizona Water Co - Apache Junction	Y
451	Meridian Manor	Pinal	1 North	8 East	30	445	27-300165.0000	11/20/96	Arizona Water Co - Apache Junction	Y
451	Vista Grande	Pinal	1 North	8 East	30	96	27-300425.0000	5/6/98	Arizona Water Co - Apache Junction	Y
451	Apache Dream Townhomes	Pinal	1 North	8 East	30	30	27-400210.0000	4/27/00	Arizona Water Co - Apache Junction	N
451	Apache Dream Townhomes	Pinal	1 North	8 East	30	30	27-400511.0000	8/9/01	Arizona Water Co - Apache Junction	Y
451	Casa Villa Subdivision	Pinal	1 North	8 East	30	38	27-402139.0000	8/14/06	Arizona Water Co - Apache Junction	Y
452	Ironwood Estates	Pinal	1 North	8 East	31	210	27-300378.0000	4/7/98	Arizona Water Co - Apache Junction	Y
453	Superstition Highlands	Pinal	1 North	9 East	30	104	27-300102.0000	5/16/96	Arizona Water Co - Apache Junction	Y
454	Ponderosa at Superstition Foothills	Pinal	1 North	9 East	31	81	27-300362.0000	1/16/98	Arizona Water Co - Apache Junction	Y
454	Acacia at Superstition Foothills	Pinal	1 North	9 East	31	18	27-300363.0000	1/1/98	Arizona Water Co - Apache Junction	Y
454	Parcel 7 at Superstition Foothills	Pinal	1 North	9 East	31	9	27-300396.0000	8/31/98	Arizona Water Co - Apache Junction	N
454	Parcel 8 at Superstition Foothills	Pinal	1 North	9 East	31	33	27-300397.0000	8/31/98	Arizona Water Co - Apache Junction	N
454	Parcel 9 at Superstition Foothills	Pinal	1 North	9 East	31	26	27-300398.0000	8/31/98	Arizona Water Co - Apache Junction	N
454	Sycamore Village at Superstition Fthls	Pinal	1 North	9 East	31	34	27-300543.0000	2/26/99	Arizona Water Co - Apache Junction	N
454	Peralta	Pinal	1 North	9 East	31	47	27-300593.0000	10/18/00	Arizona Water Co - Apache Junction	N
454	Parcel 6 at Superstition Foothills	Pinal	1 North	9 East	31	37	27-400696.0000	8/26/02	Arizona Water Co - Apache Junction	Y
455	Cottonwood Village at Superstition Fthls	Pinal	1 North	9 East	31	11	27-300544.0000	2/26/99	Arizona Water Co - Apache Junction	N
455	Parcel 5 at Superstition Foothills	Pinal	1 North	9 East	31	65	27-300605.0000	5/12/99	Arizona Water Co - Apache Junction	N
456	Parcel 16 at Superstition Foothills	Pinal	1 North	9 East	31 & 32	88	27-401066.0000	3/1/04	Arizona Water Co - Apache Junction	Y
456	Parcel 12 at Superstition Foothills	Pinal	1 North	9 East	31 & 32	41	27-300604.0000	5/12/99	Arizona Water Co - Apache Junction	N
456	Sunset Village at Superstition Foothills	Pinal	1 North	9 East	31 & 32	41	27-400302.0000	1/2/00	Arizona Water Co - Apache Junction	Y
457	Quail Canyon	Pinal	1 North	9 East	32	40	27-300540.0000	3/24/99	Arizona Water Co - Apache Junction	Y
457	Estates at Superstition Mountain	Pinal	1 North	9 East	32	28	27-400166.0000	5/30/00	Arizona Water Co - Apache Junction	Y
457	Canyon View Estates at Superstition Foothills	Pinal	1 North	9 East	32	21	27-400310.0000	10/13/00	Arizona Water Co - Apache Junction	N
457	The Casitas at First Water Village at Superstition	Pinal	1 North	9 East	32	72	27-400669.0000	5/24/02	Arizona Water Co - Apache Junction	N
457	Parcels 21 and 21A at Superstition Foothills	Pinal	1 North	9 East	32	68	27-400828.0000	1/24/03	Arizona Water Co - Apache Junction	Y
458	Lost Gold Estates Unit I at Superstition Foothills	Pinal	1 North	9 East	32	26	27-300585.0000	7/20/00	Arizona Water Co - Apache Junction	Y
458	Lost Gold Estates Unit II at Superstition Foothills	Pinal	1 North	9 East	32	23	27-300587.0000	7/20/00	Arizona Water Co - Apache Junction	Y
458	Lost Gold Estates Unit III at Superstition Foothills	Pinal	1 North	9 East	32	15	27-400027.0000	7/20/00	Arizona Water Co - Apache Junction	N
458	Silver Cholla Estates at Superstition Foothills	Pinal	1 North	9 East	32	34	27-700349.0000	2/5/08	Arizona Water Co - Apache Junction	Y
459	Pasion En La Colina Del Cascabel	Pinal	1 South	4 East	4	37	27-400337.0000	6/21/00	Arizona Water Co - Apache Junction	N
460	Sunrise Canyon	Pinal	1 South	8 East	29	81	27-400146.0000	8/26/99	Arizona Water Co - Apache Junction	N
472	Sunland Village East	Maricopa	1 South	7 East	5	314	27-200333.0000	1/24/84	Turner Ranches Water Sewer Co	N
474	Superstition View Ranchettes	Pinal	1 South	8 East	31	13	27-300013.0000	5/22/95	NA	N
475	Gold Canyon East	Pinal	1 South	9 East	4	123	27-300119.0000	5/21/96	Arizona Water Co - Apache Junction	Y
475	Mountain Whisper	Pinal	1 South	9 East	4	39	27-300546.0000	3/24/99	Arizona Water Co - Apache Junction	Y
475	Coyote Call	Pinal	1 South	9 East	4	125	27-300577.0000	7/9/99	Arizona Water Co - Apache Junction	N
475	Purple Sage II	Pinal	1 South	9 East	4	32	27-300578.0000	7/9/99	Arizona Water Co - Apache Junction	N
475	Purple Sage III	Pinal	1 South	9 East	4	32	27-300579.0000	7/9/99	Arizona Water Co - Apache Junction	Y
475	Horse Whisper (Hieroglyphic Trails)	Pinal	1 South	9 East	4	24	27-400128.0000	2/10/00	Arizona Water Co - Apache Junction	Y
475	Barkley Hill (Apacheland II)	Pinal	1 South	9 East	4	26	27-400216.0000	5/30/00	Arizona Water Co - Apache Junction	Y
476	Gold Canyon Ranch, Phase 4	Pinal	1 South	9 East	5	143	27-300220.0000	1/29/98	Arizona Water Co - Apache Junction	Y
477	Parcel 24 East at Gold Canyon Ranch	Pinal	1 South	9 East	6	103	27-300255.0000	5/27/97	Arizona Water Co - Apache Junction	Y
477	Parcel 22 West at Gold Canyon Ranch	Pinal	1 South	9 East	6	70	27-300301.0000	7/9/97	Arizona Water Co - Apache Junction	Y
477	Parcel 24 West at Gold Canyon Ranch	Pinal	1 South	9 East	6	103	27-300302.0000	11/3/97	Arizona Water Co - Apache Junction	N
477	Parcel 25 North at Gold Canyon Ranch	Pinal	1 South	9 East	6	79	27-300314.0000	8/8/97	Arizona Water Co - Apache Junction	Y
477	Parcel 22 East at Gold Canyon Ranch	Pinal	1 South	9 East	6	94	27-300315.0000	8/8/97	Arizona Water Co - Apache Junction	Y
477	Parcel 25 South at Gold Canyon Ranch	Pinal	1 South	9 East	6	72	27-300332.0000	3/11/98	Arizona Water Co - Apache Junction	Y
477	Superstition Foothills Parcel 26 2-A	Pinal	1 South	9 East	6	46	27-400114.0000	11/2/99	Arizona Water Co - Apache Junction	N
477	Superstition Foothills Parcel 23A	Pinal	1 South	9 East	6	28	27-400115.0000	11/12/99	Arizona Water Co - Apache Junction	Y
477	Superstition Foothills Parcel 28B	Pinal	1 South	9 East	6	103	27-400116.0000	1/28/00	Arizona Water Co - Apache Junction	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
477	Superstition Foothills Parcel 27B	Pinal	1 South	9 East	6	43	27-400117.0000	11/12/99	Arizona Water Co - Apache Junction	Y
477	Superstition Foothills Parcel 23B	Pinal	1 South	9 East	6	26	27-400118.0000	11/12/99	Arizona Water Co - Apache Junction	Y
477	Superstition Foothills Parcel 26C	Pinal	1 South	9 East	6	51	27-400119.0000	2/10/00	Arizona Water Co - Apache Junction	N
477	Superstition Foothills Parcel 26B	Pinal	1 South	9 East	6	96	27-400120.0000	11/2/99	Arizona Water Co - Apache Junction	N
477	Superstition Foothills Parcel 28A	Pinal	1 South	9 East	6	75	27-400121.0000	11/2/99	Arizona Water Co - Apache Junction	Y
477	Superstition Foothills Parcel 26 1-A	Pinal	1 South	9 East	6	17	27-400122.0000	11/12/99	Arizona Water Co - Apache Junction	N
477	Superstition Foothills Parcel 27A	Pinal	1 South	9 East	6	58	27-400123.0000	2/10/00	Arizona Water Co - Apache Junction	Y
478	Parcel 16A & 17 at Mountainbrook Village	Pinal	1 South	9 East	7	106	27-300278.0000	6/24/97	Arizona Water Co - Apache Junction	N
478	Parcel 18 at Mountainbrook Village	Pinal	1 South	9 East	7	94	27-300349.0000	3/2/98	Arizona Water Co - Apache Junction	Y
478	Parcel 15 at Mountainbrook Village	Pinal	1 South	9 East	7	68	27-300519.0000	4/20/99	Arizona Water Co - Apache Junction	Y
479	Foothills at Gold Canyon Ranch, The	Pinal	1 South	9 East	8	108	27-300246.0000	3/25/97	Arizona Water Co - Apache Junction	Y
479	Sunrise at Gold Canyon	Pinal	1 South	9 East	8	161	27-300373.0000	1/29/98	Arizona Water Co - Apache Junction	Y
479	Vista Point at Gold Canyon Ranch	Pinal	1 South	9 East	8	85	27-300449.0000	4/14/99	Arizona Water Co - Apache Junction	Y
479	Sierra Vista at Gold Canyon Ranch	Pinal	1 South	9 East	8	115	27-300458.0000	4/19/00	Arizona Water Co - Apache Junction	Y
479	Estates at Gold Canyon, The	Pinal	1 South	9 East	8	33	27-300479.0000	5/12/99	Arizona Water Co - Apache Junction	Y
479	Sierra Vista at Gold Canyon Ranch	Pinal	1 South	9 East	8	116	27-400307.0000	10/1/98	Arizona Water Co - Apache Junction	N
480	Phase 4-Parcel 3 @Gold Canyon E	Pinal	1 South	9 East	9	11	27-400047.0000	3/31/99	Arizona Water Co - Apache Junction	N
481	Peralta Preserve Units I, II and III	Pinal	1 South	9 East	16	832	27-400161.0000	1/12/99	Arizona Water Co - Apache Junction	Y
482	Parcel 3 at Superstition Foothills	Pinal	1 South	9 East	31	32	27-300269.0000	9/4/97	Arizona Water Co - Apache Junction	N
483	Petroglyph Estates @Superstition Foothills	Pinal	1 South	9 East	32	55	27-400315.0000	10/13/00	Arizona Water Co - Apache Junction	N
484	Parcel 13 at Superstition Foothills	Pinal	1 South	9 East	31 & 32	10	27-300403.0000	11/10/98	Arizona Water Co - Apache Junction	N
485	Vista del Corazon	Pinal	1 South	9 East	4 & 5	153	27-300226.0000	12/26/96	Arizona Water Co - Apache Junction	Y
486	Parcel 19 at Mountainbrook Village	Pinal	1 South	9 East	6 & 7	197	27-300350.0000	4/20/98	Arizona Water Co - Apache Junction	Y
487	Parcel 11 at Mountainbrook Village	Pinal	1 South	9 East	7 & 8	110	27-300099.0000	7/8/96	Arizona Water Co - Apache Junction	N
487	Parcels 10 and 14B/C at Mountainbrook	Pinal	1 South	9 East	7 & 8	199	27-300348.0000	3/2/98	Arizona Water Co - Apache Junction	N
488	Phase 1 at Entrada Del Oro	Pinal	1 South	10 East	30	372	27-400810.0000	12/15/03	Arizona Water Co - Apache Junction	Y
489	Magma Copper Company	Pinal	1 South	12 East	35 & 36	271	27-200192.0000	9/23/88	Arizona Water Co - Superior	N
490	Norte Vista	Maricopa	1 South	2 West	5	39	27-400292.0000	4/4/01	Town of Buckeye	Y
491	Southwest Desert Estates	Maricopa	1 South	2 West	17	32	27-400205.0000	1/18/01	Clearwater Utilities	Y
491	Southwest Desert Estates Two	Maricopa	1 South	2 West	17	32	27-401878.0000	5/3/07	Clearwater Utilities	Y
491	Paloma Estates	Maricopa	1 South	2 West	17	133	27-700341.0000	11/27/07	Clearwater Utilities	Y
493	Rainbow Valley Ranch	Maricopa	1 South	2 West	18 & 19	49	27-400561.0000	5/2/02	Clearwater Utilities	Y
494	Wingate and Wingate East	Maricopa	1 South	3 West	3	904	27-401994.0000	4/13/07	Town of Buckeye	Y
495	Ironwood Vista	Maricopa	1 South	3 West	4	113	27-400346.0000	10/18/00	Town of Buckeye	Y
496	Mountain View Estates	Maricopa	1 South	3 West	5	161	27-401522.0000	3/31/05	Town of Buckeye	Y
496	Camelot Condominium	Maricopa	1 South	3 West	5	80	27-402051.0000	5/23/06	Town of Buckeye	Y
497	Parkside at Buckeye	Maricopa	1 South	3 West	6	214	27-400395.0000	12/11/00	Town of Buckeye	Y
497	Terravista	Maricopa	1 South	3 West	6	317	27-400465.0000	6/13/02	Town of Buckeye	Y
497	ParkPlace at Buckeye	Maricopa	1 South	3 West	6	267	27-401536.0000	1/13/05	Town of Buckeye	Y
497	Encantada Estates	Maricopa	1 South	3 West	6	307	27-401601.0000	6/30/05	Town of Buckeye	Y
498	Painted Rock	Maricopa	1 South	3 West	8	122	27-401634.0000	8/30/05	Town of Buckeye	Y
499	White Fence Farms	Maricopa	1 South	3 West	10	59	27-401888.0000	5/22/06	Town of Buckeye	Y
500	Sienna Condominiums	Maricopa	2 South	4 East	11	274	27-400843.0000	12/19/02	Arizona American Water Company - Paradise Valley	Y
501	Oakwood Hills	Maricopa	2 South	5 East	28	NA	27-200212.0000	7/22/86	NA	N
501	Sun Lakes	Maricopa	2 South	5 East	28	558	27-200325.0000	7/3/86	Pima Utilities	N
502	Santan Vista Phase I	Maricopa	2 South	5 East	34	155	27-400129.0000	11/9/99	Pima Utilities	N
502	Santan Vista Unit 2	Maricopa	2 South	5 East	34	189	27-400648.0000	5/10/02	Pima Utilities	N
503	Sun Lakes #26,29-49	Maricopa	2 South	5 East	29, 30 & 33	4230	27-200327.0000	8/30/90	Pima Utilities	N
504	Sun Lakes #09A, 41	Maricopa	2 South	5 East	30 & 31	140	27-200326.0000	6/22/95	Pima Utilities	N
506	Santan Vistas	Maricopa	2 South	6 East	24	215	27-200312.0000	8/28/81	NA	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
507	Vaquero Estates	Maricopa	2 South	6 East	24	112	27-700373.0000	4/11/08	Queen Creek Water Co	Y
508	Brekanwood Estates	Maricopa	2 South	6 East	35	47	27-400919.0000	7/28/03	Chandler Heights Citrus ID	Y
509	Sonterra	Maricopa	2 South	6 East	36	19	27-402030.0000	5/19/06	Chandler Heights Citrus ID	Y
510	Chandler Heights #1	Maricopa	2 South	6 East	23 & 26	NA	27-200048.0000	3/1/82	NA	N
511	Queens Park (1980)	Maricopa	2 South	7 East	4	133	27-200269.0000	11/17/80	Queen Creek Water Co	N
511	Queens Park (1993)	Maricopa	2 South	7 East	4	133	27-200270.0000	4/5/93	Queen Creek Water Co	N
512	Cortina	Maricopa	2 South	7 East	7	965	27-400582.0000	7/22/02	Queen Creek Water Co	Y
512	Cortina Parcels 12 & 13	Maricopa	2 South	7 East	7	224	27-402137.0000	6/26/06	Queen Creek Water Co	Y
513	Sossaman Estates Parcel F	Maricopa	2 South	7 East	7 & 18	48	27-400562.0000	12/16/02	Queen Creek Water Co	N
513	Sossaman Estates	Maricopa	2 South	7 East	7 & 18	674	27-400291.0000	1/18/01	Queen Creek Water Co	Y
514	Emperor Estates Phases 1 & 2	Maricopa	2 South	7 East	8	479	27-400751.0000	9/27/02	Queen Creek Water Co	Y
514	Emperor Estates Phase 3	Maricopa	2 South	7 East	8	178	27-401618.0000	4/20/05	Queen Creek Water Co	Y
514	La Jara Farms	Maricopa	2 South	7 East	8	93	27-401988.0000	3/24/06	Queen Creek Water Co	Y
514	Emperor Estates IV	Maricopa	2 South	7 East	8	187	27-402085.0000	6/12/06	Queen Creek Water Co	Y
515	Crismon Ranch Estates	Maricopa	2 South	7 East	14	19	27-300073.0000	6/14/96	Queen Creek Water Co	Y
515	Crismon Meadows	Maricopa	2 South	7 East	14	45	27-401298.0000	10/29/04	Queen Creek Water Co	Y
515	Crismon Heights	Maricopa	2 South	7 East	14	250	27-401348.0000	12/17/04	Queen Creek Water Co	Y
515	Charleston Estates	Maricopa	2 South	7 East	14	331	27-402184.0000	8/28/06	Queen Creek Water Co	Y
516	Queenland Manor	Maricopa	2 South	7 East	15	366	27-400141.0000	11/12/99	Queen Creek Water Co	Y
516	Langley Gateway Estates Unit II	Maricopa	2 South	7 East	15	338	27-401147.0000	2/17/04	Queen Creek Water Co	Y
516	Emperor Estates aka Nauvoo Station	Maricopa	2 South	7 East	15	478	27-401964.0000	5/7/06	Queen Creek Water Co	Y
517	Victoria Parcels 10, 11 & 11A	Maricopa	2 South	7 East	16	345	27-401531.0000	3/22/05	Queen Creek Water Co	Y
518	Victoria PAD Parcels 5 & 9	Maricopa	2 South	7 East	16	255	27-700277.0000	1/31/08	Queen Creek Water Co	Y
519	Emans Estates	Maricopa	2 South	7 East	17	8	27-300318.0000	9/15/98	Queen Creek Water Co	Y
519	Roman Estates #1,2	Maricopa	2 South	7 East	17	52	27-300391.0000	6/15/98	Queen Creek Water Co	N
519	Arroyo De La Reina	Maricopa	2 South	7 East	17	30	27-300395.0000	4/2/98	Queen Creek Water Co	Y
519	Roman Estates # 3	Maricopa	2 South	7 East	17	20	27-400147.0000	3/21/00	Queen Creek Water Co	Y
519	Roman Estates #6	Maricopa	2 South	7 East	17	13	27-400294.0000	5/30/00	Queen Creek Water Co	Y
519	Roman Estates #4	Maricopa	2 South	7 East	17	29	27-400321.0000	4/27/01	Queen Creek Water Co	Y
519	Egyptian Valley Phase I	Maricopa	2 South	7 East	17	74	27-400358.0000	8/28/03	Queen Creek Water Co	Y
519	Egyptian Valley Phase II	Maricopa	2 South	7 East	17	96	27-400359.0000	8/28/03	Queen Creek Water Co	Y
519	Victoria, Phase 2, Parcel 1	Maricopa	2 South	7 East	17	45	27-401058.0000	1/8/04	Queen Creek Water Co	Y
519	Roman Estates, Phase V	Maricopa	2 South	7 East	17	16	27-401636.0000	4/26/05	Queen Creek Water Co	Y
519	Roman Estates Phase VII	Maricopa	2 South	7 East	17	12	27-401637.0000	4/21/05	Queen Creek Water Co	Y
519	Lucia at Queen Creek	Maricopa	2 South	7 East	17	105	27-401952.0000	5/19/06	Queen Creek Water Co	Y
519	Villagio	Maricopa	2 South	7 East	17	135	27-700396.0000	11/1/07	Queen Creek Water Co	Y
520	Queen Creek Ranchettes	Maricopa	2 South	7 East	20	109	27-200266.0000	1/13/89	Queen Creek Water Co	N
520	Circle G at Queen Creek #1	Maricopa	2 South	7 East	20	40	27-300057.0000	3/7/96	Queen Creek Water Co	Y
520	Circle G at Queen Creek Unit II	Maricopa	2 South	7 East	20	37	27-300191.0000	12/20/96	Queen Creek Water Co	Y
520	Circle G at Queen Creek Unit II-A	Maricopa	2 South	7 East	20	16	27-300245.0000	5/27/97	Queen Creek Water Co	Y
520	Queen Creek Ranchettes III	Maricopa	2 South	7 East	20	59	27-300339.0000	11/3/97	Queen Creek Water Co	Y
520	Circle G at Queen Creek Unit III	Maricopa	2 South	7 East	20	27	27-300417.0000	6/18/98	Queen Creek Water Co	Y
520	Circle G at Queen Creek, Unit 4	Maricopa	2 South	7 East	20	69	27-400007.0000	7/22/99	Queen Creek Water Co	Y
521	Will Roger's Equestrian Rnch, U I,II,III	Maricopa	2 South	7 East	21	125	27-300297.0000	8/1/97	Queen Creek Water Co	Y
521	Terra Ranch at Queen Creek	Maricopa	2 South	7 East	21	56	27-400339.0000	3/15/01	Queen Creek Water Co	Y
521	Montelena	Maricopa	2 South	7 East	21	403	27-401074.0000	1/6/04	Queen Creek Water Co	Y
521	Circle G at Ellsworth Estates	Maricopa	2 South	7 East	21	82	27-401855.0000	4/27/06	Queen Creek Water Co	Y
522	Las Villas del Ray	Maricopa	2 South	7 East	22	23	27-200178.0000	3/7/89	Queen Creek Water Co	N
522	Indigo Trails	Maricopa	2 South	7 East	22	221	27-401213.0000	7/22/04	Queen Creek Water Co	Y
522	Ocotillo Landing	Maricopa	2 South	7 East	22	171	27-401572.0000	4/6/05	Queen Creek Water Co	Y
522	Hastings Farms Parcel G	Maricopa	2 South	7 East	22	36	27-402035.0000	6/16/06	H2O Water Co	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
1	Castle Well Owners	Maricopa	6 North	3 West	16	7	27-200046.0000	9/22/93	NA	N
2	Litchfield Vista Views	Maricopa	6 North	3 West	18	83	27-200182.0000	11/1/93	Valley Utilities	N
3	Warrick Property	Maricopa	6 North	3 West	28	75	27-700392.0000	5/8/08	Circle City	Y
4	Circle City #1	Maricopa	6 North	3 West	33	NA	27-200054.0000	8/2/88	NA	N
5	Circle City Tract 1	Maricopa	6 North	3 West	33	4	27-200055.0000	3/9/83	Consolidated Water Utility	N
5	Circle City Tract I	Maricopa	6 North	3 West	33	5	27-200056.0000	7/21/81	Consolidated Water Utility	N
5	Circle City Tract I	Maricopa	6 North	3 West	33	5	27-200057.0000	7/20/81	Consolidated Water Utility	N
6	Lake Pleasant Association	Maricopa	6 North	1 East	29	350	27-200174.0000	6/27/86	NA	N
7	Anthem - Phase 1.C. (Unit 57 & Unit61)	Maricopa	6 North	2 East	10	167	27-401750.0000	6/14/05	Arizona American Water Co - Anthem	N
7	Arroyo Vista, Units 4-10	Maricopa	6 North	2 East	10	291	27-402115.0000	11/27/06	Arizona American Water Co - Anthem	N
8	Anthem Phase 1E - Freeway Mixed-Use	Maricopa	6 North	2 East	22	1243	27-401173.0000	4/28/04	Arizona American Water Co - Anthem	N
9	Anthem Phase 3.a. (Units 73, 75A & 75B)	Maricopa	6 North	2 East	27	122	27-401777.0000	8/25/05	Arizona American Water Co - Anthem	N
9	Anthem Phase 3.a, Unit 77	Maricopa	6 North	2 East	27	202	27-401882.0000	12/12/05	Arizona American Water Co - Anthem	N
10	Anthem Phase 2a. MPC III Phase 1/ MPC IV Phase I	Maricopa	6 North	2 East; 3 East	13, 23 & 24;18 & 19	1299	27-400520.0000	1/2/02	Arizona American Water Co - Anthem	N
10	Anthem Phase 2.B. - MPC IV Phase II / MPC IV Phas	Maricopa	6 North	2 East; 3 East	13, 23 & 24;18 & 19	2024	27-400753.0000	3/11/03	Arizona American Water Co - Anthem	N
11	Anthem - Phase 1.b	Maricopa	6 North	2 East	3, 14, 15,18, 22, 23 & 2	3932	27-300572.0000	3/24/99	Arizona American Water Co - Anthem	N
12	Anthem Phase 1.a., fka Villages at Desert Hills -- phase1, The	Maricopa	6 North	2 East	13-15, 22 & 23	1253	27-300387.0000	6/23/98	Arizona American Water Co - Anthem	N
13	Anthem - Phase 1.a.	Maricopa	6 North	2 East	14, 22 & 23	565	27-400008.0000	2/22/97	Arizona American Water Co - Anthem	N
14	Anthem Phase 1-D	Maricopa	6 North	2 East	15 & 22	693	27-400608.0000	1/29/02	Arizona American Water Co - Anthem	N
15	Anthem Phase 3.a (Unit 71)	Maricopa	6 North	2 East	22 & 27	73	27-401805.0000	10/5/05	Arizona American Water Co - Anthem	N
18	Cahava Springs	Maricopa	6 North	3 East	13	947	27-200015.0000	11/14/89	Cave Creek Water Co	N
19	Anthem Phase 2.B. - MPC III Phase II/MPC IV Phase II (Units 40 & 42)	Maricopa	6 North	3 East	18	135	27-401316.0000	7/21/04	Arizona American Water Co - Anthem	N
19	Anthem Phase 2.B. - MPC III Phase II / MPC IV Phase II (Unit 44)	Maricopa	6 North	3 East	18	69	27-401426.0000	3/23/05	Arizona American Water Co - Anthem	N
19	Anthem Phase 2.B Unit 48	Maricopa	6 North	3 East	18	38	27-401578.0000	5/19/05	Arizona American Water Co - Anthem	N
20	Desert Hills Equestrian Estates	Maricopa	6 North	3 East	19	56	27-700368.0000	9/6/07	Arizona American Water Co - Anthem	N
21	Apache Peak Ranch	Maricopa	6 North	3 East	28	28	27-300034.0000	7/26/95	Desert Hills Water Co	Y
21	Joy Ranch	Maricopa	6 North	3 East	28	30	27-300562.0000	7/20/00	Desert Hills Water Co	N
22	Desert Hills Estates	Maricopa	6 North	3 East	29	158	27-200092.0000	7/13/87	Desert Hills Water Co	N
22	Estates North	Maricopa	6 North	3 East	29	24	27-200113.0000	5/17/95	Desert Hills Water Co	N
22	Estates North Unit II	Maricopa	6 North	3 East	29	23	27-300074.0000	6/10/96	Desert Hills Water Co	Y
22	Cielo Grande at Desert Hills	Maricopa	6 North	3 East	29	73	27-401768.0000	11/21/06	Desert Hills Water Co	Y
23	Apache Peak III	Maricopa	6 North	3 East	33	32	27-400502.0000	4/26/01	Desert Hills Water Co	Y
24	Anthem Phase 2A Unit 91and School Site	Maricopa	6 North	3 East; 2 East	19;24	14	27-401535.0000	5/3/05	Arizona American Water Co - Anthem	N
25	Continental Mountain Estates	Maricopa	6 North	4 East	14	70	27-200077.0000	10/31/81	Cave Creek Water Co	N
26	Arrisona at Rockaway Valley	Maricopa	6 North	4 East	16	34	27-200004.0000	4/21/93	Cave Creek Water Co	N
26	Hidden Springs	Maricopa	6 North	4 East	16	72	27-200142.0000	2/13/95	Cave Creek Water Co	N
26	Camino De La Cruz	Maricopa	6 North	4 East	16	16	27-300154.0000	7/2/96	Cave Creek Water Co	N
27	Cahava Springs	Maricopa	6 North	4 East	18	947	27-200016.0000	11/14/89	Cave Creek Water Co	N
28	Mesquite Ranch	Maricopa	6 North	4 East	21	16	27-400601.0000	1/7/02	Cave Creek Water Co	N
29	Crossings, The, II	Maricopa	6 North	4 East	26	27	27-200083.0000	8/3/95	Cave Creek Water Co	N
29	Estates at Carefree	Maricopa	6 North	4 East	26	NA	27-200114.0000	2/13/86	Carefree Water Co	N
29	Estates at Carefree	Maricopa	6 North	4 East	26	28	27-200115.0000	3/31/88	Carefree Water Co	N
29	Tranquil Vistas Estates	Maricopa	6 North	4 East	26	28	27-200355.0000	4/8/88	Carefree Water Co	N
29	Tranquil Place	Maricopa	6 North	4 East	26	14	27-300038.0000	11/22/95	Carefree Water Co	N
29	Vista Montana	Maricopa	6 North	4 East	26	7	27-300050.0000	7/24/96	Cave Creek Water Co	N
29	Crossings, IV	Maricopa	6 North	4 East	26	12	27-300276.0000	10/16/97	Cave Creek Water Co	N
30	Las Lomas	Maricopa	6 North	4 East	27	25	27-300018.0000	5/22/95	Cave Creek Water Co	N
30	Black Mountain Shadows	Maricopa	6 North	4 East	27	41	27-300046.0000	8/28/95	Cave Creek Water Co	N
30	Villas at Cave Creek(AKA Las Lomas)	Maricopa	6 North	4 East	27	25	27-300126.0000	5/16/96	Cave Creek Water Co	N
30	Black Mountain Shadows	Maricopa	6 North	4 East	27	41	27-400026.0000	5/12/99	Cave Creek Water Co	N
30	Stagecoach Village	Maricopa	6 North	4 East	27	70	27-500002.0000	12/1/06	Cave Creek Water Co	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
522	Hastings Farms, Parcels A & B	Maricopa	2 South	7 East	22	316	27-402059.0000	7/5/06	Queen Creek Water Co	Y
523	Villages at Queen Creek, The	Maricopa	2 South	7 East	22 & 23	679	27-400373.0000	3/19/01	Queen Creek Water Co	Y
523	The Villages at Queen Creek Phase IIA	Maricopa	2 South	7 East	22 & 23	902	27-400645.0000	7/31/02	Queen Creek Water Co	Y
524	Ash Creek Estates	Maricopa	2 South	7 East	23	144	27-401554.0000	3/28/05	Queen Creek Water Co	Y
524	Ocotillo Heights Phase 1	Maricopa	2 South	7 East	23	151	27-401937.0000	3/20/06	Queen Creek Water Co	Y
525	Hastings Farms Parcels C, D, E, F, H, I, J, K, L	Maricopa	2 South	7 East	22, 26 & 27	793	27-402036.0000	6/20/06	Queen Creek Water Co	Y
526	Church Farms Acres	Maricopa	2 South	7 East	24	14	27-402237.0000	9/25/06	H2O Water Co	Y
527	Rittenhouse Ranch on the Creek	Maricopa	2 South	7 East	25 & 26	308	27-401226.0000	8/18/04	H2O Water Co	Y
528	South Creek Ranch	Maricopa	2 South	7 East	26	24	27-300138.0000	12/20/96	Queen Creek Water Co	Y
528	Cloud Creek Ranch	Maricopa	2 South	7 East	26	17	27-300560.0000	9/9/99	H2O Water Co	Y
528	The Villages at Queen Creek Phase II	Maricopa	2 South	7 East	26	75	27-400840.0000	1/27/04	H2O Water Co	Y
528	Cloud Creek Ranch II	Maricopa	2 South	7 East	26	28	27-401749.0000	12/14/05	H2O Water Co	Y
529	Groves of Queen Creek, The	Maricopa	2 South	7 East	28	10	27-200134.0000	1/26/95	Queen Creek Water Co	N
529	Queen Creek Ranch Estates	Maricopa	2 South	7 East	28	8	27-300472.0000	10/14/98	Queen Creek Water Co	Y
529	The Pecans	Maricopa	2 South	7 East	28	258	27-400571.0000	11/20/02	Queen Creek Water Co	Y
529	Paseo de Pecans	Maricopa	2 South	7 East	28	17	27-402232.0000	8/30/06	Queen Creek Water Co	Y
530	Cliffstone	Maricopa	2 South	7 East	28	39	27-700276.0000	6/13/08	Queen Creek Water Co	Y
531	San Marqui Estates	Maricopa	2 South	7 East	29	45	27-300218.0000	4/25/97	Queen Creek Water Co	Y
531	Creek View Ranches	Maricopa	2 South	7 East	29	16	27-400033.0000	6/10/99	Queen Creek Water Co	Y
531	San Tan Vistas Ranch	Maricopa	2 South	7 East	29	26	27-400152.0000	10/28/99	Queen Creek Water Co	Y
531	Country Park Estates	Maricopa	2 South	7 East	29	22	27-400272.0000	8/2/00	Queen Creek Water Co	Y
531	San Tan Vistas	Maricopa	2 South	7 East	29	30	27-400354.0000	10/30/00	Queen Creek Water Co	N
531	Meadows, The	Maricopa	2 South	7 East	29	24	27-400355.0000	10/30/00	Queen Creek Water Co	N
531	Equestrian, The	Maricopa	2 South	7 East	29	26	27-400356.0000	10/30/00	Queen Creek Water Co	N
531	Estrella Vista aka Sonokai Creek Ranch Phase 5	Maricopa	2 South	7 East	29	30	27-400760.0000	3/13/03	Queen Creek Water Co	Y
531	Broadland Estates @ Riggs	Maricopa	2 South	7 East	29	93	27-500078.0000	3/21/07	Queen Creek Water Co	Y
532	Ranchos Hacienda de Caballos	Maricopa	2 South	7 East	30	24	27-300014.0000	8/29/95	Queen Creek Water Co	Y
532	Ranchos Hacienda de Caballos, Lots 17-26	Maricopa	2 South	7 East	30	8	27-300062.0000	3/8/96	Queen Creek Water Co	Y
532	Saddlewood	Maricopa	2 South	7 East	30	16	27-400995.0000	10/29/03	Queen Creek Water Co	Y
532	Saddlewood Estates	Maricopa	2 South	7 East	30	16	27-401540.0000	6/27/05	Queen Creek Water Co	Y
532	Queen Creek Equestrian Estates	Maricopa	2 South	7 East	30	12	27-402025.0000	4/6/06	Queen Creek Water Co	Y
532	Saddlewood Estates Phase II	Maricopa	2 South	7 East	30	12	27-700280.0000	10/4/07	Queen Creek Water Co	Y
533	Power and Riggs Center	Maricopa	2 South	7 East	30	11	27-700496.0000	4/29/08	Queen Creek Water Co	Y
534	Chandler Heights Citrus Tract	Maricopa	2 South	7 East	31	6	27-200049.0000	8/19/92	Chandler Heights Citrus ID	N
534	San Tan Estates	Maricopa	2 South	7 East	31	16	27-200310.0000	3/24/95	Chandler Heights Citrus ID	N
534	H Bar H Estates	Maricopa	2 South	7 East	31	16	27-300471.0000	6/3/99	Chandler Heights Citrus ID	Y
535	Citrus Coves	Maricopa	2 South	7 East	33	17	27-400469.0000	10/15/01	Queen Creek Water Co	Y
535	Ranchos Legante	Maricopa	2 South	7 East	33	61	27-401957.0000	5/7/06	Queen Creek Water Co	Y
535	Orchard Ranchettes Phases 1 and 2	Maricopa	2 South	7 East	34	64	27-300176.0000	12/20/96	Queen Creek Water Co	Y
535	Orchard Ranchettes II, Phase A	Maricopa	2 South	7 East	34	32	27-400030.0000	11/18/99	Queen Creek Water Co	Y
535	Orchard Ranchettes II, Phases B,C, & D	Maricopa	2 South	7 East	34	99	27-400357.0000	3/14/01	Queen Creek Water Co	Y
535	Orchard Ranchettes III Phases A & B	Maricopa	2 South	7 East	34	56	27-400789.0000	3/11/03	Queen Creek Water Co	Y
535	Pegasus Estates	Maricopa	2 South	7 East	34	88	27-401765.0000	10/6/05	Queen Creek Water Co	Y
536	Pegasus Airpark; Phase I Hangers	Maricopa	2 South	7 East	35	31	27-400845.0000	7/23/03	Queen Creek Water Co	N
536	Pegasus Airpark Unit II	Maricopa	2 South	7 East	35	55	27-400901.0000	7/16/03	Queen Creek Water Co	Y
537	Pegasus Airpark, Unit 1	Maricopa	2 South	7 East	34 & 35	49	27-400317.0000	1/18/01	Queen Creek Water Co	Y
537	Pegasus Airpark Unit 3 and 4	Maricopa	2 South	7 East	34 & 35	76	27-401561.0000	1/14/05	Queen Creek Water Co	Y
538	Golf View Estates	Pinal	2 South	8 East	17	78	27-300134.0000	1/22/97	H2O Water Co	Y
538	Vineyard Estates	Pinal	2 South	8 East	17	161	27-400884.0000	7/15/03	H2O Water Co	Y
538	Wayne Ranch	Pinal	2 South	8 East	17	423	27-401015.0000	11/14/03	H2O Water Co	Y
538	Milagro	Pinal	2 South	8 East	17	140	27-401493.0000	2/14/05	H2O Water Co	Y

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
538	Taylor Ranch	Pinal	2 South	8 East	17	395	27-401573.0000	4/25/05	H2O Water Co	Y
538	Ocotillo Trails	Pinal	2 South	8 East	17	82	27-401665.0000	6/22/05	H2O Water Co	Y
538	Belcara at Pima	Pinal	2 South	8 East	17	46	27-401874.0000	6/23/06	H2O Water Co	Y
539	Ironwood Crossing Unit 1	Pinal	2 South	8 East	18	662	27-402061.0000	8/11/06	H2O Water Co	Y
539	Ironwood Crossing Unit 2	Pinal	2 South	8 East	18	364	27-500029.0000	1/31/07	H2O Water Co	Y
540	Links Estates, The, #01	Pinal	2 South	8 East	20	72	27-200180.0000	6/20/95	H2O Water Co	N
540	The Links Estates, Unit II	Pinal	2 South	8 East	20	76	27-400191.0000	9/22/03	H2O Water Co	Y
540	Cambria	Pinal	2 South	8 East	20	834	27-400211.0000	12/4/00	H2O Water Co	Y
541	Sun Valley Farms #5,6,7	Pinal	2 South	8 East	21	10	27-200329.0000	8/8/84	H2O Water Co	N
541	Kenworthy & Ocotillo	Pinal	2 South	8 East	21	271	27-400549.0000	11/29/01	H2O Water Co	Y
541	Meadow Vista	Pinal	2 South	8 East	21	232	27-401035.0000	1/27/04	H2O Water Co	Y
542	Castlegate	Pinal	2 South	8 East	22	930	27-400621.0000	3/27/02	H2O Water Co	Y
542	The Cottages at Castlegate Parcel 1 & Parcel 2	Pinal	2 South	8 East	22	261	27-400635.0000	5/15/03	H2O Water Co	Y
545	Laredo Ranch	Pinal	2 South	8 East	27	966	27-401472.0000	12/9/04	Diversified Water Utilities, Inc.	Y
546	Pecan Creek South	Pinal	2 South	8 East	29	1768	27-401593.0000	4/5/05	H2O Water Co	Y
547	Shoppes at Pecan Ranch	Pinal	2 South	8 East	29	8	27-700447.0000	4/11/08	H2O Water Co	Y
548	Vinwood	Pinal	2 South	8 East	30	60	27-300295.0000	11/3/97	H2O Water Co	Y
548	Stone Creek Estates	Pinal	2 South	8 East	30	163	27-401885.0000	1/25/06	Queen Creek Water Co	Y
549	The Parks, Parcels A, B and D	Pinal	2 South	8 East	31	463	27-401813.0000	6/9/06	H2O Water Co	Y
549	Circle Cross Ranch Unit 3	Pinal	2 South	8 East	31	442	27-401999.0000	5/23/06	H2O Water Co	Y
550	Pinal Professional Village	Pinal	2 South	8 East	31	45	27-700348.0000	1/29/08	H2O Water Co	Y
551	Archer Meadows	Maricopa	2 South	8 East	34	139	27-500010.0000	3/19/07	Diversified Water Utilities, Inc.	Y
552	Pecan Centers of Arizona	Pinal	2 South	8 East	20 & 29	76	27-200224.0000	2/25/81	NA	N
552	Pecan Creek North	Pinal	2 South	8 East	20 & 29	1319	27-400833.0000	12/5/02	H2O Water Co	Y
553	Queen Creek Ranchos (1984)	Pinal	2 South	8 East	9 & 16	20	27-200267.0000	9/17/84	H2O Water Co	N
553	Queen Creek Ranchos (1991)	Pinal	2 South	8 East	9 & 16	6	27-200268.0000	5/2/91	H2O Water Co	N
554	Ranch 160	Pinal	2 South	10 East	5 & 6	550	27-400594.0000	6/11/02	Arizona Water Co - Apache Junction	Y
555	Superior Highlands	Pinal	2 South	12 East	10	110	27-300459.0000	7/21/98	Arizona Water Co - Superior	Y
558	Unnamed property, Maricopa Co.	Maricopa	2 South	5 West	21 & 28	32	27-200367.0000	10/6/92	NA	N
559	West Valley Ranches	Maricopa	2 South	7 West	5, 8, 9, 24, 25, 26 & 27	NA	27-200397.0000	4/20/92	NA	N
560	Encanto Real, at San Tan Vistas	Pinal	3 South	7 East	3	37	27-400756.0000	12/5/02	Queen Creek Water Co	Y
560	Creekside Estates	Pinal	3 South	7 East	3	41	27-401004.0000	10/16/03	Queen Creek Water Co	Y
561	Gold Mine Mountain	Pinal	3 South	7 East	5	114	27-400444.0000	2/16/01	Queen Creek Water Co	Y
561	Encanto Vista I	Pinal	3 South	7 East	5	55	27-401715.0000	7/12/06	Queen Creek Water Co	Y
561	Encanto Vista II	Pinal	3 South	7 East	5	21	27-401849.0000	7/12/06	Queen Creek Water Co	Y
562	Santo Vallarta	Pinal	3 South	7 East	6	57	27-401620.0000	6/3/05	Queen Creek Water Co	Y
563	Encanto Paseo	Pinal	3 South	7 East	8	28	27-401672.0000	11/18/05	Queen Creek Water Co	Y
564	The Borgata At Santan, Lots 1-35, 88-162 & 203-209 inclusive	Pinal	3 South	7 East	2 & 3	117	27-401868.0000	2/3/06	Queen Creek Water Co	Y
565	Valley of the Sun Estates	Pinal	3 South	8 East	2	9	27-400436.0000	12/27/00	Diversified Water Utilities, Inc.	Y
565	Rolling Ridge Estates	Pinal	3 South	8 East	2	61	27-401311.0000	10/5/04	Diversified Water Utilities, Inc.	Y
565	Quail Run Estates	Pinal	3 South	8 East	2	534	27-401523.0000	2/22/05	Diversified Water Utilities, Inc.	Y
566	Skyline Vista Ranch I	Pinal	3 South	8 East	3	113	27-400046.0000	8/19/99	Diversified Water Utilities, Inc.	Y
567	Skyline Estates	Pinal	3 South	8 East	11	1017	27-401971.0000	5/25/06	Diversified Water Utilities, Inc.	Y
568	Johnson Ranch Units 3B, 4A, and 4B	Pinal	3 South	8 East	20	557	27-300457.0000	7/21/98	Johnson Utilities Company	N
569	Johnson Ranch Lakeview Gardens	Pinal	3 South	8 East	18 & 19	58	27-400019.0000	5/17/99	Johnson Utilities Company	N
570	Johnson Ranch Units 1, 2, 6, & 7	Pinal	3 South	8 East	18, 19 & 20	550	27-300393.0000	7/21/98	Johnson Utilities Company	N
571	Johnson Ranch Unit 3A	Pinal	3 South	8 East	19 & 20	164	27-300456.0000	7/21/98	Johnson Utilities Company	N
572	Shea Homes at Johnson Farms aka Trilogy Encanterra	Pinal	3 South	8 East; 8 East	5; 32	2452	27-700213.0000	7/11/07	H2O Water Co	Y
573	Anko #2	Pinal	3 South	9 East	21	15	27-200003.0000	9/20/88	NA	N
574	Tangier Acres	Maricopa	4 South	1 East	21	8	27-200341.0000	7/25/89	NA	N

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
16	Fountain Hills Plat 106	Maricopa	6 North	3 East	10	49	53-500686	Adequate	5/9/74	Chaparral City Water Co
17	Fountain Hills Plat 106	Maricopa	6 North	3 East	11	49	53-500686	Adequate	5/9/74	Chaparral City Water Co
30	Village at Cave Creek #2	Maricopa	6 North	4 East	27	28	53-501630	Adequate	8/14/79	Cave Creek Water Co
30	Village at Cave Creek, The	Maricopa	6 North	4 East	27	10	53-501631	Adequate	1/3/79	Cave Creek Water Co
34	Rancho Villas	Maricopa	6 North	4 East	28	40	53-501275	Adequate	8/20/74	Cave Creek Water Co
40	Canyon Ridge Homes	Maricopa	6 North	4 East	35	25	53-500392	Adequate	3/17/80	Carefree Water Co
40	Carefree Condominiums So & No	Maricopa	6 North	4 East	35	20	53-500394	Adequate	3/24/78	Carefree Water Co
40	Carefree Villas	Maricopa	6 North	4 East	35	13	53-500397	Adequate	6/13/73	Carefree Water Co
40	Posada del Sol	Maricopa	6 North	4 East	35	10	53-501211	Adequate	6/20/74	Carefree Water Co
47	Ranch Highlands	Maricopa	6 North	5 East	19	55	53-501247	Adequate	12/31/79	NA
48	Carefree Hills	Maricopa	6 North	5 East	28	52	53-500395	Adequate	4/19/74	NA
49	Carefree Rolling Hills	Maricopa	6 North	5 East	31	73	53-500396	Adequate	8/17/73	Carefree Water Co
55	Vista Heights	Maricopa	6 North	5 East	28 & 33	111	53-501649	Adequate	8/9/79	NA
59	Chaparral Rancheros #2	Maricopa	5 North	2 West	31	124	53-500443	Adequate	9/25/73	Hassayampa Water Co-op
80	Boulders Carefree, The #04	Maricopa	5 North	4 East	3	93	53-500349	Adequate	8/7/74	Carefree Water Co
84	Saguaro West #2	Maricopa	5 North	4 East	8	40	53-501352	Adequate	2/28/75	NA
84	Saguaro West #4	Maricopa	5 North	4 East	8	6	53-501353	Adequate	7/27/78	NA
84	Saguaro West #4A	Maricopa	5 North	4 East	8	18	53-501354	Adequate	9/26/78	NA
85	La Tierra Prometida	Maricopa	5 North	4 East	17	64	53-500866	Adequate	10/31/73	NA
88	Desert Vista Trails	Maricopa	5 North	4 East	28	65	53-500591	Adequate	3/12/75	NA
92	Desert Ranch	Maricopa	5 North	5 East	5 & 7	36	53-500573	Adequate	4/26/76	NA
140	Sunrise #3	Maricopa	4 North	1 East	10	29	53-501504	Adequate	3/20/74	Sunrise Water Co
143	Sunrise #4	Maricopa	4 North	1 East	15	17	53-501505	Adequate	12/31/77	Sunrise Water Co
155	Park View Estates	Maricopa	4 North	2 East	8	40	53-501123	Adequate	4/18/80	NA
156	Saddleback Estates	Maricopa	4 North	2 East	8	39	53-501348	Adequate	2/6/78	NA
156	Saddleback Hills	Maricopa	4 North	2 East	8	42	53-501350	Adequate	12/24/79	NA
157	Chaparral	Maricopa	4 North	2 East	32	249	53-500436	Adequate	6/18/73	Consolidated Water Utility
158	Bellair #1	Maricopa	4 North	2 East	33	175	53-500316	Adequate	5/18/73	Consolidated Water Utility
158	Bellair #1 Phase 2	Maricopa	4 North	2 East	33	170	53-500317	Adequate	9/10/74	Consolidated Water Utility
159	Knoell North Nine	Maricopa	4 North	2 East	35	132	53-500842	Adequate	6/12/73	NA
159	Knoell North Nine	Maricopa	4 North	2 East	35	216	53-500843	Adequate	5/21/74	NA
159	Knoell North Nine #1	Maricopa	4 North	2 East	35	199	53-500844	Adequate	6/4/73	NA
159	Union Hills Manor	Maricopa	4 North	2 East	35	169	53-501590	Adequate	10/30/74	Consolidated Water Utility
160	Woodridge	Maricopa	4 North	2 East	36	156	53-501707	Adequate	8/21/73	Consolidated Water Utility
162	Desert Valley Estates	Maricopa	4 North	3 East	30	282	53-500587	Adequate	10/5/73	Consolidated Water Utility
163	Happy Valley Ranch	Maricopa	4 North	4 East	1	115	53-500772	Adequate	10/25/77	NA
163	Happy Valley Ranch #2	Maricopa	4 North	4 East	1	73	53-500773	Adequate	10/31/78	NA
164	Pinnacle Peak Estates #3	Maricopa	4 North	4 East	12	235	53-501181	Adequate	2/4/80	NA
165	Pinnacle Peak Country Club	Maricopa	4 North	4 East	13	56	53-501175	Adequate	9/25/78	NA
165	Pinnacle Peak Country Club #1	Maricopa	4 North	4 East	13	30	53-501176	Adequate	12/2/76	NA
165	Pinnacle Peak Country Club #2	Maricopa	4 North	4 East	13	25	53-501177	Adequate	12/13/76	NA
165	Pinnacle Peak Country Club #3	Maricopa	4 North	4 East	13	26	53-501178	Adequate	4/11/77	NA
165	Pinnacle Peak Country Club #4	Maricopa	4 North	4 East	13	34	53-501179	Adequate	10/25/77	NA
165	Pinnacle Peak Country Club #5	Maricopa	4 North	4 East	13	47	53-501180	Adequate	10/25/77	NA

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
167	Pinnacle Peak Heights	Maricopa	4 North	5 East	8	21	53-501182	Adequate	6/27/74	NA
167	Pinnacle Peak Heights #3,4	Maricopa	4 North	5 East	8	20	53-501184	Adequate	6/12/79	NA
168	Pinnacle Peak Heights #2	Maricopa	4 North	5 East	17	35	53-501183	Adequate	4/8/77	NA
169	Pinnacle Peak Shadows #1	Maricopa	4 North	5 East	18	48	53-501185	Adequate	2/10/77	NA
169	Pinnacle Peak Shadows #2	Maricopa	4 North	5 East	18	38	53-501186	Adequate	4/27/78	NA
171	Rio Verde #2	Maricopa	4 North	7 East	6	68	53-501312	Adequate	8/24/77	Rio Verde utilities
171	Rio Verde #3A,4	Maricopa	4 North	7 East	6	97	53-501313	Adequate	8/22/75	Rio Verde utilities
171	Rio Verde #4	Maricopa	4 North	7 East	6	18	53-501314	Adequate	7/20/79	Rio Verde utilities
171	Rio Verde #5	Maricopa	4 North	7 East	6	50	53-501315	Adequate	12/20/76	Rio Verde utilities
171	Rio Verde #5A,7	Maricopa	4 North	7 East	6	108	53-501316	Adequate	6/23/78	Rio Verde utilities
171	Rio Verde #6A	Maricopa	4 North	7 East	6	43	53-501317	Adequate	4/7/78	Rio Verde utilities
171	Rio Verde 2,3	Maricopa	4 North	7 East	6	259	53-501318	Adequate	4/19/74	Rio Verde utilities
171	Rio Verde Model Park #1	Maricopa	4 North	7 East	6	10	53-501320	Adequate	7/9/74	Rio Verde utilities
173	Rio Verde #1	Maricopa	4 North	7 East	32	78	53-501311	Adequate	6/27/73	Rio Verde utilities
175	North Surprise #3	Maricopa	3 North	1 West	2	8	53-501053	Adequate	5/2/74	City of El Mirage
210	Sierra Bonita	Maricopa	3 North	3 East	25	62	53-501393	Adequate	11/7/73	NA
210	Sierra Bonita	Maricopa	3 North	3 East	25	24	53-501394	Adequate	4/17/74	NA
212	Estate Ranchos	Maricopa	3 North	1 East	12	14	53-500620	Adequate	5/6/74	City of Peoria
214	Suntown #4	Maricopa	3 North	1 East	25	161	53-501526	Adequate	10/25/73	City of Peoria
216	La Hacienda	Maricopa	3 North	1 East	32	84	53-500855	Adequate	7/27/78	NA
217	Park Place North	Maricopa	3 North	2 East	4	248	53-501111	Adequate	5/22/74	Consolidated Water Utility
218	Patterson Ranch	Maricopa	3 North	2 East	12	66	53-501126	Adequate	6/7/73	NA
219	Avant One #4,5	Maricopa	3 North	4 East	16	171	53-500303	Adequate	9/26/73	NA
220	Paradise Valley Palms	Maricopa	3 North	4 East	19	73	53-501106	Adequate	5/16/74	NA
220	Shadow Ridge	Maricopa	3 North	4 East	19	97	53-501385	Adequate	4/17/74	NA
221	Las Haciendas	Maricopa	3 North	4 East	20	41	53-500895	Adequate	2/13/74	NA
221	Roc Farms Estates	Maricopa	3 North	4 East	20	20	53-501340	Adequate	11/5/73	NA
222	Equestrian Manor #2	Maricopa	3 North	4 East	21	54	53-500615	Adequate	2/21/74	NA
223	Scottsdale Country Club	Maricopa	3 North	4 East	23	8	53-501379	Adequate	5/29/73	NA
224	Quail Hollow	Maricopa	3 North	4 East	29	0	53-501234	Inadequate	4/11/77	Arizona American Water Company - Paradise Valley
225	Tatum Canyon	Maricopa	3 North	4 East	31	72	53-501539	Adequate	6/6/75	NA
226	Mockingbird Lane Estates #6	Maricopa	3 North	4 East	32	33	53-500992	Adequate	1/24/74	NA
226	Vista Rica #1	Maricopa	3 North	4 East	32	11	53-501653	Adequate	7/9/74	NA
227	Camelback Country Club Est #6	Maricopa	3 North	4 East	34	19	53-500378	Inadequate	8/4/76	Berneil Water Co
227	Camelback Country Club Est. #5	Maricopa	3 North	4 East	34	25	53-500379	Inadequate	4/5/76	Berneil Water Co
227	Camelback Country Estates	Maricopa	3 North	4 East	34	46	53-500380	Inadequate	10/9/79	Berneil Water Co
228	Century North	Maricopa	3 North	5 East	16	167	53-500433	Adequate	10/3/74	NA
229	La Vida Buena Condominiums	Maricopa	3 North	6 East	15	71	53-500867	Inadequate	11/30/78	Chaparral City Water Co
229	Park Palisades #2	Maricopa	3 North	6 East	15	52	53-501109	Inadequate	5/6/81	Chaparral City Water Co
230	Fountain Hills 604A, 605C, 605D	Maricopa	3 North	6 East	21	216	53-500685	Adequate	1/14/75	Chaparral City Water Co
231	Los Quintos	Maricopa	3 North	6 East	23	5	53-500928	Inadequate	4/30/81	Chaparral City Water Co
232	Clear Aire	Maricopa	3 North	6 East	26	60	53-500467	Inadequate	1/3/79	Chaparral City Water Co
232	Paradise Heights	Maricopa	3 North	6 East	26	32	53-501105	Adequate	8/8/73	NA
233	Courtside Villas	Maricopa	3 North	6 East	10 & 11	118	53-500537	Inadequate	4/9/79	Chaparral City Water Co

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
234	Park Palisades Resort Condos	Maricopa	3 North	6 East	10 & 15	18	53-501110	Inadequate	2/4/80	Chaparral City Water Co
235	La Fuenta Condominiums	Maricopa	3 North	6 East	14 & 15	41	53-500854	Inadequate	12/14/78	Chaparral City Water Co
236	Fountain Hills Plat 602B,C,D	Maricopa	3 North	6 East	15 & 16	83	53-500680	Inadequate	11/4/77	Chaparral City Water Co
237	Fountain Hills 601B (1978)	Maricopa	3 North	6 East	2, 6 & 27	476	53-500683	Inadequate	7/11/78	Chaparral City Water Co
238	Fountain Hills Plat 605-A	Maricopa	3 North	6 East	21 & 22	107	53-500681	Inadequate	2/17/78	Chaparral City Water Co
239	Fountain Hills 601A, 603B&C, 605B	Maricopa	3 North	6 East	9, 15 & 16	402	53-500682	Adequate	3/14/74	Chaparral City Water Co
239	Fountain Hills 601B (1979)	Maricopa	3 North	6 East	9, 15 & 16	93	53-500684	Inadequate	10/5/79	Chaparral City Water Co
269	Clearwater Farms	Maricopa	2 North	2 West	3	303	53-500469	Inadequate	5/22/81	Arizona American Water Co - Agua Fria
289	Valencia Village #2	Maricopa	2 North	2 West	32	12	53-501594	Adequate	8/5/75	Arizona Water Co - White Tanks
322	Maryvale Ranchettes	Maricopa	2 North	1 East	21	30	53-500937	Adequate	10/2/75	NA
323	Braewood Park	Maricopa	2 North	1 East	27	335	53-500353	Adequate	5/8/75	NA
323	Braewood Park #2	Maricopa	2 North	1 East	27	50	53-500354	Adequate	3/31/76	NA
323	Casa Real	Maricopa	2 North	1 East	27	29	53-500408	Adequate	1/29/76	NA
323	Casa Real Phoenix #1B	Maricopa	2 North	1 East	27	30	53-500409	Adequate	4/22/77	NA
323	Contempo del Este	Maricopa	2 North	1 East	27	243	53-500501	Adequate	8/23/73	NA
323	Sunrise Terrace	Maricopa	2 North	1 East	27	364	53-501512	Adequate	11/3/73	NA
324	Country Meadows	Maricopa	2 North	1 East	36	2493	53-500527	Adequate	3/19/75	NA
325	Casas Norte	Maricopa	2 North	3 East	3	8	53-500416	Adequate	5/7/74	NA
326	El Dorado Estates	Maricopa	2 North	4 East	5	25	53-500604	Adequate	10/3/74	NA
327	Montana De Bonitas Casas	Maricopa	2 North	4 East	5	12	53-501005	Inadequate	2/11/81	Arizona American Water Company - Paradise Valley
328	Vista Rica II	Maricopa	2 North	4 East	5	0	53-501654	Adequate	7/10/74	Arizona American Water Company - Paradise Valley
329	Camelhead Estates #2	Maricopa	2 North	4 East	7	16	53-500382	Adequate	7/26/76	NA
329	Clearview Edition	Maricopa	2 North	4 East	7	35	53-500468	Inadequate	9/13/78	NA
329	Las Casas Escondidas	Maricopa	2 North	4 East	7	8	53-500893	Inadequate	5/11/77	NA
329	Lincoln Estates	Maricopa	2 North	4 East	7	6	53-500906	Inadequate	10/16/78	NA
329	Lincoln Ridge	Maricopa	2 North	4 East	7	0	53-500907	Inadequate	4/11/77	NA
329	Pebble Ridge	Maricopa	2 North	4 East	7	15	53-501133	Adequate	12/23/74	NA
330	Camelhead Estates	Maricopa	2 North	4 East	8	17	53-500381	Adequate	12/23/74	NA
332	Alamos Resort	Maricopa	2 North	4 East	10	52	53-500255	Inadequate	10/18/78	Arizona American Water Company - Paradise Valley
332	La Place #2	Maricopa	2 North	4 East	10	6	53-500862	Inadequate	12/16/83	
332	La Place Estates #1,2	Maricopa	2 North	4 East	10	35	53-500863	Inadequate	4/14/80	Arizona American Water Company - Paradise Valley
333	Brairwood #3	Maricopa	2 North	4 East	11	47	53-500355	Adequate	1/20/77	Arizona American Water Company - Paradise Valley
333	Briarwood #2	Maricopa	2 North	4 East	11	170	53-500360	Adequate	6/27/74	NA
333	Casabella Patio Homes	Maricopa	2 North	4 East	11	63	53-500410	Adequate	8/12/74	Arizona American Water Company - Paradise Valley
333	Cuernavaca Townhouses	Maricopa	2 North	4 East	11	41	53-500543	Adequate	12/20/74	Arizona American Water Company - Paradise Valley
333	Lincoln Drive Condos	Maricopa	2 North	4 East	11	6	53-500905	Inadequate	5/15/81	Arizona American Water Company - Paradise Valley
334	Briarwood #4	Maricopa	2 North	4 East	14	72	53-500361	Inadequate	8/25/78	Arizona American Water Company - Paradise Valley
334	Conejo Estates	Maricopa	2 North	4 East	14	18	53-500499	Inadequate	11/30/78	Arizona American Water Company - Paradise Valley
334	Del Prado	Maricopa	2 North	4 East	14	13	53-500546	Inadequate	12/28/78	Arizona American Water Company - Paradise Valley
334	La Jolla Blanca	Maricopa	2 North	4 East	14	64	53-500856	Inadequate	12/28/78	Arizona American Water Company - Paradise Valley
334	Las Villas Condominium	Maricopa	2 North	4 East	14	55	53-500900	Inadequate	1/23/79	Arizona American Water Company - Paradise Valley
334	Privado Village #1,2	Maricopa	2 North	4 East	14	57	53-501213	Inadequate	10/27/78	Arizona American Water Company - Paradise Valley
334	Valley View Place	Maricopa	2 North	4 East	14	36	53-501604	Inadequate	3/14/80	NA
334	Villa De Bendita	Maricopa	2 North	4 East	14	24	53-501617	Inadequate	8/3/79	NA

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
334	Villa Palo Verde	Maricopa	2 North	4 East	14	20	53-501628	Inadequate	12/17/80	NA
334	Woodleaf	Maricopa	2 North	4 East	14	20	53-501706	Inadequate	9/14/78	Arizona American Water Company - Paradise Valley
335	Casa Blanca	Maricopa	2 North	4 East	15	129	53-500400	Inadequate	2/11/81	Arizona American Water Company - Paradise Valley
335	Desert Arroyos	Maricopa	2 North	4 East	15	14	53-500553	Adequate	1/15/76	Arizona American Water Company - Paradise Valley
335	Tierra del Paraiso	Maricopa	2 North	4 East	15	24	53-501546	Inadequate	8/18/77	Arizona American Water Company - Paradise Valley
336	Casa del Monte	Maricopa	2 North	4 East	22	140	53-500404	Adequate	5/10/74	Arizona American Water Company - Paradise Valley
338	Camelhead Estates #3	Maricopa	2 North	4 East	7 & 8	27	53-500383	Inadequate	4/18/77	NA
343	Park Palisades	Maricopa	1 North	1 West	3	31	53-501108	Adequate	12/19/73	City of Goodyear
359	Desert Tree Development	Maricopa	1 North	3 West	7, 10 & 11	4500	53-500586	Adequate	12/31/75	NA
375	Buckeye North	Maricopa	1 North	3 West	17	68	53-500363	Adequate	9/17/74	NA
412	Valley View Ranchettes	Maricopa	1 North	6 West	1	120	53-501605	Adequate	2/19/74	Valley View Water Co
416	Tolsun Farms	Maricopa	1 North	1 East	3	50	53-501561	Adequate	8/25/75	City of Tolleson
418	Tolsun Farms #2	Maricopa	1 North	1 East	5	66	53-500206	Adequate	12/24/73	City of Tolleson
423	Rancho Grande Dos	Maricopa	1 North	2 East	31	50	53-501260	Adequate	11/30/76	Bermuda Water Company, Inc.
423	Rancho Grande Quatro	Maricopa	1 North	2 East	31	56	53-501261	Adequate	6/26/79	Bermuda Water Company, Inc.
424	Rancho Grande Tres	Maricopa	1 North	2 East	31	50	53-501262	Adequate	11/30/76	NA
425	Pecos Industrial Park	Maricopa	1 North	4 East	32	13	53-501136	Adequate	5/29/79	NA
426	Apache Wells Mobile Home Park	Maricopa	1 North	6 East	2	175	53-500279	Adequate	7/13/73	NA
426	Apache Wells Mobile Park #3B	Maricopa	1 North	6 East	2	119	53-500280	Inadequate	3/23/78	NA
427	Rossmor Leisure World	Maricopa	1 North	6 East	25	255	53-501344	Adequate	6/1/73	Turner Ranches Water Sewer Co
432	Desert Air Estates #4B	Maricopa	1 North	7 East	15	27	53-500549	Adequate	5/5/75	NA
432	Desert Air Grande	Maricopa	1 North	7 East	15	51	53-500550	Adequate	5/13/75	NA
432	Desert Aire #4-C	Maricopa	1 North	7 East	15	27	53-500552	Adequate	3/23/79	NA
432	Desert Saguaro Estates	Maricopa	1 North	7 East	15	86	53-500576	Adequate	6/16/75	NA
432	Desert Saguaro Estates #2	Maricopa	1 North	7 East	15	27	53-500577	Adequate	9/25/79	NA
433	University Estates	Maricopa	1 North	7 East	16	209	53-501592	Adequate	6/12/74	NA
434	Sun Country Estates	Maricopa	1 North	7 East	20	423	53-501477	Adequate	11/1/79	NA
435	El Cortez Mobile Home Park	Maricopa	1 North	7 East	21	36	53-500603	Adequate	5/17/74	NA
436	Whispering Winds Casitas	Maricopa	1 North	7 East	22	42	53-501676	Adequate	5/2/74	NA
437	Desert Village #2	Maricopa	1 North	7 East	23	10	53-500589	Adequate	9/20/73	NA
439	Desert Village	Maricopa	1 North	7 East	25	21	53-500588	Inadequate	3/5/79	Arizona Water Co - Apache Junction
439	Desert Village #3	Maricopa	1 North	7 East	25	21	53-500590	Inadequate	12/24/79	Arizona Water Co - Apache Junction
439	Minnesota Manor #2	Maricopa	1 North	7 East	25	18	53-500980	Inadequate	5/28/78	Arizona Water Co - Apache Junction
440	Golden Crest Terrace	Maricopa	1 North	7 East	27	85	53-500712	Adequate	6/13/74	NA
440	Golden Crest Terrace #4	Maricopa	1 North	7 East	27	34	53-500713	Adequate	1/4/79	NA
440	Golden Crest Terrace #4	Maricopa	1 North	7 East	27	51	53-500714	Adequate	8/10/79	NA
440	Superstition Country #5	Maricopa	1 North	7 East	27	116	53-501528	Adequate	9/12/78	NA
440	Superstition Country V, #1	Maricopa	1 North	7 East	27	92	53-501529	Adequate	9/23/77	NA
441	Berry Estates	Maricopa	1 North	7 East	28	26	53-500327	Adequate	10/1/74	NA
442	Casa Mia #2	Maricopa	1 North	7 East	32	150	53-500407	Adequate	1/21/75	NA
443	Sunrise Meadows	Maricopa	1 North	7 East	30 & 31	92	53-501509	Adequate	2/6/79	Turner Ranches Water Sewer Co
443	Sunrise Meadows #2,3	Maricopa	1 North	7 East	30 & 31	227	53-501510	Adequate	3/26/79	Turner Ranches Water Sewer Co
447	Sierra Entrada Garden Homes	Pinal	1 North	8 East	20	136	53-501399	Adequate	4/27/76	Arizona Water Co - Apache Junction
449	Royal Crest Estates	Pinal	1 North	8 East	24	47	53-501346	Adequate	12/6/73	Arizona Water Co - Apache Junction

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
450	San Marcos Estates #1	Pinal	1 North	8 East	29	32	53-501363	Adequate	12/16/75	Arizona Water Co - Apache Junction
450	Sun Valley	Pinal	1 North	8 East	29	39	53-501489	Adequate	7/12/73	Arizona Water Co - Apache Junction
461	Brentwood Acres	Maricopa	1 South	5 East	2	15	53-500358	Adequate	8/24/73	Town of Gilbert
462	Old West Estates	Maricopa	1 South	5 East	13	101	53-501075	Adequate	1/24/74	Town of Gilbert
463	Villa Hacienda	Maricopa	1 South	5 East	20	76	53-501626	Adequate	4/17/74	City of Chandler
464	Thunderbird Estates	Maricopa	1 South	5 East	21	26	53-501541	Adequate	8/7/73	City of Chandler
465	Central Estates	Maricopa	1 South	5 East	29	41	53-500431	Adequate	6/1/73	City of Chandler
465	Karen Manor	Maricopa	1 South	5 East	29	29	53-500836	Adequate	1/29/74	City of Chandler
465	Karen Manor #4	Maricopa	1 South	5 East	29	14	53-500837	Adequate	4/15/74	City of Chandler
466	Homestead, The	Maricopa	1 South	5 East	30	28	53-500804	Adequate	10/22/73	City of Chandler
467	Green Valley Estates #2,3	Maricopa	1 South	5 East	31	99	53-500744	Adequate	8/24/73	City of Chandler
467	Green Valley Estates (1974)	Maricopa	1 South	5 East	31	19	53-500745	Adequate	8/7/73	City of Chandler
468	Rancho Velero	Maricopa	1 South	5 East	35	27	53-501272	Adequate	4/12/74	City of Chandler
469	College Park Estates	Maricopa	1 South	6 East	6	32	53-500482	Adequate	11/8/73	Town of Gilbert
470	Holley Memorial Gardens	Maricopa	1 South	6 East	8	0	53-500802	Adequate	8/7/73	Town of Gilbert
471	El Dorado Ranches #2	Maricopa	1 South	6 East	17	54	53-500605	Adequate	9/28/73	Salt River Project
473	Apache Villa #3	Pinal	1 South	8 East	30	99	53-500276	Inadequate	9/13/77	Arizona Water Co - Apache Junction
473	Apache Villa #4	Pinal	1 South	8 East	30	150	53-500277	Inadequate	10/3/78	Arizona Water Co - Apache Junction
473	Apache Villa #4,#5	Pinal	1 South	8 East	30	10	53-500278	Inadequate	4/9/79	Arizona Water Co - Apache Junction
479	Casas at Mesa del Oro, The	Pinal	1 South	9 East	8	80	53-500415	Inadequate	4/18/83	Arizona Water Co - Apache Junction
479	Resort at Gold Canyon Ranch	Pinal	1 South	9 East	8	32	53-501293	Inadequate	1/13/83	Arizona Water Co - Apache Junction
480	Mesa del Oro	Pinal	1 South	9 East	9	38	53-500952	Inadequate	6/28/78	Arizona Water Co - Apache Junction
480	Mesa del Oro Estates #2	Pinal	1 South	9 East	9	41	53-500953	Inadequate	10/25/79	Arizona Water Co - Apache Junction
480	Mesa del Oro Estates #3	Pinal	1 South	9 East	9	121	53-500954	Inadequate	5/9/80	Arizona Water Co - Apache Junction
492	Estrella Dells #4	Maricopa	1 South	2 West	19	21	53-500621	Adequate	11/26/73	Clearwater Utilities
505	Claxton-Harvey Western Ranchet	Maricopa	2 South	6 East	4	16	53-500466	Adequate	1/30/79	NA
520	La Princessa Ranchitos	Maricopa	2 South	7 East	20	24	53-500864	Adequate	7/26/78	Queen Creek Water Co
520	Rancho Jardines #4	Maricopa	2 South	7 East	20	71	53-501265	Adequate	6/12/79	Queen Creek Water Co
526	Country Mini-Farms	Maricopa	2 South	7 East	24	13	53-500528	Adequate	8/17/73	H2O Water Co
532	Rancho Jardines #2B	Maricopa	2 South	7 East	30	57	53-501264	Adequate	1/30/74	Queen Creek Water Co
532	Ranchos Jardines	Maricopa	2 South	7 East	30	59	53-501284	Adequate	6/8/73	Queen Creek Water Co
532	Ranchos Jardines #C	Maricopa	2 South	7 East	30	67	53-501285	Adequate	4/3/75	Queen Creek Water Co

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

C. Analyses of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
60	Sun Haven Ranch	Maricopa	5 North	2 West	17, 19, 20 & 21	9012	28-400858	7/29/04	Undetermined
61	DaimlerChrysler Arizona	Maricopa	5 North; 5 North; 6 North	2 West; 3 West; 2 West	3, 4, 5, 6, 7, 8, 9, 10 & 15; 12; 31 & 33	7700	28-401647	12/27/05	Undetermined
62	Grand Vista	Maricopa	5 North	3 West	12	19735	28-401647	7/19/06	Undetermined
63	Copper Mountain Ranch	Maricopa	5 North	3 West	4, 5 & 8	2325	28-401553	2/3/05	Undetermined
96	Vista Verde	Maricopa	5 North	6 East	25 & 26	842	28-400848	5/21/03	Rio Verde utilities
108	Del Webb's Pleasant Valley Country Club -2	Maricopa	4 North	1 West	14 & 15	1900	28-400792	12/20/02	Arizona American Water Co - Agua Fria
110	Del Webb's Sun City Grand	Maricopa	4 North; 4 North	1 West; 2 West	18, 19, 28, 29, 30, 31 & 32; 23, 24, 25, 26 & 36	9990	28-300443	9/1/99	Arizona American Water Co - Agua Fria
121	Rio Rancho Estates	Maricopa	4 North	2 West	3 & 10	926	28-401761	8/4/06	Beardsley Water Co
123	Austin Ranch	Maricopa	4 North	2 West	10, 11, 14 & 15	3106	28-401767	6/11/07	Beardsley Water Co
134	Spurlock Property	Maricopa	4 North	4 West	10, 11, 12, 13, 14 & 15	7329	28-401013	10/1/03	Town of Buckeye
135	Festival Ranch, Phase 1	Maricopa	4 North	4 West	13, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 32, 33, 35 & 36	13676	28-401061	1/22/04	Town of Buckeye
138	Festival Ranch	Maricopa	4 North	4 West	4 & 8	10500	28-401539	5/23/05	Town of Buckeye
153	Fletcher Heights,Parcels1,21,5,14,18,2	Maricopa	4 North	1 East	14, 22, 23 & 26	796	28-300248	2/19/97	New River Utility Co
178	West Surprise: Legacy-TASH	Maricopa	3 North	1 West	7	1338	28-300441	6/12/98	Arizona American Water Co - Agua Fria
178	Kenly Farms	Maricopa	3 North	1 West	7	1050	28-300566	4/29/99	Arizona American Water Co - Agua Fria
187	Cactus Lane Ranch	Maricopa	3 North; 3 North	1 West; 2 West	18 & 30; 12, 13, 15, 22, 23 & 25	17020	28-401308	8/5/04	Arizona American Water Co - Agua Fria
189	Woolf Crossing	Maricopa	3 North	1 West	31 & 36	1736	28-401804	12/13/05	Arizona American Water Co - Agua Fria
198	Sonoran Ridge Estates Units 1-5	Maricopa	3 North	2 West	33	258	28-400333	8/23/00	Water Utility of Greater Buckeye
199	White Tank Mountain Ranch	Maricopa	3 North	2 West	27	1732	28-400730	8/16/02	Arizona American Water Co - Agua Fria
205	Sun Valley Community	Maricopa	3 North; 4 North	4 West; 4 West	3, 4, 5, 6, 8, 9, 16, 17, 19, 20, 21, 28, 29, 30, 31, 32 & 33; 26, 27, 28, 29, 31, 32, 33, 34 & 35	34196	28-400956	10/1/03	Town of Buckeye
207	Bell 3000	Maricopa	3 North; 3 North	4 West; 5 West	7, 8 17 & 18;12, 13 & 24	10076	28-400993	10/1/03	Town of Buckeye
207	White Tank Foothills	Maricopa	3 North; 3 North; 4 North; 4 North	2 West; 5 West; 4 West; 5 West	34;2-4, 8-11, 14-16 & 23;7 & 18;1, 12-15, 21-28, 34 & 35	1286	28-401116	8/19/04	Arizona American Water Co - Agua Fria
208	Douglas Ranch - Phases 1,2,3,4 & 5	Maricopa	3 North; 4 North; 4 North	5 West; 4 West; 5 West	2, 3, 4, 8, 9, 10, 11, 14, 15, 16 & 23; 7 & 18; 1, 12, 13, 14, 15, 21, 22, 23, 24, 25, 26, 27, 28, 34 & 35	55000	28-401037	5/12/04	Town of Buckeye
240	The Preserve at Goldfield Ranch	Maricopa	3 North	7 East	9 & 10	1088	28-500095	6/12/07	Undetermined
266	Estrella Falls	Maricopa	2 North	1 West	32	3	28-700498	5/23/08	Litchfield Park Service Co
269	Zanjero Trails and Pass	Maricopa	2 North	2 West	4	10476	28-401489	4/4/05	Arizona American Water Co - Agua Fria
305	Sun Valley South	Maricopa	2 North	4 West	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15 & 16		28-401719	2/2/04	Town of Buckeye
306	Tartesso North	Maricopa	2 North	4 West	15-18, 21, 22, 27 & 28	12022	28-401222	3/26/04	Town of Buckeye
307	Balterra	Maricopa	2 North	6 West	19	5195	28-401555	3/1/05	Water Utility of Greater Tonopah
308	Wintersburg Interchange - Tonopah Market Place	Maricopa	2 North	6 West	28		28-402079	6/12/06	Water Utility of Greater Tonopah
309	Desert Whisper	Maricopa	2 North	6 West	14 & 23	2943	28-402188	8/30/06	Water Utility of Greater Tonopah
310	Odom Farms	Maricopa	2 North	6 West	16 & 17	6803	28-401401	1/3/05	Undetermined
312	Four-Eleven Estates	Maricopa	2 North	7 West	25	150	28-402052	9/5/06	Water Utility of Greater Tonopah
331	Mountain Shadows	Maricopa	2 North	4 East	8 & 9	305	28-401963	10/5/06	Arizona American Water Company - Paradise Valley
339	Montiere	Maricopa	2 North	5 West	1	2065	28-401883	3/7/06	Town of Buckeye
340	Hassayampa Ranch	Maricopa	2 North	5 West	15, 16, 17 & 22	5707	28-401585	2/28/05	Water Utility of Greater Tonopah
341	Belmont	Maricopa	2 North; 2 North; 3 North; 3 North	5 West; 6 West; 5 West; 6 West	3, 4, 5, 6, 7, 8, 9, 10, 18, 19, 29, 30 & 31; 1, 2, 11, 12, 13, 14 & 24; 17, 18, 19, 20, 21, 29, 29, 30, 31, 32, 33 & 34; 14, 23, 24, 25, 26, 35 & 36	60308	28-400903	10/1/03	Undetermined
347	Las Palmas	Maricopa	1 North	2 West	3	750	28-402088	10/10/06	Arizona Water Co - White Tanks
350	Blue Horizons	Maricopa	1 North	2 West	8	2230	28-300517	11/23/98	Arizona Water Co - White Tanks
357	Whitestone	Maricopa	1 North; 2 North; 2 North	2 West; 2 West; 3 West	6;7, 18, 19, 30 & 31;3, 10-13, 23-25	14080	28-400460	1/16/01	Arizona American Water Co - Agua Fria
358	SunCor Phases I & II	Maricopa	1 North; 2 North; 2 North; 3 North	1 West; 1 West; 2 West; 1 West	3, 4 & 6;8-17, 19-23, 27-31, 33 & 34;24, 25 & 36;7	22262	28-300596	10/12/99	Litchfield Park Service Co
358	Liberty Park	Maricopa	1 North	2 West	29, 31 & 32	495	28-700375	10/30/07	Undetermined
365	Brookridge MPC, Buckeye/Sundance	Maricopa	1 North	3 West	3, 8, 9, 10, 11, 13, 14 & 15	6862	28-400400	3/16/01	Town of Buckeye
379	Monte Verde	Maricopa	1 North	3 West	19, 20 & 21	2335	28-401796	8/31/05	Valencia Water Co
386	Buckeye Farms	Maricopa	1 North	3 West	27 & 34	1388	28-401970	3/7/06	Town of Buckeye

Table 8.1-12 Assured Water Supply Determinations in the Phoenix AMA[1]

C. Analyses of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
387	Portico	Maricopa	1 North	3 West	34 & 35	1401	28-402113	7/10/06	Town of Buckeye
389	Blue Hills	Maricopa	1 North	3 West	31	488	28-400137	12/22/99	Valencia Water Co
396	Roston/Buckeye Community	Maricopa	1 North; 1 North	3 West; 4 West	18 & 19;13, 23 & 24	3895	28-400513	7/4/01	Town of Buckeye
397	Tartesso and Tartesso West	Maricopa	1 North; 2 North; 2 North	4 West; 4 West; 5 West	1, 3, 4, 10 & 11; 19, 20, 24, 25, 26, 29, 30, 31, 35 & 36; 11, 12, 13, 14, 24, 25 & 35	36925	28-400947	10/1/03	Town of Buckeye
398	Tartesso Master - Planned Community	Maricopa	1 North; 2 North; 2 North	4 West; 4 West; 5 West	1, 3, 4, 10 & 11; 19, 20, 24, 25, 26, 29, 30, 31, 35 & 36; 11, 12, 13, 14, 24, 25 & 35	9321	28-401120	2/9/04	Town of Buckeye
399	Westwind	Maricopa	1 North	4 West	15, 21 & 22	3000	28-401738	10/14/05	Town of Buckeye
407	Desert Creek	Maricopa	1 North	5 West	2 & 3	8490	28-401685	5/24/07	Town of Buckeye
410	Cipriani	Maricopa	1 North; 2 North	5 West; 4 West	12, 13, 23, 24, 25 & 36; 19, 30 & 31	9636	28-401866	7/11/06	Town of Buckeye
413	Rocky G Development	Maricopa	1 North	6 West	5	1520	28-401622	4/29/05	Undetermined
414	Sierra Negra Ranch	Maricopa	1 North; 2 North	6 West; 6 West	6 & 7; 21, 28, 29, 31, 32 & 33	9900	28-401346	9/28/04	Undetermined
422	107th Avenue & Broadway	Maricopa	1 North	1 East	30	539	28-401302	11/8/04	Rigby Water Co
456	Superstition Foothills	Pinal	1 North	9 East	31 & 32	714	28-300406	2/26/99	Arizona Water Co - Apache Junction
494	Bella Vagare	Maricopa	1 South	3 West	3	512	28-402019	7/10/06	Town of Buckeye
494	Cotton Pickin	Maricopa	1 South	3 West	3	220	28-402116	8/7/06	Town of Buckeye
523	Chuparosa	Maricopa	2 South	7 East	22 & 23	2100	28-300127	9/30/96	Queen Creek Water Co
549	The Parks	Pinal	2 South	8 East	31	1264	28-401438	10/21/04	H2O Water Co

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated Demand (af/yr)
A	Apache Junction Water Facility	Pinal	26-400989	6/9/03	2/1/05	7/31/07
B	Chapparal City Water Company	Maricopa	26-401242	2/11/04	4/7/04	11/25/21
C	City of Avondale	Maricopa	86-002003	6/11/07	2/4/08	1/1/58
D	City of Chandler	Maricopa	26-002009	2/15/95	12/31/97	3/2/74
E	City of El Mirage	Maricopa	26-400054	3/22/99	11/2/99	1/24/21
F	City of Glendale	Maricopa	26-002018	3/15/95	9/25/97	4/4/56
G	City of Goodyear	Maricopa	26-402090	4/7/06	1/27/08	8/22/43
H	City of Mesa	Maricopa	26-002023	5/28/96	9/19/97	8/23/87
I	City of Peoria	Maricopa	26-400679	1/18/02	10/17/02	8/31/07
J	City of Phoenix	Maricopa	26-002030	10/11/96	12/31/97	2/12/76
K	City of Scottsdale	Maricopa	26-400619	10/11/01	4/25/02	3/5/90
L	City of Surprise	Maricopa	26-300431	11/11/97	9/7/99	9/2/55
M	City of Tempe	Maricopa	26-002043	3/27/97	12/31/97	11/29/92
N	Johnson Utilities	Pinal	26-400665	12/26/01	8/12/03	6/3/15
O	Town of Gilbert	Maricopa	26-402208	6/19/06	10/30/07	4/4/94

[1] Includes water reports issued under the Water Adequacy program prior to the 1980 implementation of the Assured Water Supply program.

[2] Adequacy determinations were based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. A determination of inadequacy could be due to insufficent physical or legal access to water or poor water quality. The Adequacy Program was replaced by the Assured Water Supply Program in the AMAs in 1980.

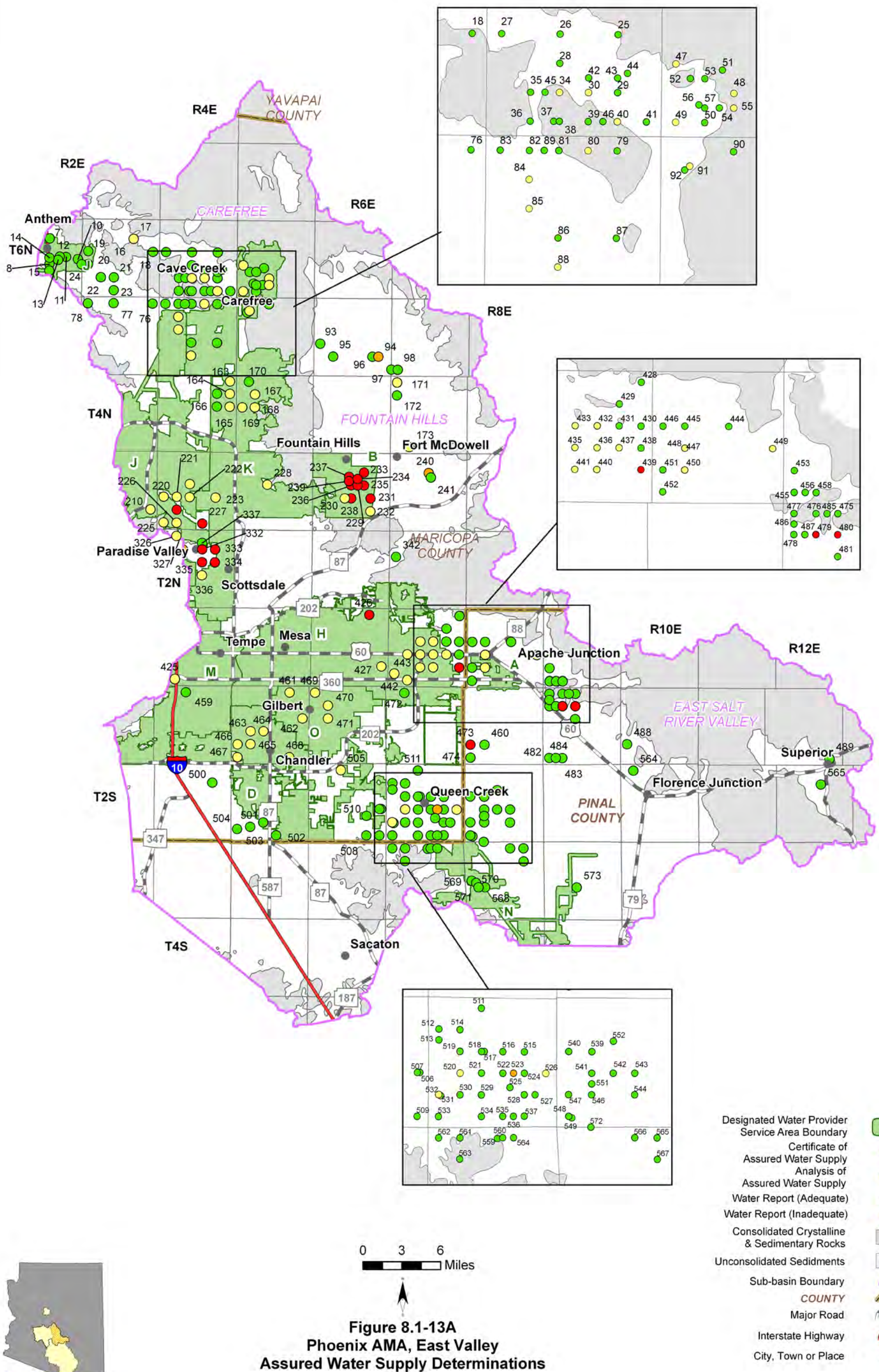


Figure 8.1-13A
Phoenix AMA, East Valley
Assured Water Supply Determinations

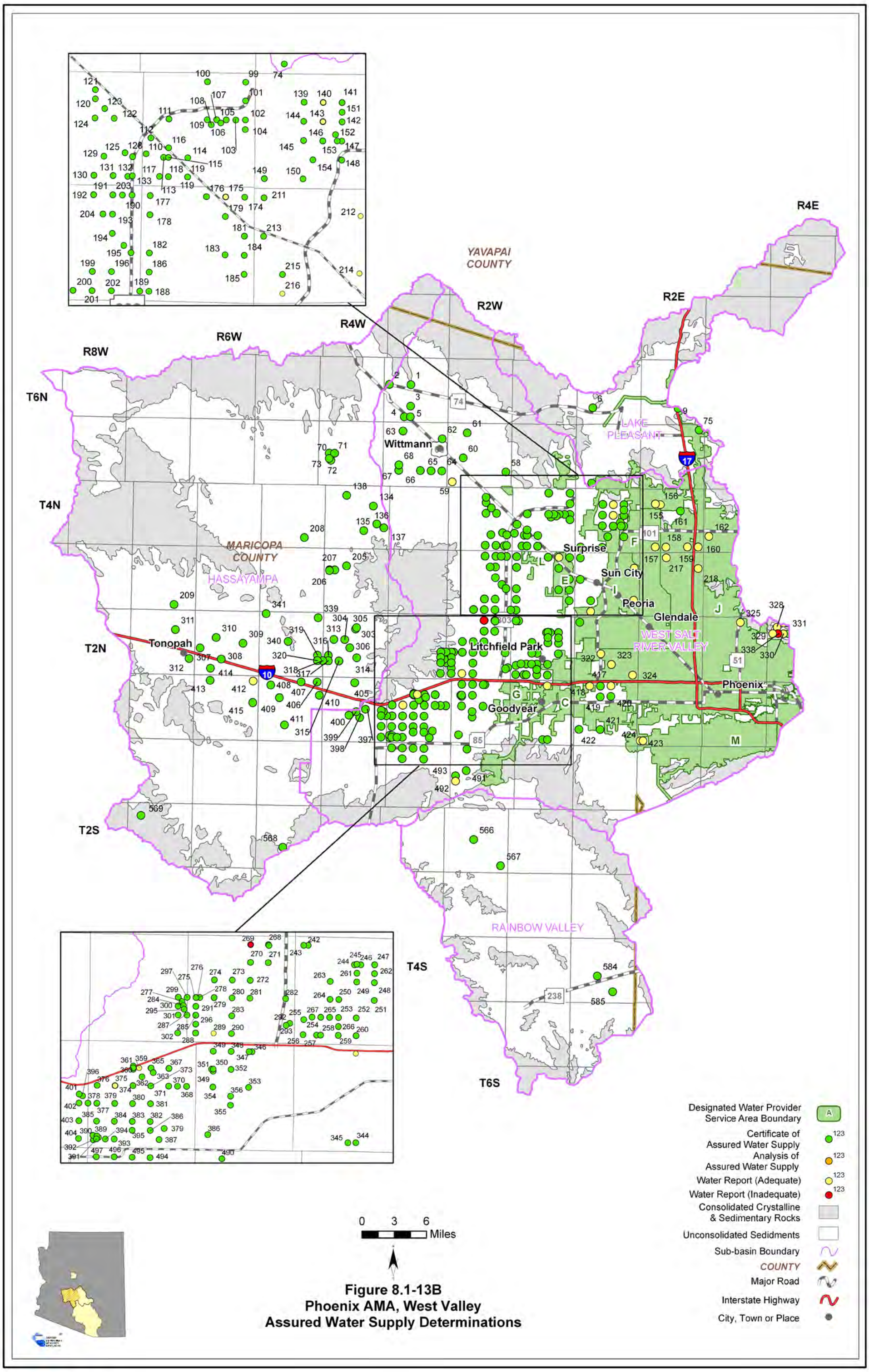


Figure 8.1-13B
Phoenix AMA, West Valley
Assured Water Supply Determinations

Phoenix AMA

References and Supplemental Reading

References

A

Arizona Department of Economic Security (DES), 2005, Workforce Informer: Data file, accessed August 2005, http://www.workforce.az.gov.

Arizona Department of Environmental Quality, 2005, ADEQSWI: Data file, received September 2005.

_____, 2005, ADEQWATP: Data file, received May 2005.

_____, 2005, ADEQWWTP: Data file, received August 2005.

_____, 2005, Azurite: Data file, received September 2005.

_____, 2005, Effluent dependent waters: GIS cover, received December 2005.

_____, 2005, Impaired lakes and reaches: GIS cover, received January 2006.

_____, 2004, Water providers with arsenic concentrations in wells over 10ppb: Data file, received August 2004**.**

_____, 2004, Water quality exceedences by watershed: Data file, received June 2004.

_____, 2004, Water quality exceedences for drinking water providers in Arizona: Data file, received September 2004.

Arizona Department of Water Resources (ADWR), 2008, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006, Assured and adequate water supply applications: Project files, ADWR Hydrology Division.

_____, 2005, Automated recorder sites: Data files, ADWR Basic Data Unit.

_____, 2005, Assured and adequate water supply determinations: Database, ADWR Office of Assured and Adequate Water Supply.

_____, 2005, Flood warning gages: Database, ADWR Office of Water Engineering.

_____, 2005, Inspected dams: Database, ADWR Office of Dam Safety.

_____, 2005, Non-jurisdictional dams: Database, ADWR Office of Dam Safety.

_____, 2005, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.

_____, 2005, Registry of surface water rights: ADWR Office of Water Management.

_____, 2005, Wells55: Database.

_____, 2004, Annual withdrawal and use reports for the Phoenix AMA: ADWR Office of Water Management.

_____, 1999, Third Management Plan for the Phoenix Active Management Area 2000-2010.

_____, 1994, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.

_____, 1994, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.

Arizona Game and Fish Department (AGF), 2005, Arizona Waterways: Data file, received April 2005.

_____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.

Arizona Land Resource Information System (ALRIS), 2005, Springs: GIS cover, accessed January 2006 at http://www.land.state.az.us/alris/index.html.

_____, 2005, Streams: GIS cover, accessed 2005 at http://www.land. state.az.us/alris/index.html.

_____, 2005, Water features: GIS cover, accessed July 2005 at http://www.land. state.az.us/alris/

index.html.
_____, 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.
Arizona Meteorological Network (AZMET), 2005, Arizona climate stations: Pan evaporation data, accessed December 2005 at http://www.ag.arizona.edu/ azmet/locate.html.

D

Diroll, M., and Marsh, D., 2006, Status of water quality in Arizona-2004 integrated 305(b) assessment and 303(d) listing report: ADEQ report.

E

Environmental Protection Agency (EPA), 2005, Surf Your Watershed: Facility reports, accessed April 2005 at http://oaspub.epa.gov/enviro/ef_home2.water.
_____, 2005, 2000 and 1996, Clean Watershed Needs Survey: datasets, accessed March 2005 at http://www.epa.gov/owm/mtb/cwns/index.htm.

K

Konieczki, A.D. and Wilson, R.P., 1992, Annual summary of ground-water conditions in Arizona, spring 1986 to spring 1987: USGS Open File Report 92-54.

M

Maricopa County Association of Governments, 2007, Socioeconomic Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone.

McCormack, H.F., Fisk, G.G., Duet, N.R., Evans, D.W., Roberts, W.P., and Castillo, N.K., 2002, Water resources data Arizona, water year 2002: USGS Water Data Report AZ-02-1.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

U

US Army Corps of Engineers, 2004 and 2005, National Inventory of Dams: Arizona Dataset, accessed November 2004 to April 2005 at http://crunch. tec.army.mil/nid/webpages/nid.cfm
US Geological Survey (USGS), 2006, Average annual runoff in the United States, 1951-1980: Data file, accessed March 2006 at http://aa179.cr.usgs.gov/ metadata/wrdmeta/runoff.htm.
_____, 2006, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.
_____, 2006, National Hydrography Dataset: Arizona dataset, accessed at http://nhd.usgs.gov/.
_____, 2005, National Water Information System (NWIS): Arizona dataset, accessed December 2005 at http://waterdata.usgs.gov/nwis.
_____ 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file,

accessed January 2005 at http://earth.gis.usu.edu/swgap.
_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

V

Valencia, R.A., Wennerlund, J.A., Winstead, R.A., Woods, S., Riley, L., Swanson, E., and Olson, S., 1993, Arizona riparian inventory and mapping project: Arizona Game and Fish Department.

W

Wahl, C.R., Boe, S.R., Wennerlund, R.A., Winstead, R.A., Allison, L.J., Kubly, D.M., 1997, Remote sensing mapping of Arizona intermittent stream riparian areas: Arizona Game and Fish Technical Report 112.
Western Regional Climate Center (WRCC), 2005, Pan evaporation stations: Data file accessed December 2005 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.
_____, 2005, Precipitation and temperature stations: Data file, accessed December 2007 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.
Weidner, C., 1996, ADEQ Pollution Prevention Report, Arizona Pollution Prevention. Spring/Summer 1996.

Supplemental Reading

Arizona Department of Water Resources, 2003, Phoenix AMA Comprehensive Hydrologic Monitoring Plan: Second Annual Status Report.

Arizona Department of Water Resources, 2002, Phoenix AMA Comprehensive Hydrologic Monitoring Plan: First Annual Status Report.

Bernier, J.C. and Associates, 1992, Report on the 1992 Static Water Level Measurement in the Carefree - Cave Creek Basin: Prepared for the City of Scottsdale and the Towns of Carefree and Cave Creek.

Bush, J., S. Guhathakurta, J. Dworkin and J. Keane, 2006, Examination of Phoenix Regional Water Supply for Sustainable Yield and Carrying Capacity: Natural Resources Journal. 46(4):925-958.

Colby, B.G. and Jacobs, K.L eds, 2007, Arizona Water Policy: Management and Innovations in an Urbanizing, Arid Region: Resources for the Future, Washington D.C.

Campbell, H.E. et al, 1999, Some Best Bets in Residential Water Conservation, Morison Institute for Public Policy, Arizona State University.

Capesius, J.P. and Lehman, T.W., 2002, Determination of channel change for selected streams, Maricopa County, Arizona: Water Resources Investigations Report No. 2001-4209, United

States Geological Survey.

CH2M Hill, 1995, Study and Evaluation of Irrigation Water Duties Established Under the Second Management Plan. Arizona Department of Water Resources Task P-2.

City of Chandler, 2002, General Plan: Water Resources Element.

City of El Mirage, 2003, General Plan: Water Resources Element.

City of Gilbert, 2006, General Plan.

City of Glendale, 2002, Glendale 2025 The Next Step General Plan: Water Resource Element.

City of Goodyear, 2003, Goodyear General Plan Update 2003-2013: Chapter 5 Water Resources Element.

City of Mesa, 2006, Mesa 2025 General Plan: Chapter 11 Water Resource Element.

City of Peoria, 2006, General Plan: Water Resource Element.

City of Phoenix, 2005, Water Resources Plan Update: Water Services Department, Water Resources and Development Planning Section.

City of Scottsdale, 2002, General Plan.

City of Surprise, 2008, General Plan 2030: Chapter 6.3 Water Resources.

City of Tempe, 2003, Tempe General Plan 2030: Water Resources Element, Adopted December 4, 2003.

Corell, S.W., 1992, Phoenix-Goodyear Airport Groundwater Flow and Contaminant Transport Model: Model Report No. 05, Arizona Department of Water Resources.

Corkhill, E.F., Corell, S.W., Hill, B.M. and Carr, D.A., 1993, Regional Groundwater Flow Model of the Salt River Valley – Phase One: Phoenix Active Management Area Hydrologic Framework and Basic Data Report: Model Report No. 06, Arizona Department of Water Resources.

Decision Center for a Desert City, 2007, WaterSim, online application available at: http://watersim.asu.edu/

Gelt, J. (1992). Land Subsidence, Earth Fissures Change Arizona's Landscape. Arroyo, v. 6, no.2.

Gober, P , In Press, Climate Adaptation and Water Resource Management in Phoenix, Water Resources IMPACT.

Governor's Drought Task Force, 2004, Arizona Drought Preparedness Plan. Draft. Phoenix.

Governor's Drought Task Force, 2004, Arizona Drought Management Plan. Draft. Phoenix

Governor's Water Management Commission, 2002, Final Report and Recommendations. Phoenix: Arizona Department of Water Resources.

Governor's Water Management Commission, 2000, Briefing Book: Water Management Framework for AMAs, Groundwater Use Restrictions and Requirements. Phoenix: Arizona Department of Water Resources.

Hammett, B.A. and Herther, R.L., 1995, Maps showing groundwater conditions in the Phoenix Active Management Area, Maricopa, Pinal and Yavapai Counties: Hydrographic Map Series No. 27, Arizona Department of Water Resources.

Hipke, W., Putman, F., Holway, J.M., and Ferrell, M., 1996, An Application of the Regional Groundwater Flow Model of the Salt River Valley, Arizona, Analysis of Future Water Use and Supply Conditions: Current Trends Alternative 1989-2025, Model Report No. 11, Arizona Department of Water Resources.

Hoffmann, J.P. and O'Day, C.M., 2001, Quality of water and estimates of water inflow, northern boundary area, Fort McDowell Indian Reservation, Maricopa County, Arizona: Water Resources Investigations Report No. 2001-4151, United States Geological Survey.

Hoffmann, J.P., 2000, Hydrogeology, water quality, and stormwater-sediment chemistry of the Grande Wash area, Fort McDowell Indian Reservation, Maricopa County, Arizona, Water Resources Investigations Report No. 2000-4116, United States Geological Survey.

Holway, J.M. and K.L. Jacobs, 2006, Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth: in Mays, L., eds., Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth. McGraw-Hill.

Jacobs, K. L. and J. M. Holway, 2004, Lessons Learned from Twenty Years of Groundwater Management in Arizona, USA. *Hydrogeology Journal*. 12, No. 1.

Konieczki, A.D. and Anderson, S. R., 1990, Evaluation of ground-water recharge along the Gila River as a result of the flood of October 1983, in and near the Gila River Indian Reservation, Maricopa and Pinal counties, Arizona, Water Resources Investigations Report No. 89-4148, United States Geological Survey.

Megdal, S. and Smith, Z., 2008, Evolution and Evaluation of the Active Management Area Management Plans, Water Resources Research Center, University of Arizona.

Megdal, S. and Colby, B., 2004, Arizona's Water Future: Challenges and Opportunities, 85th Arizona Town Hall Background Report, University of Arizona.

Morrison Institute, 1996, 1996 Residential Water Conservation in Arizona: Expert Assessment of Provider Efforts in the Phoenix Active Management Area: Arizona State University.

Pewe, T.L, 1990, Subsidence and Earth Fissure Formation Caused by Groundwater Withdrawal in Arizona. A review, in Higgins, C.G. and Coates, D.R., eds., Groundwater Geomorphology: The Role of Subsurface Water in Earth-surface Processes and Landforms. Boulder, Colorado, Geological Society of America Special Paper 252, pp. 219-233.

Rascona, S.J., 2005, Maps showing groundwater conditions in the Phoenix Active Management Area, Maricopa, Pinal and Yavapai Counties: Hydrographic Map Series No. 35, Arizona Department of Water Resources.

Raymond, R.H., undated. Land Subsidence and Potential Earth Fissures, Salt-Gila Aqueduct, Central Arizona Project.

Salt River Project, 1994, Strategic Water Resource Plan, Phase I: Assessment and Potential Strategies, January 1994.

Schumann, H.H. and O'Day, C.M., 1995, U.S. Department of the Interior-U.S. Geological Survey-Investigation of Hydrogeology, Land Subsidence, and Earth Fissures, Luke Air Force Base, Arizona - Administrative Report. Tucson, Arizona.

Seventy-first Arizona Town Hall. 1997. Ensuring Arizona's Water Quantity and Quality into the 21st Century. Marshall A. Worden, editor. Phoenix: Arizona Town Hall.

Town of Buckeye, 2007, General Plan Update 2007: Chapter 8 Water Resource Element.

Town of Cave Creek, 2005, General Plan: Water Resource Element.

Town of Fountain Hills, 2002, General Plan: Water Resource Element.

Town of Paradise Valley, 2002, General Plan: Water Resource Element.

Town of Queen Creek, 2002, General Plan 2002: Water Resource Element.

Index to Section 8.0

Overview of the AMA Planning Area 3

Geography 5,6

Hydrology
- Groundwater Hydrology 6-9
- Surface Water Hydrology 15,16-17

Climate 19,20,21-23

Environmental Conditions
- Vegetation 24,26
- Arizona Water Protection Fund 28
- Instream Flow 28
- Endangered Species 31
- Protected Areas 34

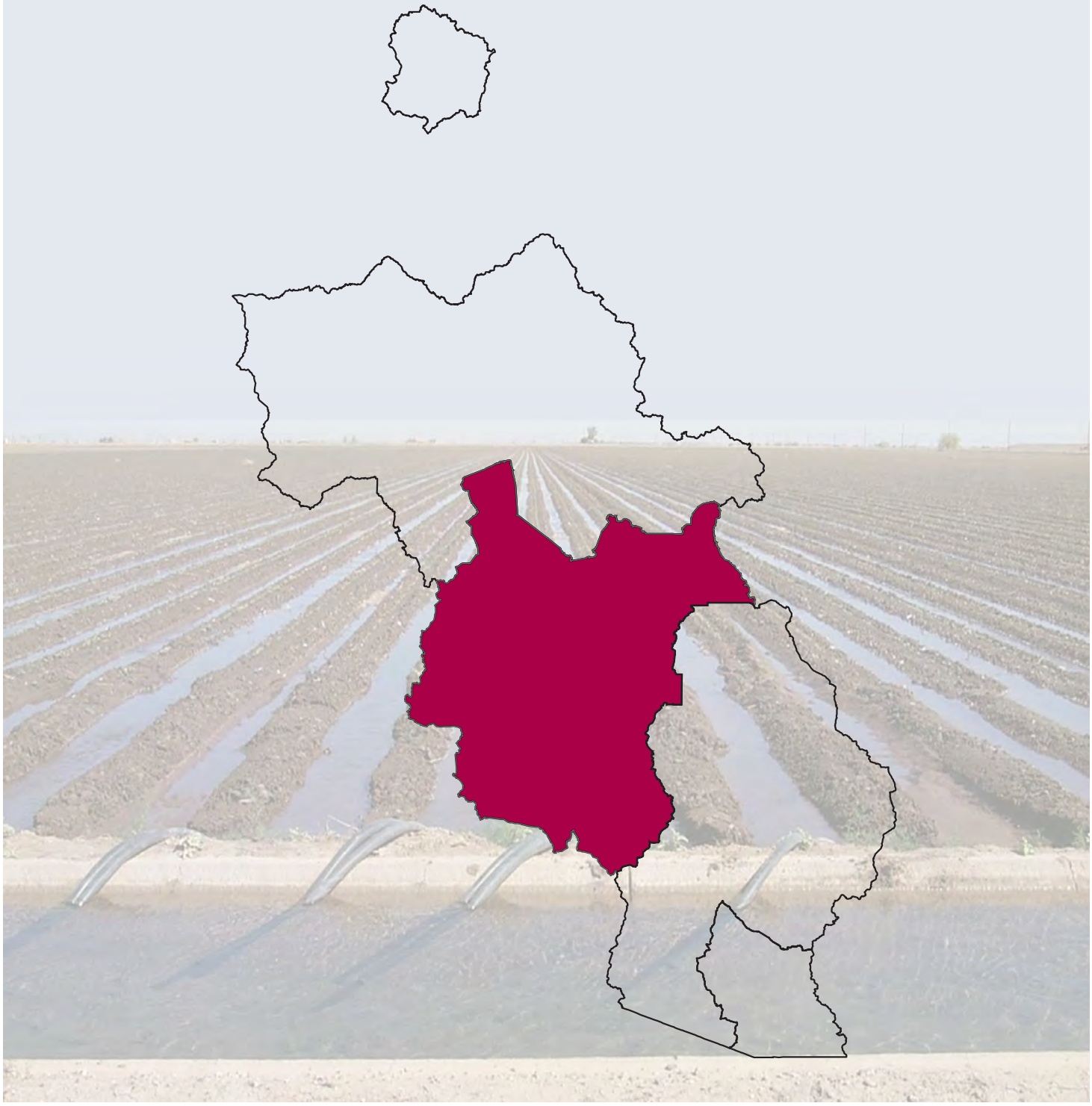
Population 35-37,41

Water Supply 42
- Central Arizona Project 43
- Surface Water 45
- Groundwater 46
- Effluent 47-48
- Contamination Sites 49

Cultural Water Use 50,51,52
- Tribal Demand 53-54,55
- Municipal Demand 56,57,59-60
- Agricultural Demand 65,66
- Industrial Demand 69-70

Water Resource Issues 71-75

Section 8.2
Pinal AMA



8.2.1 Geography of the Pinal AMA

The Pinal AMA is 4,100 square miles in area. Geographic features and principal communities are shown on Figure 8.2-1. The AMA is characterized by gently sloping alluvial valleys separated by north to northwest trending fault-block mountains. Vegetation types are predominantly Lower Colorado River Valley and Arizona Uplands Sonoran desertscrub with a small area of semi-desert grassland in the western portion of the AMA. (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.2-1 are:
    - The Gila River in the northern part of the AMA in the vicinity of Florence and Coolidge, running west and exiting the AMA at the northwestern tip.
    - The Santa Cruz River, which enters the AMA from the southeast, south of Picacho Peak.
    - The Aguirre and Santa Rosa Washes in the south and center.
    - The Santa Cruz Wash east of Casa Grande, running northwest toward the Gila River.
    - Numerous valleys and plains including Aguirre and Santa Rosa Valleys in the south, and Vekol Valley in the west.
    - Mountain ranges along the AMA boundary: the Santan, Sacaton and South Mountains on the north; Picacho, Waterman and Roskruge Mountains on the east; the Quinlan, North Comobabi, and Quijotoa Mountains on the south; and the Castle, Sand Tank and Sierra Estrella Mountains on the west. Picacho Peak, a prominent geographic feature, is located southeast of Picacho on the eastern AMA boundary.
    - The lowest point in the AMA at 1,000 feet where the Santa Cruz Wash and Gila River exit to the northwest.
    - The highest point is Kitt Peak at 6,857 feet in the Quinlan Mountains at the southern AMA boundary.

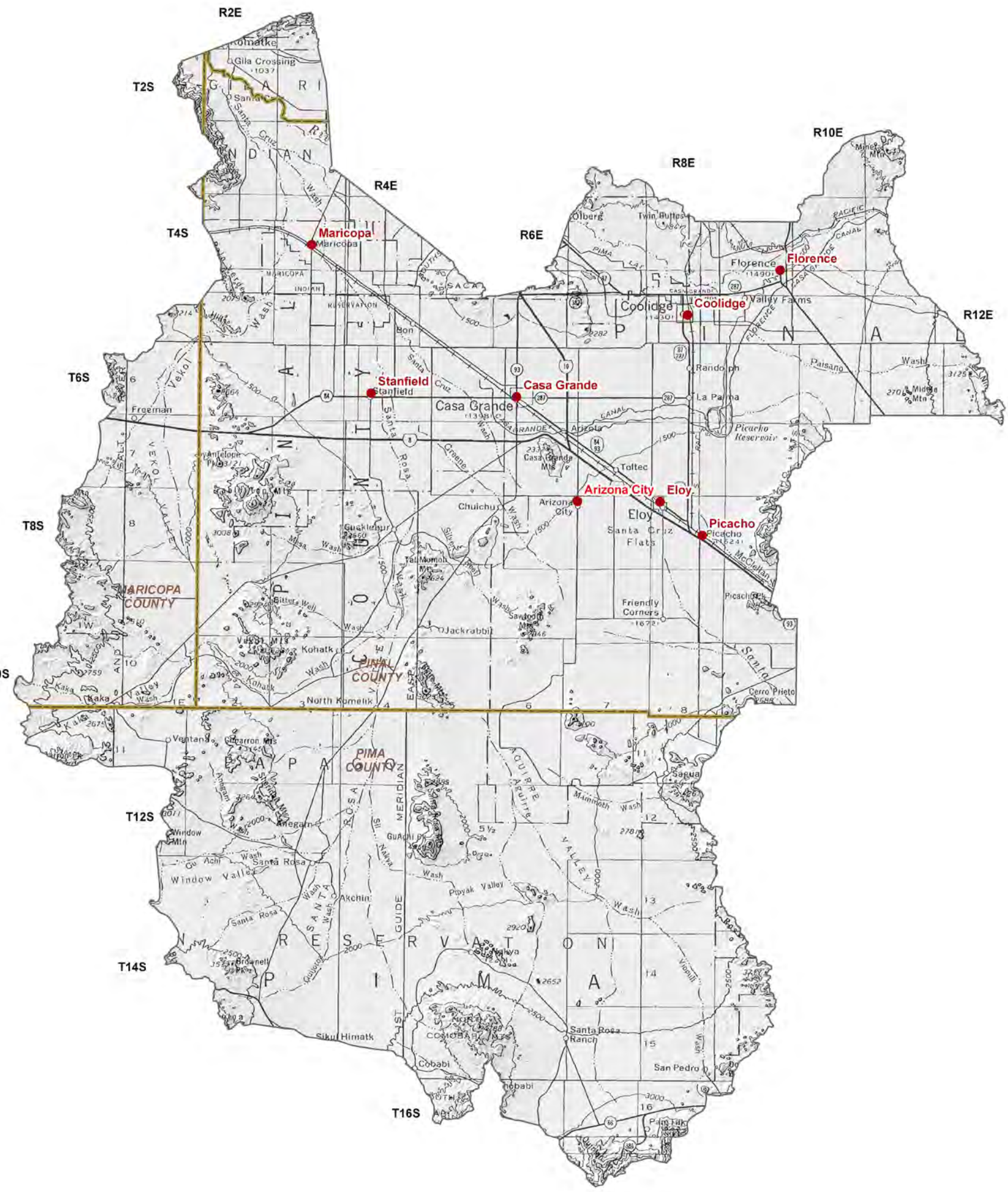


Figure 8.2-1
Pinal AMA
Geographic Features

8.2.2 Land Ownership in the Pinal AMA

Land ownership, including the percentage of ownership by category, for the Pinal AMA is shown in Figure 8.2-2. The principal feature of land ownership in this AMA is the large proportion of Indian Reservation lands. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of largest to smallest percentage in the AMA.

Indian Reservation

- 51.4% of the land is under tribal ownership as the Tohono O'odham, Gila River and Ak-Chin Indian Reservations.
- This is the largest percentage of Indian reservation land in any of the AMA basins.
- Land uses include domestic, commercial, agriculture and grazing.

Private

- 22.5% of the land is private.
- Land uses include domestic, commercial, agriculture and mining.

State Trust Land

- 13.0% of the land is held in trust for public schools and other beneficiaries under the State Trust Land system.
- A portion of state trust land is within the Ironwood and Sonoran Desert National Monuments.
- Land uses include agriculture, grazing and recreation.

U.S. Bureau of Land Management (BLM)

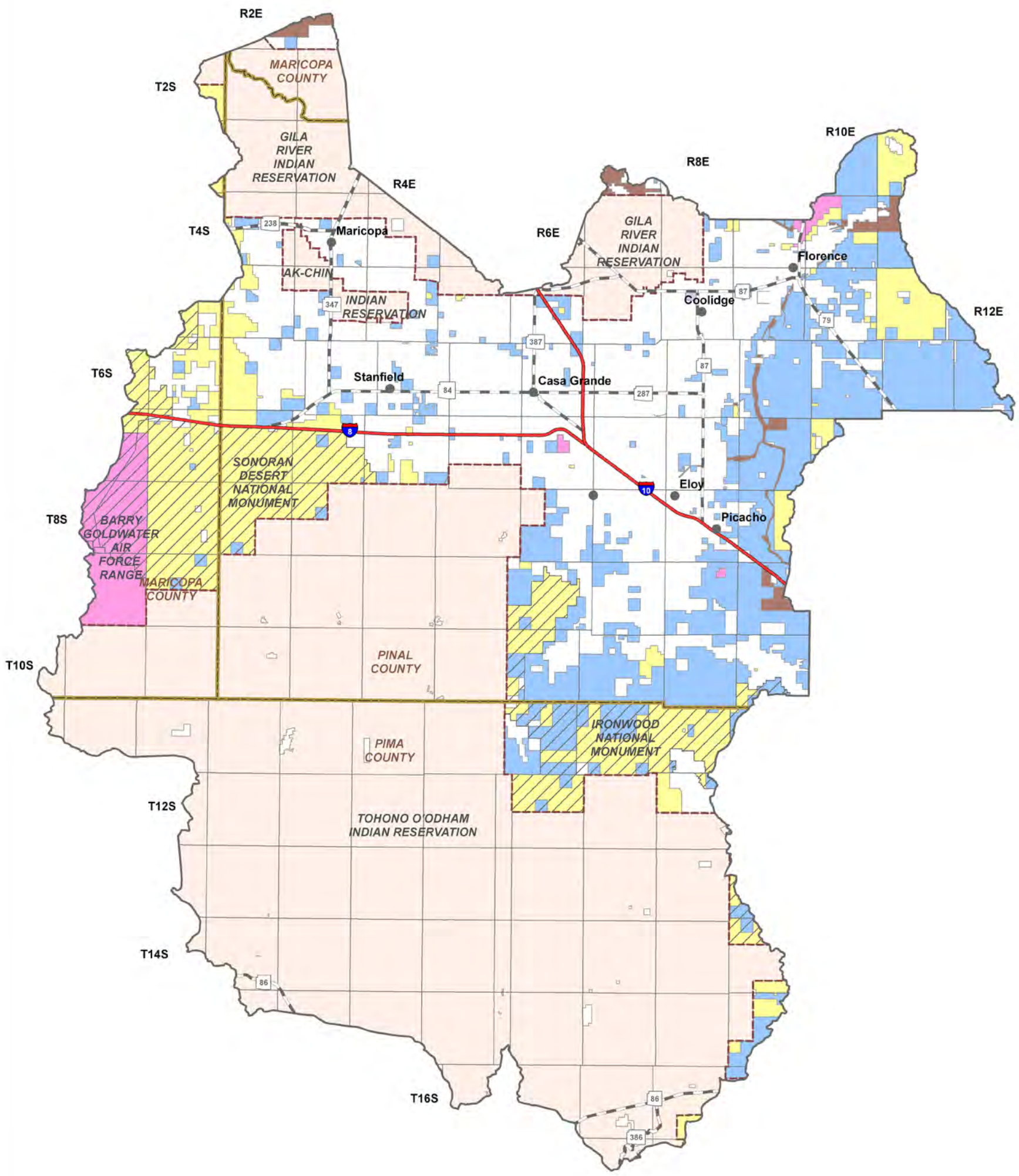
- 10.5% of the land is federally owned and managed by the Tucson and Lower Sonoran Field Offices of the Bureau of Land Management.
- The AMA includes 1,309 acres of the 5,080-acre Coyote Mountain Wilderness and 3,041 acres of the 14,400-acre Sierra Estrella Wilderness. BLM lands also include portions of the Sonoran Desert and Ironwood National Monuments (See Figure 8.0-13)
- Land uses include resource conservation, recreation and grazing.

U.S. Military

- 1.9% of the land is federally owned and managed by the U.S. Military.
- Military lands include a portion of the Barry Goldwater Air Force Range, part of which is within the Sonoran Desert National Monument.
- Primary land use is military activity.

Other

- 0.7% of the land is owned and managed by the U.S. Bureau of Reclamation (BOR) or local and regional governments.
- "Other" includes land in the eastern portion of the AMA managed by BOR for the Central Arizona Project canal and pumping stations as well as local and regional parks managed by Maricopa County.
- Land uses include water infrastructure and recreation.



Indian Reservation (51.4%)
Private (22.5%)
State Trust (13.0%)
BLM (10.5%)
Military (1.9%)
Other (0.7%)
National Monument
Indian Reservation Boundary
COUNTY
Interstate Highway
Major Road
City, Town or Place

0 3 6 Miles

Source: ALRIS, 2004

Figure 8.2-2
Pinal AMA
Land Ownership

8.2.3 Climate of the Pinal AMA

Climate data from NOAA/NWS Co-op Network and AZMET stations are complied in Table 8.2-1 and the locations are shown on Figure 8.2-3. Figure 8.2-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Pinal AMA does not contain Evaporation Pan or SNOTEL /Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.2-1A
- There are nine NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July and is between 70.7°F and 91.1°F. The average monthly minimum temperature occurs in December or January and is between 41.3°F and 52.9°F.
- The highest seasonal rainfall occurs at most stations in the summer (July-September). For the period of record used, the highest average annual rainfall is 23.95 inches at the Kitt Peak station and the lowest is 6.11 inches at the Santa Rosa School station.

AZMET

- Refer to Table 8.2-1C
- There are three AZMET stations in the AMA. Elevation at the stations range from 1,184 feet to 1,512 feet and the corresponding annual average evaporation ranges from 79.84 inches to 77.53 inches.

SCAS Precipitation Data

- See Figure 8.2-3
- Additional precipitation data shows average annual rainfall as high as 30 inches on the AMA boundary near Kitt Peak and as low as six inches in the northwestern portion of the AMA near Maricopa.

Table 8.2-1 Climate Data for the Pinal AMA

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Casa Grande	1,462	1971-2000	90.4/Jul	51.9/Dec	2.59	0.57	3.59	2.47	9.22
Casa Grande Natl Mon	1,419	1971-2000	90.4/Jul	50.4/Dec	3.06	0.66	3.12	2.77	9.61
Covered Wells 1E	2,622	1956-1963	88.2/Jul	50.22/Jan	2.67	0.89	5.89	2.34	11.8
Eloy 4 NE	1,545	1971-2000	89.9/Jul	52/Dec	3.10	0.69	3.69	3.12	10.60
Florence	1,505	1971-2000	89/Jul	52.3/Jan	3.29	0.84	3.05	2.87	10.05
Kitt Peak	6,800	1971-2000	70.7/Jul	41.3/Jan	5.45	1.43	11.53	5.54	23.95
Maricopa 4 N	1,160	1971-2000	91.4/Jul	50.3/Dec	2.59	0.51	2.61	2.27	7.98
Maricopa 9 SSW	1,401	1898-1958[1]	91.1/Jul	48.8/Jan	1.83	0.55	3.10	1.86	7.34
Picacho 8 SE	1,830	1971-2000	91.1/Jul	52.9/Jan	3.26	0.73	3.52	2.56	10.07
Santa Rosa School	1,841	1959-1977[1]	88.2/Jul	49.1/Jan	0.87	0.72	2.97	1.55	6.11
Silver Bell	2,740	1906-1974	85.8/Jul	52.7/Jan	2.65	0.73	6.2	3.2	12.78

Source: WRCC
Notes:
[1]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

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

Source: WRCC

C. AZMET:

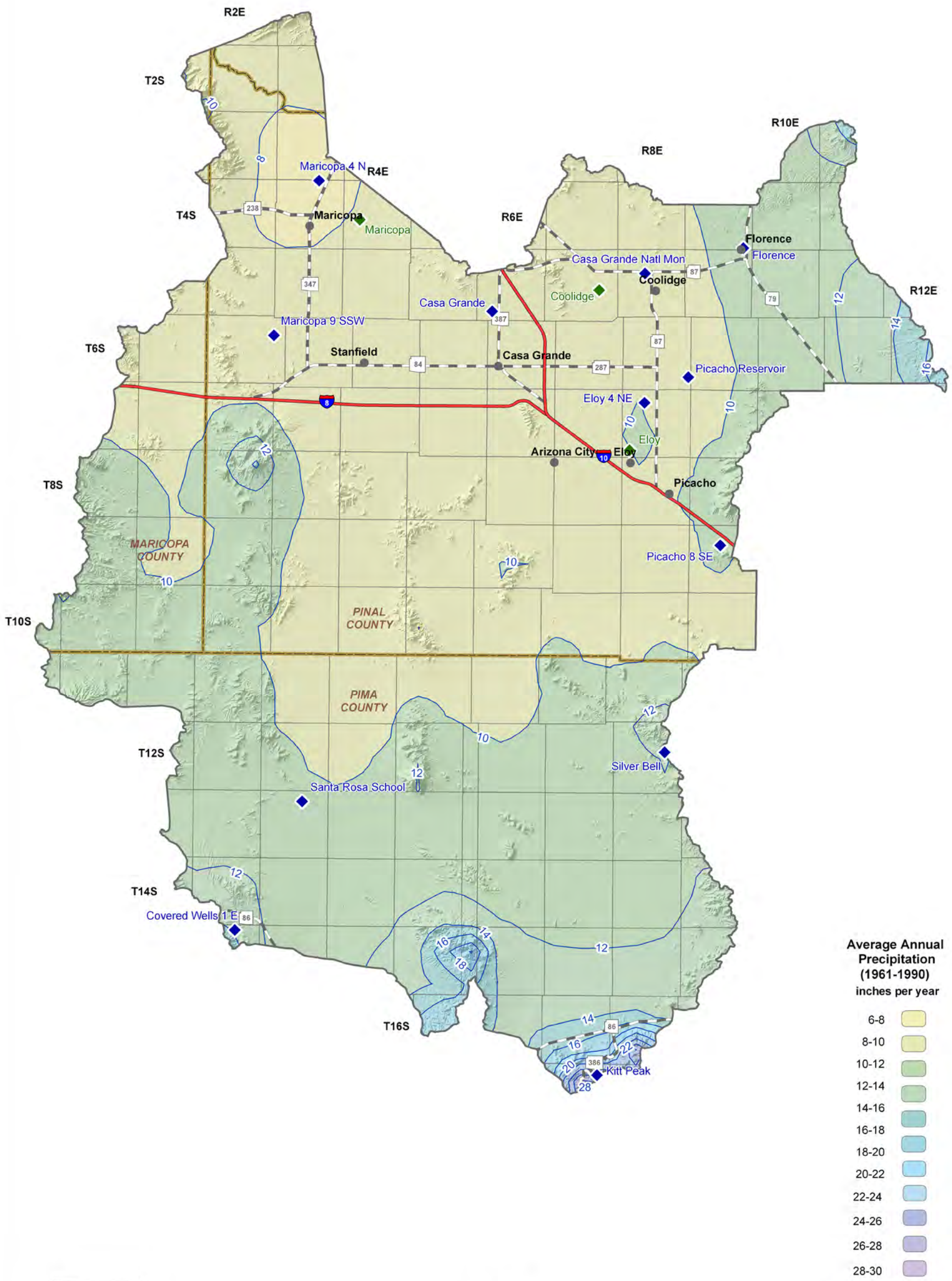
Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
Coolidge	1,385	1999 - current	77.53
Eloy	1,512	1999 - current	79.84
Maricopa	1,184	1999 - current	79.37

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	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								

Source: NRCS, 2005



Precipitation Data Source: Oregon State University, 1998

Figure 8.2-3
Pinal AMA
Meteorological Stations and Annual Precipitation

8.2.4 Surface Water Conditions in the Pinal AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.2-2. Flood ALERT equipment in the AMA is shown in Table 8.2-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.2-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 8.2-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.2-2.
- Data from nine stations located at five watercourses are shown in the table and on Figure 8.2-4.
- Average seasonal flow at the Gila River gages is highest during the winter season (January-March) and highest on other watercourses during the summer (July-September).
- The largest annual flow recorded in the AMA is 1.2 million acre feet in 1993 at the Gila River near Laveen gage with a contributing drainage area of 7,729 square miles.

Flood ALERT Equipment

- Refer to Table 8.2-3.
- There are six ALERT gages in the Pinal AMA.

Reservoirs and Stockponds

- Refer to Table 8.2-4.
- The AMA contains three large reservoirs. The largest, Saint Clair, has a maximum storage of 375,000 acre-feet.
- Reservoirs uses vary and include recreation, flood control, irrigation, fish and wildlife, fire protection, stock or farm, and water supply.
- Water is diverted for the San Carlos Irrigation Project (SCIP) at Ashurst-Hayden Diversion Dam located on the north bank of the Gila River 12 miles east of Florence. The dam, completed in 1922, consists of diversion works and is not a storage or flood control facility.
- Surface water is stored or could be stored in 12 small reservoirs.
- There are 315 registered stockponds in the AMA.

Runoff Contour

- Refer to Figure 8.2-4.
- Average annual runoff is highest, 0.5 inches per year or 26.7 acre-feet per square mile, at the northeastern tip of the AMA and the southwestern portion of the AMA and decreases to 0.1 inches, or five acre-feet per square mile, in the center of the AMA.

Table 8.2-2 Streamflow Data for the Pinal AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9477570	Gila River at Attaway	18,776	1,418	10/2002-current (real-time)	53	0	47	0	0 (2004)	0	10,719	32,158 (2005)	3
9479500	Gila River near Laveen	7,729	1,019	1/1940-9/1994 (discontinued)	67	6	13	15	0 (1969)	9,420	45,227	1,189,109 (1993)	52
9479501	Gila River near Laveen (Main Channel)	20,615	1,019	10/1992-5/1995 (discontinued)	No statistics run, less than 3 years of data								
9479502	Gila River near Laveen (Overflow Channel)	NA	NA	10/1983-5/1995 (discontinued)	83	10	0	8	0 (1994)	0	75,390	677,452 (1993)	9
9487500	Santa Rosa Wash at Gu Komelik near Sells	629	1,590	10/1954-6/1959 (discontinued)	24	0	48	28	417 (1956)	9,759	9,981	19,989 (1958)	4
9488000	Kohatk Wash near Chiapuk near Sells	185	1,932	10/1954-6/1959 (discontinued)	1	1	96	2	155 (1956)	412	1,873	6,514 (1955)	4
9488500	Santa Rosa Wash near Vaiva Vo	1,782	1,470	1954-1980 (discontinued)	7	1	76	16	9 (1979)	3,937	8,107	51,056 (1962)	25
9488650	Vekol Wash near Stanfield	150	1,724	10/1989-9/1996 (discontinued)	1	1	96	2	2 (1991)	195	391	1,318 (1994)	6
9489000	Santa Cruz River near Laveen	8,581	1,021	1/1940-current (real-time)	27	3	41	29	173 (1969)	6,122	12,637	134,770 (1983)	64

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal 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 recor

Table 8.2-3 Flood ALERT Equipment in the Pinal AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
750	Sacaton Peak Repeater	Repeater/Precip	6/11/1996	FCD Maricopa Co
770	Tat Momolikot Dam	Precip/Stage	1/29/1998	FCD Maricopa Co
780	Gila @ Olberg	Precip/Stage	4/12/1995	FCD Maricopa Co
785	Santa Cruz @ SR 84	Precip/Stage	3/16/1994	FCD Maricopa Co
795	Santa Rosa @ SR 84	Precip/Stage	3/16/1994	FCD Maricopa Co
6980	Vekol Wash	Precip/Stage	3/7/1990	FCD Maricopa Co

FCD = Flood Control District

Table 8.2-4 Reservoirs and Stockponds in the Pinal AMA

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
1	Saint Clair *(Tat Momoliklot)*	Bureau of Indian Affairs	375,000	C,I,P,R	Federal
2	Reach 11 Detention Dike 3	Bureau of Reclamation	9,100	C,I,R,S	Federal

Source: U.S. Army Corps of Engineers 2005

B. Other Large Reservoirs (50 acre surface area or greater)[2]

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE[1]	JURISDICTION
3	Picacho Reservior[3]	Pinal County	2,238	F,R	County

Source: USGS 2005

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

Total number: 0
Total maximum storage: 0 acre-feet

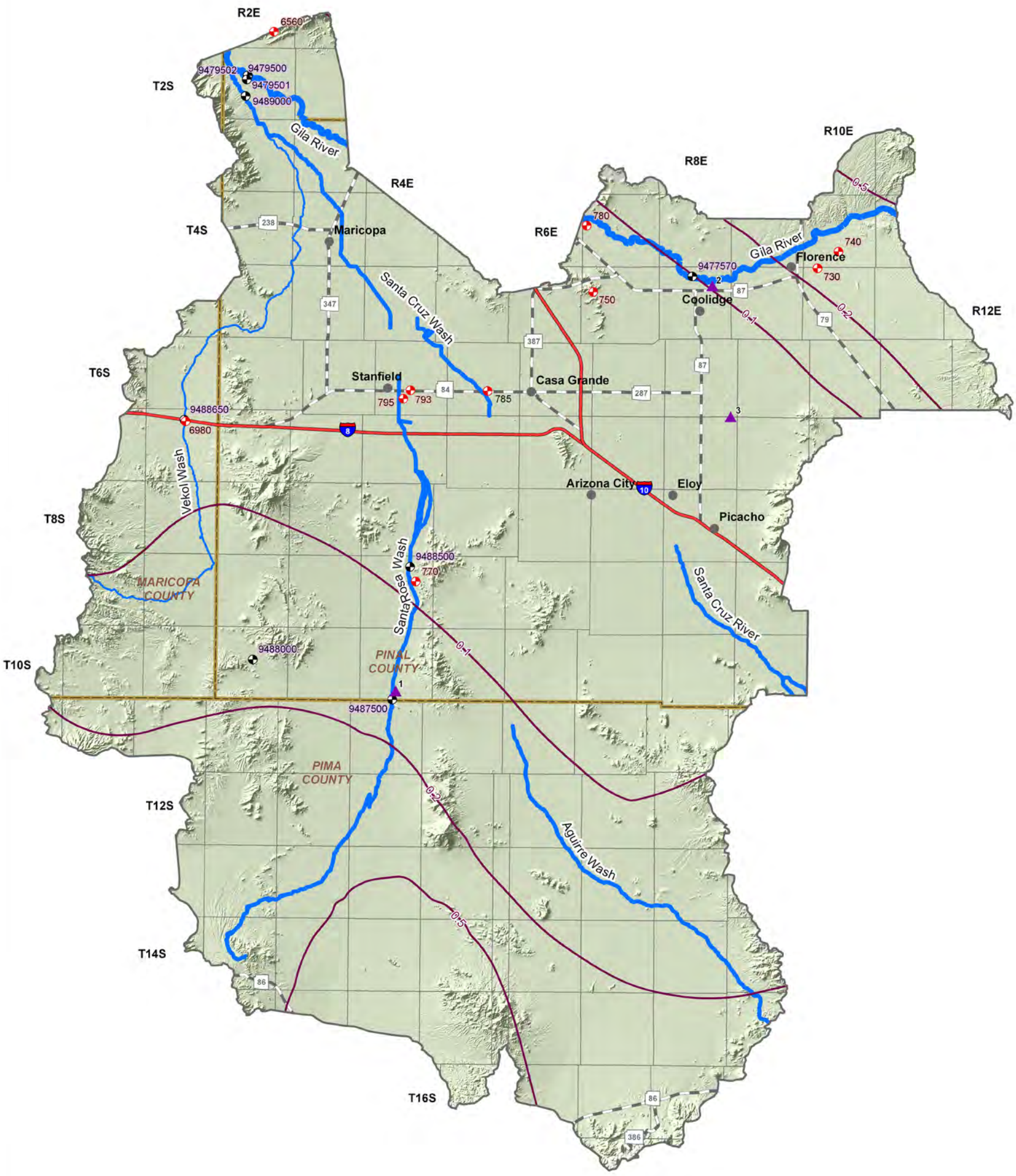
D. Other Small Reservoirs (between 5 and 50 acres surface area)[2]

Total number: 12
Total surface area: 150 acres

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

Total number: 315

Notes:
[1]C= Flood Control, F = fish & wildlife pond, I = Irrigation, P = Fire Protection, Stock or Farm pond, R = Recreation, S = Water Supply
[2]Capacity data is not available to ADWR
[3] Intermittent Lake



Stream Data Source: ALRIS, 2005

0 3 6 Miles

USGS Annual Runoff Contour for 1951-1980 (in inches)
Stream Channel (width of line reflects stream order)
Large Reservoir
USGS Gage and Station ID
Flood ALERT Equip. & Station ID
Interstate Highway
Major Road
City, Town or Place

Figure 8.2-4
Pinal AMA
Surface Water Conditions

8.2.5 Perennial/Intermittent Streams and Springs in the Pinal AMA

The locations perennial and intermittent streams are shown on Figure 8.2-5. There are no major or minor springs in the Pinal AMA. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- There are two intermittent streams in the AMA, the Gila River in the north and a portion of the Santa Cruz River south of Picacho.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from five to six, depending on the database reference.

Table 8.2-5 Springs in the Pinal AMA

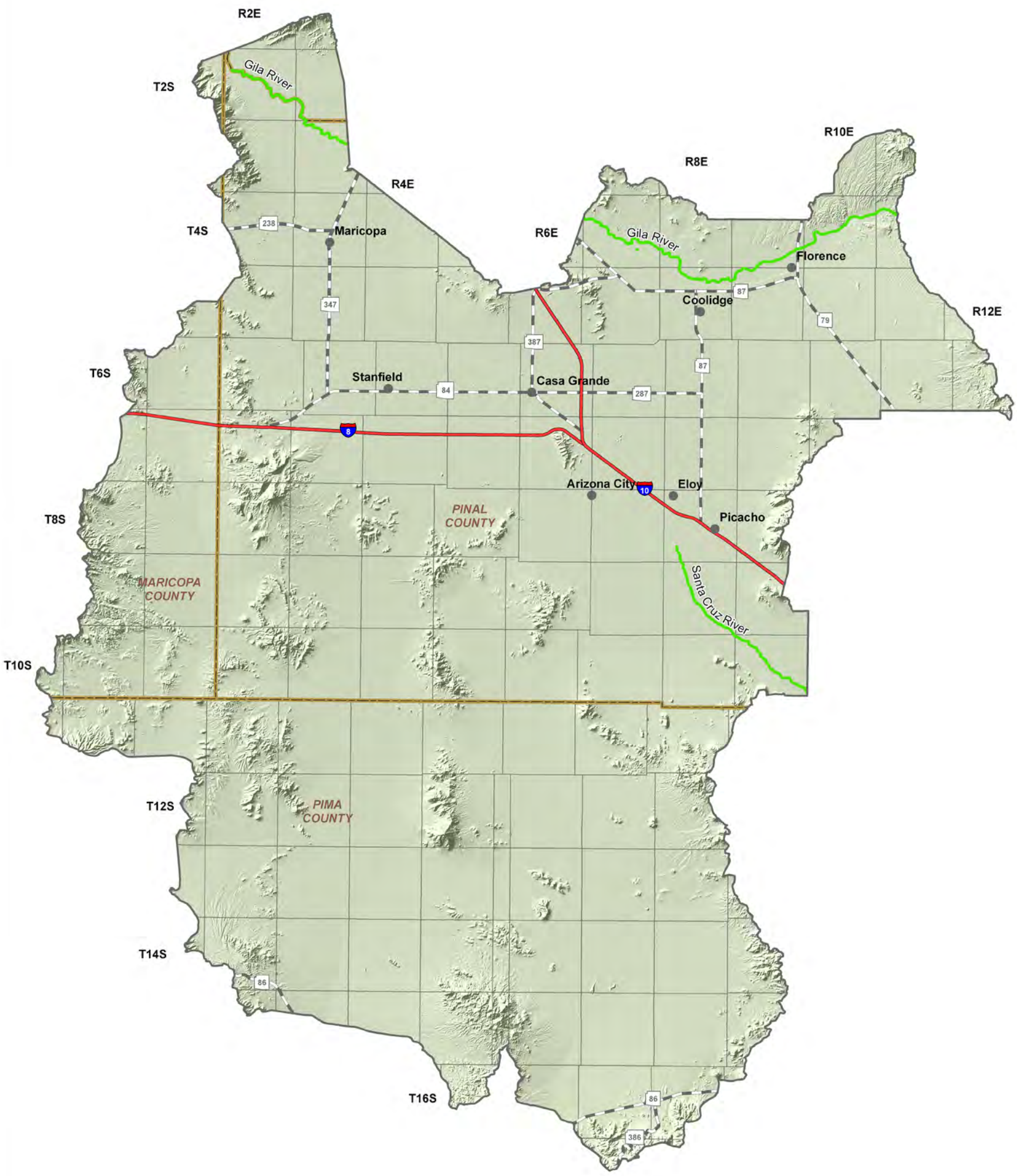
A. Major Springs (10 gpm or greater):

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				

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 5-6



Stream Data Source: AZGF, 1993 & 1997

0 3 6 Miles

Figure 8.2-5
Pinal AMA
Perennial/Intermittent Streams and Major (>10 gpm) Springs

Intermittent Stream
COUNTY
Interstate Highway
Major Road
City, Town or Place

8.2.6 Groundwater Conditions of the Pinal AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.2-6. Figure 8.2-6 shows aquifer flow direction and water-level change between 1993-1994 and 2003-2004 for the entire Pinal AMA. Figures 8.2-6A-B show depth to water during 2003-2004 and water-level change between 1993-1994 and 2003-2004 for selected wells by sub-basin. Figure 8.2-7 contains hydrographs for selected wells shown on Figures 8.2-6A-B. Figure 8.2-8 shows well yields in five yield categories. Underground Storage Facilities (USF) and Groundwater Savings Facilities (GSF) are shown on Table 8.2-7 with facility name, facility permit number and type, permittee name, permitted acre-feet per year and water source. Locations of USFs and GSFs are shown on Figure 8.2-9. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.2-6 and Figure 8.2-6
- The major aquifers in this AMA are recent stream alluvium and basin fill.
- Groundwater flow is generally to the north with flow toward cones of depression at the center of the Maricopa-Stanfield Sub-basin and west of Maricopa.

Well Yields

- Refer to Table 8.2-6 and Figure 8.2-8
- As shown on Figure 8.2-8, well yields are generally greater than 1,000 gallons per minute (gpm).
- One source of well yield information, based on 1,582 reported wells, indicates that the median well yield is 1,000 gpm.

Natural Recharge

- Refer to Table 8.2-6
- Natural recharge in the Pinal AMA is estimated at 82,750 acre-feet per year.
- Primary source of natural recharge is streambed recharge along the Gila and Santa Cruz Rivers.

Water Level

- Refer to Figures 8.2-6 and 8.2-6A-B. Water levels are shown for wells measured in 2003-2004. Not all water level data shown on Figure 8.2-6 are shown on Figure 8.2-6A-B.
- The Department annually measures 163 index wells in the AMA; hydrographs for nine index wells are shown on Figure 8.2-7.
- The deepest water level shown is 662 feet south of I-8 (Figure 8.2-7A) and the shallowest is 24 feet west of highway 387 in the Eloy Sub-basin (Figure 8.2-7B).

Recharge Sites

- Refer to Table 8.2-7 and Figure 8.2-9.

- There are six active USFs and four active GSFs.
- Total permitted storage capacity for USFs is 6,400 acre-feet per year. All USFs are permitted to store effluent.
- Total permitted storage capacity for GSFs is 303,480. All GSFs are permitted to store CAP water.

Table 8.2-6 Groundwater Data for the Pinal AMA

Basin Area, in square miles:	4,000	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill	
Well Yields, in gal/min:	Range 2-6000 Median 1,010 (1,342 wells measured)	ADWR GWSI
	Range 3-3,600 Median 1,000 (1,582 wells reported)	ADWR Wells55 (>10-inch diameter)
Estimated Natural Recharge, in acre-feet/year:	82,750	ADWR (2004 Estimate)
Current Number of Index Wells:	163	
Date of Last Water-level Sweep:	2004 (1,003 well measurements)	

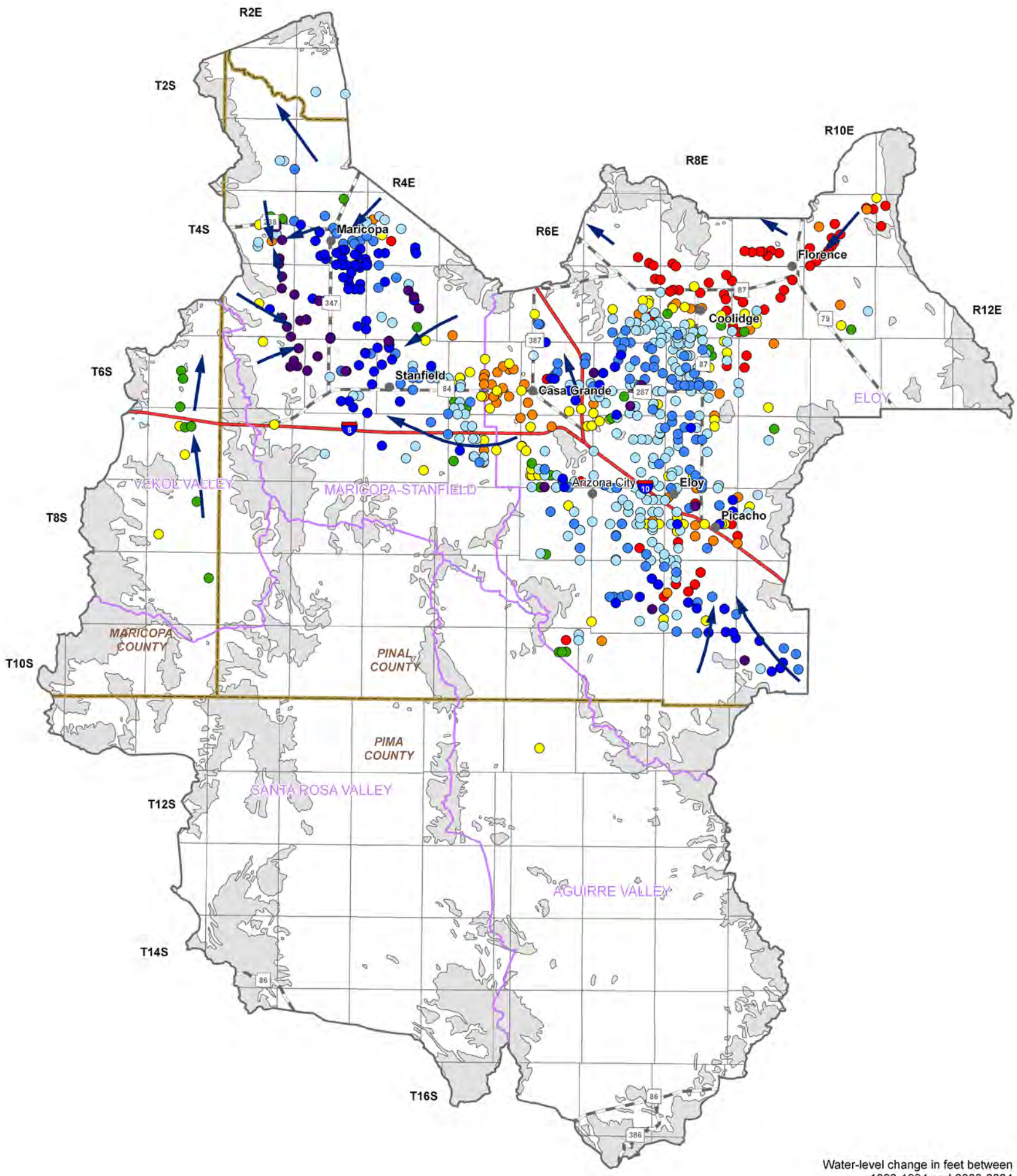


Figure 8.2-6
Pinal AMA
Groundwater Conditions

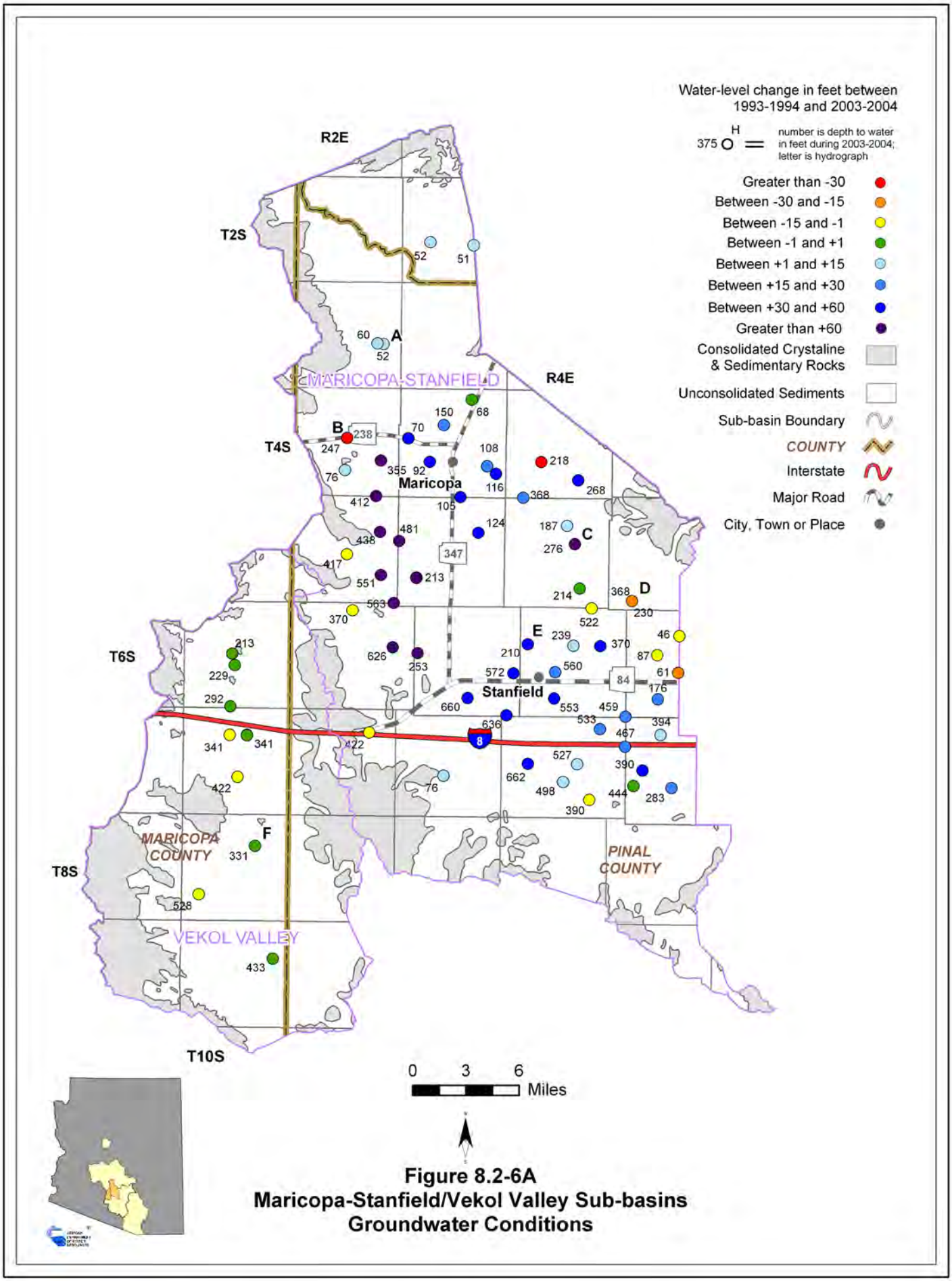


Figure 8.2-6A
Maricopa-Stanfield/Vekol Valley Sub-basins
Groundwater Conditions

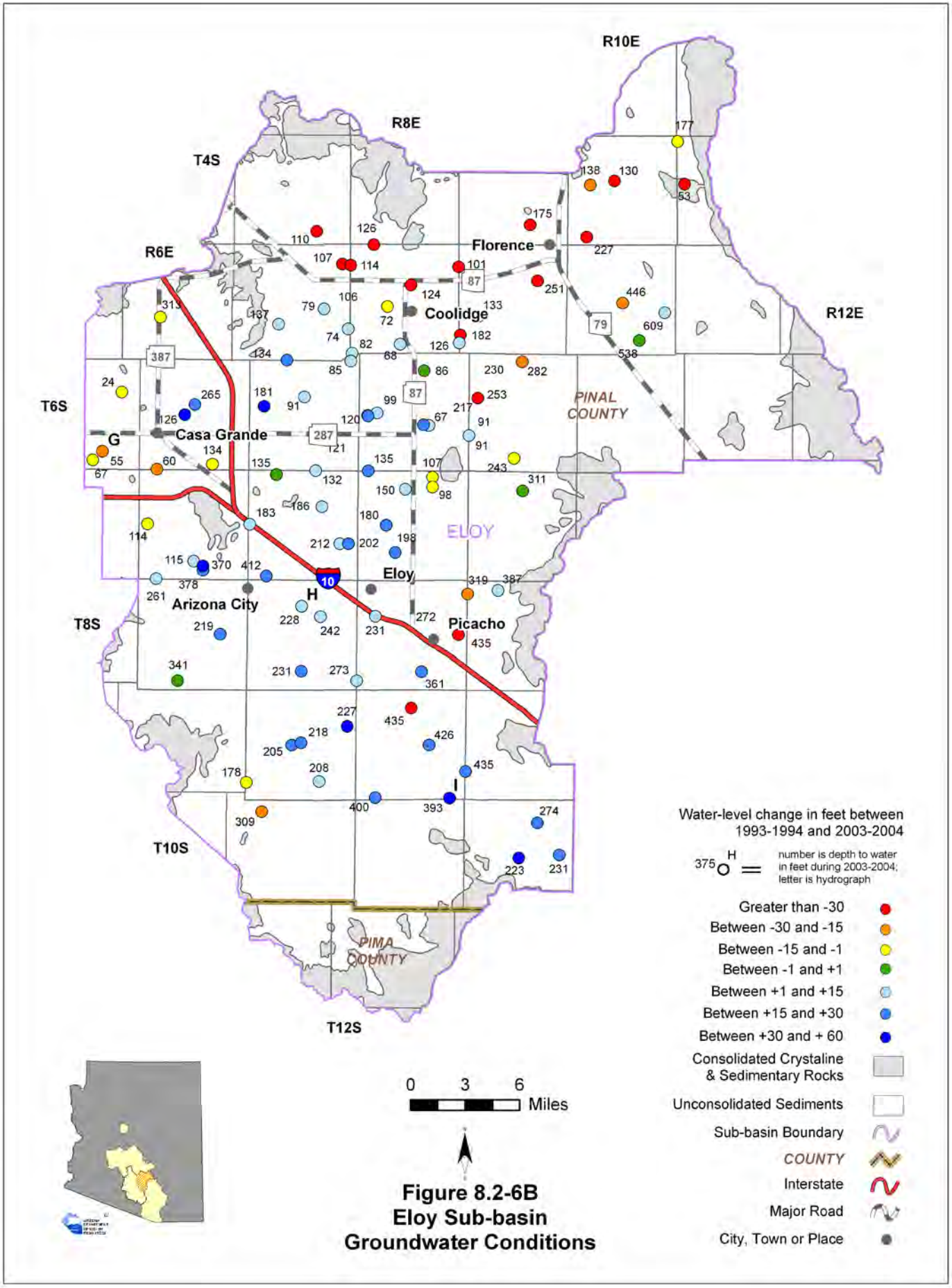


Figure 8.2-6B
Eloy Sub-basin
Groundwater Conditions

Figure 8.2-7
Pinal Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

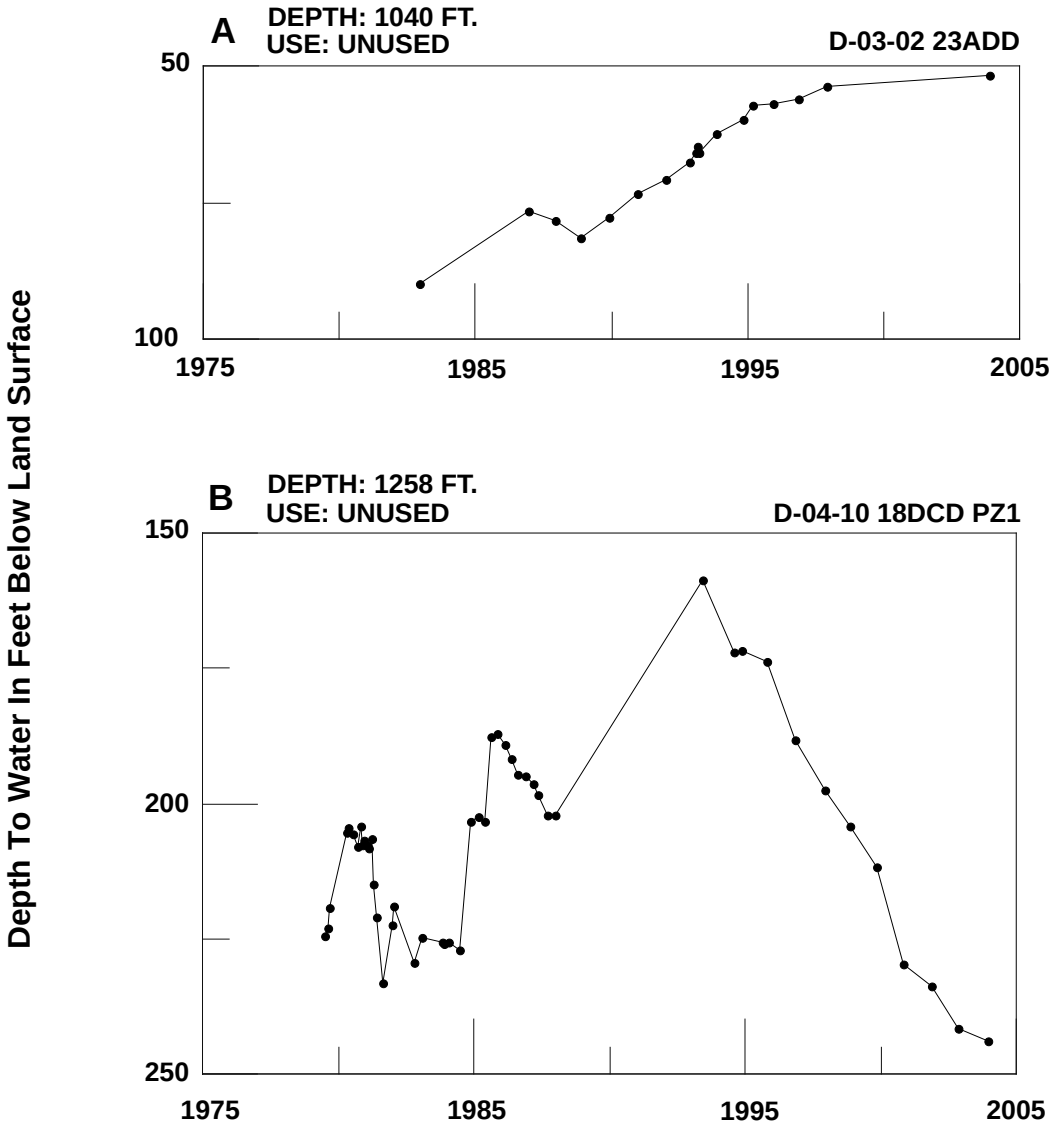


Figure 8.2-7 (cont)
Pinal Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

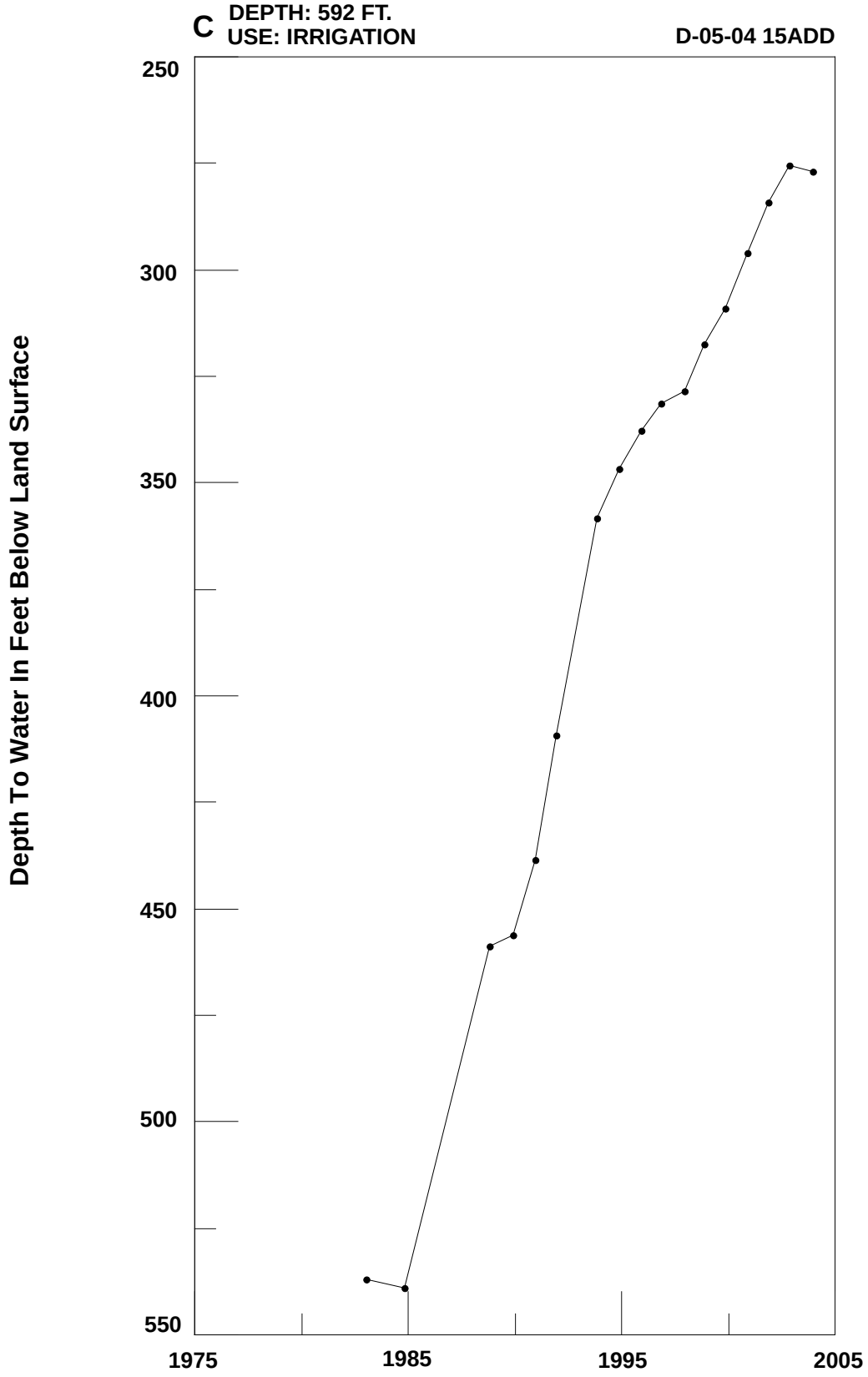


Figure 8.2-7 (cont)
Pinal Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

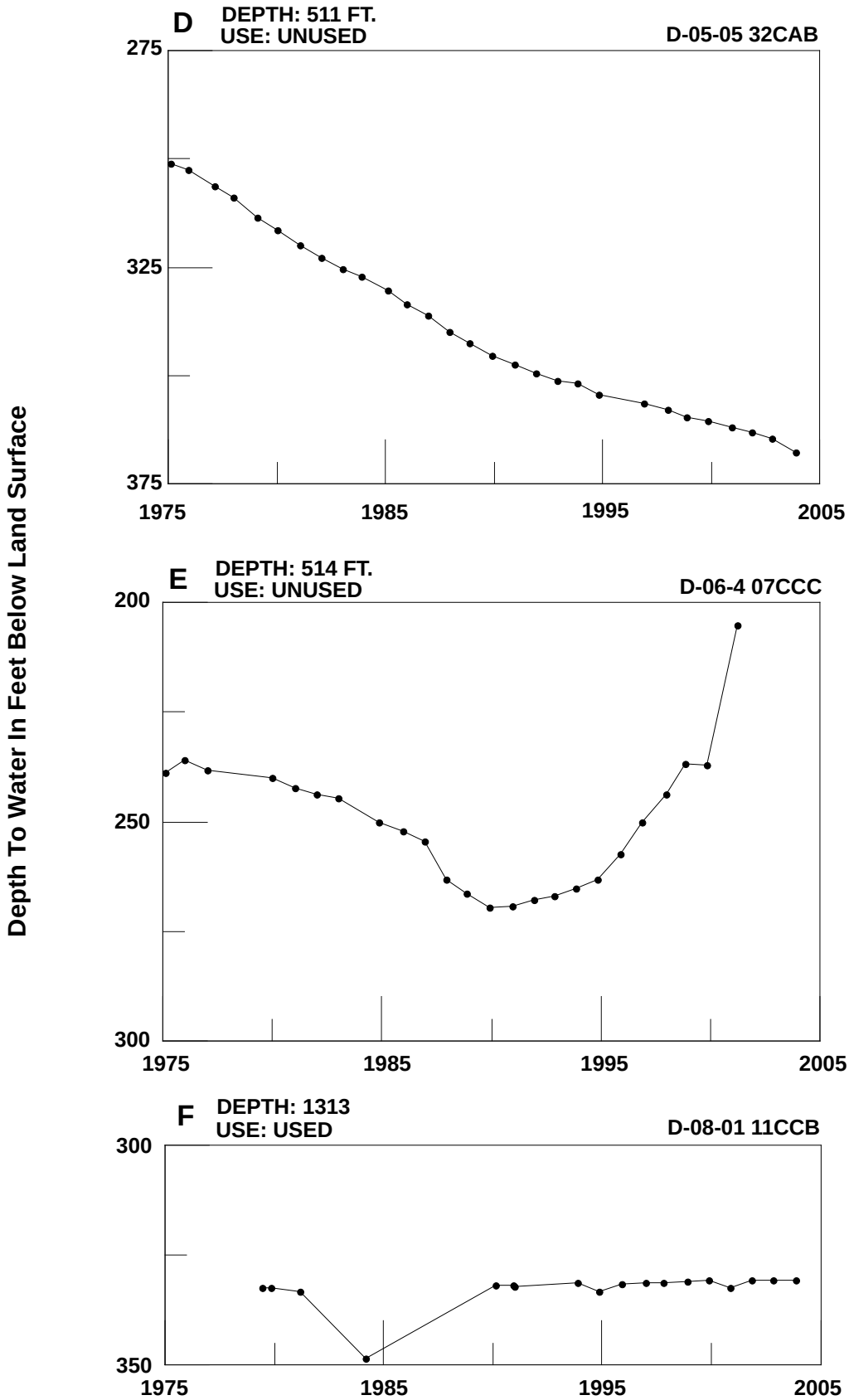


Figure 8.2-7 (cont)
Pinal Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

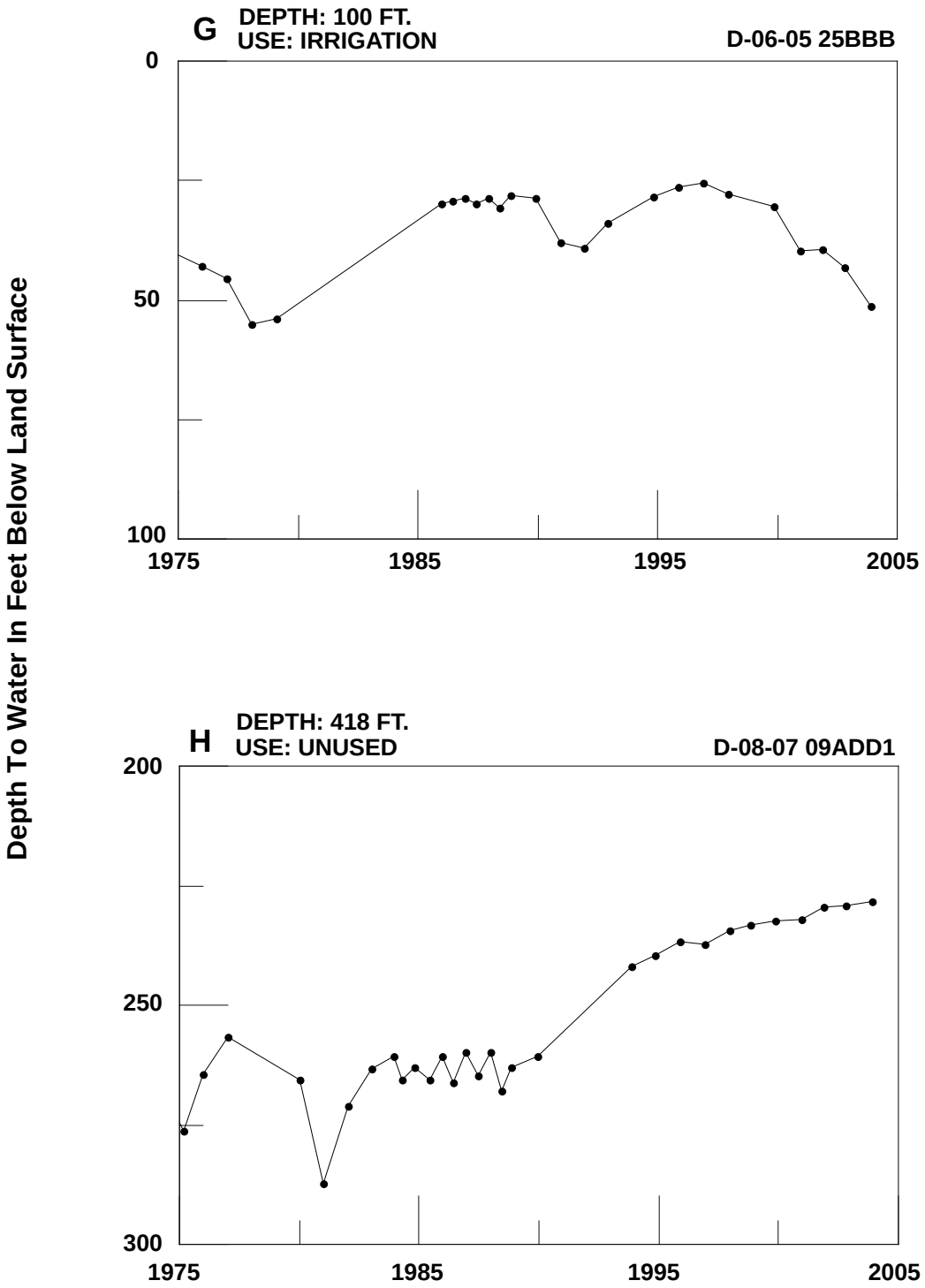
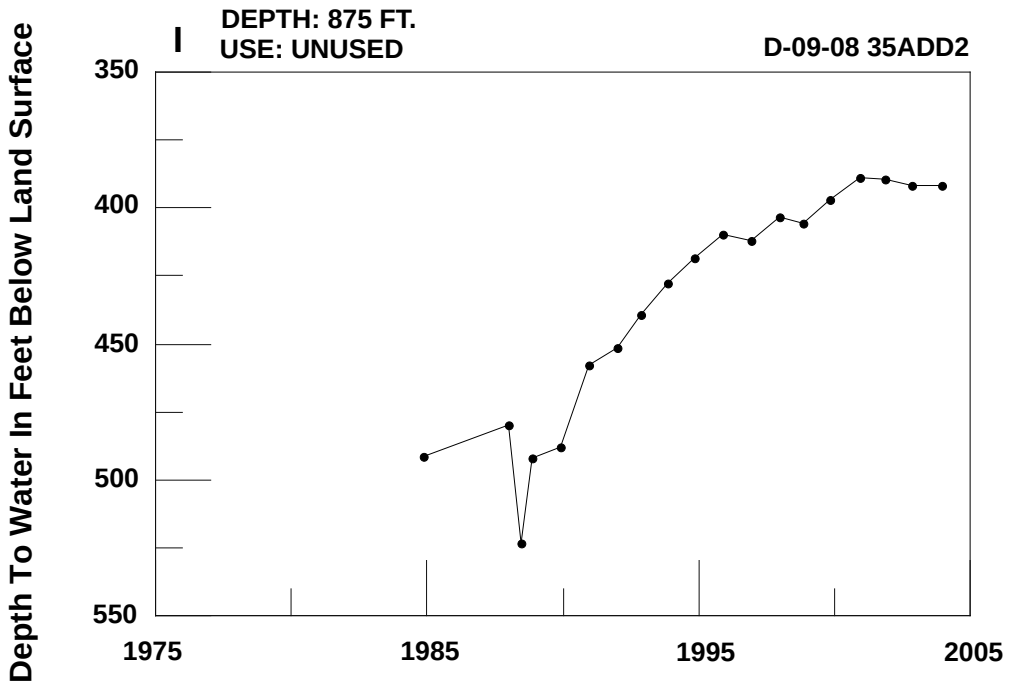


Figure 8.2-7 (cont)
Pinal Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



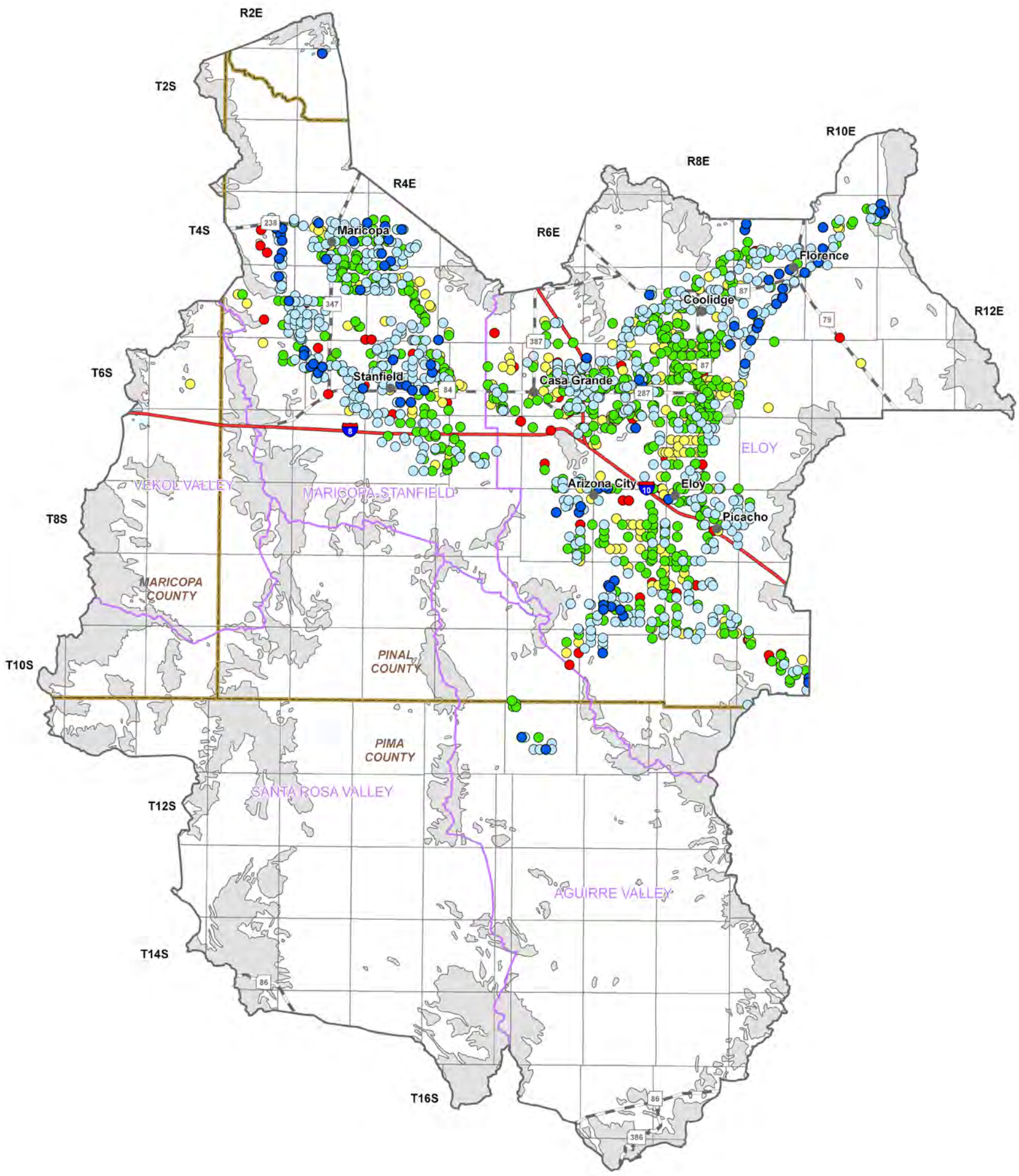


Figure 8.2-8
Pinal AMA
Well Yields

Table 8.2-7 Recharge Sites in the Pinal AMA

FACILITY NAME	FACILITY NUMBER	PERMITTEE NAME	FACILITY TYPE	PERMITTED AF/YEAR	WATER SOURCE
ARIZONA CITY SANITARY DISTRICT	71-209000.0000	ARIZONA CITY SANITARY DISTRICT	CONSTRUCTED	2,240	E
ELOY RECLAIMED WATER RECHARGE PROJECT	71-591932.0000	CITY OF ELOY	CONSTRUCTED	2,240	E
NORTH FLORENCE RECHARGE FACILITY	71-519876.0001	TOWN OF FLORENCE	CONSTRUCTED	135	E
PICACHO SEWER COMPANY	71-575760.0000	PICACHO SEWER COMPANY	CONSTRUCTED	340	E
SOUTHWEST WATER DISTRIBUTION CENTER	71-211279.0000	GLOBAL WATER	CONSTRUCTED	1,120	E
SUN LAKES AT CASA GRANDE	71-591938.0000	PICACHO SEWER COMPANY	CONSTRUCTED	340	E

B. Groundwater Savings Facilities

PERMITEE/FACILITY NAME	FACILITY NUMBER	PERMITTED AF/YEAR	WATER SOURCE
GILA RIVER INDIAN IDD	72-211277.0000	18,480	C
HOHOKAM IDD	72-534489.0003	55,000	C
CENTRAL ARIZONA IDD	72-531382.0002	110,000	C
MARICOPA STANFIELD IDD	72-531381.0003	120,000	C

Notes:
Gila River Indian IDD GSF is located in the Phoenix and Pinal AMAs. Permitted AF/Year shown here is for the Pinal AMA only.
C - CAP
E - Effluent
IDD - Irrigation and Drainage District

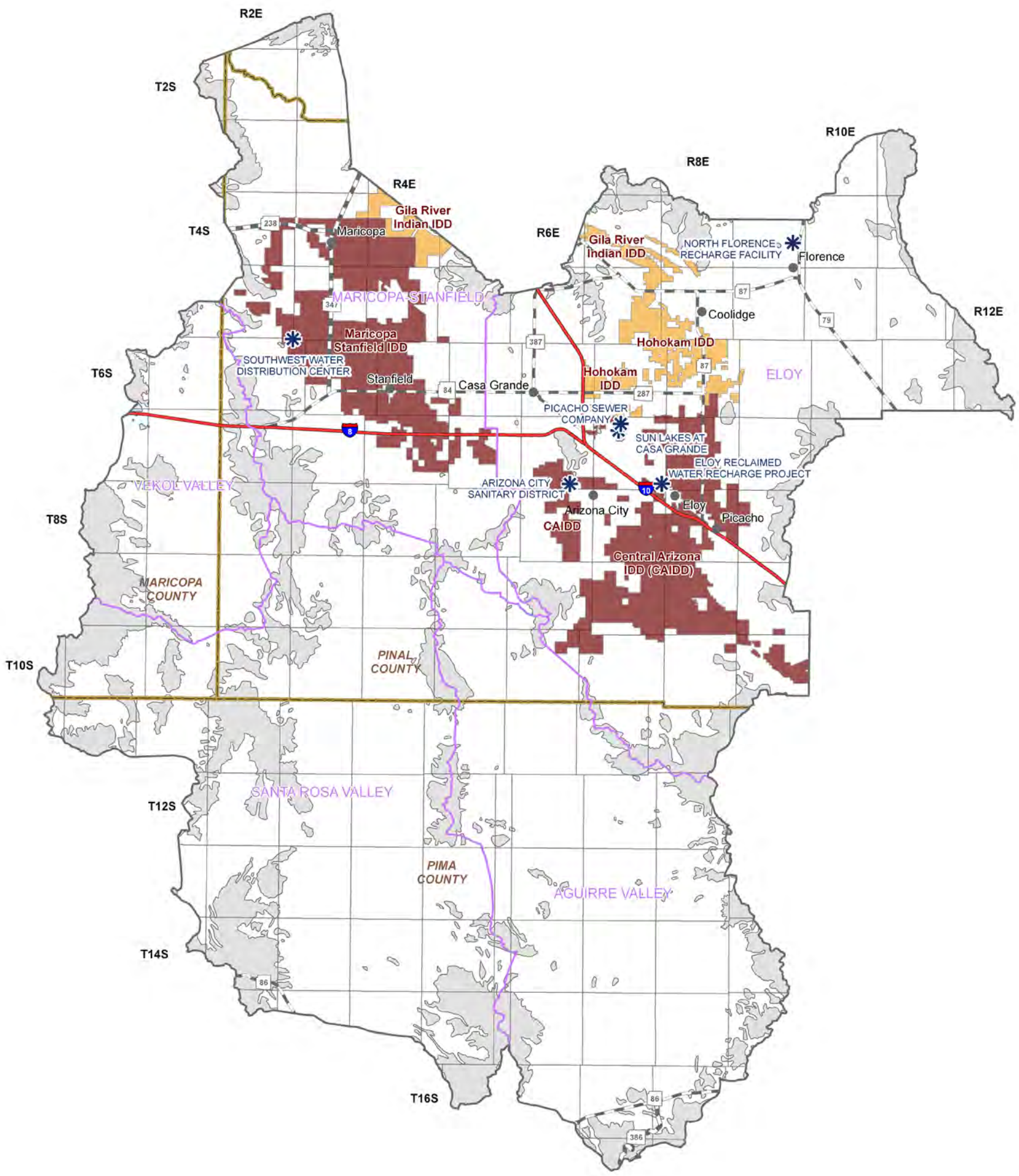


Figure 8.2-9
Pinal AMA
Recharge Sites

8.2.7 Water Quality Exceedences and Contamination Sites in the Pinal AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s), including location and parameter(s) are shown in Table 8.2-8A. There are no impaired lakes or streams in the Pinal AMA. Figure 8.2-10 shows the location of water quality occurrences keyed to Table 8.2-8. Figure 8.2-11 shows the located of contamination sites with site information shown in Table 8.2-9. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Well, spring and mine sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 8.2-8A.
- Three hundred and twenty five sites have parameter concentrations that have equaled or exceeded DWS.
- Frequently equaled or exceeded the parameters include nitrate, fluoride and arsenic.
- Other parameters equaled or exceeded include manganese, cadmium, lead, radionuclides, selenium, beryllium, total dissolved solids and zinc.

Effluent Dependent Reaches

- Refer to Figure 8.2-10
- There are two effluent dependent reaches on the Santa Cruz River and the Gila River.

Contamination Sites

- Refer to Figure 8.2-11 and Table 8.2-9
- There are three Voluntary Remediation Program: Terminal 2 Plume, Anderson Clayton - Sunshine Gin and Former Puregro #175.

Table 8.2-8 Water Quality Exceedences in the Pinal AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	2 South	3 East	9	1	TDS
2	2 South	3 East	20	1	NO3, TDS
2	2 South	3 East	27	2	NO3, TDS
2	2 South	3 East	28	1	TDS
3	3 South	2 East	23	1	F
3	3 South	2 East	24	2	As, F
4	4 South	2 East	14	2	F
4	4 South	2 East	23	1	F
4	4 South	2 East	26	1	F
5	4 South	2 East	13	1	F
6	4 South	3 East	15	1	F
6	4 South	3 East	22	1	F
7	4 South	3 East	2	1	F
8	4 South	3 East	25	2	F, NO3
8	4 South	3 East	26	2	F
8	4 South	3 East	34	1	NO3
8	4 South	4 East	19	3	F, NO3
9	4 South	4 East	27	3	As, F
9	4 South	4 East	34	2	NO3
10	5 South	3 East	12	1	F
10	5 South	4 East	6	1	NO3
10	5 South	4 East	8	1	NO3
10	5 South	4 East	18	1	F
11	5 South	4 East	20	1	F
11	5 South	4 East	29	2	As, NO3
12	5 South	4 East	10	1	NO3
12	5 South	4 East	11	1	NO3
13	5 South	4 East	23	2	F, NO3
14	5 South	2 East	2	1	F, NO3
15	5 South	2 East	24	3	F, NO3
15	5 South	3 East	18	1	F
15	5 South	3 East	19	2	F
15	5 South	3 East	30	2	F, NO3
16	5 South	3 East	21	2	As, Cd, F, NO3, TDS
17	5 South	3 East	33	1	Cd, NO3
18	5 South	3 East	22	1	F
19	5 South	4 East	31	1	Cd
20	4 South	8 East	6	1	NO3
21	4 South	9 East	28	2	NO3
22	4 South	9 East	15	1	Mn
23	4 South	10 East	31	2	NO3
23	5 South	10 East	6	1	Mn
24	5 South	5 East	32	1	As
25	5 South	5 East	16	1	F
25	5 South	5 East	21	1	F
26	5 South	6 East	30	1	NO3
27	5 South	6 East	20	1	NO3
27	5 South	6 East	21	2	As, F, NO3
27	5 South	6 East	26	1	As, F
27	5 South	6 East	27	1	F
27	5 South	6 East	28	1	As, F, Mn
27	5 South	6 East	34	2	As, F
27	6 South	6 East	3	1	As, F
27	6 South	6 East	4	1	F
28	5 South	7 East	27	1	F

Table 8.2-8 Water Quality Exceedences in the Pinal AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
28	5 South	7 East	34	2	F
29	5 South	7 East	23	2	F, NO3, TDS
29	5 South	7 East	25	2	F
29, 30	5 South	7 East	24	4	As, F, NO3, TDS
30	5 South	7 East	13	2	F
30	5 South	8 East	18	1	F
30	5 South	8 East	19	5	As, F
30	5 South	8 East	20	1	F
30	5 South	8 East	21	1	F
31	5 South	8 East	29	1	F
31	5 South	8 East	33	3	Be, Cd, F, NO3, TDS
32	5 South	8 East	22	1	NO3
32	5 South	8 East	23	1	As, Mn
33	5 South	8 East	13	2	NO3
34	6 South	8 East	2	2	F
34	5 South	8 East	25	1	NO3
34	5 South	8 East	36	3	F, Mn, NO3
34	5 South	9 East	31	2	F, NO3
34	5 South	9 East	32	1	NO3
35	5 South	9 East	19	1	NO3
35	5 South	9 East	20	1	Cd
36	5 South	10 East	34	1	As
37	6 South	2 East	27	1	F
38	6 South	2 East	3	2	F, NO3
39	6 South	2 East	1	1	F
39	6 South	2 East	12	1	As
39	6 South	3 East	6	2	As
39	6 South	3 East	7	2	As, F
40	6 South	3 East	16	1	As
40	6 South	3 East	17	1	As, NO3
40	6 South	3 East	21	1	F
41	6 South	3 East	26	2	As, NO3, Organics
41	6 South	3 East	27	1	As, NO3
42	6 South	4 East	6	1	F
42	6 South	4 East	7	1	NO3
43	6 South	4 East	19	1	Cd
43	6 South	4 East	29	1	NO3
44	6 South	4 East	10	2	NO3
45	6 South	4 East	13	1	Rad
45	6 South	4 East	14	1	As
46	6 South	5 East	19	2	As, Cd
46	6 South	5 East	20	1	As, Cd
47	6 South	5 East	32	2	As, NO3
48	6 South	5 East	22	1	NO3
48	6 South	5 East	26	1	As, F, NO3
48	6 South	5 East	35	2	NO3
49	6 South	5 East	12	1	F
49	6 South	5 East	13	1	As, F, NO3
49	6 South	5 East	24	1	As
49	6 South	6 East	7	2	As, F, NO3

Table 8.2-8 Water Quality Exceedences in the Pinal AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
49	6 South	6 East	8	2	As, NO3
49	6 South	6 East	18	1	NO3
50	6 South	6 East	31	1	As, F, NO3
51	6 South	6 East	10	2	As
51	6 South	6 East	15	2	As
51	6 South	6 East	16	1	As
51	6 South	6 East	23	2	F, NO3
51	6 South	6 East	27	1	Mn
52	6 South	7 East	5	1	NO3
52	6 South	7 East	8	1	F
52	6 South	7 East	9	1	As
52	6 South	7 East	17	1	As
52	6 South	7 East	18	2	F
53	6 South	7 East	15	1	As, F
53	6 South	7 East	22	1	F
53	6 South	7 East	23	1	As, F
54	6 South	7 East	13	1	F
54	6 South	8 East	19	1	As, NO3
55	6 South	8 East	6	2	F, NO3, TDS
55	6 South	8 East	7	2	NO3, TDS
56	6 South	8 East	20	1	NO3
57	6 South	8 East	15	1	Mn, Pb
57	6 South	8 East	16	1	Mn, Pb
58	6 South	8 East	2	1	F
58	6 South	8 East	11	1	As, F
58	6 South	8 East	12	1	F
59	6 South	9 East	6	1	F
59	6 South	9 East	7	1	F
59	6 South	9 East	18	3	As, F
60	7 South	1 East	22	1	As
61	7 South	2 East	10	2	NO3
61	7 South	2 East	11	2	NO3
62	7 South	3 East	1	2	As, F
62	7 South	4 East	6	1	F
62	7 South	4 East	8	1	F
63	7 South	4 East	23	1	F
63	7 South	4 East	26	1	F
64	7 South	4 East	1	2	As
65	7 South	5 East	16	1	F
66	7 South	6 East	32	2	NO3
66	7 South	6 East	33	3	NO3
66	7 South	6 East	34	2	NO3, Organics
66	8 South	6 East	3	3	NO3
67	7 South	6 East	12	1	NO3
67	7 South	7 East	6	1	NO3
68	7 South	7 East	32	1	F
68	8 South	6 East	1	1	As
68	8 South	7 East	5	1	As, F
69	6 South	7 East	33	2	As, NO3
69	7 South	7 East	5	2	NO3
70	7 South	7 East	2	1	F
71	7 South	8 East	16	2	NO3
72	7 South	8 East	33	1	NO3
73	7 South	9 East	9	2	Mn

Table 8.2-8 Water Quality Exceedences in the Pinal AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
74	8 South	1 East	31	1	As
75	8 South	1 East	11	1	Mn
76	8 South	4 East	23	1	As
77	8 South	5 East	24	1	As
78	8 South	6 East	8	1	As
78	8 South	6 East	10	1	As
78	8 South	6 East	16	1	As
79	8 South	6 East	35	1	As
80	9 South	1 West	15	1	Mn
81	8 South	7 East	25	1	NO3
81	8 South	7 East	34	1	F
81	8 South	7 East	35	1	NO3
81	9 South	7 East	1	1	NO3
82	8 South	7 East	12	1	As, F
83	8 South	7 East	23	1	F
83	8 South	7 East	24	1	NO3
83	8 South	8 East	19	1	NO3
83	8 South	8 East	30	1	F
84	7 South	8 East	31	1	NO3
84	8 South	8 East	5	1	NO3
84	8 South	8 East	8	1	F
84, 86	8 South	8 East	9	2	Mn, NO3, Pb, TDS
85	8 South	8 East	32	2	NO3
85	9 South	8 East	6	1	NO3
86	8 South	8 East	14	1	As
86	8 South	8 East	15	1	NO3
86	8 South	8 East	21	1	NO3
86	8 South	8 East	22	1	NO3
86	8 South	8 East	23	3	Mn, NO3
87	8 South	8 East	27	1	As
88	8 South	9 East	5	1	Mn
88	8 South	9 East	7	1	F
88	8 South	9 East	18	1	As
89	9 South	7 East	4	1	As
90	10 South	6 East	1	1	NO3
91	9 South	6 East	25	1	As
92	10 South	7 East	5	1	As
93	9 South	7 East	27	1	As
93	9 South	7 East	28	1	As
93	9 South	7 East	34	1	As
94	9 South	7 East	2	1	NO3
94	9 South	7 East	11	1	NO3
95	9 South	7 East	35	1	F
95	9 South	7 East	36	1	As
96	9 South	7 East	12	2	NO3
96	9 South	7 East	13	2	F, NO3
96	9 South	7 East	14	1	NO3
96	9 South	7 East	24	1	NO3
97	9 South	8 East	33	1	As
97	10 South	8 East	4	1	As, F
98	9 South	8 East	15	1	As
99	9 South	8 East	25	1	As
100	10 South	3 East	12	1	As, Mn

Table 8.2-8 Water Quality Exceedences in the Pinal AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
101	10 South	1 West	36	1	Pb
102	10 South	4 East	28	1	As, Pb
102	11 South	4 East	3	2	As, Pb
103	10 South	8 East	12	1	NO3
104	10 South	9 East	10	1	As
104	10 South	9 East	11	1	As
105	11 South	1 East	14	1	Pb
106	11 South	4 East	29	1	As
107	12 South	3 East	27	2	As, Pb
108	12 South	3 East	35	1	As
108	13 South	3 East	2	1	As
108	13 South	3 East	11	1	As
109	12 South	3 East	23	1	As
110	13 South	2 East	22	1	As
111	13 South	4 East	30	2	As, Mn
112	14 South	5 East	12	3	As, Mn
113	14 South	2 East	27	1	Pb
113	14 South	2 East	34	2	As
114	14 South	2 East	36	1	As
114	14 South	3 East	31	1	Cd, Mn, Pb, Zn
115	14 South	5 East	27	1	As
116	14 South	6 East	20	1	As
116	14 South	6 East	21	1	As
117	16 South	8 East	10	1	Mn
118	15 South	8 East	27	1	Pb
118	15 South	8 East	36	1	As, Mn
119	17 South	7 East	5	1	Mn
119	17 South	7 East	8	1	Mn
120	16 South	7 East	35	1	Mn
121	16 South	8 East	30	1	Cd

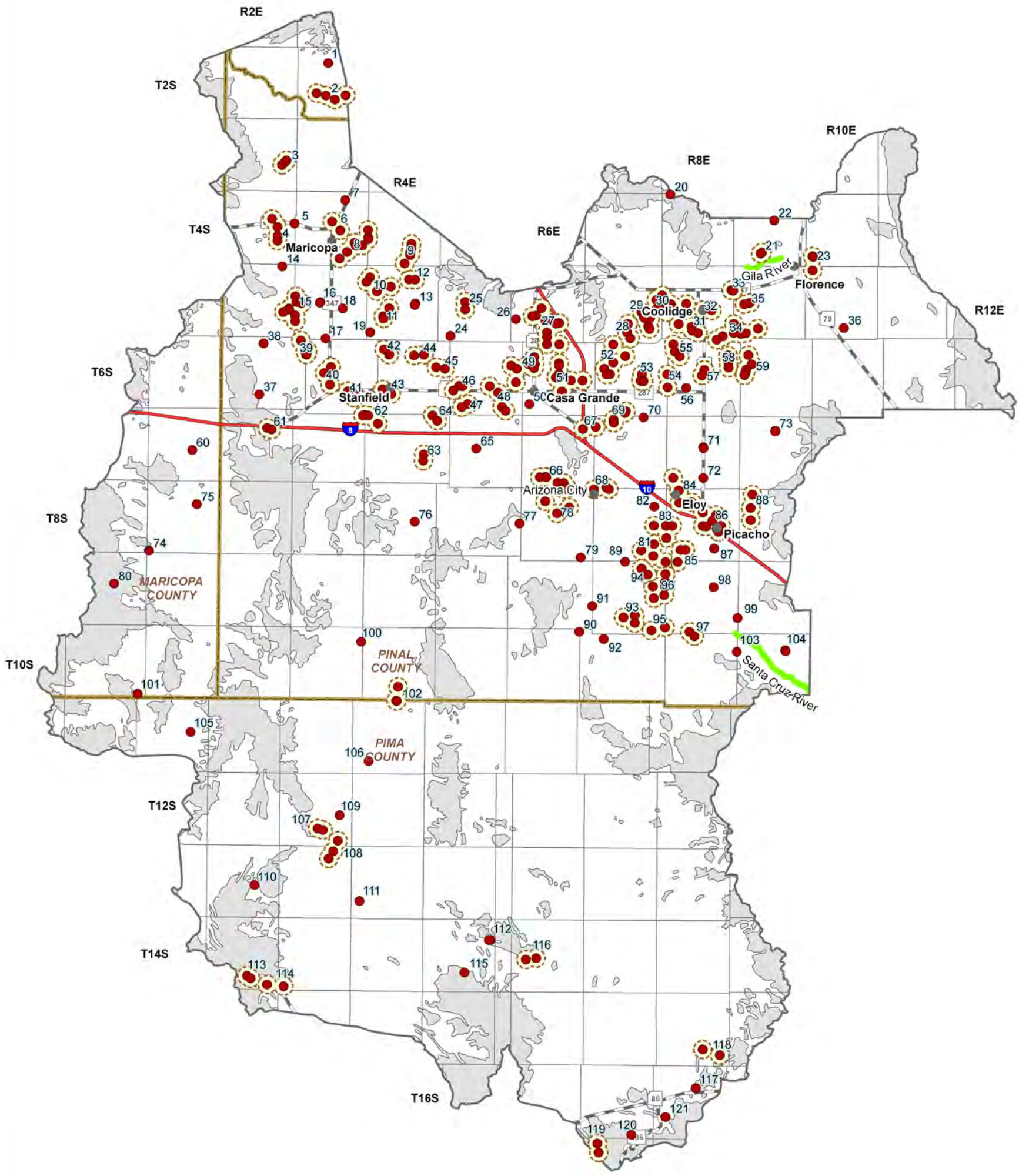
B. Lakes and Streams

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 1975 and 2004.

[2] As = Arsenic
Be = Beryllium
Cd = Cadmium
F = Fluoride
Mn = Manganese
Pb = Lead
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = radionuclides
TDS = Total Dissolved Solids
Zn = Zinc



0 3 6 Miles

Figure 8.2-10
Pinal AMA
Water Quality Conditions

Site that has Equaled or Exceeded DWS
Effluent dominated reach
Consolidated Crystalline & Sedimentary Rocks
Unconsolidated Sediments
COUNTY
Interstate
Major Road
City, Town or Place

Table 8.2-9 Contamination Sites in the Pinal AMA

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites	
Terminal 2 Plume	Soil & Groundwater/Jet-A-Fuel
Anderson Clayton - Sunshine Gin	Soil/Hydraulic fluid
Former Puregro #175	Soil/Pesticides
Resource Conservation and Remediation Act Sites	
Griffen/Kocide Corporation	Groundwater & Soil/Pesticides

Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

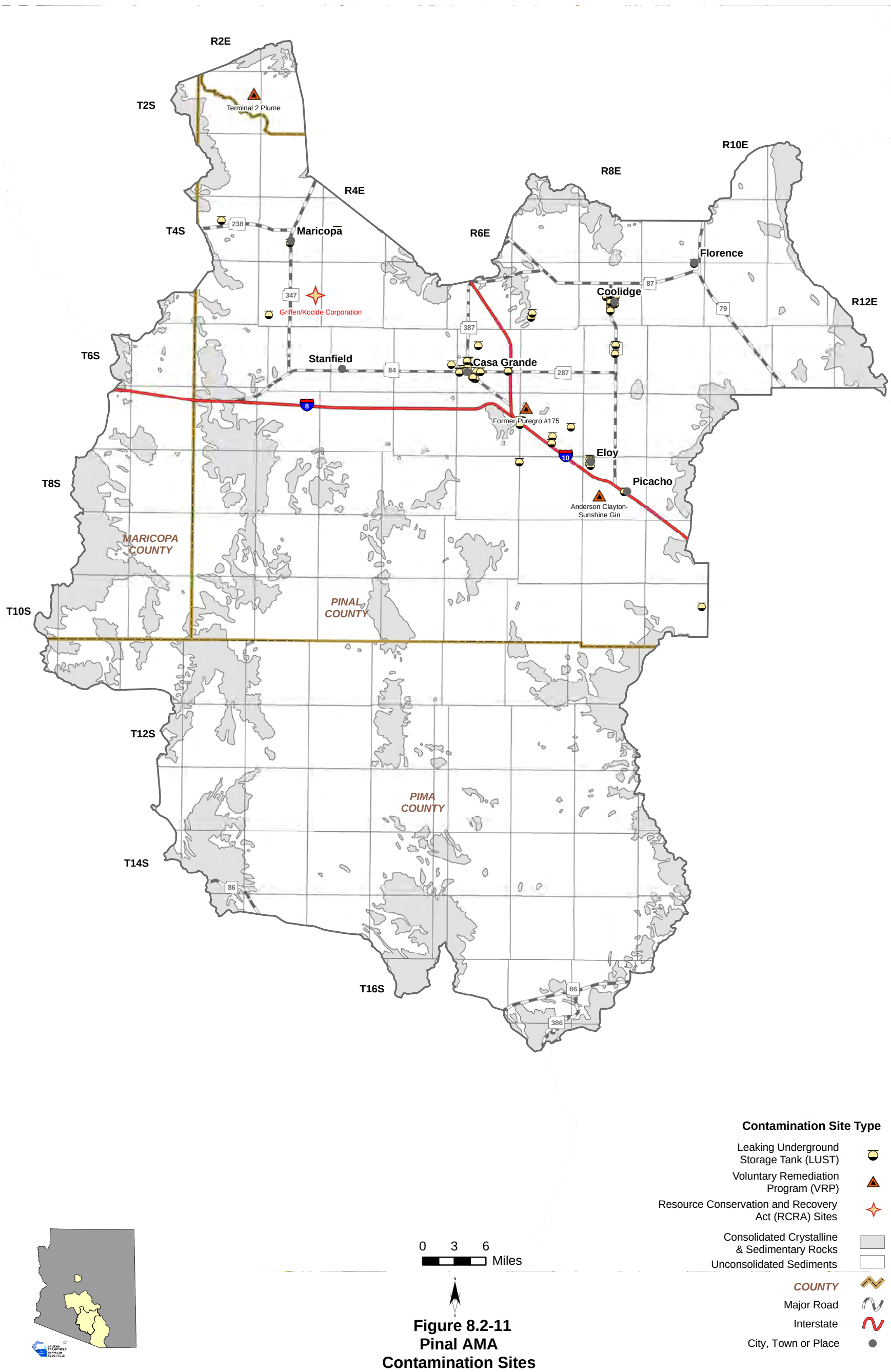


Figure 8.2-11
Pinal AMA
Contamination Sites

8.2.8 Cultural Water Demands in the Pinal AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.2-10. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.2-11. Figure 8.2-12 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.2-10 and Figure 8.2-12.
- Population in the Pinal AMA increased from 41,677 in 1980 to 89,032 in 2000 and projections suggest an increase to over 677,000 residents by 2050.
- Agricultural water use is by far the largest demand in the Pinal AMA. Approximately 96% of the average annual demand was agricultural in 2001-2003.
- Approximately 45% of the agricultural demand in 2001-2003 was met with groundwater.
- Average annual municipal demand in 2001-2003 increased roughly 50% from a decade earlier.
- The industrial sector accounted for approximately 1% of the total annual AMA water demand in the period between 2001-2003.
- As of 2003 there were 1,770 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 2,956 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.2-12.
- 21 wastewater treatment facilities were identified in the AMA.
- There are a wide range of effluent disposal methods with some of the most common being: discharge into an open watercourse, golf course irrigation, permitted recharge, industrial reuse and crop irrigation.
- More than 6,930 acre-feet of effluent are treated/produced annually in the Pinal AMA.

Table 8.2-10 Cultural Water Demands in the Pinal AMA[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		799[5]	2,105[5]	959,000			251,000			ADWR (1994)
1972										
1973										
1974										
1975										
1976				885,000			276,000			
1977										
1978										
1979										
1980	41,667									
1981	43,204	129	53	788,000			383,000			
1982	44,742									
1983	46,279									
1984	47,816									
1985	49,353									
1986	50,457	108	115	553,600			367,900			ADWR (2008)
1987	52,066									
1988	58,015									
1989	61,770									
1990	61,222									
1991	64,281	108	335	17,600	5,400	347,100	700	200	530,500	
1992	64,831									
1993	58,937									
1994	67,730									
1995	72,487									
1996	76,173	307	240	21,300	7,800	457,000	1,000	200	560,900	
1997	78,016									
1998	81,548									
1999	85,307									
2000	89,032									
2001	91,516	319	108	23,700	11,900	444,400	4,200	2,100	543,100	
2002	90,481									
2003	99,000									
2010	199,522									
2020	325,054									
2030	448,804									
2040	565,315									
2050	677,164									
ADDITIONAL WELLS:[6]		**18**	**0**							
WELL TOTALS:		**1,788**	**2,956**							

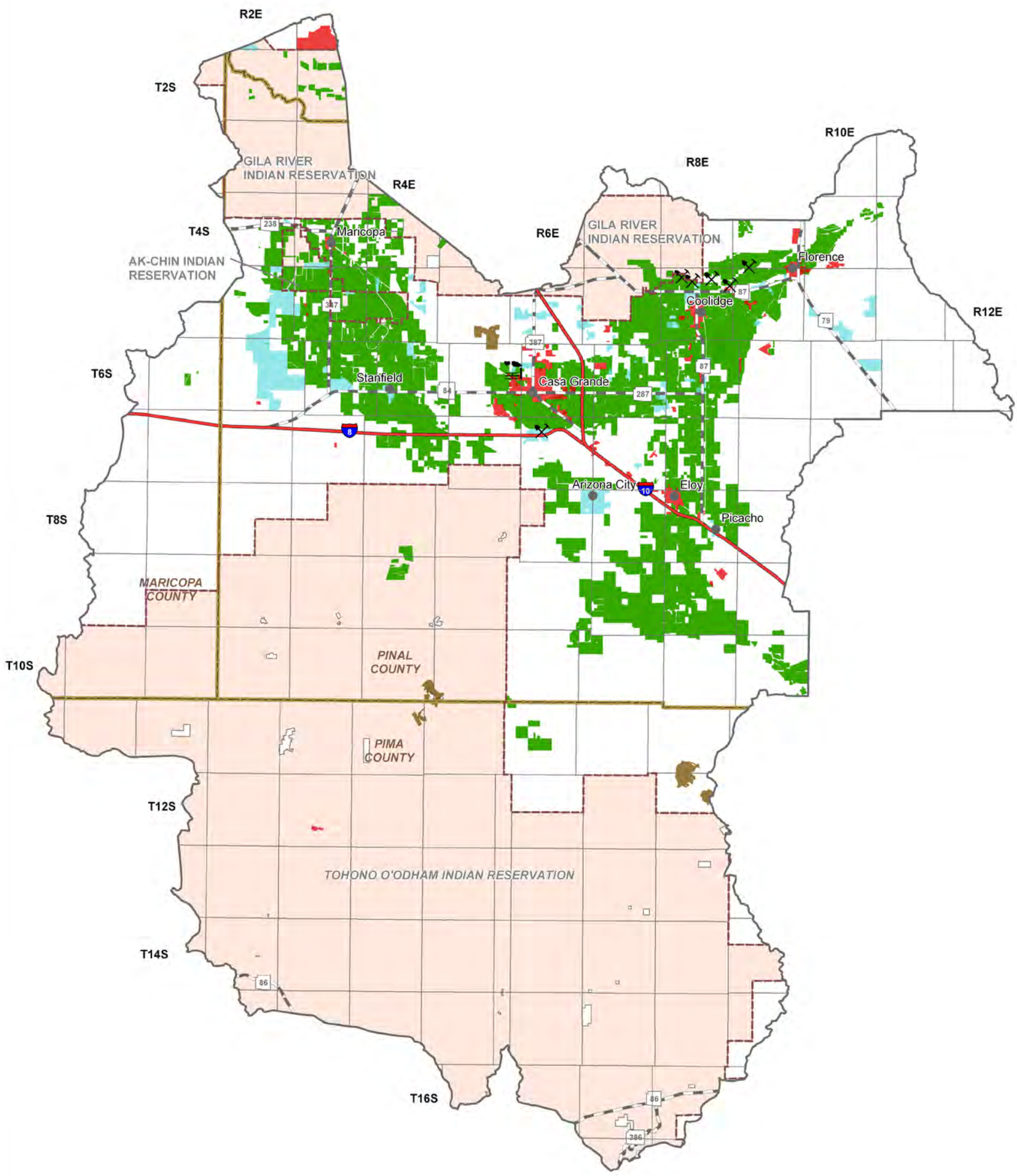
Notes:

[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes Indian Demand.
[3] Non-Groundwater supplies may include surface water, CAP, effluent, spill water or tail water.
[4] Agricultural use does not include small exempt use after 1993.
[5] Includes all wells through 1980.
[6] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.

Table 8.2-11 Effluent Generation in the Pinal AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basins	Industrial Reuse	Other			
Ak-Chin Village	Ak-Chin Tribe	Ak-Chin Tribe	1,820	148							X			Secondary	NA	2004
Arizona City WWTF	Arizona City Sanitary District	Arizona City	5,400	700	X		X	X			P			Advanced Treatment I	NA	2004
Casa Grande WWTF	City of Casa Grande	Casa Grande	29,285	2,800	X			X				X		Advanced Treatment I	1285	2004
Coolidge WWTF	City Of Coolidge	Coolidge	8,500	728			X							Secondary	NA	2004
Desert Gardens RV Park - WWTF	Private	Florence	NA	NA	NA											
Dunn Ranch WWTF	Private	Maricopa	NA	NA	NA											
Eloy WWTF	Town of Eloy	Eloy	10,400	694			X				P			Advanced Treatment I	NA	2004
Entrada Del Oro	Private	Maricopa	NA	NA	NA											
Florence Prison WWTF	Arizona State Prison Complex	Florence Prison	3,360	NA	X		X							NA	NA	2007
Florence WWTF	Town of Florence	Florence	11,000	1,680			X							Secondary	NA	2004
Francisco Grande Resort WWTF	Private	Casa Grande	NA	NA				X						NA	NA	NA
Frito-Lay WWTF	Private	Casa Grande	NA	NA								X		NA	NA	NA
Maricopa WWTF	Pinal County	Maricopa	NA	NA	NA											
North Florence WWTF	Town of Florence	Florence	3,540	179				X			P			Primary	NA	2004
Palo Verde Utility WWTF	Private	Maricopa	NA	NA			X							NA	NA	NA
Stanfield WWTF	Pinal County	Stanfield	NA	NA	NA											
Sun Lakes at Casa Grande	Private	Casa Grande	NA	NA			X	X						NA	NA	NA
Sunscape RV Resort - WWTF	Private	Casa Grande	NA	NA	NA											
Sunshine Estates WWTF	Private	Casa Grande	NA	NA	NA											
Tierra Grande WWTF	Private	Casa Grande	NA	NA	NA											
Eleven-Mile Corner WWTF	Pinal County	Casa Grande	NA	NA	NA											
Total			**73,305**	**6,930**												

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, Pinal County Comprehensive Plan 2001, ADEQ's AZURITE Facility website, ADWR 2004 Annual Water Use Reports
P = Permited Underground Recharge Facility
NA = Not available
WWTF=Wastewater Treatment Facility



Demand Centers

- Agriculture
- M&I - High Intensity
- M&I - Low Intensity
- Large Mine
- Power Plant
- Small Mine\Quarry
- Indian Reservation Boundary
- Indian Reservation
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

Primary Data Source: USGS National Gap Analysis Program, 2004

Figure 8.2-12
Pinal AMA
Cultural Water Demand

8.2.9 Assured Water Supply Determinations in the Pinal AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination, subdivision water provider and Central Arizona Groundwater Replenishment District (CAGRD) membership status are shown in Table 8.2-12A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.2-12D with date of application, date the designation was issued and projected or annual estimated demand. Figure 8.2-13 shows the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Assured Water Supply Records

- See Table 8.2-12
- As of February 2008, 251 subdivisions with a total of 161,062 lots have been reviewed for an assured water supply determination. All of the determinations were in Pinal County.
- 84,160 lots in 216 subdivisions received Certificates of Assured Water Supply, 2,134 lots in 16 subdivisions received Water Adequacy Reports and 74,768 lots in 19 developments received an Analyses of Assured Water Supply.
- Of the 216 subdivisions with a Certificate of Assured Water Supply, 137 are CAGRD members.
- There are five designated providers with a total projected or estimated annual water use of 90,112 acre-feet.

Table 8.2-12 Assured Water Supply Determinations in the Pinal AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
1	Maricopa Manor	Pinal	4 South	3 East	21	38	27-200195	07/22/87	NA	N
2	Smith Farms	Pinal	4 South	3 East	25	705	27-401185	10/13/04	387 District	N
3	Senita Unit 3	Pinal	4 South	3 East	26	499	27-401646	01/03/06	387 District	Y
4	Desert Cedars	Pinal	4 South	3 East	27	418	27-401158	06/25/04	387 District	Y
4	Senita Unit 1 and Unit 2	Pinal	4 South	3 East	26 & 27	876	27-401159	08/30/04	387 District	Y
5	Alterra	Pinal	4 South	3 East	28	1005	27-401126	04/08/04	387 District	Y
6	Maricopa Meadows	Pinal	4 South	3 East	28 & 33	1608	27-401014	03/01/04	387 District	Y
7	Palo Brea	Pinal	4 South	3 East	34	525	27-401143	04/08/04	387 District	N
8	Tortosa	Pinal	4 South	4 East	21 & 28	1290	27-401243	06/25/04	387 District	Y
12	Western Pueblo Ranchettes	Pinal	5 South	3 East	3	24	27-300382	07/28/98	NA	N
20	Red River Phase 1 - Province	Pinal	5 South	3 East	26, 27, 34 & 35	2276	27-700380	02/28/08	Santa Rosa Water Company	Y
22	Maricopa Industrial Park	Pinal	5 South	4 East	15	56	27-200194	11/22/89	NA	N
23	Ghost Hollow Estates	Pinal	5 South	6 East	17	260	27-402224	09/21/07	Arizona Water Co - Casa Grande	Y
24	Desert Views, Unit 1	Pinal	5 South	6 East	19	10	27-300224	03/28/97	Arizona Water Co - Casa Grande	Y
24	Desert Views, Unit 2	Pinal	5 South	6 East	19	26	27-400153	01/28/00	Arizona Water Co - Casa Grande	Y
25	Copper Vista, Parcels A,B,C,D	Pinal	5 South	6 East	20	206	27-400567	06/12/02	Arizona Water Co - Casa Grande	N
26	Ghost Ranch	Pinal	5 South	6 East	21	125	27-400568	08/26/02	Arizona Water Co - Casa Grande	Y
26	Ghost Ranch Unit II	Pinal	5 South	6 East	21	235	27-401399	08/23/04	Arizona Water Co - Casa Grande	N
26	Countrywalk Estates	Pinal	5 South	6 East	21	67	27-401652	08/04/05	Arizona Water Co - Casa Grande	N
26	Dominion Creek	Pinal	5 South	6 East	21	202	27-401724	07/12/05	Arizona Water Co - Casa Grande	Y
26	Mystic Trails	Pinal	5 South	6 East	21	11	27-402020	07/17/06	Arizona Water Co - Casa Grande	N
27	Val Vista Estates	Pinal	5 South	6 East	25	126	27-300267	04/04/97	Arizona Water Co - Casa Grande	Y
28	Villa Arroyo	Pinal	5 South	6 East	27	723	27-700378	01/07/08	Arizona Water Co - Casa Grande	Y
29	Villago, Phase 1	Pinal	5 South	6 East	28 & 33	999	27-401411	05/13/05	Arizona Water Co - Casa Grande	Y
30	Avalon Phase A	Pinal	5 South	6 East	30	131	27-401114	02/17/04	Arizona Water Co - Casa Grande	N
30	Gila Buttes	Pinal	5 South	6 East	30	525	27-402186	07/26/06	Arizona Water Co - Casa Grande	N
31	Avalon Phase B	Pinal	5 South	6 East	30	116	27-401518	12/09/04	Arizona Water Co - Casa Grande	N
31	Casa Grande Air Park	Pinal	5 South	6 East	32	34	27-402068	06/26/06	Arizona Water Co - Casa Grande	Y
32	Arroyo Grande	Pinal	5 South	6 East	34	672	27-400560	05/23/02	Arizona Water Co - Casa Grande	Y
33	McCartney Center	Pinal	5 South	6 East	35	1083	27-400384	03/19/01	Arizona Water Co - Casa Grande	Y
34	Sandia NW, Parcels A,B,C & K	Pinal	5 South	7 East	13, 14, 23 & 24	4188	27-402039	11/21/06	Woodruff Water Company	Y
34	Sandia - SE1	Pinal	5 South	7 East	13, 24 & 25	5634	27-402227	12/11/06	Woodruff Water Company	Y
34	Sandia SE2	Pinal	5 South	7 East	13, 24 & 25	484	27-402228	12/06/06	Woodruff Water Company	Y
35	Martin Valley	Pinal	5 South	7 East	23, 25 & 26	1108	27-402084	08/11/06	Arizona Water Co - Casa Grande	Y
36	Tierra Rica Estates	Pinal	5 South	7 East	30	305	27-400028	04/16/99	Arizona Water Co - Casa Grande	N
37	Chaparral Estates	Pinal	5 South	7 East	31	204	27-400399	01/26/01	Arizona Water Co - Casa Grande	Y
37	Bel Aire Estates	Pinal	5 South	7 East	31	44	27-400529	11/29/01	Arizona Water Co - Casa Grande	Y
37	Signal Peak Estates	Pinal	5 South	7 East	31	19	27-401436	01/25/05	Arizona Water Co - Casa Grande	Y
38	Ridge at Black Butte, The	Pinal	5 South	7 East	32	32	27-300342	10/16/97	Arizona Water Co - Casa Grande	Y
38	Weaver Ranch	Pinal	5 South	7 East	32	31	27-400273	08/22/00	Arizona Water Co - Casa Grande	Y
38	Black Mountain Estates	Pinal	5 South	7 East	32	101	27-400305	09/21/00	Arizona Water Co - Casa Grande	Y
38	Lusitano	Pinal	5 South	7 East	32	79	27-401986	05/19/06	Arizona Water Co - Casa Grande	Y
39	Mandalay Ranch	Pinal	5 South	7 East	33	32	27-400643	03/11/03	Arizona Water Co - Casa Grande	Y
39	Saddle Creek Ranch	Pinal	5 South	7 East	33	130	27-400936	02/09/04	Arizona Water Co - Casa Grande	Y
40	Arlington Ranch	Pinal	5 South	7 East	31	22	27-401629	06/08/05	Arizona Water Co - Casa Grande	Y
41	Coolidge Gateway Manor	Pinal	5 South	8 East	15	114	27-401891	01/03/06	Arizona Water Co - Coolidge	Y
41	Casa Blanca	Pinal	5 South	8 East	15	240	27-500072	03/09/07	Arizona Water Co - Coolidge	N
42	Cota Ranch	Pinal	5 South	8 East	16	67	27-400667	09/25/02	Arizona Water Co - Coolidge	Y
43	Skousen Farms	Pinal	5 South	8 East	17 & 18	1300	27-401939	06/23/06	Arizona Water Co - Coolidge	Y
44	Heartland Unit 1	Pinal	5 South	8 East	20	490	27-400353	09/26/00	Arizona Water Co - Coolidge	N
44	Heartland - Unit 4	Pinal	5 South	8 East	20	480	27-401935	11/09/06	Arizona Water Co - Coolidge	N
44	Heartland - Unit 3	Pinal	5 South	8 East	20	622	27-401936	05/02/06	Arizona Water Co - Coolidge	N
45	Coolidge Country Village Estates	Pinal	5 South	8 East	21	150	27-300351	03/27/99	Arizona Water Co - Coolidge	Y
45	Carter Ranch	Pinal	5 South	8 East	21	176	27-400377	09/18/01	Arizona Water Co - Coolidge	Y
45	Elizabeth Ranch	Pinal	5 South	8 East	21	62	27-401872	11/30/05	Arizona Water Co - Coolidge	Y
45	The Village at Coolidge	Pinal	5 South	8 East	21	51	27-500077	02/22/07	Arizona Water Co - Coolidge	Y
46	Kenilworth Gardens	Pinal	5 South	8 East	22 & 23	1247	27-400393	12/11/00	Arizona Water Co - Coolidge	Y
47	KLC Ranch	Pinal	5 South	8 East	23	24	27-300569	03/12/99	Arizona Water Co - Coolidge	N
47	CLK Ranches (Formerly known as KLC Ranches)	Pinal	5 South	8 East	23	745	27-500051	06/08/07	Arizona Water Co - Coolidge	Y
48	Picacho Crossing	Pinal	5 South	8 East	27	625	27-401983	03/08/06	Arizona Water Co - Coolidge	Y
48	Picacho Village	Pinal	5 South	8 East	27	137	27-500027	01/11/07	Arizona Water Co - Coolidge	Y
49	Park Homes	Pinal	5 South	8 East	28	115	27-400293	05/30/00	Arizona Water Co - Coolidge	Y
49	Landmark Ranch - Unit 1 - Parcel 1	Pinal	5 South	8 East	28	187	27-401111	02/02/04	Arizona Water Co - Coolidge	N
49	McClellan Meadows	Pinal	5 South	8 East	28	325	27-401587	06/10/05	Arizona Water Co - Coolidge	Y
49	Landmark Ranch Unit 1, Parcels 2, 3,& 4	Pinal	5 South	8 East	28	451	27-401811	10/17/05	Arizona Water Co - Coolidge	Y

Table 8.2-12 Assured Water Supply Determinations in the Pinal AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
49	Stoney Creek Estates I & II	Pinal	5 South	8 East	28	48	27-700339	01/15/08	Arizona Water Co - Coolidge	Y
50	Landmark Ranch, Parcels 9 & 10	Pinal	5 South	8 East	33	244	27-402042	05/11/06	Arizona Water Co - Coolidge	Y
50	Brighton Village Phase 1	Pinal	5 South	8 East	33	890	27-500001	01/18/07	Arizona Water Co - Coolidge	N
51	Cross Creek Ranch I Phases 1-8 and Cross Creek Ranch II	Pinal	5 South	8 East	16, 17 & 25	1311	27-401940	03/13/06	Arizona Water Co - Coolidge	Y
52	Heartland - Unit 2	Pinal	5 South	8 East		667	27-401630	11/15/05	Arizona Water Co - Coolidge	N
53	Homestead Acres	Pinal	5 South	9 East	17	45	27-200145	07/07/87	Arizona Water Co - Coolidge	N
54	Valley Vista Estates	Pinal	5 South	9 East	20	115	27-400370	12/06/00	Arizona Water Co - Coolidge	Y
56	Mesquite Tree Ranch	Pinal	6 South	5 East	10	150	27-400150	01/28/00	Arizona Water Co - Casa Grande	Y
57	Gadsden Greens	Pinal	6 South	5 East	12	391	27-400193	07/20/00	Arizona Water Co - Casa Grande	Y
58	Westfield Park	Pinal	6 South	5 East	23	282	27-401987	03/08/06	Arizona Water Co - Casa Grande	Y
59	Central Arizona Commerce Park	Pinal	6 South	5 East	25	18	27-700410	11/08/07	Arizona Water Co - Casa Grande	N
60	Acacia Farms	Pinal	6 South	5 East	26 & 35	1314	27-402146	10/04/06	Arizona Water Co - Casa Grande	Y
63	Central Arizona Commerce Park Phase 2	Pinal	6 South	5 East		6	27-700501	05/14/08	Arizona Water Co - Casa Grande	N
64	Desert Reins	Pinal	6 South	6 East	1	31	27-402266	11/09/06	Arizona Water Co - Casa Grande	Y
65	Sandalwood, Phase 1	Pinal	6 South	6 East	2	47	27-300345	12/23/97	Arizona Water Co - Casa Grande	N
66	Mission Ranch	Pinal	6 South	6 East	3	344	27-401122	07/19/04	Arizona Water Co - Casa Grande	Y
67	Arroyo Vista	Pinal	6 South	6 East	4	509	27-401367	07/21/04	Arizona Water Co - Casa Grande	N
67	Mission Ranch II	Pinal	6 South	6 East	3	157	27-500054	03/23/07	Arizona Water Co - Casa Grande	Y
68	Santa Rosa	Pinal	6 South	6 East	4	201	27-300446	08/21/98	Arizona Water Co - Casa Grande	Y
68	Mountain View Ranch Parcel E	Pinal	6 South	6 East	4	137	27-400195	11/21/00	Arizona Water Co - Casa Grande	Y
68	Mountain View Ranch, Parcels B,C,D	Pinal	6 South	6 East	4	184	27-401313	08/18/04	Arizona Water Co - Casa Grande	Y
68	Mountain View Ranch Parcel F	Pinal	6 South	6 East	4	85	27-401378	04/22/05	Arizona Water Co - Casa Grande	Y
69	Quail Run	Pinal	6 South	6 East	5	38	27-300316	10/16/97	Arizona Water Co - Casa Grande	Y
69	Pebble Trail	Pinal	6 South	6 East	5	51	27-300432	08/21/98	Arizona Water Co - Casa Grande	Y
69	Pebble Trail Units 3, 4 & 5	Pinal	6 South	6 East	5	80	27-400108	02/17/00	Arizona Water Co - Casa Grande	Y
69	Cornerstone	Pinal	6 South	6 East	5	26	27-400176	01/19/00	Arizona Water Co - Casa Grande	Y
69	Manor Vista	Pinal	6 South	6 East	5	7	27-400200	05/01/00	Arizona Water Co - Casa Grande	N
69	McCartney Ranch	Pinal	6 South	6 East	5	2334	27-400202	05/30/00	Arizona Water Co - Casa Grande	Y
69	McCartney Ranch, Parcel 2 aka Tierra Pointe Apartments	Pinal	6 South	6 East	5	236	27-700247	03/19/07	Arizona Water Co - Casa Grande	Y
71	Casa Mirage	Pinal	6 South	6 East	7	86	27-300421	06/23/98	Arizona Water Co - Casa Grande	Y
71	Los Portales	Pinal	6 South	6 East	7	208	27-401011	12/30/04	Arizona Water Co - Casa Grande	Y
71	Santa Cruz Village	Pinal	6 South	6 East	7	386	27-401416	11/23/04	Arizona Water Co - Casa Grande	Y
71	Mesquite Trails	Pinal	6 South	6 East	7	159	27-402054	07/05/06	Arizona Water Co - Casa Grande	Y
71	Lake Shore Village Office Condominiums	Pinal	6 South	6 East	7	24	27-700290	08/30/07	Arizona Water Co - Casa Grande	N
72	Rodeo Ranch Estates	Pinal	6 South	6 East	8	37	27-401978	05/07/06	Arizona Water Co - Casa Grande	Y
72	Elaine Farms	Pinal	6 South	6 East	8	532	27-402058	10/19/07	Arizona Water Co - Casa Grande	Y
73	Bella Visa Estates	Pinal	6 South	6 East	9	253	27-700266	11/27/07	Arizona Water Co - Casa Grande	Y
74	Mission Valley Unit One	Pinal	6 South	6 East	10	891	27-400454	05/03/01	Arizona Water Co - Casa Grande	N
74	Mission Valley Unit II	Pinal	6 South	6 East	10	227	27-400599	06/07/02	Arizona Water Co - Casa Grande	Y
75	Vista Ranch	Pinal	6 South	6 East	14	1112	27-402289	05/23/07	Arizona Water Co - Casa Grande	Y
76	Highland Manor	Pinal	6 South	6 East	15	305	27-400495	09/14/01	Arizona Water Co - Casa Grande	Y
76	Monterra Village	Pinal	6 South	6 East	15	253	27-401484	02/10/05	Arizona Water Co - Casa Grande	Y
76	Tamaron	Pinal	6 South	6 East	15	422	27-401487	11/23/04	Arizona Water Co - Casa Grande	Y
77	SK Ranch	Pinal	6 South	6 East	16	281	27-400140	12/10/99	Arizona Water Co - Casa Grande	N
77	Cottonwood Ranch	Pinal	6 South	6 East	16	923	27-400323	11/07/00	Arizona Water Co - Casa Grande	Y
77	G Diamond Ranch a Portion of Parcel "C"	Pinal	6 South	6 East	16	224	27-401548	01/25/05	Arizona Water Co - Casa Grande	Y
77	'G' Diamond Ranch Preserve	Pinal	6 South	6 East	16	10	27-401929	06/20/06	Arizona Water Co - Casa Grande	N
77	G-Diamond Ranch Parcels D and E Phase II	Pinal	6 South	6 East	16	324	27-402280	12/11/06	Arizona Water Co - Casa Grande	N
78	Rancho Palo Verde Estates	Pinal	6 South	6 East	17	108	27-400088	12/02/99	Arizona Water Co - Casa Grande	Y
78	Safeway Store #1706	Pinal	6 South	6 East	17	6	27-400419	04/18/01	Arizona Water Co - Casa Grande	Y
79	Desert Sky Ranch	Pinal	6 South	6 East	18	108	27-300261	08/08/97	Arizona Water Co - Casa Grande	Y
79	Desert Sky Ranch Unit II and IV	Pinal	6 South	6 East	18	262	27-400429	04/06/01	Arizona Water Co - Casa Grande	Y
79	Desert Crossing	Pinal	6 South	6 East	18	249	27-400646	06/07/02	Arizona Water Co - Casa Grande	Y
79	Desert Views	Pinal	6 South	6 East	18	200	27-402055	08/18/06	Arizona Water Co - Casa Grande	Y
80	Saguaro Estates	Pinal	6 South	6 East	19	9	27-300389	03/20/98	Arizona Water Co - Casa Grande	Y
80	Lancaster Estates	Pinal	6 South	6 East	19	11	27-400248	06/28/00	Arizona Water Co - Casa Grande	Y
80	Cottonwoods, The	Pinal	6 South	6 East	19	197	27-400303	07/27/00	Arizona Water Co - Casa Grande	N
80	Jardines de Esperanzas	Pinal	6 South	6 East	19	16	27-400402	08/09/01	Arizona Water Co - Casa Grande	Y
80	The Cottonwoods, Phase II - VI	Pinal	6 South	6 East	19	393	27-402014	05/10/06	Arizona Water Co - Casa Grande	N
80	Cottonwoods Industrial Park	Pinal	6 South	6 East	19	10	27-700360	09/06/07	Arizona Water Co - Casa Grande	N
82	Casa de Ensueno	Pinal	6 South	6 East	21	11	27-300095	07/10/96	Arizona Water Co - Casa Grande	Y
82	Echeverria Estates	Pinal	6 South	6 East	21	12	27-300353	04/15/98	Arizona Water Co - Casa Grande	Y
82	Acacia Landing	Pinal	6 South	6 East	21	350	27-400168	03/02/00	Arizona Water Co - Casa Grande	Y
82	Smoketree-1c	Pinal	6 South	6 East	21	30	27-400171	04/20/99	Arizona Water Co - Casa Grande	Y
82	Ironwood Commons	Pinal	6 South	6 East	21	267	27-400214	08/10/00	Arizona Water Co - Casa Grande	Y
82	Garrett Estates	Pinal	6 South	6 East	21	6	27-400311	12/11/00	Arizona Water Co - Casa Grande	Y
82	Cottonwood Village	Pinal	6 South	6 East	21	16	27-400313	04/30/01	Arizona Water Co - Casa Grande	Y
82	Ironwood Commons II	Pinal	6 South	6 East	21	79	27-401437	01/05/05	Arizona Water Co - Casa Grande	Y
82	Cottonwood Commons	Pinal	6 South	6 East	21	27	27-401473	12/09/04	Arizona Water Co - Casa Grande	Y
82	Cinco Viejos	Pinal	6 South	6 East	21	8	27-401580	03/16/05	Arizona Water Co - Casa Grande	Y

Table 8.2-12 Assured Water Supply Determinations in the Pinal AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
82	Acacia Lofts	Pinal	6 South	6 East	21	180	27-401822	11/30/05	Arizona Water Co - Casa Grande	Y
82	Pueblo Townhomes	Pinal	6 South	6 East	21	40	27-402262	11/06/06	Arizona Water Co - Casa Grande	Y
83	Casa Grande Medical Campus	Pinal	6 South	6 East	22	9	27-300538	03/29/99	Arizona Water Co - Casa Grande	Y
83	Sandalwood, Phase 2	Pinal	6 South	6 East	22	47	27-300545	01/21/99	Arizona Water Co - Casa Grande	N
83	Villa De Jardines	Pinal	6 South	6 East	22	124	27-400063	12/22/99	Arizona Water Co - Casa Grande	N
83	Sandalwood, Phase 3	Pinal	6 South	6 East	22	58	27-400217	03/21/00	Arizona Water Co - Casa Grande	N
83	Silverhawk	Pinal	6 South	6 East	22	158	27-400234	04/13/00	Arizona Water Co - Casa Grande	Y
83	Ironwood Village	Pinal	6 South	6 East	22	264	27-400281	10/27/00	Arizona Water Co - Casa Grande	Y
83	Wildwood	Pinal	6 South	6 East	22	97	27-400605	05/14/02	Arizona Water Co - Casa Grande	Y
84	The Promenade at Casa Grande	Pinal	6 South	6 East	24	31	27-700316	07/09/07	Arizona Water Co - Casa Grande	N
85	Mission Royal Parcels A, H, & I	Pinal	6 South	6 East	25	322	27-400797	05/20/03	Arizona Water Co - Casa Grande	Y
85	Mission Royale Block M	Pinal	6 South	6 East	25	73	27-401100	12/16/03	Arizona Water Co - Casa Grande	N
85	Mission Royale Block G	Pinal	6 South	6 East	25	180	27-401101	12/16/03	Arizona Water Co - Casa Grande	N
85	Mission Royale Phase 2, Parcel F	Pinal	6 South	6 East	25	245	27-401949	03/27/06	Arizona Water Co - Casa Grande	N
86	Sonoran Heights	Pinal	6 South	6 East	26	1076	27-400237	11/07/00	Arizona Water Co - Casa Grande	Y
86	Casa Grande Crossings	Pinal	6 South	6 East	26	635	27-400452	05/02/01	Arizona Water Co - Casa Grande	N
86	Sonoran Heights	Pinal	6 South	6 East	26	750	27-401839	11/15/05	Arizona Water Co - Casa Grande	Y
87	Carlton Commons	Pinal	6 South	6 East	27	892	27-401335	01/24/05	Arizona Water Co - Casa Grande	Y
87	Carlton Commons Phase 4 & 5	Pinal	6 South	6 East	27	508	27-401371	03/25/05	Arizona Water Co - Casa Grande	Y
87	Sierra Ranch II	Pinal	6 South	6 East	27	471	27-401881	03/08/06	Arizona Water Co - Casa Grande	Y
87	McNatt Estates	Pinal	6 South	6 East	27	28	27-500091	04/18/07	Arizona Water Co - Casa Grande	N
88	McMurtry Ranch	Pinal	6 South	6 East	28	7	27-400830	02/14/03	Arizona Water Co - Casa Grande	N
88	Southfork Unit II	Pinal	6 South	6 East	28	28	27-401611	05/09/05	Arizona Water Co - Casa Grande	N
88	Tuscany	Pinal	6 South	6 East	28	189	27-401789	04/18/06	Arizona Water Co - Casa Grande	Y
89	Trekell Estates	Pinal	6 South	6 East	29	40	27-400312	06/11/01	Arizona Water Co - Casa Grande	Y
90	Parks Ranch	Pinal	6 South	6 East	30	165	27-500086	04/10/07	Arizona Water Co - Casa Grande	N
91	Vista Estates	Pinal	6 South	6 East	35	1186	27-500058	06/13/07	Arizona Water Co - Casa Grande	Y
92	Las Palmas	Pinal	6 South	6 East		66	27-700491	06/13/08	Arizona Water Co - Casa Grande	Y
93	The Shops at TC Village	Pinal	6 South	6 East		7	27-700462	04/25/08	Arizona Water Co - Casa Grande	Y
94	Desert Sky Ranch, Unit III, Phase IV	Pinal	6 South	6 East		75	27-700406	02/08/08	Arizona Water Co - Casa Grande	Y
95	Los Alamos Professional Condominium Complex	Pinal	6 South	6 East		22	27-700500	05/20/08	Arizona Water Co - Casa Grande	Y
96	Mission Royale Phase 2, Parcel C	Pinal	6 South	6 East		145	27-401895	10/04/06	Arizona Water Co - Casa Grande	Y
96	Mission Royale Phase 2, Parcel D	Pinal	6 South	6 East		164	27-401896	03/08/06	Arizona Water Co - Casa Grande	N
96	Mission Royale Phase 2, Parcel E	Pinal	6 South	6 East		121	27-401897	03/08/06	Arizona Water Co - Casa Grande	N
97	Marabella Parcels 1,2,& 3	Pinal	6 South	6 East		281	27-700448	02/12/08	Arizona Water Co - Casa Grande	Y
98	Mission Royale Phase 3, Parcel 1	Pinal	6 South	6 East		178	27-401898	03/08/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 2	Pinal	6 South	6 East	25 & 36	119	27-401899	03/08/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 3	Pinal	6 South	6 East		85	27-401900	03/08/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 4	Pinal	6 South	6 East	25 & 36	177	27-401901	03/08/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 5	Pinal	6 South	6 East		159	27-401902	03/08/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 6	Pinal	6 South	6 East		158	27-401903	04/27/06	Arizona Water Co - Casa Grande	N
98	Mission Royale Phase 3, Parcel 7	Pinal	6 South	6 East		164	27-401904	05/02/06	Arizona Water Co - Casa Grande	N
99	Vista Del Rey Estates	Pinal	6 South	7 East	3	80	27-401817	08/11/06	Arizona Water Co - Casa Grande	Y
99	Saddle Creek II	Pinal	6 South	7 East	3	144	27-401828	07/26/06	Arizona Water Co - Casa Grande	Y
101	Arroyo Verde Estates	Pinal	6 South	7 East	6	94	27-401677	10/12/05	Arizona Water Co - Casa Grande	Y
101	Overfield Country Estates	Pinal	6 South	7 East	6	68	27-700288	10/23/07	Arizona Water Co - Casa Grande	Y
104	Post Ranch	Pinal	6 South	7 East	29	2417	27-401944	02/22/06	Arizona Water Co - Casa Grande	N
105	Hacienda Highlands	Pinal	6 South	7 East	30	266	27-402070	07/06/06	Arizona Water Co - Casa Grande	N
105	Hacienda Estates	Pinal	6 South	7 East	30	275	27-402071	07/06/06	Arizona Water Co - Casa Grande	N
105	Springwater Pointe	Pinal	6 South	7 East	30	497	27-402135	02/02/07	Arizona Water Co - Casa Grande	Y
106	Tierra Grande Co Club Twnhs #1	Pinal	6 South	7 East	36		27-200347	03/23/84	Arizona Water Co - Casa Grande	N
106	Tierra Grande Village #1-6	Pinal	6 South	7 East	36		27-200349	08/01/83	Arizona Water Co - Casa Grande	N
106	Sun Fair Estates	Pinal	6 South	7 East	36	73	27-300561	12/01/98	Arizona Water Co - Casa Grande	N
107	EJR Ranch, Phase II	Pinal	6 South	7 East	32, 33 & 34	3640	27-402076	07/12/06	Picacho Water Company	Y
108	Sunrise at Wildhorse	Pinal	6 South	8 East	4	95	27-400882	08/01/03	Arizona Water Co - Coolidge	Y
109	Sunset View Units 1 & 2	Pinal	6 South	8 East	5	45	27-400836	04/16/03	Arizona Water Co - Casa Grande	Y
110	Verona at 11 Mile Corner	Pinal	6 South	8 East	6	1468	27-401924	12/20/06	Arizona Water Co - Coolidge	Y
111	Northview Estates	Pinal	6 South	8 East	31	198	27-400044	07/01/99	Arizona Water Co - Casa Grande	Y
112	Saguaro Estates	Pinal	6 South	10 East	11	33	27-200307	06/30/81	Arizona Water Co - Casa Grande	N
113	Casa Vista	Pinal	7 South	6 East	2	366	27-402024	07/10/06	Arizona Water Co - Casa Grande	N
113	The Shops at Palm Court	Pinal	7 South	6 East	2	294	27-700251	06/15/07	Arizona Water Co - Casa Grande	N
114	Sun Lakes- Casa Grande	Pinal	7 South	7 East	3, 4, 8, 9, 16 & 17	7891	27-400614	12/16/02	Picacho Water Company	Y
114	Robson Ranch Unit 60	Pinal	7 South	7 East	3	255	27-401775	11/18/05	Picacho Water Company	Y
115	Robson Ranch Arizona Units 27 & 28	Pinal	7 South	7 East	20 & 21	583	27-402206	02/22/07	Picacho Water Company	Y
117	Villa Grande Casa Simpatico #2	Pinal	7 South	8 East	28	41	27-200376	11/19/85	Villa Grande DWID	N
118	Sunland Ranches	Pinal	8 South	6 East	13	84	27-400203	03/21/00	Arizona Water Co - Casa Grande	N
119	Brookside Farms	Pinal	8 South	6 East	14	15	27-400738	02/24/03	Sunland Water Company	N
119	Phillips Country Estates	Pinal	8 South	6 East	14	459	27-402276	01/30/07	Sunland Water Company	Y
121	Toltec Estates West	Pinal	8 South	7 East	4	30	27-400165	01/05/00	NA	N
122	Hacienda Palo Verde	Pinal	8 South	7 East	5	21	27-400531	03/27/02	Arizona Water Co - Casa Grande	Y
123	Casitas Hermosa	Pinal	8 South	7 East	6	10	27-200042	12/20/84	Arizona Water Co - Casa Grande	N

Table 8.2-12 Assured Water Supply Determinations in the Pinal AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
124	Rae-Berwick Townhomes	Pinal	8 South	7 East	6 & 7	4	27-200272	04/13/81	Arizona Water Co - Casa Grande	N
126	Milliner Project,The	Pinal	8 South	7 East	19 & 30	72	27-200198	01/29/82	NA	N
126	Sunland Estates	Pinal	8 South	7 East	19 & 30	25	27-200332	05/04/88	NA	N
128	Picacho Pecans	Pinal	8 South	8 East	15 & 22	695	27-200228	11/22/89	NA	N
129	Agrocenter AZ R E Ltd Prtnrshp	Pinal	8 South	8 East	31	50	27-200002	07/09/84	City of Eloy	N
130	Picacho Peak Estates	Pinal	9 South	8 East	6	64	27-300427	09/15/98	NA	N
132	Unnamed property, Pinal Co.	Pinal	10 South	6 East	13	9	27-200369	04/06/84	Silverbell Irrigation and Drainage District	N
132	Montana Del Sol	Pinal	10 South	6 East	13	203	27-401098	02/17/04	Silverbell Irrigation and Drainage District	Y

B. Water Adequacy Reports

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
9	Caliente Casa del Sol	Pinal	4 South	9 East	24	218	53-500376	Adequate	09/19/73	Town of Florence
10	Thunderbird Farms North	Pinal	5 South	2 East	2	41	53-501542	Inadequate	02/20/81	NA
11	Papago Buttes Ranchos	Pinal	5 South	2 East	13 & 24	180	53-501102	Adequate	01/30/79	NA
14	Papago Buttes Ranchos	Pinal	5 South	3 East	18, 19, 20, 21 & 29	225	53-501101	Inadequate	09/19/73	NA
21	Saddleback Farms #2	Pinal	5 South	4 East	11	88	53-501349	Adequate	12/24/73	NA
23	Park West	Pinal	5 South	6 East	17	107	53-501124	Adequate	07/13/73	Arizona Water Co - Casa Grande
55	Hacienda Acres	Pinal	6 South	2 East	4	24	53-500768	Adequate	06/03/74	NA
81	Bomac Corporation Subdivision	Pinal	6 South	6 East	20	48	53-500347	Adequate	06/07/73	Arizona Water Co - Casa Grande
100	College View Ranchettes	Pinal	6 South	7 East	4	16	53-500483	Adequate	11/09/78	Signal Peak Water Co
106	Tierra Grande	Pinal	6 South	7 East	36	0	53-501548	Adequate	07/10/73	Arizona Water Co - Casa Grande
116	Villa Grande	Pinal	7 South	8 East	22	192	53-501625	Adequate	12/31/73	Villa Grande DWID
119	Sunland Estates	Pinal	8 South	6 East	14	119	53-501498	Adequate	06/13/73	Sunland Water Company
119	Sunland Estates #2,3	Pinal	8 South	6 East	14	430	53-501499	Adequate	07/10/74	Sunland Water Company
120	Sunland Park #1	Pinal	8 South	6 East	25	56	53-501500	Adequate	12/10/73	Sunland Water Company
125	Arizona City #17	Pinal	8 South	7 East	8	120	53-500285	Adequate	08/08/73	Arizona Water Co - Casa Grande
131	Silver Bell Estates Units 1-5	Pinal	10 South	6 East	10	270	53-501408	Adequate	01/29/74	Silverbell Irrigation and Drainage District

Table 8.2-12 Assured Water Supply Determinations in the Pinal AMA[1]

C. Analyses of Assured Water Supply

Map Key	Subdivision	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
13	Amarillo Creek	Pinal	5 South	3 East	17 & 20	3235	28-401363	02/10/05	387 District
15	Villages at Palomino Ranch	Pinal	5 South	3 East	18 & 19	2100	28-401364	07/07/05	387 District
16	Pecan Woods	Pinal	5 South	3 East	20	581	28-401362	01/24/05	387 District
17	Red River	Pinal	5 South; 6 South	3 East; 4 East	25, 26 & 27; 25 & 26	15210	28-401958	05/24/06	NA
18	Sunset Canyon	Pinal	5 South	3 East	28	1225	28-401361	12/28/04	387 District
18	McLean Ranch	Pinal	5 South	3 East	28	1200	28-401365	02/10/05	387 District
19	Papago and Val Vista Property	Pinal	5 South	3 East	29	2569	28-401360	02/22/05	387 District
43	Cross Creek Ranch	Pinal	5 South	8 East	16 & 17	1676	28-401734	08/22/05	Arizona Water Co - Coolidge
61	Traviano	Pinal	6 South; 7 South	5 East; 5 East	34; 3, 4, 9, 10 & 15	9012	28-402194	09/15/06	Arizona Water Co - Casa Grande
62	Francisco Grande	Pinal	6 South	5 East	20 & 21	1875	28-300052	01/25/96	Francisco Grande Utility Company
70	Villago Phases 2,3,4 & Villago Village	Pinal	6 South	6 East	6	5792	28-401951	03/07/06	Arizona Water Co - Casa Grande
84	Casa Grande 761	Pinal	6 South	6 East	13 & 24	1628	28-700408	10/24/07	Arizona Water Co - Casa Grande
85	Sun Dance Ranch	Pinal	6 South	6 East	25 & 36	2415	28-300169	08/01/96	Arizona Water Co - Casa Grande
85	Mission Royale	Pinal	6 South	6 East	25 & 36	2415	28-400417	03/02/01	Arizona Water Co - Casa Grande
99	Vista Del Monte	Pinal	6 South	7 East	3, 4 & 5	2653	28-401917	03/07/06	Arizona Water Co - Casa Grande
102	EJR Ranch	Pinal	6 South; 7 South	7 East; 7 East	26-28, 32-34;1-3	8099	28-401544	03/02/05	Picacho Water Company
103	Northwest Quarter Section 28, T6S, R7E	Pinal	6 South	7 East	28	583	28-402240	10/04/06	NA
114	Sun Lakes Casa Grande	Pinal	7 South	7 East	3, 4, 8, 9, 16 & 17	8000	28-400308	08/24/00	Picacho Water Company
127	Palmilla	Pinal	8 South	8 East	4 & 5	4500	28-402275	10/24/06	NA

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated Demand (af/yr)	Year of Projected or Annual Estimated Demand
A	City of Casa Grande	Pinal	26-400728.0000	05/06/02	07/21/03	4,113	2013
B	City of Eloy	Pinal	26-402148.0000	05/10/06	02/20/07	49,159	2015
C	Johnson Utilities	Pinal	26-401382.0000	05/26/04	10/14/05	551	2007
D	Santa Cruz Water Company	Pinal	26-402008.0000	01/24/06	12/27/07	23,979	2013
E	Town of Florence	Pinal	26-401284.0000	03/12/04	01/25/05	12,310	2014

[1] Includes water reports issued under the Water Adequacy program prior to 1980 implementation of the Assured Water Supply program.

[2] Adequacy determinations were based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. A determination of inadequacy could be due to insufficent physical or legal access to water or poor water quality. The Adequacy Program was replaced by the Assured Water Supply Program in the AMAs in 1980.

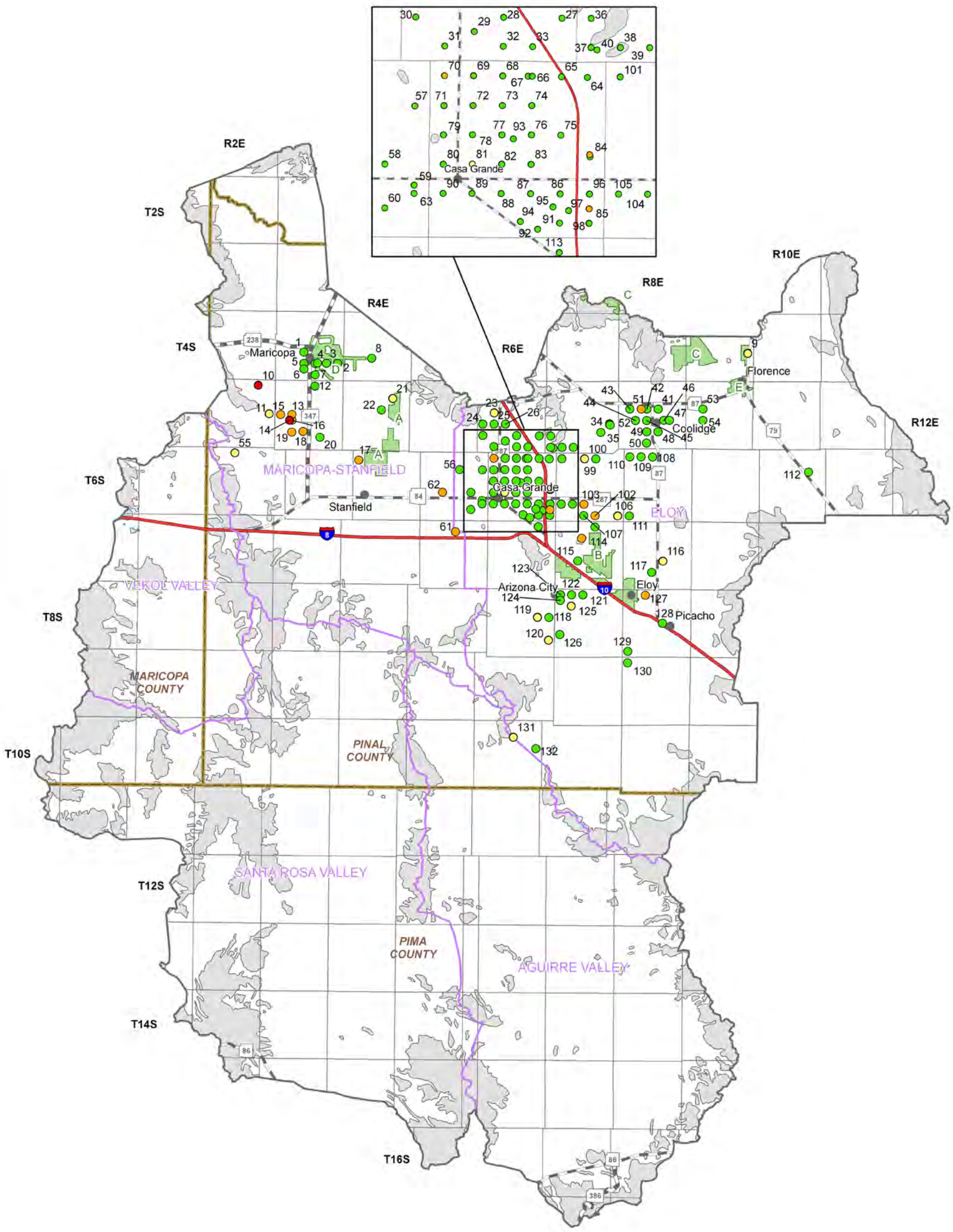


Figure 8.2-13
Pinal AMA
Assured Water Supply Determinations

Pinal AMA
References and Supplemental Reading

References

A

Arizona Department of Economic Security (DES), 2005, Workforce Informer: Data file, accessed August 2005, http://www.workforce.az.gov.

Arizona Department of Environmental Quality, 2005, ADEQSWI: Data file, received September 2005.

_____, 2005, ADEQWATP: Data file, received May 2005.

_____, 2005, ADEQWWTP: Data file, received August 2005.

_____, 2005, Azurite: Data file, received September 2005.

_____, 2005, Effluent dependent waters: GIS cover, received December 2005.

_____, 2005, Impaired lakes and reaches: GIS cover, received January 2006.

_____, 2004, Water providers with arsenic concentrations in wells over 10ppb: Data file, received August 2004.

_____, 2004, Water quality exceedences by watershed: Data file, received June 2004.

_____, 2004, Water quality exceedences for drinking water providers in Arizona: Data file, received September 2004.

Arizona Department of Water Resources (ADWR), 2007, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006, Assured and adequate water supply applications: Project files, ADWR Hydrology Division.

_____, 2005, Automated recorder sites: Data files, ADWR Basic Data Unit.

_____, 2005, Assured and adequate water supply determinations: Database, ADWR Office of Assured and Adequate Water Supply.

_____, 2005, Flood warning gages: Database, ADWR Office of Water Engineering.

_____, 2005, Inspected dams: Database, ADWR Office of Dam Safety.

_____, 2005, Non-jurisdictional dams: Database, ADWR Office of Dam Safety.

_____, 2005, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.

_____, 2005, Registry of surface water rights: ADWR Office of Water Management.

_____, 2005, Wells55: Database.

_____, 2004, Annual withdrawal and use reports for the Pinal AMA: ADWR Office of Water Management.

_____, 1999, Third Management Plan for the Pinal Active Management Area 2000-2010.

_____, 1994, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.

_____, 1994, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.

Arizona Game and Fish Department (AGF), 2005, Arizona Waterways: Data file, received April 2005.

_____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.

Arizona Land Resource Information System (ALRIS), 2005, Springs: GIS cover, accessed January 2006 at http://www.land.state.az.us/alris/index.html.

_____, 2005, Streams: GIS cover, accessed 2005 at http://www.land. state.az.us/alris/index.html.

_____, 2005, Water features: GIS cover, accessed July 2005 at http://www.land. state.az.us/alris/

index.html.
_____, 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.
Arizona Meteorological Network (AZMET), 2005, Arizona climate stations: Pan evaporation data, accessed December 2005 at http://www.ag.arizona.edu/ azmet/locate.html.

D

Diroll, M., and Marsh, D., 2006, Status of water quality in Arizona-2004 integrated 305(b) assessment and 303(d) listing report: ADEQ report.

E

Environmental Protection Agency (EPA), 2005, Surf Your Watershed: Facility reports, accessed April 2005 at http://oaspub.epa.gov/enviro/ef_home2.water.
_____, 2005, 2000 and 1996, Clean Watershed Needs Survey: datasets, accessed March 2005 at http://www.epa.gov/owm/mtb/cwns/index.htm.

K

Konieczki, A.D. and Wilson, R.P., 1992, Annual summary of ground-water conditions in Arizona, spring 1986 to spring 1987: USGS Open File Report 92-54.

M

McCormack, H.F., Fisk, G.G., Duet, N.R., Evans, D.W., Roberts, W.P., and Castillo, N.K., 2002, Water resources data Arizona, water year 2002: USGS Water Data Report AZ-02-1.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

P

Pinal County, 2001, Pinal County Comprehensive Plan, Adopted by the Pinal County Board of Supervisors December 19, 2001.

U

US Army Corps of Engineers, 2004 and 2005, National Inventory of Dams: Arizona Dataset, accessed November 2004 to April 2005 at http://crunch. tec.army.mil/nid/webpages/nid.cfm
US Geological Survey (USGS), 2006, Average annual runoff in the United States, 1951-1980: Data file, accessed March 2006 at http://aa179.cr.usgs.gov/ metadata/wrdmeta/runoff.htm.
_____, 2006, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.
_____, 2006, National Hydrography Dataset: Arizona dataset, accessed at http://nhd.usgs.gov/.
_____, 2005, National Water Information System (NWIS): Arizona dataset, accessed December 2005 at http://waterdata.usgs.gov/nwis.

_____ 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file, accessed January 2005 at http://earth.gis.usu.edu/swgap.

_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

V

Valencia, R.A., Wennerlund, J.A., Winstead, R.A., Woods, S., Riley, L., Swanson, E., and Olson, S., 1993, Arizona riparian inventory and mapping project: Arizona Game and Fish Department.

W

Wahl, C.R., Boe, S.R., Wennerlund, R.A., Winstead, R.A., Allison, L.J., Kubly, D.M., 1997, Remote sensing mapping of Arizona intermittent stream riparian areas: Arizona Game and Fish Technical Report 112.

Western Regional Climate Center (WRCC), 2005, Pan evaporation stations: Data file accessed December 2005 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

_____, 2005, Precipitation and temperature stations: Data file, accessed December 2007 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

Weidner, C., 1996, ADEQ Pollution Prevention Report, Arizona Pollution Prevention. Spring/Summer 1996.

Supplemental Reading

Arizona Department of Environmental Quality, 2007, Ambient Groundwater Quality of the Pinal Active Management Area: A 2005-2006 Baseline Study, ADEQ Fact Sheet C -7-27.

City of Casa Grande, 2001, City of Casa Grande General Plan 2010: Chapter 8 Water Resources Element.

Colby, B.G. and Jacobs, K.L eds, 2007, Arizona Water Policy: Management and Innovations in an Urbanizing, Arid Region: Resources for the Future, Washington D.C.

Corkhill, E.F. and Plato, P.R, 1992, Pinal Active Management Area Second Management Plan Simulations of Water Use Scenarios Utilizing the Pinal AMA Regional Groundwater Flow Model: Arizona Department of Water Resources, Model Report No. 04 - 000190

Corkhill, E.F. and Hill, B.M, 1990, Pinal Active Management Area Regional Groundwater Flow Model Phase II: Numerical Model, Calibration, Sensitivity and Recommendations: Arizona Department of Water Resouces, Model Report No. 02 - 000188.

Governor's Drought Task Force, 2004, Arizona Drought Preparedness Plan. Draft. Phoenix.

Governor's Drought Task Force, 2004, Arizona Drought Management Plan. Draft. Phoenix

Governor's Water Management Commission, 2000, Briefing Book: Water Management

Framework for AMAs, Groundwater Use Restrictions and Requirements. Phoenix: Arizona Department of Water Resources.

Governor's Water Management Commission, 2002, Final Report and Recommendations. Phoenix: Arizona Department of Water Resources.

Hammett, B.A., 1992, Maps showing groundwater conditions in the Eloy and Maricopa-Stanfield sub-basins of the Pinal Active Management Area, Pinal, Pima, and Maricopa Counties, Arizona 1989, Arizona Department of Water Resources, HMS No. 23 - 000238.

Holway, J.M. and K.L. Jacobs, 2006, Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth: in Mays, L., eds., Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth. McGraw-Hill.

Jacobs, K. L. and J. M. Holway, 2004, Lessons Learned from Twenty Years of Groundwater Management in Arizona, USA. *Hydrogeology Journal*. 12, No. 1.

Megdal, S. and Smith, Z., 2008, Evolution and Evaluation of the Active Management Area Management Plans, Water Resources Research Center, University of Arizona.

Megdal, S. and Colby, B., 2004, Arizona's Water Future: Challenges and Opportunities, 85th Arizona Town Hall Background Report, University of Arizona.

Rascona, S.J., 2003, Maps showing groundwater conditions in the Pinal Active Management Area, Maricopa, Pinal, and Pima Counties, Arizona-Nov. 2002-Feb 2003: Arizona Department of Water Resources, HMS No. 36 - 000319

Seventy-first Arizona Town Hall. 1997. Ensuring Arizona's Water Quantity and Quality into the 21st Century. Marshall A. Worden, editor. Phoenix: Arizona Town Hall.

Town of Florence, 2002, Florence Area General Plan Update.

Index to Section 8.0

Geography 6

Hydrology
- Groundwater Hydrology 6,7,8,9-10
- Surface Water Hydrology 17-18

Environmental Conditions
- Vegetation 24,26
- Arizona Water Protection Fund 28
- Endangered Species 31
- Protected Areas 34

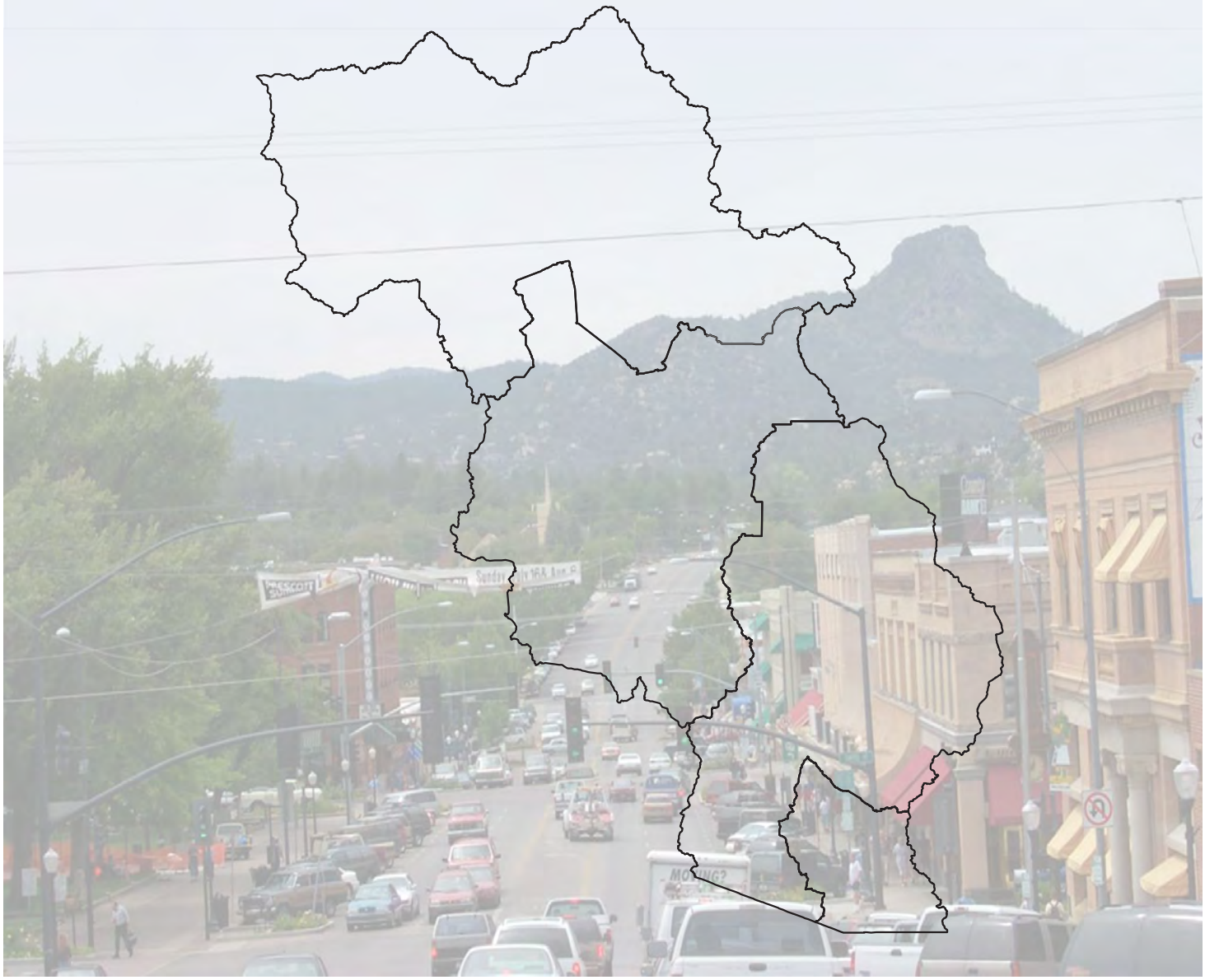
Population 35,38,39,40,41

Water Supply 42
- Central Arizona Project 43
- Surface Water 45
- Groundwater 46
- Effluent 48
- Contamination Sites 49

Cultural Water Use 50,51,52
- Tribal Demand 53,54-55,56
- Municipal Demand 56,60
- Agricultural Demand 65,67
- Industrial Demand 70-71

Water Resource Issues 71-75

Section 8.3
Prescott AMA



8.3.1 Geography of the Prescott AMA

The Prescott AMA is 485 square miles in area, the smallest AMA in the planning area. Geographic features and principal communities are shown on Figure 8.3-1. Prescott is the only AMA in the planning area in the Central Highlands physiographic province and is characterized by rolling hills and broad valleys. Vegetation types include plains and Great Basin grassland, southwestern interior chaparral, Great Basin conifer woodland and petran montane conifer forest. (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.3-1 are:
    - The Agua Fria River running southeast from near the AMA center to Dewey -Humboldt.
    - Lynx Creek joining the Agua Fria southeast of Prescott Valley.
    - Granite Creek running south to north and Willow Creek running west to east in the center of the AMA.
    - The Bradshaw Mountains on the south, Granite Mountain and Sullivan Buttes to the west, and the Black Hills along the northeast AMA boundary (not well shown on the map).
    - Chino Valley in the north central part of the AMA.
    - The lowest point in the AMA at 4,280 feet where Granite Creek exits the AMA.
    - The highest point in the AMA, Mount Davis at 7,882 feet in the Bradshaw Mountains in the southernmost part of the AMA.

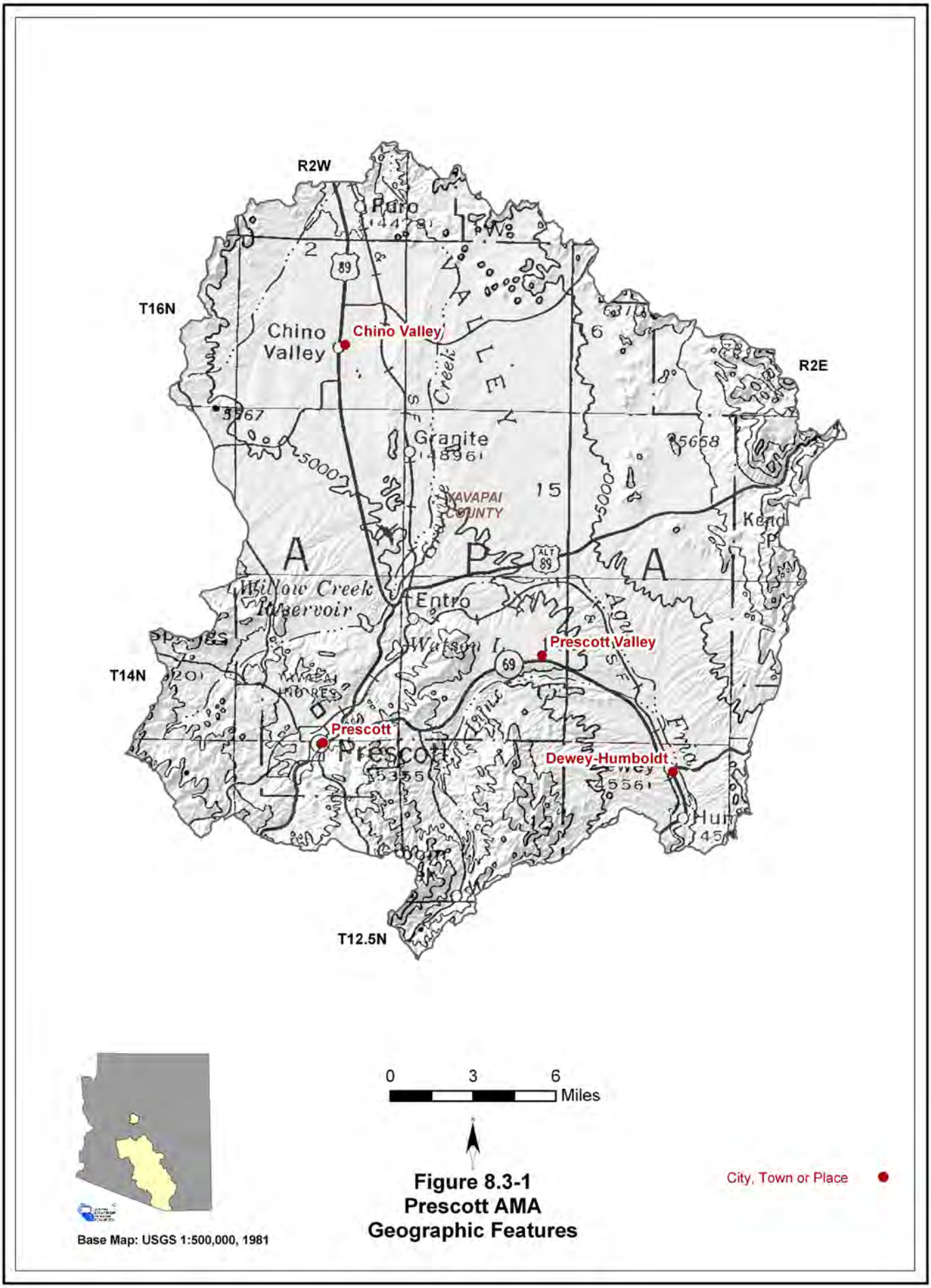


Figure 8.3-1
Prescott AMA
Geographic Features

8.3.2 Land Ownership in the Prescott AMA

Land ownership, including the percentage of ownership by category, for the Prescott AMA is shown in Figure 8.3-2. The principal feature of land ownership in the AMA is the relatively large amount of private land dispersed in a checkerboard pattern with state trust land. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of percentage from largest to smallest in the AMA.

Private

- 55.0% of the land is private; the largest percentage of any of the AMA basins.
- Land uses include domestic, commercial, agriculture and grazing.

National Forest

- 21.9% of the land is federally owned and managed as the Prescott National Forest.
- The AMA contains 1,411 acres of the 5,553-acre Woodchute Wilderness along the east central border of the AMA north of Highway 89A (See Figure 8.0-13).
- Land uses include recreation, grazing and timber production.

State Trust Land

- 21.2% of the land is held in trust for the public schools and other beneficiaries under the State Trust Land system.
- Primary land use is grazing.

U.S. Bureau of Land Management (BLM)

- 1.1% of the land is federally owned and managed by the Hassayampa Field Office of the U.S. Bureau of Land Management.
- Primary land use is grazing.

Indian Reservation

- 0.4% of the land is under ownership of the Yavapai-Prescott Tribe.
- Land uses include domestic and commercial.

Other

- 0.2% of the land is owned and managed by local or regional governments, principally Pioneer Park.
- Primary land use is recreation.

U.S. Military

- 0.1% of the land is federally owned by the U.S. Military
- Originally the site of Fort Whipple, these lands are now the location of Yavapai Community College and Veterans Administration Medical Center.

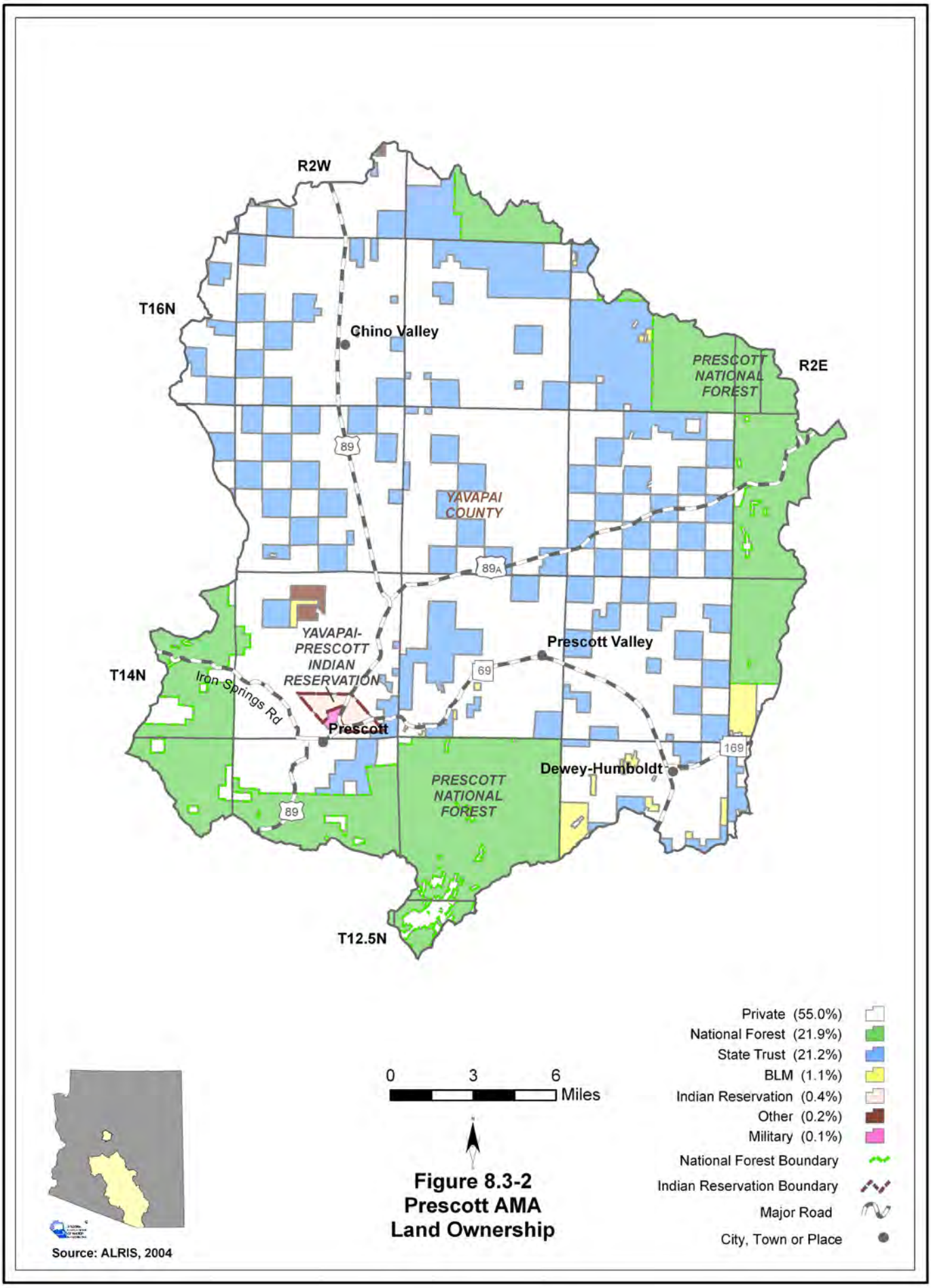


Figure 8.3-2
Prescott AMA
Land Ownership

8.3.3 Climate of the Prescott AMA

Climate data from NOAA/NWS Co-op Network stations are complied in Table 8.3-1 and the locations are shown on Figure 8.3-3. Figure 8.3-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Prescott AMA does not contain Evaporation Pan, AZMET or SNOTEL/Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.3-1A
- There are three NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July and is between 73.4°F and 75.6°F. The average monthly minimum temperature occurs in December or January and is between 36.9°F and 37.9°F.
- Highest average seasonal rainfall occurs in the summer (July-September). For the period of record used, the highest average annual rainfall is 19.19 inches at the Prescott station and the lowest is 12.82 inches at the Chino Valley station.

SCAS Precipitation Data

- See Figure 8.3-3
- Additional precipitation data shows average annual rainfall as high as 30 inches on the eastern AMA boundary and as low as 12 inches in the northern portion of the AMA.

Table 8.3-1 Climate Data for the Prescott AMA

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Chino Valley	4,750	1971-2000	75.6/Jul	37.9/Dec,Jan	3.55	1.36	5.30	2.61	12.82
Prescott	5,205	1971-2000	73.4/Jul	37.1/Jan	5.36	1.80	8.22	3.81	19.19
Prescott Municipal	5,020	1948-2001[1]	75.3/Jul	36.9/Jan	2.04	1.31	8.09	2.50	13.94

Source: WRCC
Notes:
[1]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

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

Source: WRCC

C. AZMET:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
None			

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	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								

Source: NRCS, 2005

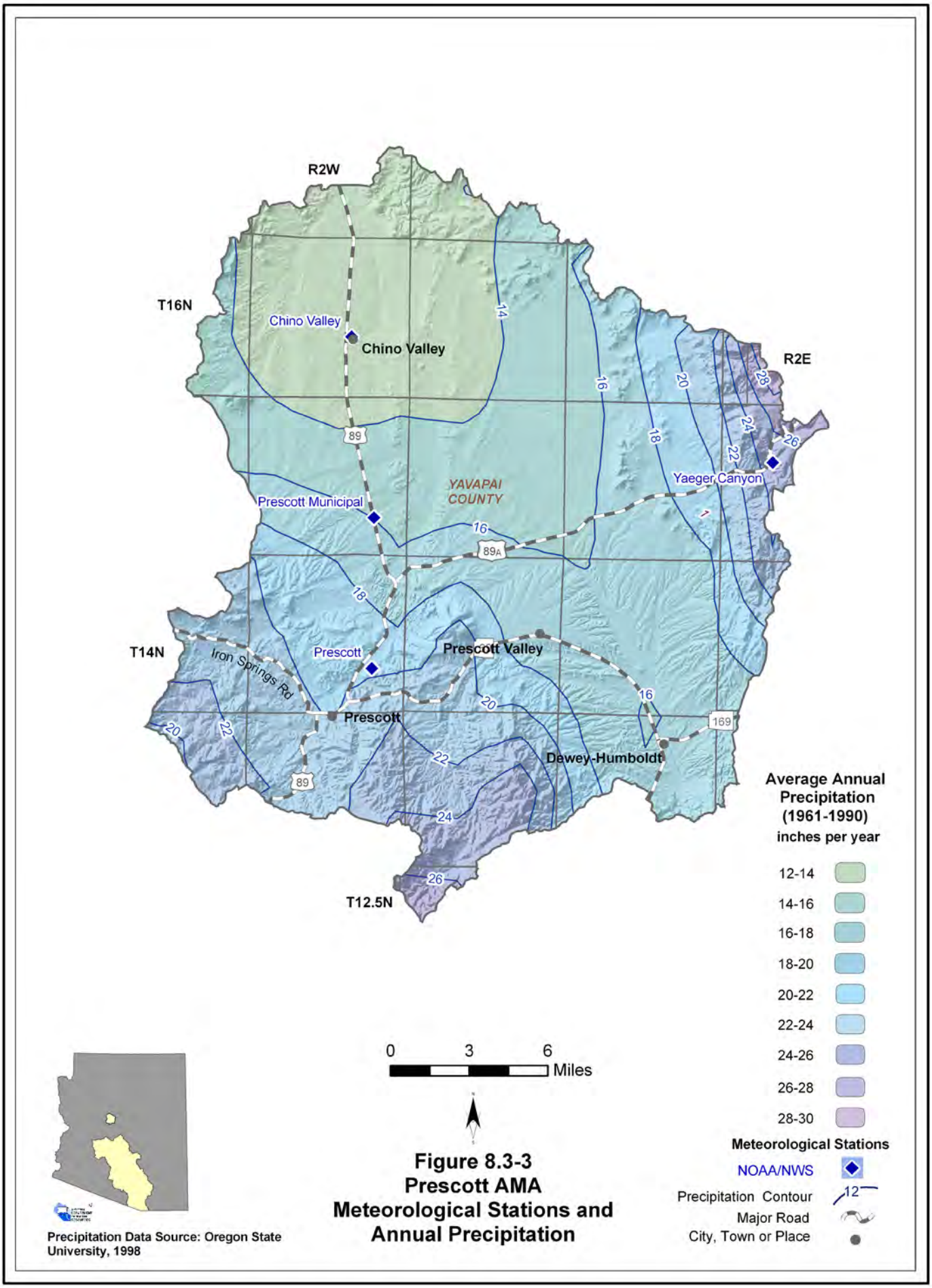


Figure 8.3-3
Prescott AMA
Meteorological Stations and Annual Precipitation

8.3.4 Surface Water Conditions in the Prescott AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.3-2. Flood ALERT equipment in the AMA is shown in Table 8.3-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.3-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 8.3-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.3-2.
- Data from six stations located at four watercourses are shown in the table and on Figure 8.3-4.
- Average seasonal flow is highest at all stations in the winter season (January-March).
- The largest annual flow recorded in the AMA is 18,757 acre-feet in 2005 at the Granite Creek near Prescott gage with a contributing drainage area of 36 square miles.

Flood ALERT Equipment

- Refer to Table 8.3-3.
- There are 21 ALERT gages in the AMA, primarily precipitation or precipitation/stage gages.

Reservoirs and Stockponds

- Refer to Table 8.3-4.
- The AMA contains four large reservoirs. The largest, Willow Creek, has a maximum storage of 7,800 acre-feet.
- Reservoir uses include recreation and water supply.
- Surface water is stored or could be stored in 13 small reservoirs.
- There are 216 registered stockponds in the AMA.

Runoff Contour

- Refer to Figure 8.3-4.
- Average annual runoff is one inch or 53.33 acre feet per square mile.

Table 8.3-2 Streamflow Data for the Prescott AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9502900	Del Rio Springs near Chino Valley	41	4,430	1996-2004 (real time)	29	23	22	27	1,056 (2003)	1,313	1,300	1,490 (1997)	7
9502960	Granite Creek at Prescott	30	5,285	1994-current (real-time)	61	7	19	12	600 (2002)	3,052	5,059	16,842 (2005)	12
9503000	Granite Creek near Prescott	36	5,204	1932-current (real-time)	65	11	14	10	273 (1935)	3,133	5,036	18,757 (2005)	26
9503300	Granite Creek Blw Watson Lake near Prescott	NA	5,020	1999-current (real time)	81	4	4	11	82 (2002)	737	3,574	17,327 (2005)	6
9503500	Willow Creek near Prescott	25	5,031	1932-1937 (discontinued)	51	12	27	10	211 (1936)	422	631	1,471 (1935)	4
9512450	Agua Fria River near Humboldt	NA	4,400	2000-current (real-time)	43	8	26	23	1,335 (2003)	3,386	4,431	10,911 (2005)	5

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal 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 recor

Table 8.3-3 Flood ALERT Equipment in the Prescott AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
300	Upper Goldwater Dam	Precip/Stage	8/28/2001	Yavapai Co FCD
305	Turtle People	Precipitation	11/7/1990	Yavapai Co FCD
310	Lower Goldwater Dam	Precip/Stage	1/9/1991	Yavapai Co FCD
315	Bannon Creek	Precip/Stage	4/8/1992	Yavapai Co FCD
320	Saw Mountain	Precipitation	11/8/1990	Yavapai Co FCD
325	Granite Creek @ White Spar Campground	Precip/Stage	2/26/1991	Yavapai Co FCD
330	Wolverton Mountain	Precipitation	2/26/1991	Yavapai Co FCD
335	Yavapai Co FCD Office	Base Station/Weather	11/16/1998	Yavapai Co FCD
340	Thumb Butte Tank	Precipitation	9/10/1991	Yavapai Co FCD
345	Sierra Prieta	Precipitation	9/10/1991	Yavapai Co FCD
350	Williams Peak	Precipitation	9/9/1991	Yavapai Co FCD
355	Prescott Heights	Precipitation	8/28/2001	Yavapai Co FCD
360	Haisley Water Tank Repeater	Repeater/Precip	5/5/1997	Yavapai Co FCD
365	YC Public Works Yard	Precipitation	10/23/1997	Yavapai Co FCD
380	Granite Basin	Precipitation	12/30/1998	Yavapai Co FCD
385	Watson Lake	Precipitation	3/19/2001	Yavapai Co FCD
400	Prescott Valley PD Yard	Weather Station	9/21/2001	Yavapai Co FCD
405	Chino Valley	Precipitation	10/23/1997	Yavapai Co FCD
440	Lynx Creek Levee	Precip/Stage	8/27/2001	Yavapai Co FCD
450	Clipper Wash @ Prescott Country Club	Precip/Stage	7/8/1998	Yavapai Co FCD
5820	Prescott Valley	Precipitation	12/7/1982	FCD Maricopa Co

FCD = Flood Control District

Table 8.3-4 Reservoirs and Stockponds in the Prescott AMA

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
1	Willow Creek	City of Prescott	7,800	R,S	Local
2	Watson *(Granite Creek)*	City of Prescott	4,900	R,S	Local
3	Lynx	AZ Game and Fish	2,763	R	State
4	Upper Goldwater	City of Prescott	700	R	Local

Source: U.S. Army Corps of Engineers 2005

B. Other Large Reservoirs (50 acre surface area or greater)[2]

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					

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

Total number: 5
Total maximum storage: 888 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)[2]

Total number: 8
Total surface area: 91 acres

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

Total number: 216

Notes:
[1]R = Recreation, S= Water Supply
[2]Capacity data is not available to ADWR

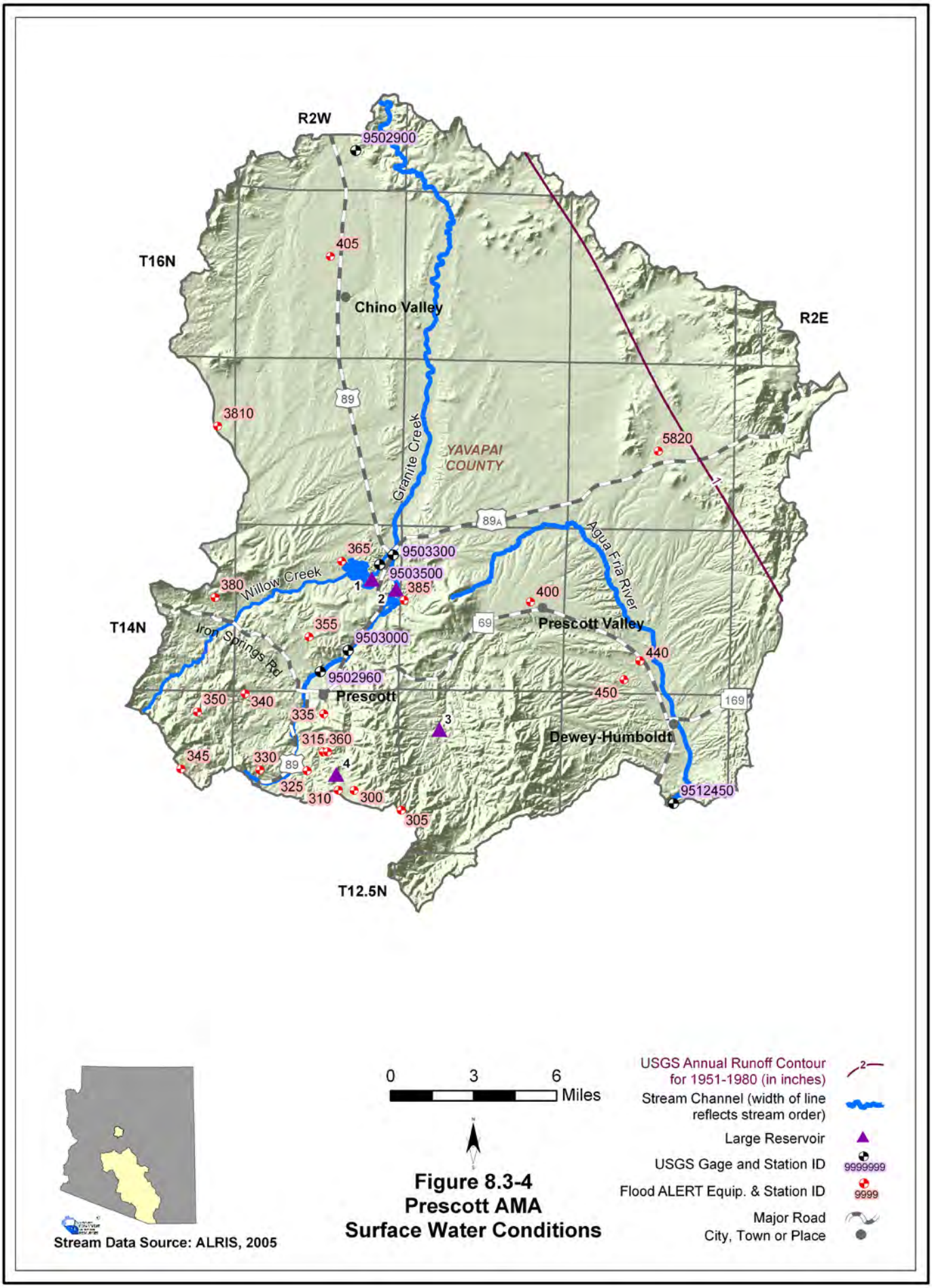


Figure 8.3-4
Prescott AMA
Surface Water Conditions

8.3.5 Perennial/Intermittent Streams and Springs in the Prescott AMA

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the AMA are shown in Table 8.3-5. The locations of major springs and perennial and intermittent streams are shown on Figure 8.3-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- A portion of the Agua Fria is the only perennial stream in the AMA.
- Intermittent streams are found on the eastern AMA boundary and in the south central part of the AMA.
- There is one major spring, Del Rio, with a measured discharge of 874 gallons per minute (gpm).
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 8.3-5B. There are 10 minor springs.
- Listed discharge rates may not be indicative of current conditions. Most spring measurements were taken during or prior to 1981.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from 57 to 65, depending on the database reference.

Table 8.3-5 Springs in the Prescott AMA

A. Major Springs (10 gpm or greater):

Map Key	Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
1	Del Rio	344914	1122643	874	1999[2]

B. Minor Springs (1 to 10 gpm):

Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
Coyote	344233	1121159	9	2/24/1981
Unnamed on Lower Granite Creek	345103	1122542	5	5/2/1977
Unnamed	343458	1123325	4	3/12/1981
Cowell No 2	343504	1123129	4	3/12/1981
Unnamed	343118	1121736	2	6/18/1979
Spence Creek	343420	1123249	2	3/12/1981
Unnamed	343003	1123208	2	3/10/1981
Aspen Creek HW-1	342934	1123222	2	4/16/2001
Unnamed	343302	1122632	1	2/28/2001
Unnamed	344252	1121227	1	2/24/1981

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 57-65

Notes:
[1] Location datum is NAD 27
[2] Exact date unavailable

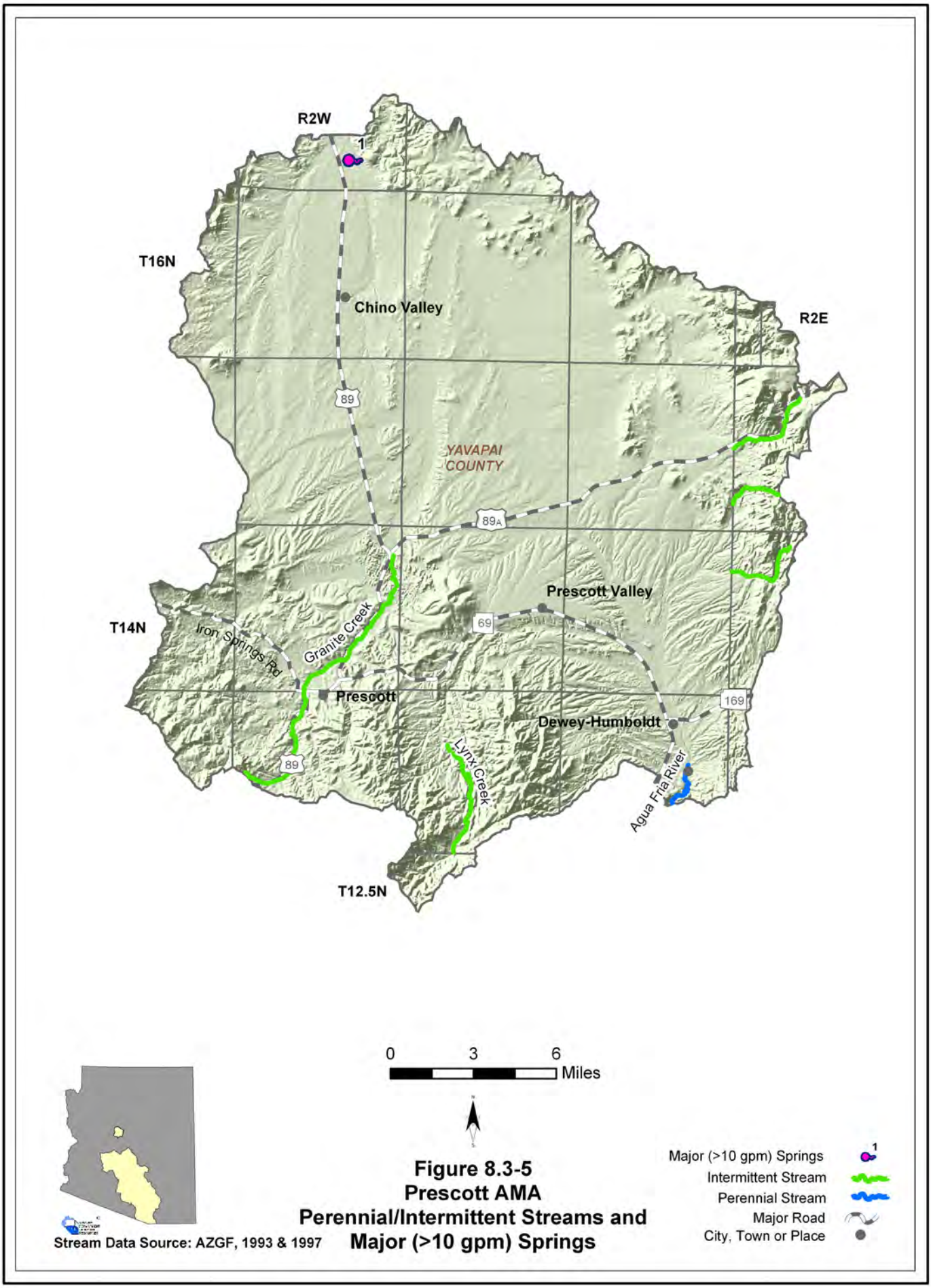


Figure 8.3-5
Prescott AMA
Perennial/Intermittent Streams and Major (>10 gpm) Springs

8.3.6 Groundwater Conditions of the Prescott AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.3-6. Figure 8.3-6 shows aquifer flow direction and water-level change between 1993-1994 and 2004. Figure 8.3-7 contains hydrographs for selected wells shown on Figure 8.3-6. Figure 8.3-8 shows well yields in five yield categories. Underground Storage Facilities (USF) are shown on Table 8.5-7 with facility name, facility permit number and type, permittee name, permitted acre-feet per year and water source. Locations of USFs are shown on Figure 8.5-9. There are no Groundwater Savings Facilities (GSF) in the AMA. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.3-6 and Figure 8.3-6
- The major aquifers in this AMA are basin fill and igneous and metamorphic rock.
- Groundwater flow is generally from the mountains on the AMA boundary toward the center of the AMA. Groundwater flows north from the Little Chino Sub-basin and south from the Upper Agua Fria Sub-basin.

Well Yields

- Refer to Table 8.3-6 and Figure 8.3-8
- One source of well yield information, based on 137 reported wells, indicates that the median well yield is 644 gpm.

Natural Recharge

- Refer to Table 8.3-6
- Natural recharge in the Prescott AMA is approximately 7,000 acre-feet per year.
- Primary source of natural recharge is from infiltration of runoff into stream channels and mountain front recharge.

Water Level

- Refer to Figure 8.3-6. Water levels are shown for wells measured in 2004.
- The Department annually measures 93 index wells in this AMA; hydrographs for six index wells are shown on Figure 8.3-7.
- The deepest water level shown is 428 feet west of the junction of Highway 89 and Highway 89A in the center of the AMA and the shallowest is 16 feet in the northern portion of the AMA west of Highway 89.

Recharge Sites

- Refer to Table 8.3-7 and Figure 8.3-9.
- There are three active USFs with a total permitted storage capacity of almost 13,000 acre-feet per year.

Table 8.3-6 Groundwater Data for the Prescott AMA

Basin Area, in square miles:	485	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Basin Fill	
	Igneous and Metamorphic Rock	
Well Yields, in gal/min:	Range 2-4,590 Median 644 (137 wells measured)	ADWR GWSI
	Range 2-3,600 Median 763 (78 wells reported)	ADWR Wells55 (>10-inch diameter)
Estimated Natural Recharge, in acre-feet/year:	7,000	Timmons and Springer 2006
Current Number of Index Wells:	93	
Date of Last Water-level Sweep:	1999 (189 wells measured)	

TMP = Third Management Plan

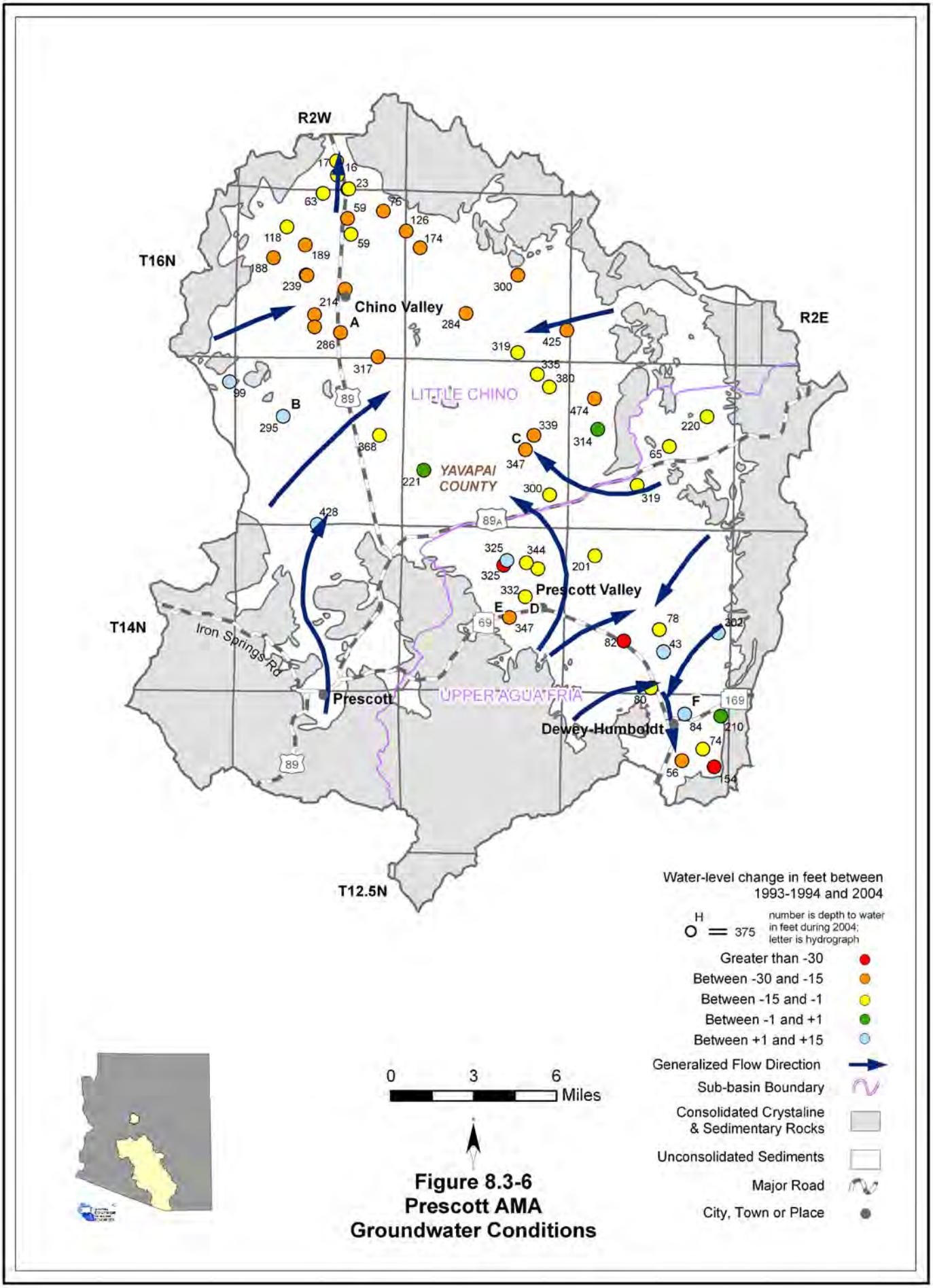


Figure 8.3-6
Prescott AMA
Groundwater Conditions

Figure 8.3-7
Prescott Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

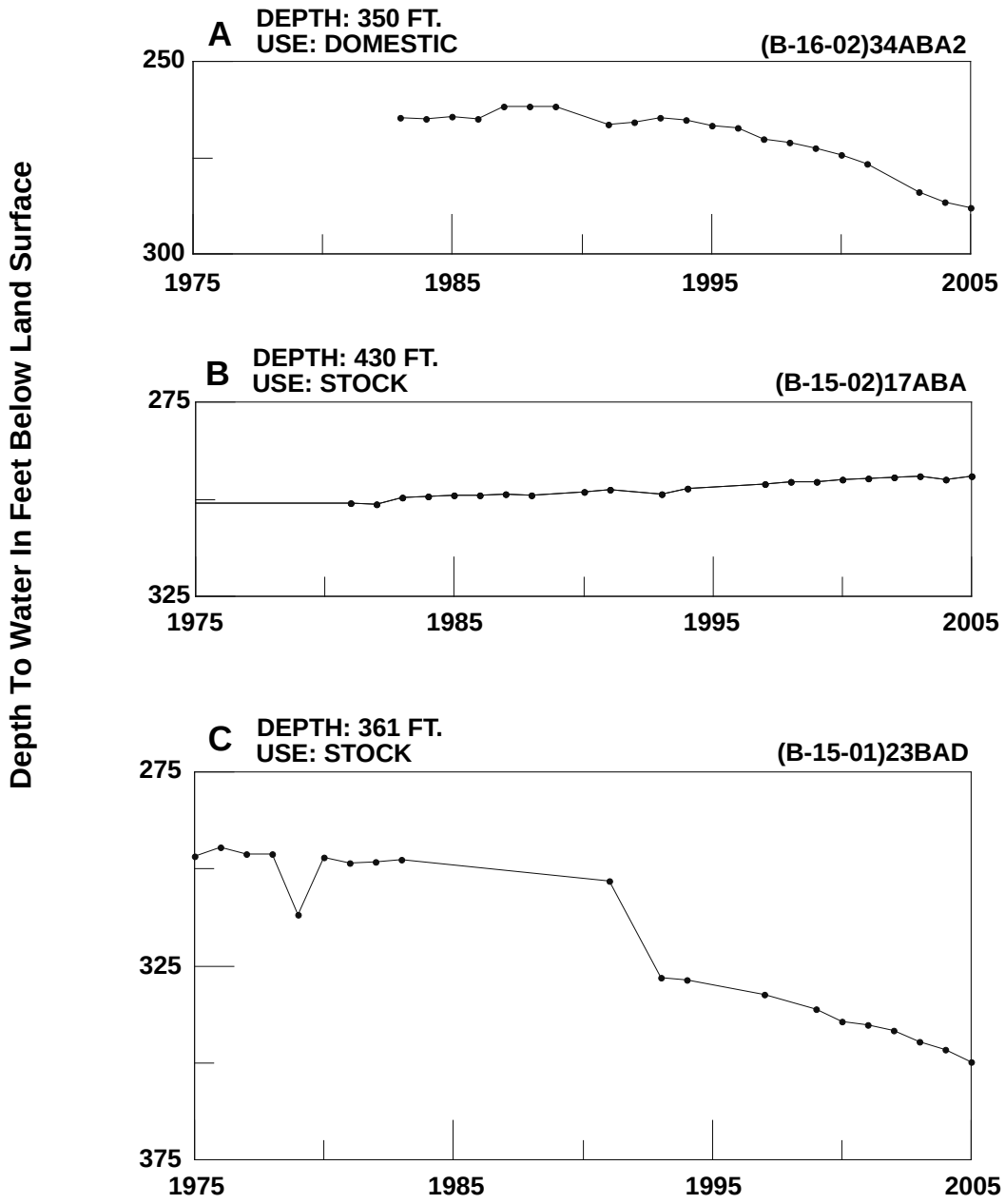
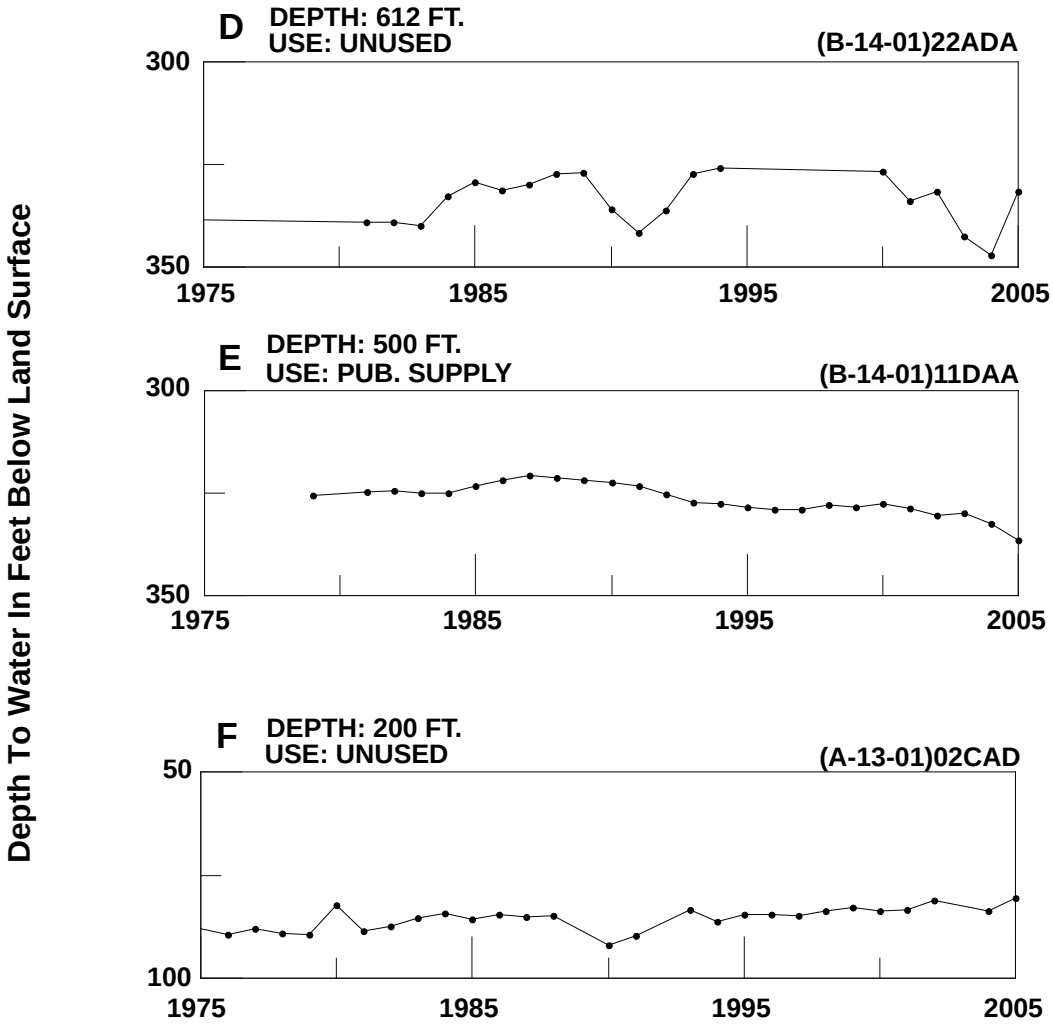


Figure 8.3-7 (cont)
Prescott Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



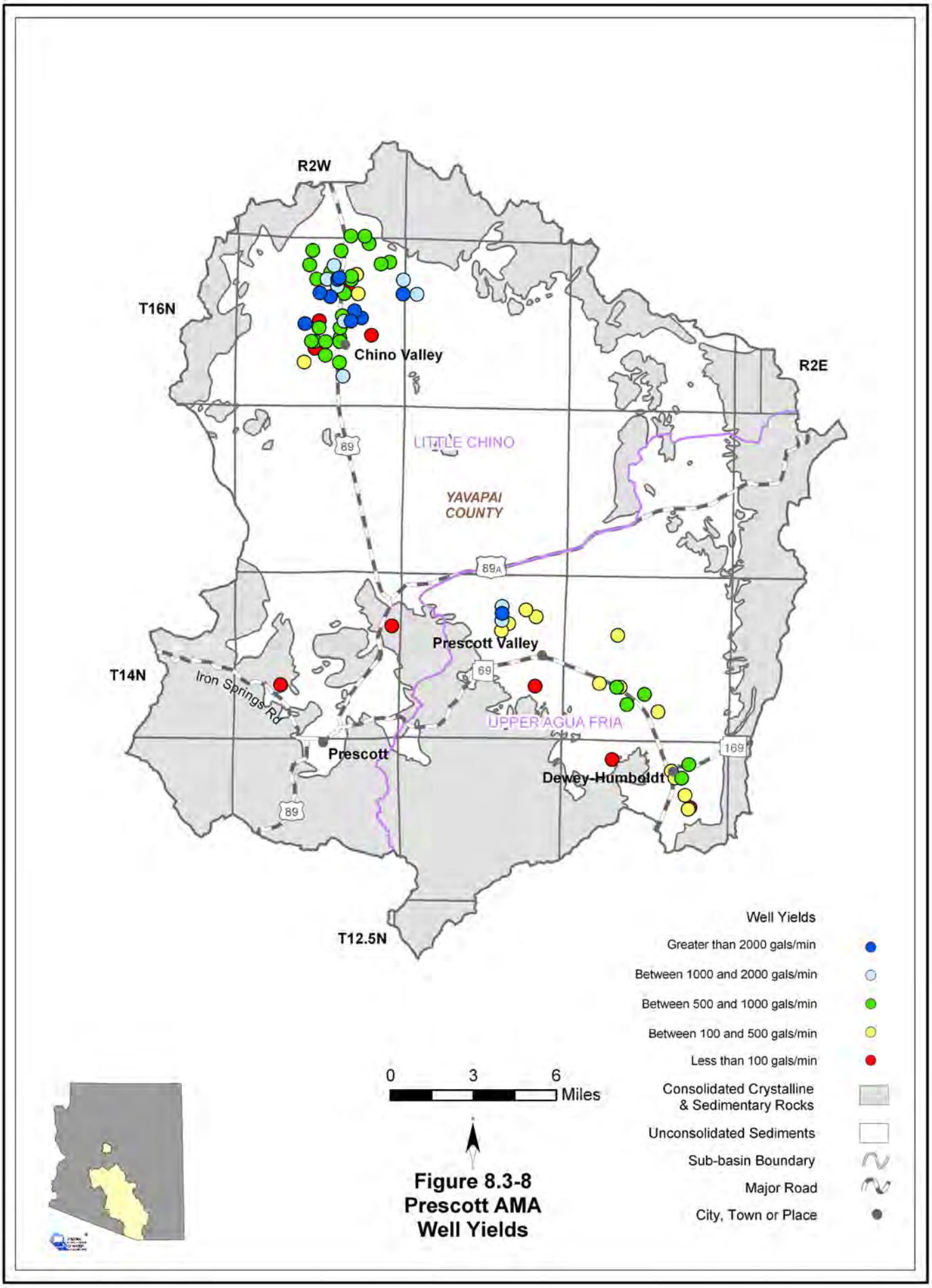


Figure 8.3-8
Prescott AMA
Well Yields

Table 8.3-7 Recharge Sites in the Prescott AMA

FACILITY NAME	FACILITY NUMBER	PERMITTEE NAME	FACILITY TYPE	PERMITTED AF/YEAR	WATER SOURCE
OLD HOME MANOR RECHARGE PROJECT	71-595206.0001	TOWN OF CHINO VALLEY	CONSTRUCTED	1,120	E
SUNDOG WWTP RECHARGE FACILITY	71-519567.0000	CITY OF PRESCOTT	CONSTRUCTED	6,721	ES
TOWN OF PRESCOTT VALLEY CONSTRUCTED	71-205386.0000	TOWN OF PRESCOTT VALLEY	CONSTRUCTED	5,150	E

Notes:
WWTP = Wastewater Treatment Plant
E - Effluent
S - Surface Water

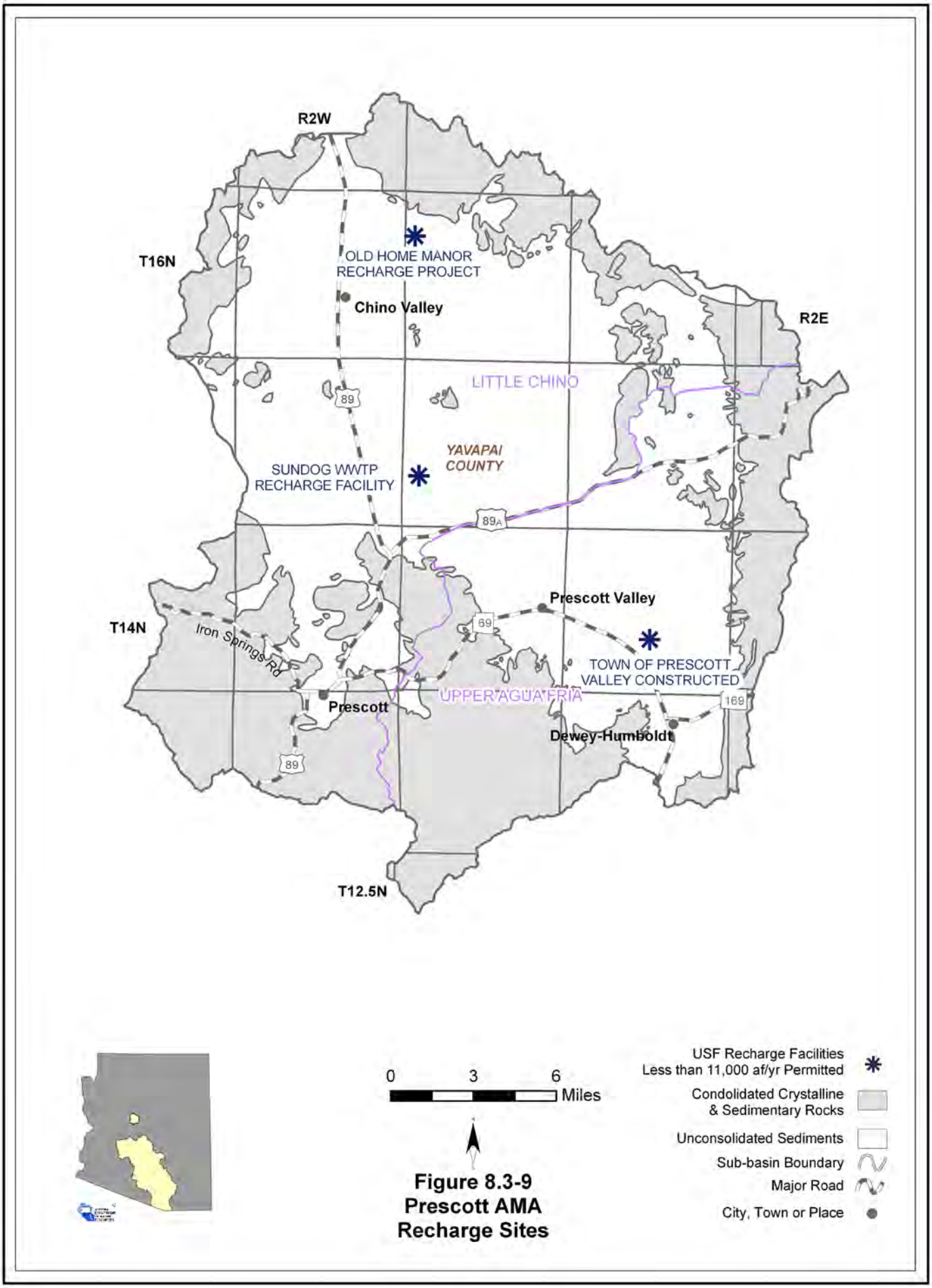


Figure 8.3-9
Prescott AMA
Recharge Sites

8.3.7 Water Quality Exceedences and Contamination Sites in the Prescott AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s), (DWS) including location and parameter(s) are shown in Table 8.3-8A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 8.3-8B. Figure 8.3-10 shows the location of water quality occurrences keyed to Table 8.3-8. Figure 8.3-11 shows the located of contamination sites with site information in Table 8.3-9. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Well, spring and mine sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 8.3-8A.
- Sixty-eight sites have parameter concentrations that have equaled or exceeded DWS.
- The most frequently equaled or exceeded the parameter is arsenic.
- Other parameters equaled or exceeded include manganese, fluoride, barium, cadmium, lead, radionuclides and nitrates.

Lakes and Streams with impaired waters

- Refer to Table 8.3-8B.
- Water quality standards were equaled or exceeded in one stream reach and two lakes. The most common parameter equaled or exceeded was dissolved oxygen.
- One lake, Watson Lak,e is part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) Program. Sampling is ongoing at the site at this time.

Effluent Dependent Reaches

- Refer to Figure 8.3-10
- A portion of the Agua Fria River in this AMA is effluent dependent, due to discharge from the Prescott Valley WWTF.

Contamination Sites

- Refer to Figure 8.3-11 and Table 8.3-9
- There are three Voluntary Remediation Program sites with soil and groundwater contamination.

Table 8.3-8 Water Quality Exceedences in the Prescott AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	17 North	2 West	35	1	As
2, 3	17 North	2 West	34	2	As
4, 5, 6, 8	16 North	2 West	3	4	As
7	16 North	2 West	5	1	As
9	16 North	2 West	4	1	As
10	16 North	2 West	39	1	As
11	16 North	2 West	16	1	As
12	16 North	2 West	55	1	As
13	16 North	2 West	22	1	As
14	16 North	1 East	7	1	As
15	16 North	2 West	26	1	As
16	16 North	1 East	26	1	Mn
17, 18, 19	16 North	2 West	34	3	As
20	16 North	2 West	31	1	As
21, 22	15 North	2 West	3	2	As
23	15 North	1 West	1	1	Mn
24	15 North	2 West	8	1	As, F
25, 26	15 North	2 East	19	2	As, Ba, Mn
27	15 North	1 East	28	1	Mn
28	15 North	2 West	30	1	F
29, 30	14 North	2 West	12	2	Mn, Rad
31, 33	14 North	2 West	13	2	F, NO3
32	14 North	1 West	14	1	NO3
34	14 North	1 West	23	1	Mn
35	14 North	1 East	29	1	Pb
36, 38	14 North	2 West	25	2	As, NO3
37, 39	14 North	2 West	26	2	Mn, NO3
40	14 North	2 West	35	1	Mn, Pb
41	14 North	1 West	34	1	Mn, NO3, Pb
42	14 North	1 East	33	1	As
43, 44, 46	14 North	2 West	34	3	As, Mn
45	14 North	1 West	34	1	Mn, NO3, Pb
47	14 North	2 West	35	1	Mn, Pb
48	14 North	1 West	33	1	As, F
49	14 North	1 East	35	1	As
50, 51	13 North	1 East	2	2	As
52, 53, 54	13 North	1 East	3	3	As, NO3, Pb
55	13 North	1 East	4	1	Cd, NO3
56	13 North	2 West	3	1	Mn
57	13 North	1 East	10	1	Cd
58	13 North	1 East	12	1	As
59	13 North	1 East	11	1	As
60	13 North	1 East	7	1	Mn
61	13 North	1 West	8	1	Mn
62	13 North	2 West	11	1	Rad
63	13 North	2 West	8	1	As, Mn
64, 65, 66	13 North	1 East	14	3	As
67	13 North	1 East	15	1	As, NO3
68	12.5 North	1 West	20	1	Mn

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[3]	Parameter(s) Exceeding Use Standard[2]
a	Stream	Granite Creek headwaters - Willow Creek	13	NA	A&W	Do
not shown[4]	Lake	Granite Basin Lake	NA	7	A&W	Do
b	Lake	Watson Lake	NA	152	A&W, FBC, Agl	N, Do, pH

Notes:

[1] Water quality samples collected between 1975 and 2004.
[2] As = Arsenic
Ba = Barium
Cd = Cadmium
Do = Dissolved Oxygen
F = Fluoride
Mn = Manganese
N = Nitrogen
Pb = Lead
NO3 = Nitrate/ Nitrite
Rad = radionuclides
[3] A&W = Aquatic and Wildlife
Agl = Agriculture
FBC= Full Body Contact
[4] Granite Basin Lake was added to ADEQ's impaired waters list in 2006. Figure 8.3-10 contains impaired waters through 2004.

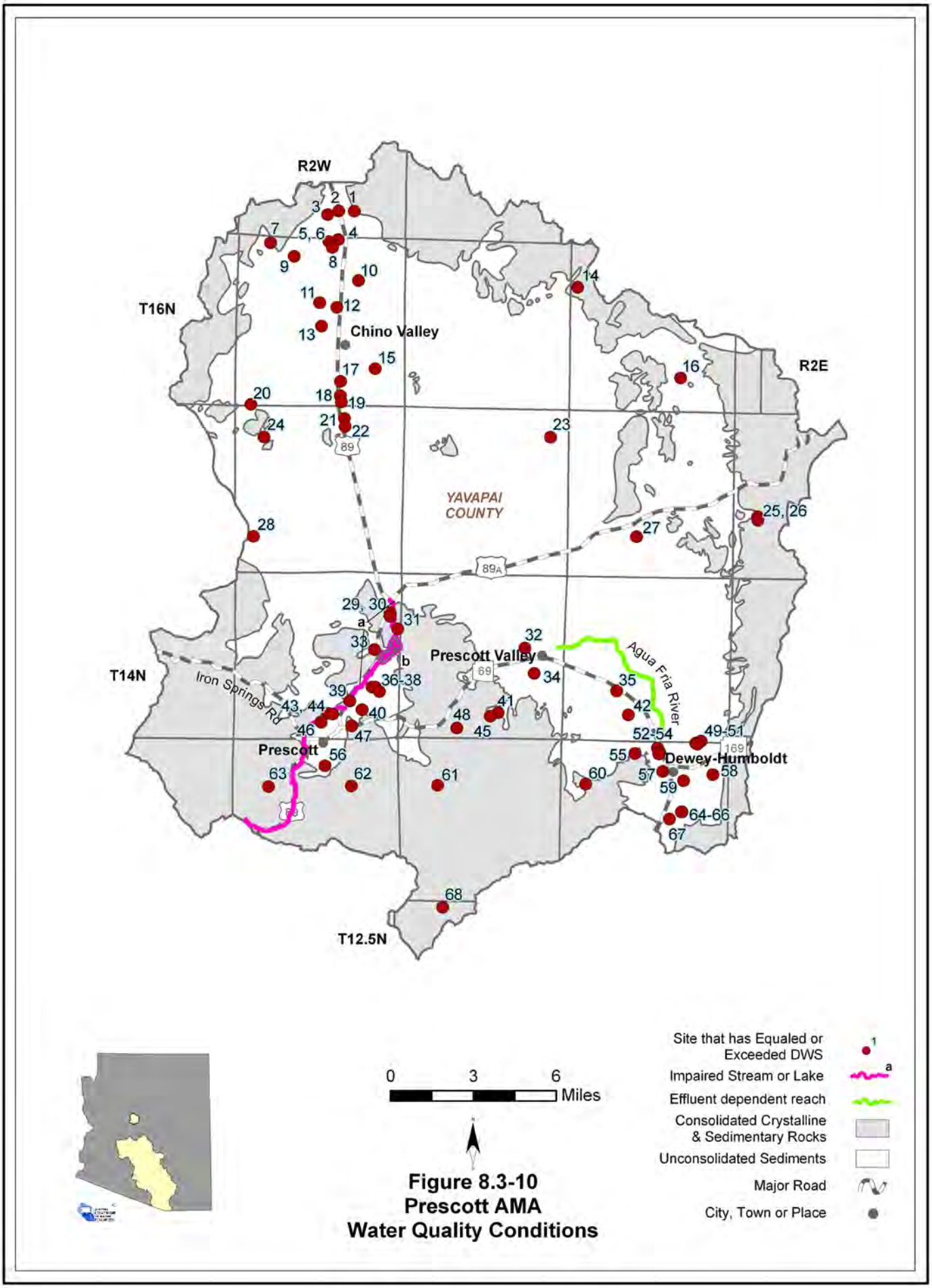


Figure 8.3-10
Prescott AMA
Water Quality Conditions

Table 8.3-9 Contamination Sites in the Prescott AMA

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites	
APS Prescott Manufactured Gas Plant (MGP)	Soil/Polycyclic aromatic hydrocarbons (PAHs), Total Petroleum Hydrocarbons (TPH), Benzene and Lead Groundwater/Nitrate, Cyanide and Arsenic
Chino Valley Welding and Automotive Repair Center	Soil & Groundwater/Total Petroleum Hydrocarbons (TPH) and Lead
Ironite Product Company	Soil & Groundwater/Not known at this time

Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

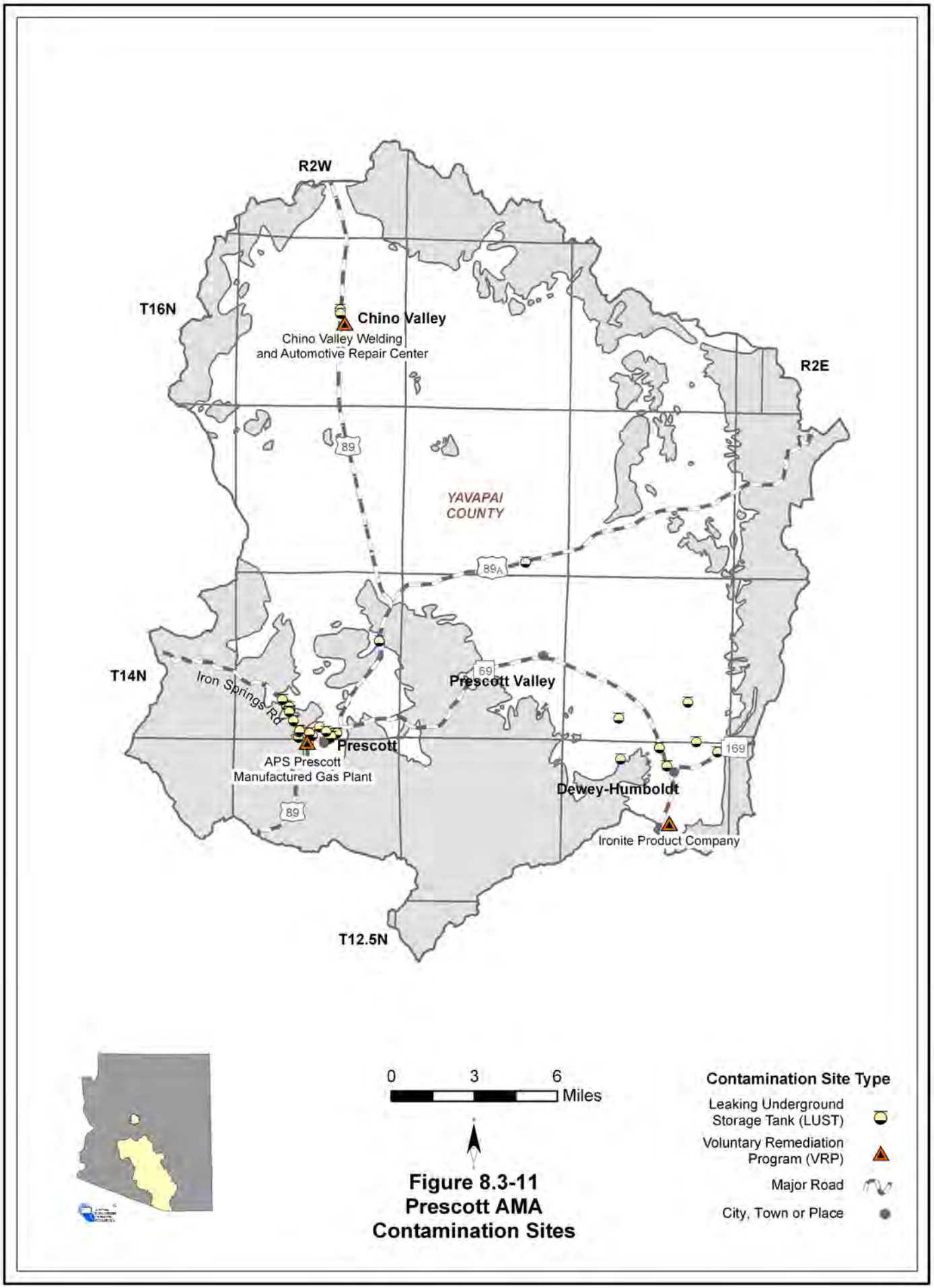


Figure 8.3-11
Prescott AMA
Contamination Sites

8.3.8 Cultural Water Demands in the Prescott AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.3-10. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.3-11. Figure 8.3-12 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.3-10 and Figure 8.3-12.
- Population in the AMA increased from 32,618 in 1980 to 92,832 in 2000 and projections suggest an increase to over 221,000 residents by 2050.
- The majority of the water used in the AMA is groundwater.
- In the period of 2001-2003, municipal water demand accounted for almost 70% of the total average annual water demand.
- Agricultural demand dropped by more than 60% between the early to mid-90s and 2001-2003 and has continued to drop as agricultural land is developed and taken out of production.
- As of 2003 there were 9,782 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 709 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.3-11.
- 9 wastewater treatment facilities were identified in the AMA.
- There are a wide range of effluent disposal methods including discharge into a watercourse, permitted recharge projects and golf course irrigation
- More than 6,150 acre-feet of effluent are treated/generated annually in the AMA.

Table 8.3-10 Cultural Water Demands in the Prescott AMA[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		3,435[5]	301[5]	13,000			3,000			ADWR (1994)
1972										
1973										
1974										
1975										
1976				15,000			3,300			
1977										
1978										
1979										
1980	32,618									
1981	35,077	1,125	18	15,000			3,900			
1982	37,536									
1983	39,995									
1984	42,454									
1985	47,016									
1986	49,126	1,052	83	14,100			6,000			ADWR (2008)
1987	51,709									
1988	54,047									
1989	56,898									
1990	57,944									
1991	59,622	1,339	111	9,600	700	5,600	400	0	10,300	
1992	61,330									
1993	64,021									
1994	67,611									
1995	71,613									
1996	73,990	1,692	138	12,300	900	5,400	200	0	4,500	
1997	77,719									
1998	80,133									
1999	85,399									
2000	92,832									
2001	94,916	1,121	58	14,800	1,500	4,000	2,400	0	2,100	
2002	100,429									
2003	106,384									
2010	127,581									
2020	161,196									
2030	187,655									
2040	206,392									
2050	221,024									
ADDITIONAL WELLS:[6]		**19**	**0**							
WELL TOTALS:		**9,801**	**709**							

Notes:

[1] Does not include evaporation losses from stockponds and reservoirs.

[2] Includes Indian Demand

[3] Non-Groundwater supplies may include surface water or effluent.

[4] Agricultural demand includes use by small exempt irrigation rights.

[5] Includes all wells through 1980.

[6] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.

Table 8.3-11 Effluent Generation in the Prescott AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Chino Valley WWTF, Town of	Town of Chino Valley	Chino Valley	8,500	37							P			NA	NA	2007
Clipper Wash	Prescott Country Club	Dewey	NA	NA	X									NA	NA	NA
Hassayampa WWTF	City of Prescott	Prescott	NA	347				X						NA	NA	2007
Hidden Hills WWTP	NA	Dewey	NA	NA	NA									NA	NA	NA
La Fiesta WWTF	Prescott Country Club	Dewey	NA	2.7		X								NA	NA	2007
Prescott Valley WWTF	Prescott Valley	Prescott Valley	33,500	2,072	X			X		X	P			Advanced Treatment II	40	2004
Prescott, City of - Airport WWTF	City of Prescott	Prescott	11,330	784				X				X		Advanced Treatment I	1330	2004
Prescott, City of - Sundog WWTF	City of Prescott	Prescott	25,500	2,912				X			P			Advanced Treatment II with Nutrient Removal	500	2004
Softwinds Mobile Home Park	Private	Dewey	NA	4	NA									NA	NA	2007
Total			**78,830**	**6,159**											**1,870**	

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, City of Prescott Water Management Policy 2005-2010 (2007), Town of Prescott Valley (2008), ADEQ's AZURITE Facility website
P=Permitted Underground Storage Facility
WWTF=Wastewater Treatment Facility
WWTP=Wastewater Treatment Plant

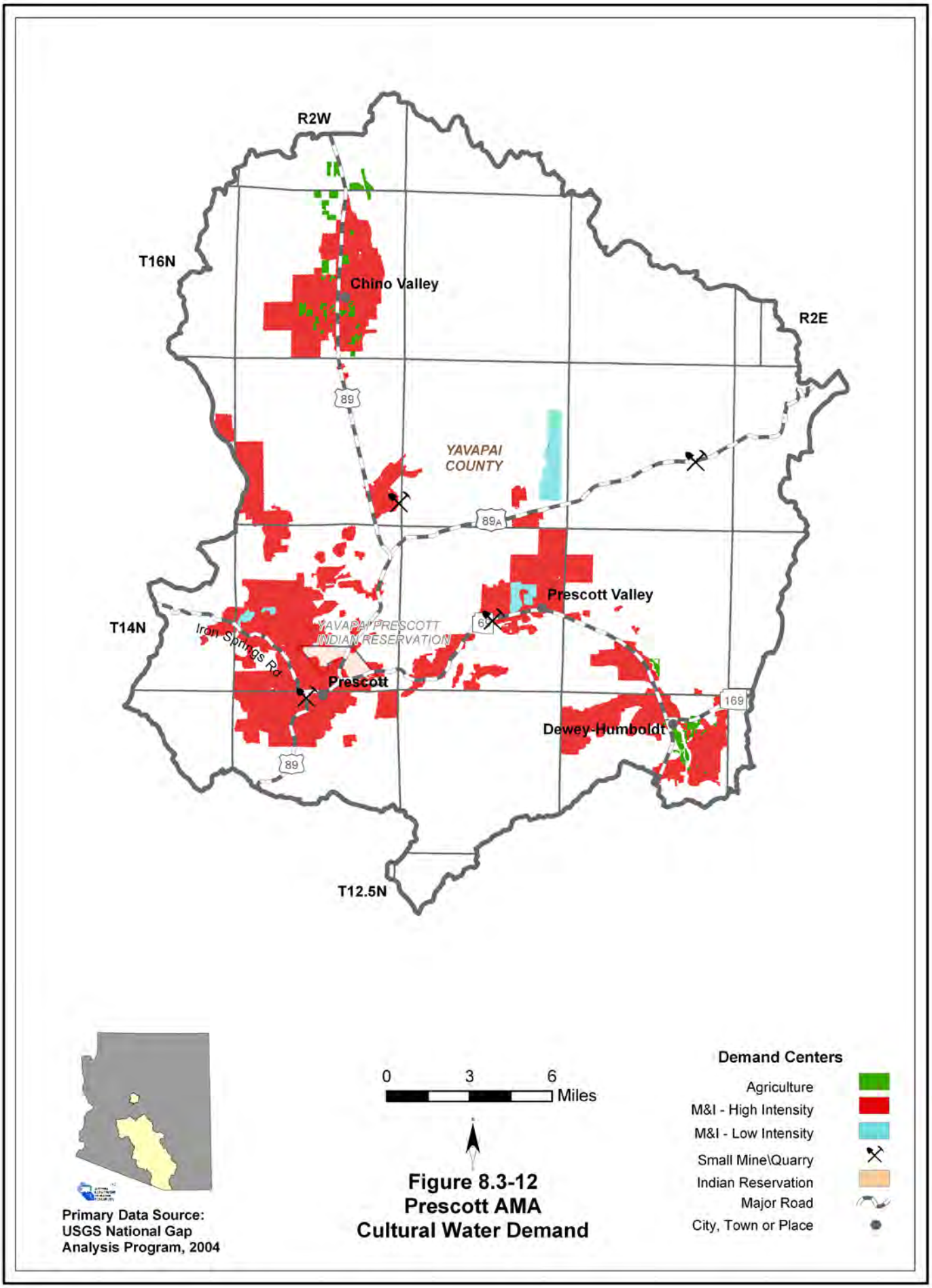


Figure 8.3-12
Prescott AMA
Cultural Water Demand

8.3.9 Assured Water Supply Determinations in the Prescott AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination and subdivision water provider are shown in Table 8.3-12A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.3-12D with date of application, date the designation was issued and projected or annual estimated demand. Figure 8.3-13 shows the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Water Supply Records

- See Table 8.3-12
- As of February 2008, 115 subdivisions with a total of more than 196,000 lots have been reviewed for an assured water supply determination.
- 16,431 lots in 104 subdivisions received a Certificate of Assured Water Supply, 298 lots in nine subdivisions received Water Adequacy Reports and 2,871 lots in two developments received an Analyses of Assured Water Supply.
- There is one designated provider, City of Prescott, with a total projected or estimated annual water use of 14,350 acre-feet by 2014.

Table 8.3-12 Assured Water Supply Determinations in the Prescott AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Proivderat the Time of Application
			Township	Range	Section				
1	Rancho Santa Maria	Yavapai	16 North	2 West	17	87	27-200279	9/26/83	NA
1	Rancho Santa Maria #2	Yavapai	16 North	2 West	17	18	27-200280	5/23/94	NA
1	Rancho Santa Maria #2, 3	Yavapai	16 North	2 West	17	38	27-200281	3/17/95	NA
1	Vista de Chino	Yavapai	16 North	2 West	17	80	27-200388	5/27/87	NA
1	Rancho Santa Maria Unit Two	Yavapai	16 North	2 West	17	19	27-400162	11/12/99	NA
2	Quail Ridge	Yavapai	16 North	2 West	5	180	27-300493	10/14/98	NA
3	Gold Rush Ranches	Yavapai	16 North	2 West	21	16	27-200122	4/6/93	NA
3	Fire Sky Ranch	Yavapai	16 North	2 West	21	18	27-300440	7/27/98	NA
4	Grassland	Yavapai	16 North	2 West	4	16	27-200132	12/15/80	NA
4	Stetson Ranch	Yavapai	16 North	2 West	4	14	27-200319	7/8/85	NA
4	Yo He Wah	Yavapai	16 North	2 West	4	32	27-200408	4/28/83	NA
5	Easy Street Estates	Yavapai	16 North	2 West	16	42	27-300511	3/29/99	NA
6	Appaloosa Meadows Phases I,II and III	Yavapai	16 North	2 West	9 & 10	318	27-300352	1/16/98	Appaloosa Water Co
7	Chino Valley Business Park & Marketplace	Yavapai	16 North	2 West	15	13	27-300455	7/14/98	NA
7	Hawksnest Estates	Yavapai	16 North	2 West	15	150	27-700399	12/19/07	Town of Chino Valley
10	Chino de Manana	Yavapai	16 North	2 West	10	20	27-200053	5/15/89	NA
10	Luna Estates	Yavapai	16 North	2 West	10	31	27-200188	8/21/89	NA
10	Commerce Park	Yavapai	16 North	2 West	10	9	27-300334	10/16/97	NA
11	Chino Meadows #4	Yavapai	16 North	2 West	23	98	27-200052	8/6/94	NA
11	Highlands Ranch	Yavapai	16 North	2 West	23	210	27-401234	10/8/04	Town of Chino Valley
11	Highlands Ranch Unit 1B & Unit 2	Yavapai	16 North	2 West	23	349	27-401741	1/25/06	Town of Chino Valley
11	Colonial Villas	Yavapai	16 North	2 West	23	60	27-700393	1/15/08	Town of Chino Valley
12	Tony Town	Yavapai	16 North	2 West	11	57	27-300418	8/27/98	NA
13	BrightStar at Chino Valley	Yavapai	16 North	2 West	24	80	27-400861	8/18/03	Town of Chino Valley
13	Bright Star Phase 3	Yavapai	16 North	2 West	24	166	27-500060	6/20/07	Town of Chino Valley
14	Bright Star, Unit 1, Phase 2, Unit 2, Phase 2	Yavapai	16 North	2 West	13 & 24	125	27-401835	10/21/05	Town of Chino Valley
15	I U Bar Ranch Estates	Yavapai	16 North	1 West	18 & 19	15	27-200147	3/9/88	NA
15	I U Bar Ranch Estates	Yavapai	16 North	1 West	18 & 19	56	27-200148	6/12/89	NA
16	Royal Oaks	Yavapai	15 North	2 West	30	165	27-200294	10/28/91	NA
16	Royal Oaks Lots 166-185	Yavapai	15 North	2 West	30	20	27-200295	4/4/94	NA
16	Granite Park Ranch	Yavapai	15 North	2 West	30	29	27-300158	8/30/96	NA
16	Granite Oaks Estates	Yavapai	15 North	2 West	30	10	27-300400	8/27/98	NA
17	Granite Oaks I, Units 1, 2, 3	Yavapai	15 North	2 West	19	160	27-200129	3/6/90	NA
17	Granite Oaks I, Units 4 & 5	Yavapai	15 North	2 West	19	141	27-200130	11/27/92	NA
17	Granite Oaks II	Yavapai	15 North	2 West	19	14	27-200131	9/28/94	NA
18	Bee Mountain Estates	Yavapai	16 North	2 West	27	20	27-200007	4/20/87	NA
19	Vista Grande Estates, Unit IV	Yavapai	16 North	2 West	26	118	27-300323	12/1/97	NA
20	Antelope Village	Yavapai	15 North	1 West	23 & 26	1440	27-300522	12/30/99	Prescott Valley Water District
21	Viewpoint, Phase I	Yavapai	15 North	1 West	23, 26 & 35	112	27-300019	5/15/95	Town of Prescott Valley
21	Viewpoint, The	Yavapai	15 North	1 West	23, 26 & 35	488	27-300183	8/29/96	Town of Prescott Valley
21	Viewpoint North, The	Yavapai	15 North	1 West	23, 26 & 35	112	27-300434	5/17/95	Town of Prescott Valley
22	Poquito Valley Development	Yavapai	15 North	1 West	2, 11, 14, 23, 26 & 35	48	27-200236	3/9/88	NA
24	Mingus West	Yavapai	15 North	1 East	23	468	27-300225	10/16/97	Town of Prescott Valley
26	Granite Mountain Homesites #4	Yavapai	15 North	2 West	31	19	27-200126	8/18/86	NA
26	Granite Mountain Homesites #3	Yavapai	15 North	2 West	31	8	27-200128	9/15/82	NA
27	Willow Lake Estates	Yavapai	14 North	2 West	15	277	27-200407	6/10/81	Wilhoit Water Co
29	Victorian Estates Unit I & II	Yavapai	14 North	1 West	21 & 28	179	27-200375	5/23/94	Prescott Valley Water District
30	Castle Canyon Mesa #4	Yavapai	14 North	1 West	15	118	27-200045	10/25/93	Prescott Valley Water District
31	Glassford Hill Road Property	Yavapai	14 North	1 West	3, 10 & 15	3288	27-300494	10/3/00	Prescott Valley Water District
32	Castle Canyon Mesa #2	Yavapai	14 North	1 West	15 & 22	19	27-200044	9/16/92	Prescott Valley Water District
32	Prescott East #1,2	Yavapai	14 North	1 West	15 & 22	40	27-200243	9/1/81	Town of Prescott Valley
33	Town and Country Industrial Pk	Yavapai	14 North	1 West	22 & 23	43	27-200352	8/3/84	Prescott Valley Water District
34	StoneRidge	Yavapai	14 North	1 West	26, 27 & 35	3053	27-300483	4/14/00	Town of Prescott Valley

Table 8.3-12 Assured Water Supply Determinations in the Prescott AMA (cont)[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Proivderat the Time of Application
			Township	Range	Section				
35	Town and Country Industrial Pk	Yavapai	14 North	1 West	23	35	27-200351	12/10/82	Prescott Valley Water District
36	Town and Country Valley Mall	Yavapai	14 North	1 West	14 & 23	300	27-200353	3/30/81	Prescott Valley Water District
37	Prescott Valley #19	Yavapai	14 North	1 West	11	6	27-200252	4/23/87	Prescott Valley Water District
37	Prescott Valley #19	Yavapai	14 North	1 West	11	4	27-200253	6/21/93	Prescott Valley Water District
38	Prescott Valley #18-20	Yavapai	15 North	1 West	35	8	27-200251	1/14/82	Prescott Valley Water District
38	Antelope Park 1	Yavapai	15 North	1 West	35	102	27-300525	3/2/99	NA
38	Antelope Park 2	Yavapai	15 North	1 West	35	75	27-300526	3/2/99	NA
39	Prescott Valley	Yavapai	14 North	1 West	11, 12 & 13	51	27-200245	1/28/81	Town of Prescott Valley
40	Villas, The	Yavapai	14 North	1 West	13	8	27-200384	9/14/82	Prescott Valley Water District
40	Mingus View Condominiums	Yavapai	14 North	1 West	13	12	27-401543	3/18/05	Prescott Valley Water District
41	Prescott Valley, Town of	Yavapai	14 North	1 West	1, 12 & 13	42	27-200257	11/14/89	Prescott Valley Water District
42	Quad Villas	Yavapai	14 North	1 West	12	8	27-200259	3/17/82	Prescott Valley Water District
42	Quad Villas #2	Yavapai	14 North	1 West	12	4	27-200260	3/17/82	Prescott Valley Water District
43	Prescott Valley #09	Yavapai	14 North	1 West	1	10	27-200247	2/3/81	Town of Prescott Valley
43	Prescott Valley #15	Yavapai	14 North	1 West	1	4	27-200248	3/23/81	Town of Prescott Valley
43	Prescott Valley #20	Yavapai	14 North	1 West	1	1	27-200254	8/24/81	Prescott Valley Water District
44	Prescott Valley Business Park	Yavapai	14 North	1 East	19	44	27-200256	4/15/83	Prescott Valley Water District
45	Fairway Patio Homes	Yavapai	14 North	1 East	18	5	27-200117	1/10/83	Prescott Valley Water District
46	Prescott Valley	Yavapai	14 North	1 East	7	49	27-200244	1/28/81	Town of Prescott Valley
46	Prescott Valley #18-20	Yavapai	14 North	1 East	7	8	27-200249	1/14/82	Town of Prescott Valley
46	Prescott Valley #20	Yavapai	14 North	1 East	7	8	27-200255	10/25/93	Prescott Valley Water District
47	Prescott Country Club #6	Yavapai	14 North	1 East	29	54	27-200242	3/29/94	Prescott Valley Water District
47	Prescott Country Club #6, phase 2	Yavapai	14 North	1 East	29	31	27-300111	5/16/96	Town of Prescott Valley
48	Green View Townhomes	Yavapai	14 North	1 East	28	34	27-300527	3/29/99	Prescott Valley Water District
51	Prescott Buttes	Yavapai	14 North	2 West	31	38	27-300581	3/5/99	City of Prescott
52	Lynx Mountain View Estates	Yavapai	14 North	1 West	33	95	27-200189	7/3/86	Bradshaw Water Co
52	Lynx Mountain View Estates	Yavapai	14 North	1 West	33	122	27-200190	6/12/89	Bradshaw Water Co
52	Lynx Mountain View Estates #6	Yavapai	14 North	1 West	33	39	27-200191	10/25/93	Bradshaw Water Co
52	Creekside of Prescott, Phase 1	Yavapai	14 North	1 West	33	33	27-300045	10/12/95	Bradshaw Water Co
52	Creekside of Prescott, Phase 2	Yavapai	14 North	1 West	33	39	27-300513	4/15/99	Bradshaw Water Co
52	Creekside of Prescott Phase 3	Yavapai	14 North	1 West	33	25	27-400759	11/15/02	Bradshaw Water Co
53	Mobile Villas Units #1&2	Yavapai	14 North	1 East	28 & 29	NA	27-200200	5/6/87	Prescott Valley Water District
53	Mobile Villas Units #1&2	Yavapai	14 North	1 East	33	NA	27-200200	5/6/87	Prescott Valley Water District
53	Prescott Country Club	Yavapai	14 North	1 East	28, 29 & 33	87	27-200240	5/6/87	Prescott Valley Water District
53	Prescott Country Club	Yavapai	14 North	1 East	28, 29 & 33	104	27-200241	5/8/87	Prescott Valley Water District
54	Wagon Wheel Condominiums	Yavapai	14 North	1 East	33	4	27-200394	7/12/88	NA
55	Country Club Townhomes	Yavapai	14 North	1 East	28 & 33	76	27-200081	3/11/85	Prescott Valley Water District
56	Chaparral Heights	Yavapai	13 North	1 East	10 & 15	34	27-300178	1/21/97	NA
57	Quailwood Meadows Townhomes	Yavapai	14 North	1 East	34	204	27-401653	8/29/05	Prescott Valley Water District
58	Parker Hill	Yavapai	13 North	1 East	15	186	27-200218	3/2/82	NA
59	Villages at Lynx Creek	Yavapai	14 North	1 East	27 & 34	515	27-200380	5/5/89	Prescott Valley Water District
60	Quailwood Meadows	Yavapai	14 North	1 East	27, 34 & 35	1012	27-300521	3/29/99	Prescott Valley Water District
61	Rolling Ridge Ranches	Yavapai	13 North	1 East	11	10	27-200293	10/6/80	NA
62	Command Estates #2	Yavapai	13 North	1 East	13	17	27-200075	7/21/85	NA
63	Command Estates	Yavapai	13 North	1 East	12	47	27-200074	9/4/80	NA
63	Golden View Estates	Yavapai	13 North	1 East	12	14	27-200123	6/10/82	NA
63	Indian Castles	Yavapai	13 North	1 East	12	17	27-200149	9/4/80	NA
64	Clearview Estates	Yavapai	13 North	1 East	1 & 12	22	27-200059	11/4/85	NA
64	Meadow Ranch	Yavapai	13 North	1 East	1 & 12	34	27-200196	5/30/95	NA
64	Vista View Estates	Yavapai	13 North	1 East	1 & 12	8	27-200387	7/4/80	NA
64	Meadow View	Yavapai	13 North	1 East	1 & 12	40	27-401979	9/5/06	NA

Table 8.3-12 Assured Water Supply Determinations in the Prescott AMA (cont)[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Proivder at the Time of Application
			Township	Range	Section					
8	Luna Estates	Yavapai	16 North	2 West	10 & 15	106	53-500930	Inadequate	5/5/80	NA
12	Sunrise	Yavapai	16 North	2 West	11	43	53-501503	Adequate	2/3/77	NA
19	Vista Grande Estates	Yavapai	16 North	2 West	26	66	53-501648	Adequate	8/15/77	NA
25	Granite Foothills	Yavapai	14 North	2 West	30	11	53-500726	Adequate	1/16/89	NA
26	Granite Mountain Estates	Yavapai	15 North	2 West	31	23	53-500727	Adequate	3/30/76	NA
28	Savage Mountain	Yavapai	14 North	2 West	23	12	53-501374	Adequate	3/12/79	NA
49	Highland Pines	Yavapai	14 North	3 West	33 & 34	27	53-500202	Adequate	9/6/73	NA
49	Highland Pines	Yavapai	14 North	3 West	33 & 34	NA	53-500203	Adequate	7/6/73	NA
50	Aspen Acres	Yavapai	13 North	2 West	7	10	53-500302	Adequate	4/10/80	NA

C. Analyses of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Proivderat the Time of Application
			Township	Range	Section				
9	Old Home Manor	Yavapai	16 North; 16 North	1 West; 2 West	7; 12	2700	28-700319	1/3/08	Town of Chino Valley
23	Mingus Meadows Estates Subdivision	Yavapai	16 North	1 East	31	171	28-500006	7/19/07	NA

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated Demand (af/yr)	Year of Projected or Annual Estimated Demand
A	City of Prescott	Yavapai	26-401501.0000	09/02/04	09/16/05	14,350	2014

[1] Includes water reports issued under the Water Adequacy program prior to 1980 implementation of the Assured Water Supply program.

[2] Adequacy determinations were based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. A determination of inadequacy could be due to insufficent physical or legal access to water or poor water quality. The Adequacy Program was replaced by the Assured Water Supply Program in the AMAs in 1980.

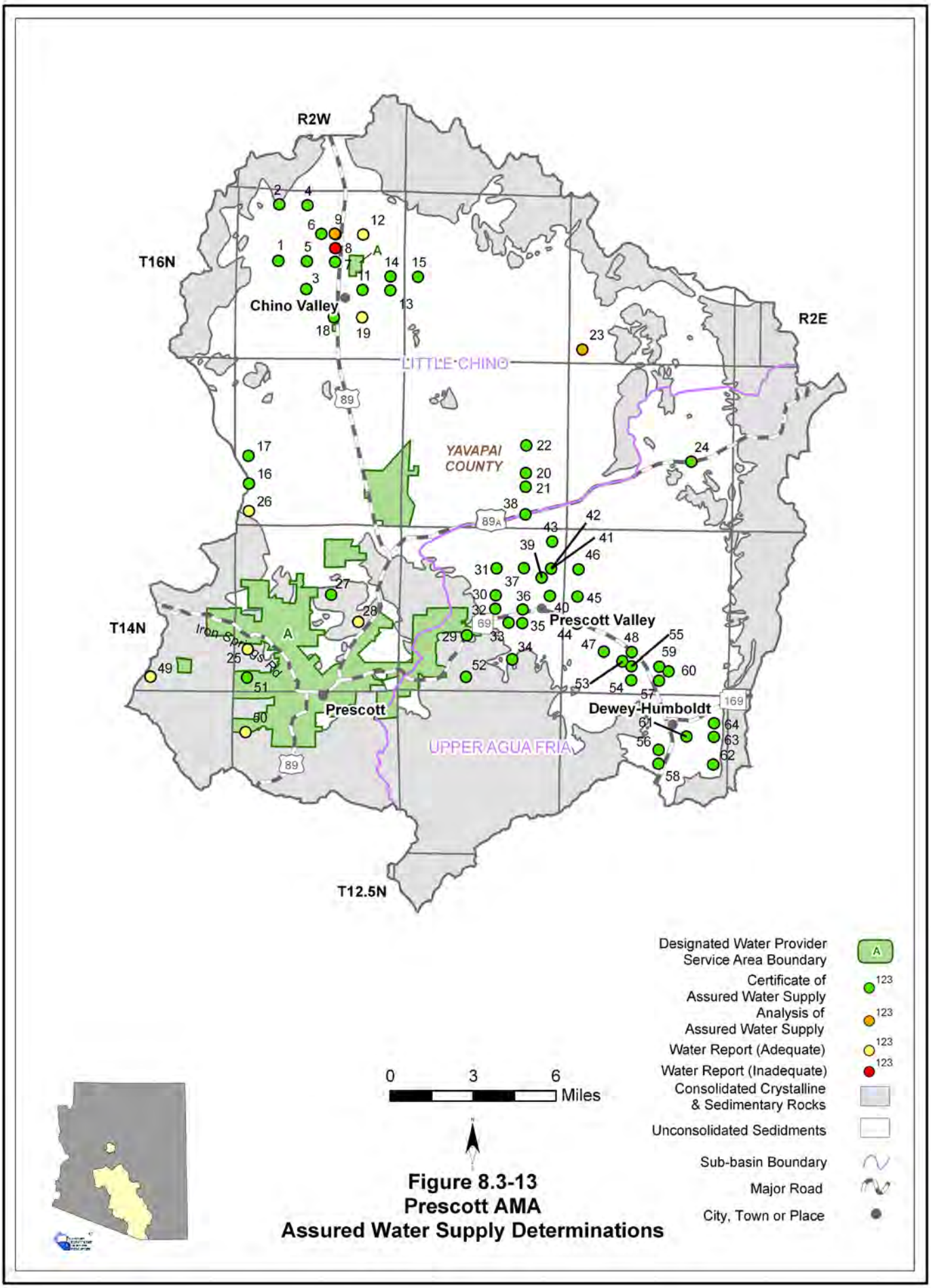


Figure 8.3-13
Prescott AMA
Assured Water Supply Determinations

Prescott AMA
References and Supplemental Reading

References

A

Arizona Department of Economic Security (DES), 2005, Workforce Informer: Data file, accessed August 2005, http://www.workforce.az.gov.

Arizona Department of Environmental Quality, 2005, ADEQSWI: Data file, received September 2005.

_____, 2005, ADEQWATP: Data file, received May 2005.

_____, 2005, ADEQWWTP: Data file, received August 2005.

_____, 2005, Azurite: Data file, received September 2005.

_____, 2005, Effluent dependent waters: GIS cover, received December 2005.

_____, 2005, Impaired lakes and reaches: GIS cover, received January 2006.

_____, 2004, Water providers with arsenic concentrations in wells over 10ppb: Data file, received August 2004.

_____, 2004, Water quality exceedences by watershed: Data file, received June 2004.

_____, 2004, Water quality exceedences for drinking water providers in Arizona: Data file, received September 2004.

Arizona Department of Water Resources (ADWR), 2008, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006, Assured and adequate water supply applications: Project files, ADWR Hydrology Division.

_____, 2005, Automated recorder sites: Data files, ADWR Basic Data Unit.

_____, 2005, Assured and adequate water supply determinations: Database, ADWR Office of Assured and Adequate Water Supply.

_____, 2005, Flood warning gages: Database, ADWR Office of Water Engineering.

_____, 2005, Inspected dams: Database, ADWR Office of Dam Safety.

_____, 2005, Non-jurisdictional dams: Database, ADWR Office of Dam Safety.

_____, 2005, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.

_____, 2005, Registry of surface water rights: ADWR Office of Water Management.

_____, 2005, Wells55: Database.

_____, 2004, Annual withdrawal and use reports for the Prescott AMA: ADWR Office of Water Management.

_____, 1999, Third Management Plan for the Prescott Active Management Area 2000-2010.

_____, 1994, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.

_____, 1994, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.

Arizona Game and Fish Department (AGF), 2005, Arizona Waterways: Data file, received April 2005.

_____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.

Arizona Land Resource Information System (ALRIS), 2005, Springs: GIS cover, accessed January 2006 at http://www.land.state.az.us/alris/index.html.

_____, 2005, Streams: GIS cover, accessed 2005 at http://www.land. state.az.us/alris/index.html.

_____, 2005, Water features: GIS cover, accessed July 2005 at http://www.land. state.az.us/alris/

index.html.
_____, 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.

C

City of Prescott, 2007, City of Prescott Water Management Policy 2005-2010, Amended March 27, 2007: Resolution #3807.

D

Diroll, M., and Marsh, D., 2006, Status of water quality in Arizona-2004 integrated 305(b) assessment and 303(d) listing report: ADEQ report.

E

Environmental Protection Agency (EPA), 2005, Surf Your Watershed: Facility reports, accessed April 2005 at http://oaspub.epa.gov/enviro/ef_home2.water.
_____, 2005, 2000 and 1996, Clean Watershed Needs Survey: datasets, accessed March 2005 at http://www.epa.gov/owm/mtb/cwns/index.htm.

K

Konieczki, A.D. and Wilson, R.P., 1992, Annual summary of ground-water conditions in Arizona, spring 1986 to spring 1987: USGS Open File Report 92-54.

M

McCormack, H.F., Fisk, G.G., Duet, N.R., Evans, D.W., Roberts, W.P., and Castillo, N.K., 2002, Water resources data Arizona, water year 2002: USGS Water Data Report AZ-02-1.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

T

Timmons, D. and Springer, A., 2006, Prescott AMA Groundwater Flow Model Update Report, Prepared for Arizona Department of Water Resources: Contract #: 2005-2592, Final Report.

U

US Army Corps of Engineers, 2004 and 2005, National Inventory of Dams: Arizona Dataset, accessed November 2004 to April 2005 at http://crunch. tec.army.mil/nid/webpages/nid.cfm
US Geological Survey (USGS), 2006, Average annual runoff in the United States, 1951-1980: Data file, accessed March 2006 at http://aa179.cr.usgs.gov/ metadata/wrdmeta/runoff.htm.
_____, 2006, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.
_____, 2006, National Hydrography Dataset: Arizona dataset, accessed at http://nhd.usgs.gov/.

_____, 2005, National Water Information System (NWIS): Arizona dataset, accessed December 2005 at http://waterdata.usgs.gov/nwis.

_____ 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file, accessed January 2005 at http://earth.gis.usu.edu/swgap.

_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

V

Valencia, R.A., Wennerlund, J.A., Winstead, R.A., Woods, S., Riley, L., Swanson, E., and Olson, S., 1993, Arizona riparian inventory and mapping project: Arizona Game and Fish Department.

W

Wahl, C.R., Boe, S.R., Wennerlund, R.A., Winstead, R.A., Allison, L.J., Kubly, D.M., 1997, Remote sensing mapping of Arizona intermittent stream riparian areas: Arizona Game and Fish Technical Report 112.

Western Regional Climate Center (WRCC), 2005, Precipitation and temperature stations: Data file, accessed December 2007 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

Weidner, C., 1996, ADEQ Pollution Prevention Report, Arizona Pollution Prevention. Spring/Summer 1996.

Supplemental Reading

Arizona Department of Water Resources, 2004, Prescott Active Management Area Hydrologic Monitoring Report 2003-2004: Hydrology Division – Technical Support, Field Services and Modeling Sections.

_____, 2003, Prescott Active Management Area Hydrologic Monitoring Report 2002-2003: Hydrology Division – Technical Support, Field Services and Modeling Sections.

_____, 2002, Prescott Active Management Area Hydrologic Monitoring Report 2001-2002: Hydrology Division – Technical Support, Field Services and Modeling Sections.

_____, 2000, Verde River watershed study, 473 pp.

_____, 1997. Index Well Measurement and Water Level Data from Basic Data Section for Prescott Active Management Area. Compiled and Summarized By F. Corkhill, Hydrology Division.

Arizona State Parks, 1991, Verde River Corridor Project Final Report and Plan of Action.

Averitt, E. M., 1991, Verde River corridor environmental planning recommendations: Department of Planning, College of Architecture and Environmental Design, Arizona State University, Spring 1992.

Baker, M.B., 1999, History of watershed research in the central Arizona highlands: USDA Rocky Mountain Research Station, Report GTR-29.

Baldys, S., 1990, Trend analysis of selected water-quality constituents in the Verde River basin, central Arizona: USGS Water-Resources Investigations Report 90-4128.

Barnett, L.O., and Hawkins, R.H., 2002, Reconnaissance watershed analysis on the upper and middle Verde watershed: School of Renewable Resources, University of Arizona, 116 pp.

Blasch, K.W., Hoffman, J.P., Graser, L.F., Bryson, J.R. and Flint, 2005, A.L. Hydrogeology of the Upper and Middle Verde River Watersheds , Central Arizona, U.S. Geological Survey Scientific Investigations Report 2005-5198, 101 p.

Bureau of Reclamation, 2000, Appraisal level study of Water Delivery System Analyses: North Central Arizona Regional Water Supply Project.

Colby, B.G. and Jacobs, K.L eds, 2007, Arizona Water Policy: Management and Innovations in an Urbanizing, Arid Region: Resources for the Future, Washington D.C.

Cook, E.A., et al., 1991, Verde River corridor - Environmental planning recommendations: Department of Planning, Arizona State University, Spring, 1991.

Cordy, G.E., Gellenbeck, D.J., Gebler, J.B., Anning, D.W., Coes, A.L., Edmonds, R.J. Rees, J.A., and Sanger, H.W., 2000, Water quality in the central Arizona basins, Arizona, 1995-1998: USGS Circular 1213.

Corkhill, E.F. and Mason, D.A., 1995. Hydrogeology and Simulation of Groundwater Flow, Prescott Active Management Area, Yavapai County, Arizona. Arizona Department of Water Resources Modeling Report No. 9, 143 p.

Corkhill, F, Remick, W., Norton, C. and Nelson, K, 2001, Prescott Active Management Area 2000-2001 Hydrologic Monitoring Report: Arizona Department of Water Resources.

Flora, S., and Springer, A., 2003, Summary table of physical parameters of middle Verde watershed springs: Department of Geology, Northern Arizona University, 1 pp.

Flora, S. P., and Springer, A. E., 2003, Implications for regional hydrogeology of an Arizona rural watershed based on spring discharge variability and recharge response: Geological Society of America Abstracts with Programs, v. 35.

Flora, S.P. and Springer A.E. 2002. Hydrogeological characterization of springs in the Verde River watershed, central Arizona: Geological Society of America Abstracts with Programs, v. 34, no. 6, p. 25.

Gellenbeck, D.J., and Anning, D.W., 2001, Occurrence and distribution of pesticides and volatile organic compounds in groundwater and surface water in central Arizona basins, 1996-1998, and their relation to land use: USGS Water Resources Investigations Report 01-4144, 107 pp.

Governor's Drought Task Force, 2004, Arizona Drought Preparedness Plan. Draft. Phoenix.

Governor's Drought Task Force, 2004, Arizona Drought Management Plan. Draft. Phoenix.

Governor's Water Management Commission, 2000, Briefing Book: Water Management Framework for AMAs, Groundwater Use Restrictions and Requirements. Phoenix: Arizona Department of Water Resources.

Governor's Water Management Commission, 2002, Final Report and Recommendations. Phoenix: Arizona Department of Water Resources.

Holway, J.M. and K.L. Jacobs, 2006, Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth: in Mays, L., eds., Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth. McGraw-Hill.

Jacobs, K. L. and J. M. Holway, 2004, Lessons Learned from Twenty Years of Groundwater Management in Arizona, USA. *Hydrogeology Journal*. 12, No. 1.

Keadle, D.A., Brown, C.A., Eichberg, S., Musielak, W.D., Whitmer, T., Rall, K.L., 1999, Verde River watershed study: in Water Issues and Partnerships for Rural Arizona: Proceedings from the 12th annual Arizona Hydrological Society Symposium, September 1999, Pinetop, Arizona.

Knauth, P.L. and M. Greenbie, 1997. Stable Isotope Investigation of Groundwater - Surface Water Interactions in the Verde River Headwaters Area. Department of Geology, Arizona State University.

Lopez, S.M., and Springer, A.E., 2001, Assessment of human influence on riparian change in the Verde Valley, Arizona: Department of Geology, Northern Arizona University, 43 pp.

McGavock, E., 2002, Water in the Verde River watershed: in Water Transfers, Past, Present and Future: Proceedings from the 15th annual Arizona Hydrological Society Symposium, September 2002, Flagstaff, Arizona.

McGavock, E., 1996, Overview of groundwater conditions in the Verde Valley, Arizona: in Wanted: Water for Rural Arizona: Proceedings from the 9th annual Arizona Hydrological Society Symposium, September 1996, Prescott, Arizona, p. 65.

Melis, T.S., 1990, Evaluation of Flood Hydrology on Twelve Drainage Basins in the Central

Highlands Region of Arizona: An Integrated Approach: Northern Arizona University, M.S. thesis, 135 pp.

Megdal, S. and Smith, Z., 2008, Evolution and Evaluation of the Active Management Area Management Plans, Water Resources Research Center, University of Arizona.

Megdal, S. and Colby, B., 2004, Arizona's Water Future: Challenges and Opportunities, 85th Arizona Town Hall Background Report, University of Arizona.

Mondry, Z., 2002, Drought, storms, and stream flow and temperature observations from the Coconino and Prescott National Forests: in Sustainability Issues of Arizona's Regional Watersheds: Proceedings from the 15th annual Arizona Hydrological Society Symposium, September 2003, Mesa, Arizona.

Nelson, K., 2002, Application of the Prescott Active management Area Groundwater Flow Model Planning Scenario 1999-2005: Arizona Department of Water Resources Model Report No. 12.

Northern Arizona University, 2001, Proceedings, Verde watershed symposium-state of the watershed in 2001:Verde Watershed Research and Education Program, Center for \ Sustainable Environments.

Ostenaa, D.A., Schimschal, U.S., King, C.E., Wright, J.W., Furgerson, R.B., Harrel, H.C., and Throner, R.H., 1993, Big Chino Valley Groundwater Study: Bureau of Reclamation, Denver office, Geologic Framework Investigations, 31 pp.

Rusinek, W., 1986, Battle for the Verde River: Water, power and politics in Arizona, 1890-1934: Arizona Historical Society Symposium, May 1987, Douglas, Arizona.

Seventy-first Arizona Town Hall. 1997. Ensuring Arizona's Water Quantity and Quality into the 21st Century. Marshall A. Worden, editor. Phoenix: Arizona Town Hall.

United State Geological Survey, 2004, Aquifer framework and groundwater flow paths in the Big and Little Chino basin: Arizona Water Protection Fund Project 99-078.

United States Fish and Wildlife Service, 1991, Advance identification of functions and values of the Verde River, Arizona: Final Study Plan

Verde Watershed Association and the USDA, 1996, Summary report, Verde Cooperative River Basin Study, Coconino, Gila, Maricopa, and Yavapai counties, Arizona, 34 pp.

Whitmore, W., Cook, E. A., and Steiner, F., 1991, Verde River visual assessment: Verde River Corridor Study, Tapico to Beasley Flat: Arizona State University, Department of Planning, draft report, May 1991.

Wirt, Laurie, DeWitt, Ed and V.E. Langenheim, 2004, Geologic Framework of Aquifer

Units and Ground-Water Flowpaths, Verde River Headwaters, North-Central Arizona, U.S. Geological Survey Open File Report 2004-1411, 43 p.

Wirt, L., 1992, The use of stable isotopes and water chemistry to determine movement of water in the upper Verde River basin, Yavapai County, Arizona: in Protecting Riparian Systems-Meeting the Challenges of Urban Needs: Abstracts from the 6th annual meeting of the Arizona Riparian Council, April 1992, Cottonwood Arizona, p. 16-17.

Woodhouse, B.G, and Flynn, M.E., 2002, Investigation of the geology and hydrology of the upper and middle Verde River watershed of central Arizona: A project of the Rural Arizona Initiative, USGS Fact Sheet 059-02.

Yavapai County Water Advisory Committee, 2004, Big Chino sub-basin-historical and current water uses and water use projections: Draft, Feb.2004, 38 pp.

Index to Section 8.0

Geography 3,6

Hydrology
- Groundwater Hydrology 6-7,12-13
- Surface Water Hydrology 15-16

Climate 19,20

Environmental Conditions
- Vegetation 24,26
- Arizona Water Protection Fund 28
- Endangered Species 30,31

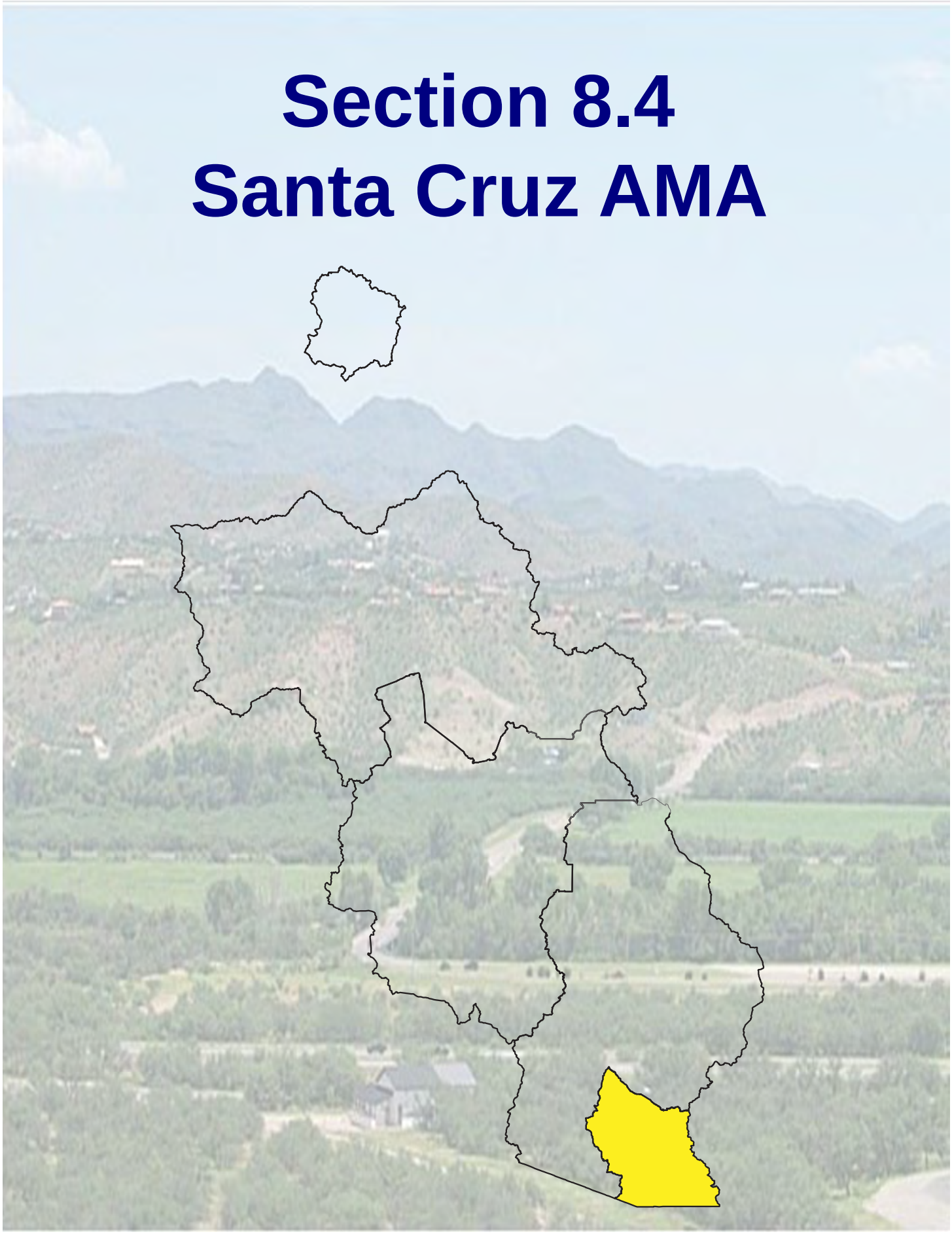
Population 35,37,38,41

Water Supply 43
- Surface Water 45-46
- Groundwater 46
- Effluent 47,48
- Contamination Sites 49

Cultural Water Use 50,51,52
- Tribal Demand 53,56
- Municipal Demand 56,60-61
- Agricultural Demand 65,67-68
- Industrial Demand 71

Water Resource Issues 71-75

Section 8.4
Santa Cruz AMA



8.4.1 Geography of the Santa Cruz AMA

The Santa Cruz AMA is 716 square miles in area. Geographic features and principal communities are shown on Figure 8.4-1. The AMA is characterized by mid to high elevation mountains surrounding the Santa Cruz River Valley. Vegetation types include southwestern grassland, madrean evergreen woodland and riparian species, principally found along the Santa Cruz River and Sonoita Creek (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.4-1 are:
    - The Santa Cruz River flowing north in the center of the AMA
    - Sonoita Creek running from the eastern AMA boundary to its confluence with the Santa Cruz River near Rio Rico
    - The Sierrita and Santa Rita Mountains on the northern AMA boundary, the San Cayetano and Santa Rita Mountains on the eastern boundary, and the Pajarito, Atascosa and Tumacacori Mountains on the western boundary.
    - The lowest point in the AMA at 3,000 feet where the Santa Cruz River exits the AMA
    - The highest point in the AMA at 9,453 feet at Mt. Wrightson in the Santa Rita Mountains

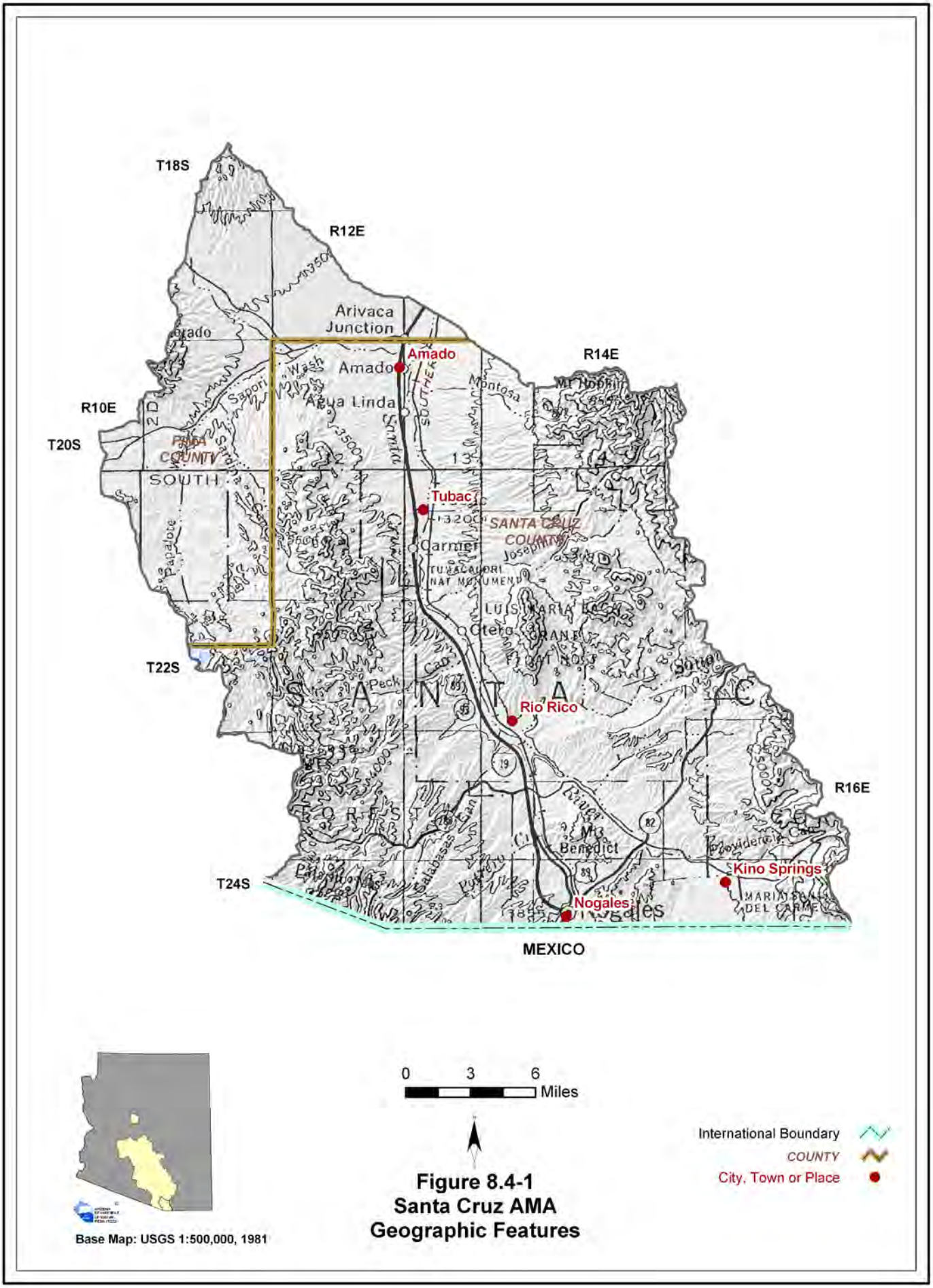


Figure 8.4-1
Santa Cruz AMA
Geographic Features

8.4.2 Land Ownership in the Santa Cruz AMA

Land ownership, including the percentage of ownership by category, for the Santa Cruz AMA is shown in Figure 8.4-2. Features of land ownership in the AMA are contiguous areas of private and forest service land. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of percentage from largest to smallest in the AMA.

Private

- 42.6% of the land is private.
- Land uses include domestic, commercial, agriculture and grazing.

National Forest

- 35.7% of the land is federally owned and managed as the Coronado National Forest.
- The AMA contains 5,540 acres of the 15,860-acre Mt. Wrightson Wilderness in the northeast corner (See Figure 8.0-13).
- Land uses include resource conservation, recreation and grazing.

State Trust Land

- 21.3% of the land is held in trust for the public schools and other beneficiaries under the State Trust Land system.
- Primary land use is grazing.

U.S. Bureau of Land Management (BLM)

- 0.2% of the land is federally owned and managed by the Tucson Field Office of the U.S. Bureau of Land Management.
- Primary land use is grazing.

Other

- 0.1% of the land is owned and managed by Arizona State Parks as Patagonia State Park and Tubac Presidio State Historic Park.
- Primary land use is recreation.

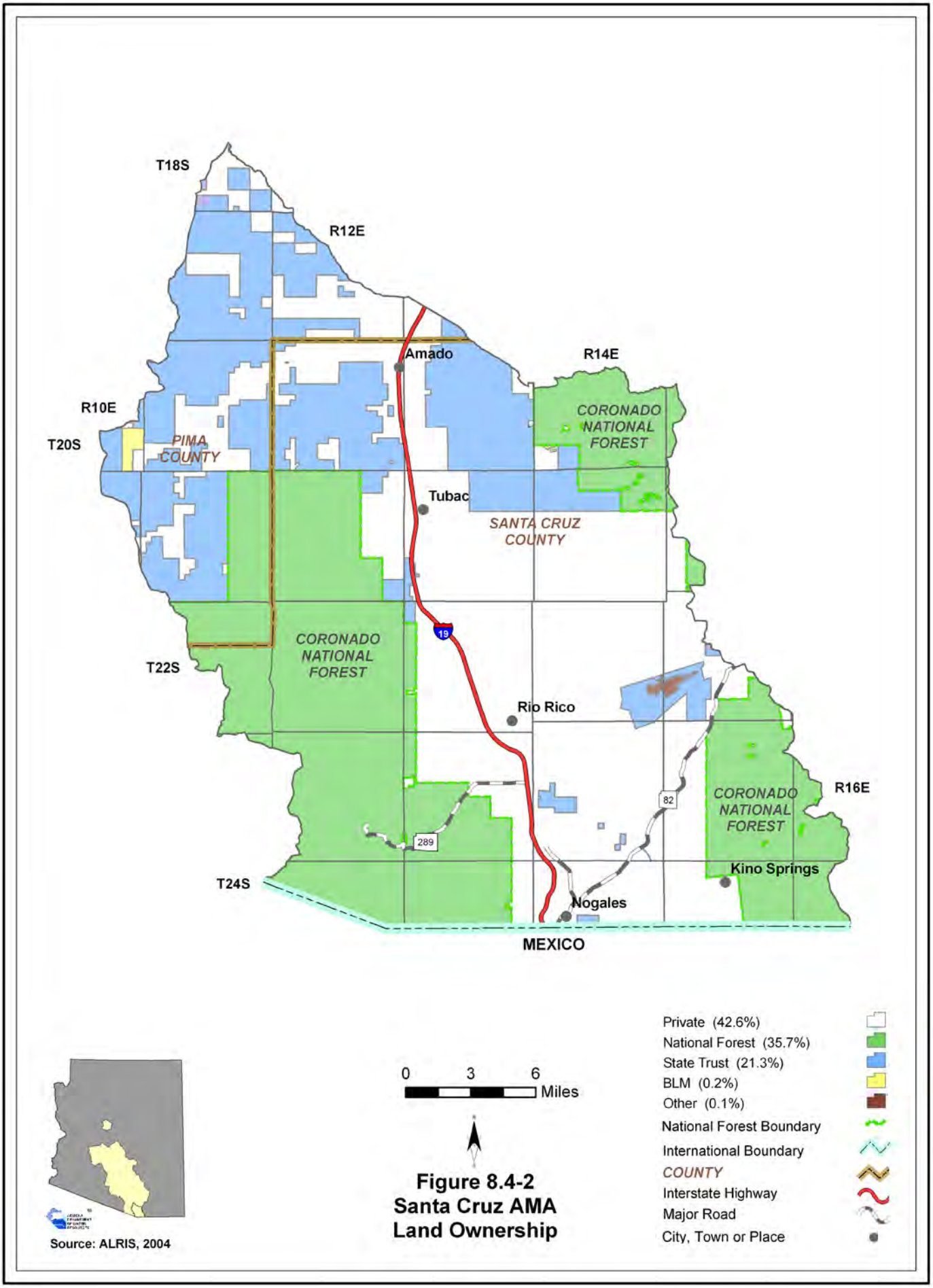


Figure 8.4-2
Santa Cruz AMA
Land Ownership

8.4.3 Climate of the Santa Cruz AMA

Climate data from NOAA/NWS Co-op Network and Evaporation Pan stations are complied in Table 8.4-1 and the locations are shown on Figure 8.4-3. Figure 8.4-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Santa Cruz AMA does not contain AZMET or SNOTEL/Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.4-1A
- There are four NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July and is between 78°F and 81.1°F. The average monthly minimum temperature occurs in January and is between 45.5°F and 48.4°F.
- Highest average seasonal rainfall occurs in the summer (July-September). For the period of record used, the highest average annual rainfall is 19.03 inches at the Nogales 6N station and the lowest is 15.70 inches at the Old Nogales station.

Evaporation Pan

- Refer to Table 8.4-1B
- There is one Evaporation Pan station in the AMA. Elevation at the station is 3,560 feet and average annual evaporation is 91.2 inches.

SCAS Precipitation Data

- See Figure 8.4-3
- Additional precipitation data shows average annual rainfall as high as 36 inches on the eastern AMA boundary and as low as 14 inches in the center of the AMA in the vicinity of Amado and Tubac.

Table 8.4-1 Climate Data for the Santa Cruz AMA

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Nogales	3,813	1948-1983[1]	78/Jul	45.5/Jan	3.41	1.20	9.64	3.65	17.90
Nogales 6 N	3,560	1971-2000	78.9/Jul	45.5/Jan	3.40	1.35	10.19	4.09	19.03
Old Nogales	3,904	1892-1948[1]	80.1/Jul	46.6/Jan	2.59	0.92	9.59	2.60	15.70
Tumacacori Natl Monm	3,266	1971-2000	81.1/Jul	48.4/Jan	3.37	1.03	9.48	3.52	17.40

Source: WRCC
Notes:
[1]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
Nogales 6 N	3,560	1952-2005	91.20

Source: WRCC

C. AZMET:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
None			

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	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								

Source: NRCS, 2005

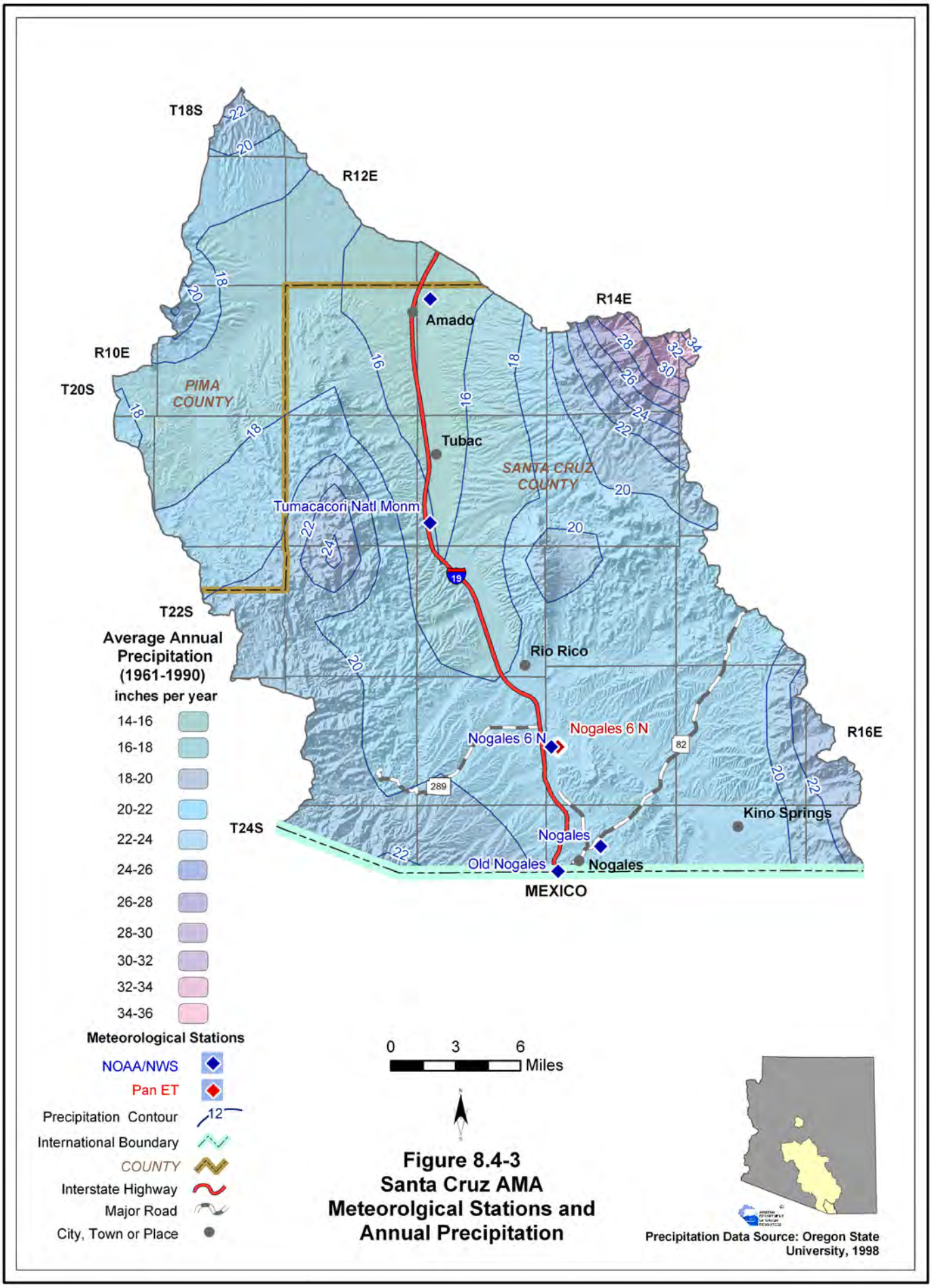


Figure 8.4-3
Santa Cruz AMA
Meteorolgical Stations and Annual Precipitation

8.4.4 Surface Water Conditions in the Santa Cruz AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.4-2. Flood ALERT equipment in the AMA is shown in Table 8.4-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.4-4. The location of streamflow gages identified by USGS number, flood ALERT equipment and large reservoirs are shown on Figure 8.4-4. There are no USGS runoff contours in the Santa Cruz AMA. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.4-2.
- Data from four stations located at three watercourses are shown in the table and on Figure 8.4-4.
- Average seasonal flow is highest at all stations in the summer season (July-September).
- The largest annual flow recorded in the AMA is 88,145 acre feet in 1983 at the Santa Cruz River near Nogales gage with a contributing drainage area of 533 square miles.

Flood ALERT Equipment

- Refer to Table 8.4-3.
- There are three ALERT gages in the Santa Cruz AMA.

Reservoirs and Stockponds

- Refer to Table 8.4-4.
- The AMA contains two large reservoirs. The largest, Patagonia, has a maximum storage of 7,540 acre-feet.
- Surface water is stored or could be stored in four small reservoirs.
- There are 452 registered stockponds in the Santa Cruz AMA.

Table 8.4-2 Streamflow Data for the Santa Cruz AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9480500	Santa Cruz River near Nogales	533	3,703	1913-current (real-time)	29	3	46	22	273 (2004)	14,013	18,627	88,145 (1983)	76
9481000	Nogales Wash at Nogales	37	3,753	1932-1934 (discontinued)	No statistics run, less than 3 years data								
9481500	Sonoita Creek near Patagonia	209	3,818	1930-1972 (discontinued)	23	9	50	18	1,431 (1944)	4,857	5,868	20,714 (1966)	39
9481740	Santa Cruz River at Tubac	NA	3,180	1995-current (real-time)	20	10	32	38	11,331 (1996)	16,837	25,276	82,257 (2000)	8

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal 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 recor

Table 8.4-3 Flood ALERT Equipment in the Santa Cruz AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
2530	Potrero	Precipitation/Stage	10/16/2001	ADWR
2540	Las Canoas	Precipitation/Stage	10/15/2001	ADWR
2550	Nogales Wash	Precipitation/Stage	10/16/2001	ADWR
6060	SCR Conoa	Precipitation/Stage	3/1/1993	Pima Co FCD

ADWR = Arizona Department of Water Resources

FCD = Flood Control District

Table 8.4-4 Reservoirs and Stockponds in the Santa Cruz AMA

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
1	Patagonia	AZ Game and Fish Dept	7,540	R,S	State
2	Peña Blanca	Arizona State Parks	1,240	R	State

Source: U.S. Army Corps of Engineers 2005

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[1]	JURISDICTION
None identified by ADWR at this time					

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

Total number: 1
Total maximum storage: 200 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)[2]

Total number: 3
Total surface area: 26 acres

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

Total number: 452

Notes:
[1] R = Recreation, S = Water Supply
[2]Capacity data is not available to ADWR

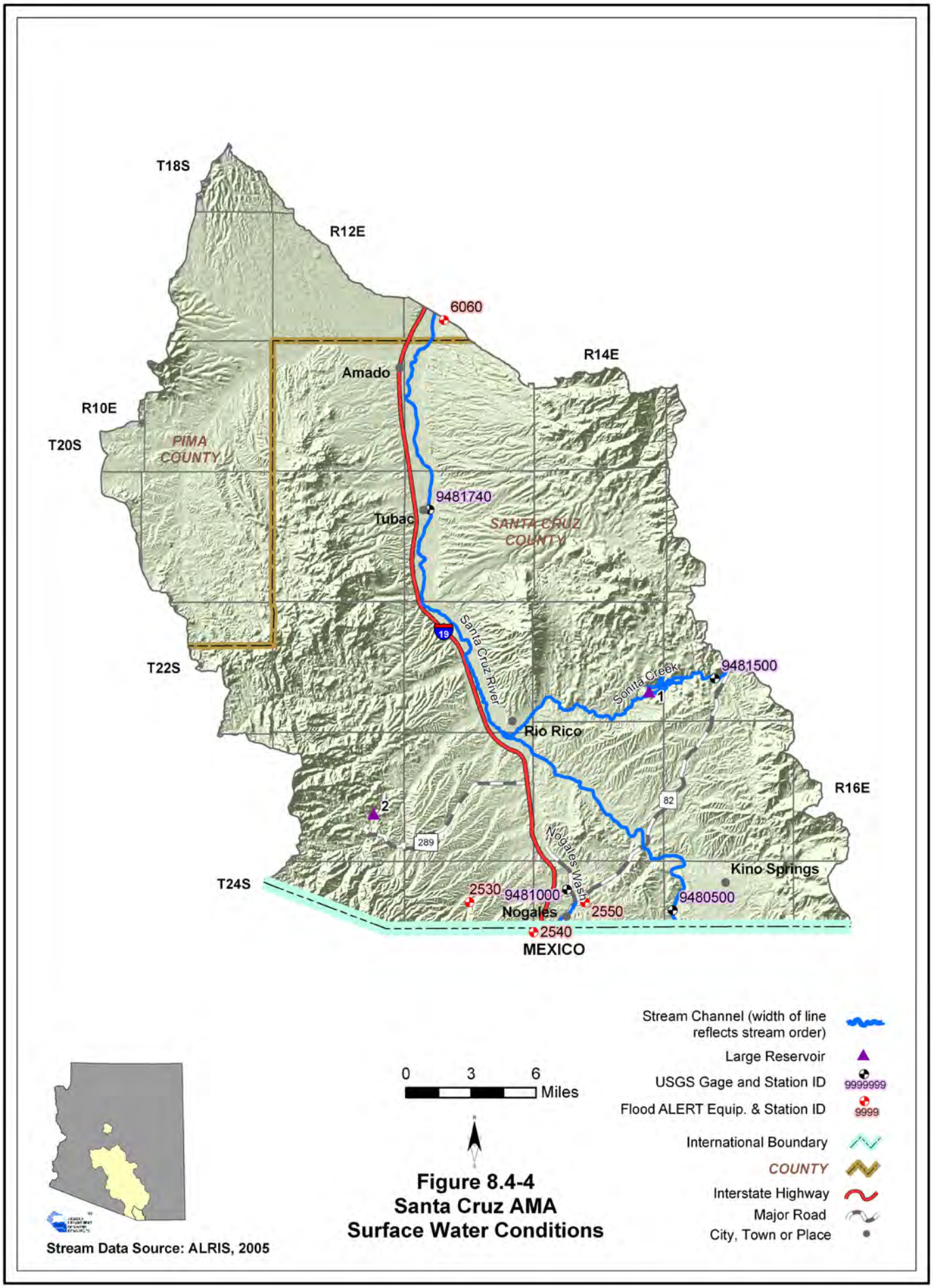


Figure 8.4-4
Santa Cruz AMA
Surface Water Conditions

8.4.5 Perennial/Intermittent Streams and Springs in the Santa Cruz AMA

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the AMA are shown in Table 8.4-5. The locations of major springs and perennial and intermittent streams are shown on Figure 8.4-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- Perennial streams include reaches of the Santa Cruz River and Sonita Creek. The perennial reach of the Santa Cruz River is in a 12-mile long effluent dominated segment.
- A number of intermittent streams occur along the eastern AMA boundary.
- There are two major springs in the AMA with a measured discharge of 10 gallons per minute (gpm) or greater at any time.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 8.4-5B. There is one minor spring.
- Listed discharge rates may not be indicative of current conditions. Both measurements were taken during or prior to 1952.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from 46 to 48, depending on the database reference.

Table 8.4-5 Springs in the Santa Cruz AMA

A. Major Springs (10 gpm or greater):

Map Key	Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
1	Sopori	314321	1110707	377	1/9/1952
2	Elias	314228	1110949	40	NA

B. Minor Springs (1 to 10 gpm):

Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
Pena Blanca	312321	1110530	4	4/17/1946

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 46-48

Notes:
[1] Location datum is NAD 27

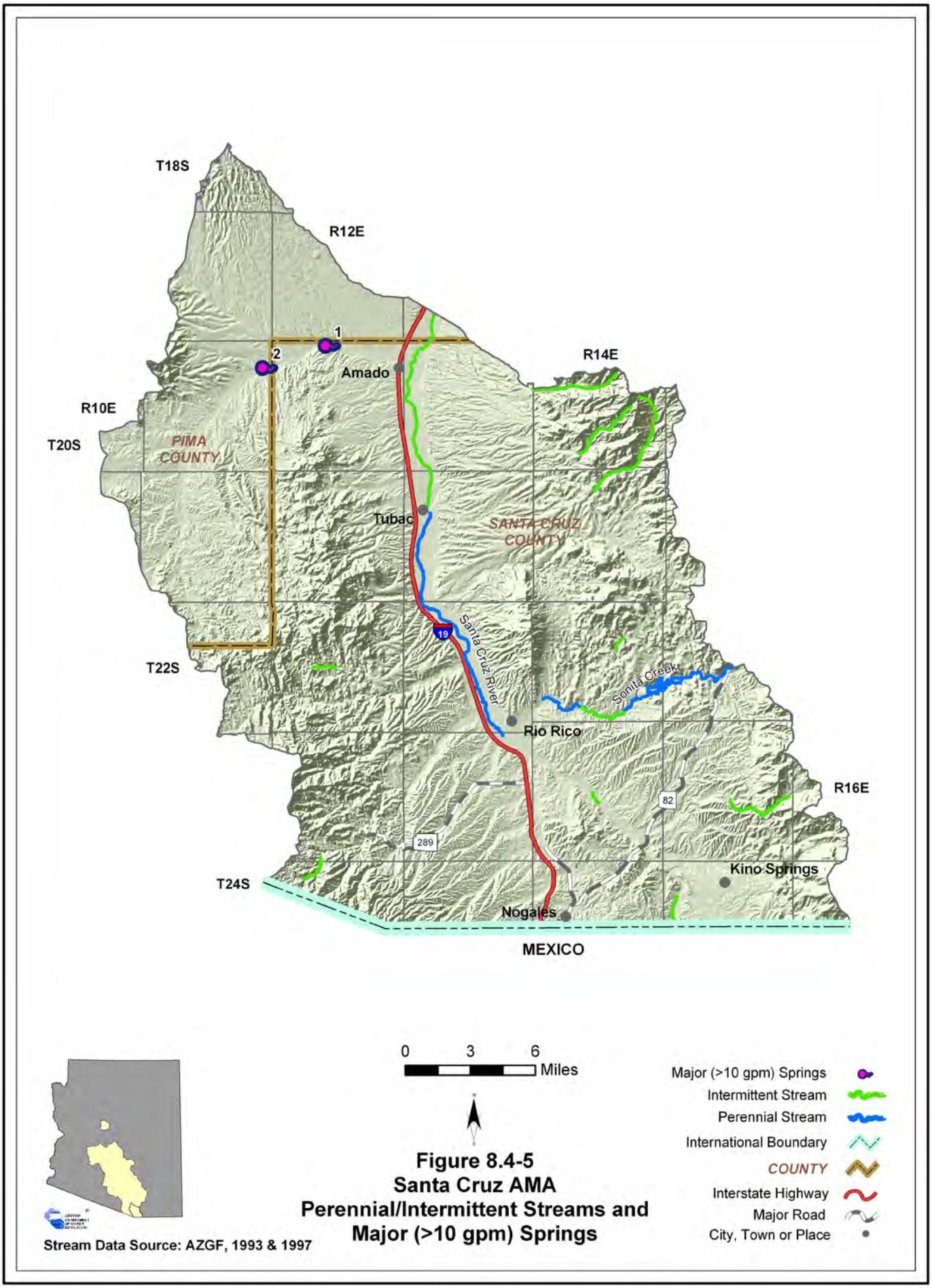


Figure 8.4-5
Santa Cruz AMA
Perennial/Intermittent Streams and Major (>10 gpm) Springs

8.4.6 Groundwater Conditions of the Santa Cruz AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.4-6. Figure 8.4-6 shows aquifer flow direction and water-level change between 1995 and 2004-2005. Figure 8.4-7 contains hydrographs for selected wells shown on Figures 8.4-6. Figure 8.4-8 shows well yields in five yield categories. There are no Underground Storage Facilities (USFs) in the Santa Cruz AMA. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.4-6 and Figure 8.4-6
- The major aquifers in this AMA are recent stream alluvium and basin fill.
- Groundwater flow is to the north, toward and along the Santa Cruz River drainage.
- Groundwater is stored in smaller, fault delimited micro-basins.

Well Yields

- Refer to Table 8.4-6 and Figure 8.4-8
- One source of well yield information, based on 115 reported wells, indicates that the median well yield is 800 gpm.
- Well yields are typically higher in the recent stream alluvium and lower in the basin fill.

Natural Recharge

- Refer to Table 8.4-6
- Natural recharge in the Santa Cruz AMA is estimated at 61,050 acre-feet per year.
- Sources of natural recharge include infiltration from the Santa Cruz River, mountain front recharge and groundwater inflow from the south.

Water Level

- Refer to Figure 8.4-6. Water levels are shown for wells measured in 2004-2005.
- The Department annually measures 52 index wells in the AMA; hydrographs for five index wells are shown on Figure 8.4-7.
- The deepest and shallowest water levels shown are along Highway 289 at 323 feet and two feet, respectively.

Table 8.4-6 Groundwater Data for the Santa Cruz AMA

Basin Area, in square miles:	716	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill	
Well Yields, in gal/min:	Range 3.6-4,083 Median 628 (97 wells measured)	ADWR GWSI
	Range 1-5,400 Median 800 (115 wells reported)	ADWR Wells55 (>10-inch diameter)
Estimated Natural Recharge, in acre-feet/year:	61,050	ADWR Santa Cruz TMP
Current Number of Index Wells:	52	
Date of Last Water-level Sweep:	2005 (188 well measurements)	

TMP = Third Management Plan

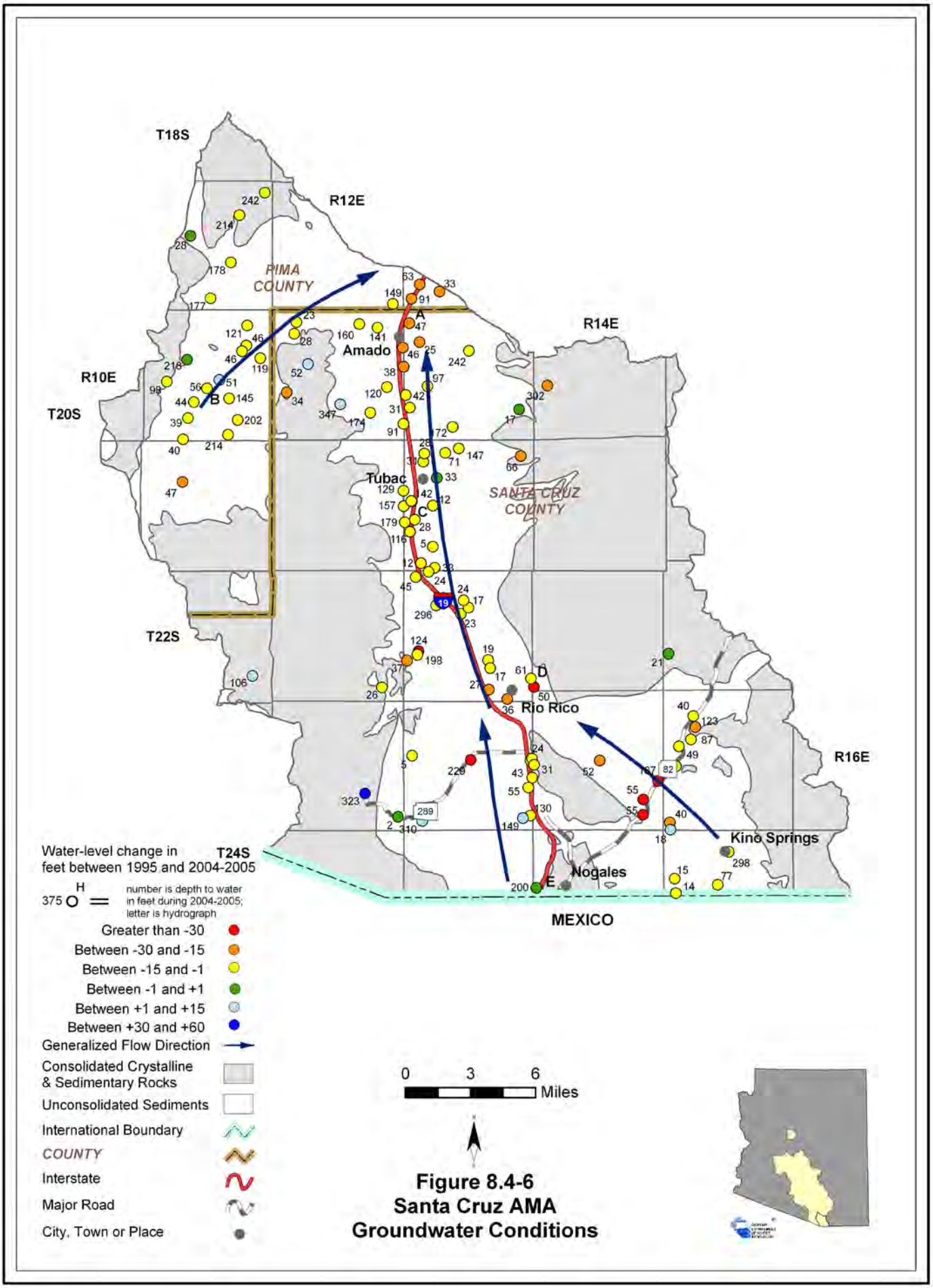


Figure 8.4-6
Santa Cruz AMA
Groundwater Conditions

Figure 8.4-7
Santa Cruz Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

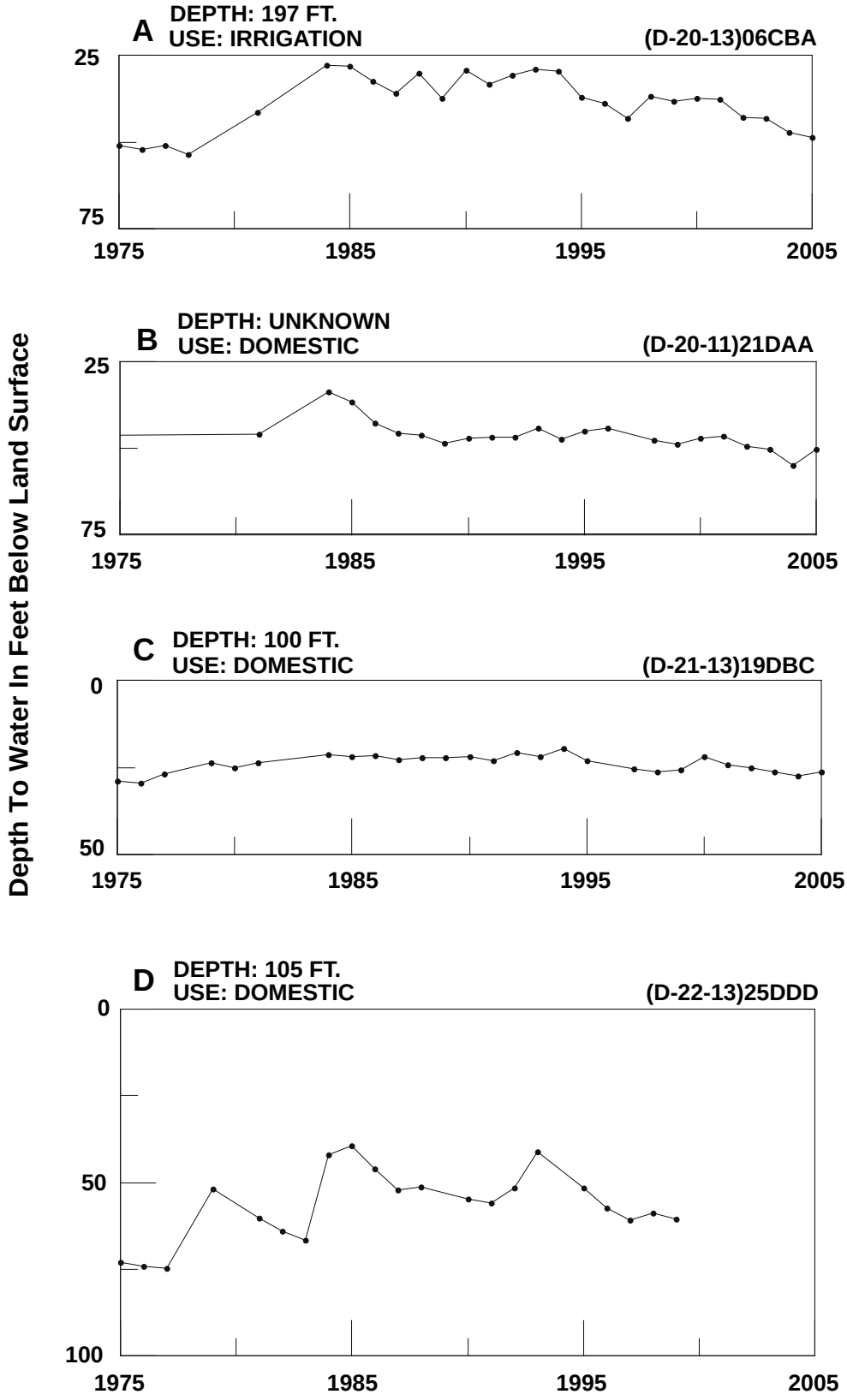
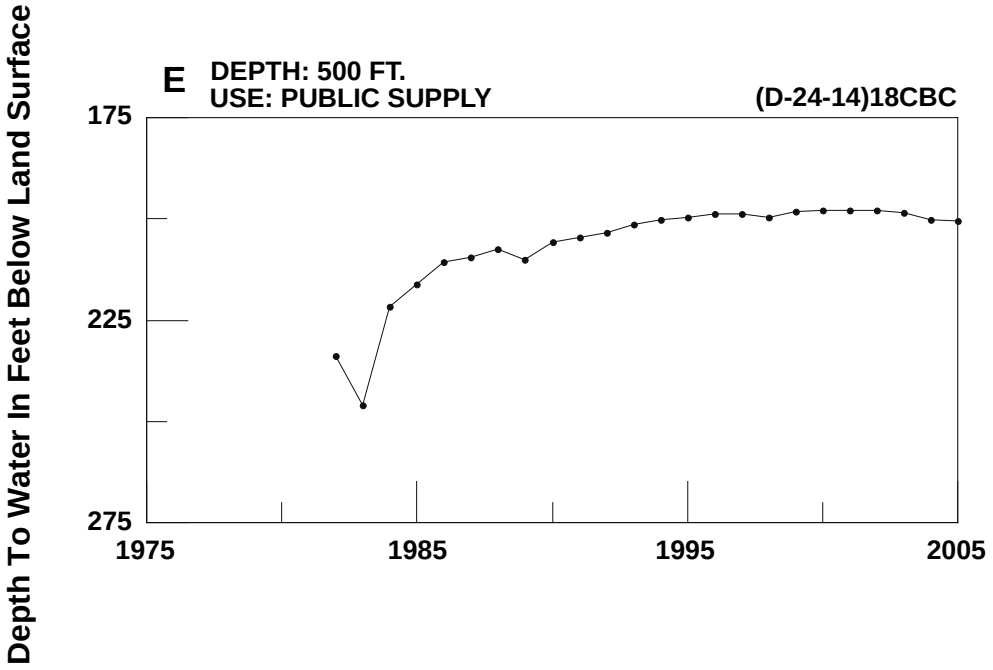


Figure 8.4-7 (cont)
Santa Cruz Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



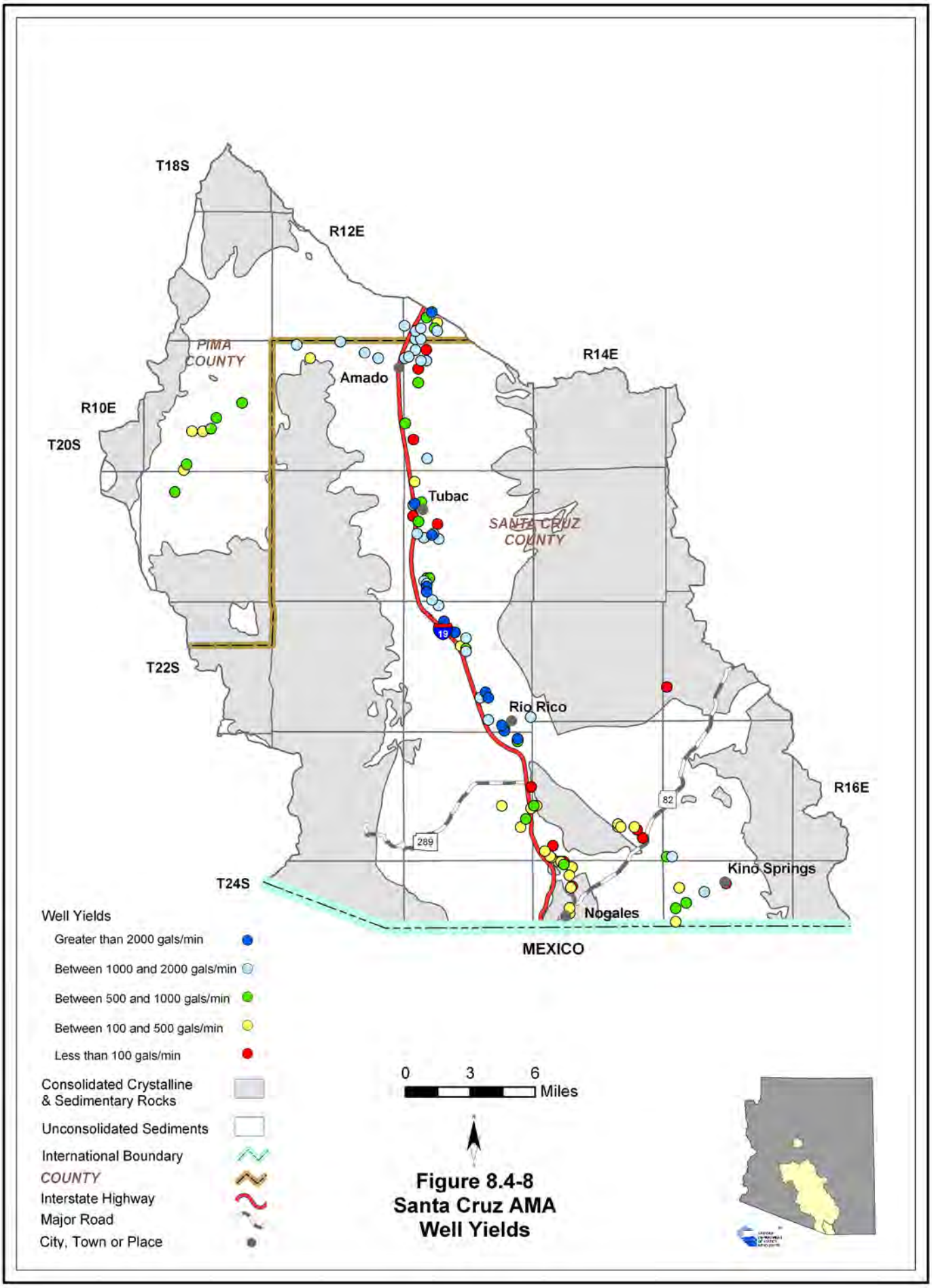


Figure 8.4-8
Santa Cruz AMA
Well Yields

8.4.7 Water Quality Exceedences and Contamination Sites in the Santa Cruz AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 8.4-7A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 8.4-7B. Figure 8.4-9 shows the location of water quality occurrences keyed to Table 8.4-7. Figure 8.4-10 shows the located of contamination sites in the Santa Cruz AMA with site information in Table 8.4-8. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Well, mine and spring sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 8.4-7A.
- Forty-five sites have parameter concentrations that have equaled or exceeded DWS.
- The most frequently equaled or exceeded parameters are organics and arsenic.
- Other parameters equaled or exceeded include mercury, manganese, fluoride, lead, radionuclides, selenium and nitrates.

Lakes and Streams with impaired waters

- Refer to Table 8.4-7B.
- Water quality standards were equaled or exceeded in three stream reaches and one lake. The parameters most commonly equaled or exceeded were copper and E. coli.
- One reach, Three R Canyon - headwaters to ephemeral segment, and one lake, Pena Blanca Lake, are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) Program. The final TMDL document has been completed for both.

Effluent Dependent Reaches

- Refer to Figure 8.4-9
- A portion of the Santa Cruz River in this AMA is effluent dependent.

Contamination Sites

- Refer to Figure 8.4-10 and Table 8.4-8
- There are two contamination sites in the AMA in the vicinity of Nogales.

Table 8.4-7 Water Quality Exceedences in the Santa Cruz AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	19 South	13 East	29	2	Organics, Pb
2	20 South	13 East	31	1	As
3	21 South	12 East	13	1	As
4	21 South	13 East	19	1	As
5	21 South	13 East	30	1	As
6	21 South	14 East	30	1	Hg
7	22 South	11 East	3	1	Rad
8	22 South	13 East	9	1	Mn
9	22 South	13 East	34	1	Mn, NO3
12	23 South	12 East	26	1	F
10	23 South	13 East	1	1	Pb
11, 13	23 South	14 East	19	2	NO3
13, 14	23 South	13 East	25	6	Mn, Organics
13	23 South	14 East	30	4	F, Mn, NO3, Organics
14, 16	23 South	13 East	36	6	F, Mn, NO3, Organics, Pb
15	23 South	14 East	31	4	As, Organics, Se
17	24 South	14 East	5	2	As, Organics
18	24 South	14 East	8	1	As
19	24 South	14 East	16	1	As, Mn, Pb
19, 20	24 South	14 East	17	6	As, Mn, Organics, Pb
20	24 South	14 East	20	1	Organics

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[3]	Parameter(s) Exceeding Use Standard[2]
a	Stream	Three R Canyon-headwaters to ephemeral segment	2.3	NA	A&W, PBC, Agl	Cd, Cu, Zn, pH
b	Stream	Santa Cruz River - Mexican border to Nogales WWTP outfall	17	NA	FBC	E. Coli
c	Stream	Nogales Wash - Mexico border to Santa Cruz River	6.2	NA	A&W, PBC	E. Coli, Cu, Cl
d	Lake	Pena Blanca Lake	NA	50	FC	Hg

Notes:

[1] Water quality samples collected between 1975 and 2004.
[2] As = Arsenic
Cd = Cadmium
Cl = Chlorine
Cu = Copper
F = Fluoride
Hg = Mercury
Mn = Manganese
Pb = Lead
pH = Measurement of acidity or alkalinity
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = radionuclides
Se = Selenium
Zn = Zinc
[3] A&W = Aquatic and Wildlife
Agl = Agriculture
FC = Fish Consumption
FBC= Full Body Contact
PBC = Partial Body Contact

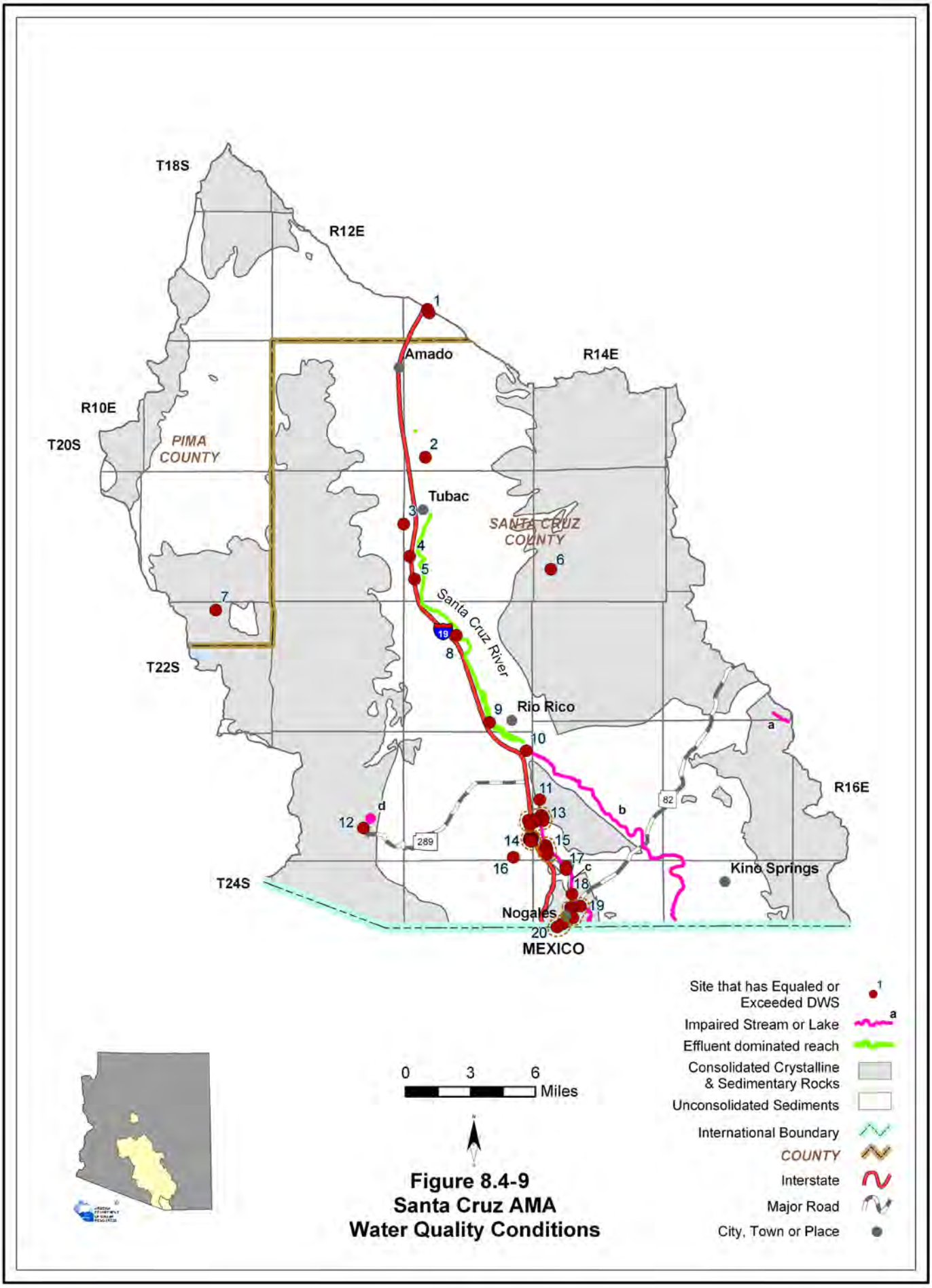


Figure 8.4-9
Santa Cruz AMA
Water Quality Conditions

Table 8.4-8 Contamination Sites in the Santa Cruz AMA

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites	
Valencia Power Plant	Soil & Groundwater/Volitile Organic Compounds (VOCs) and Chromium
Resource Conservation and Recovery Sites	
United Musical	Groundwater/Volitile Organic Compounds (VOCs)

NA - Not Available
Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

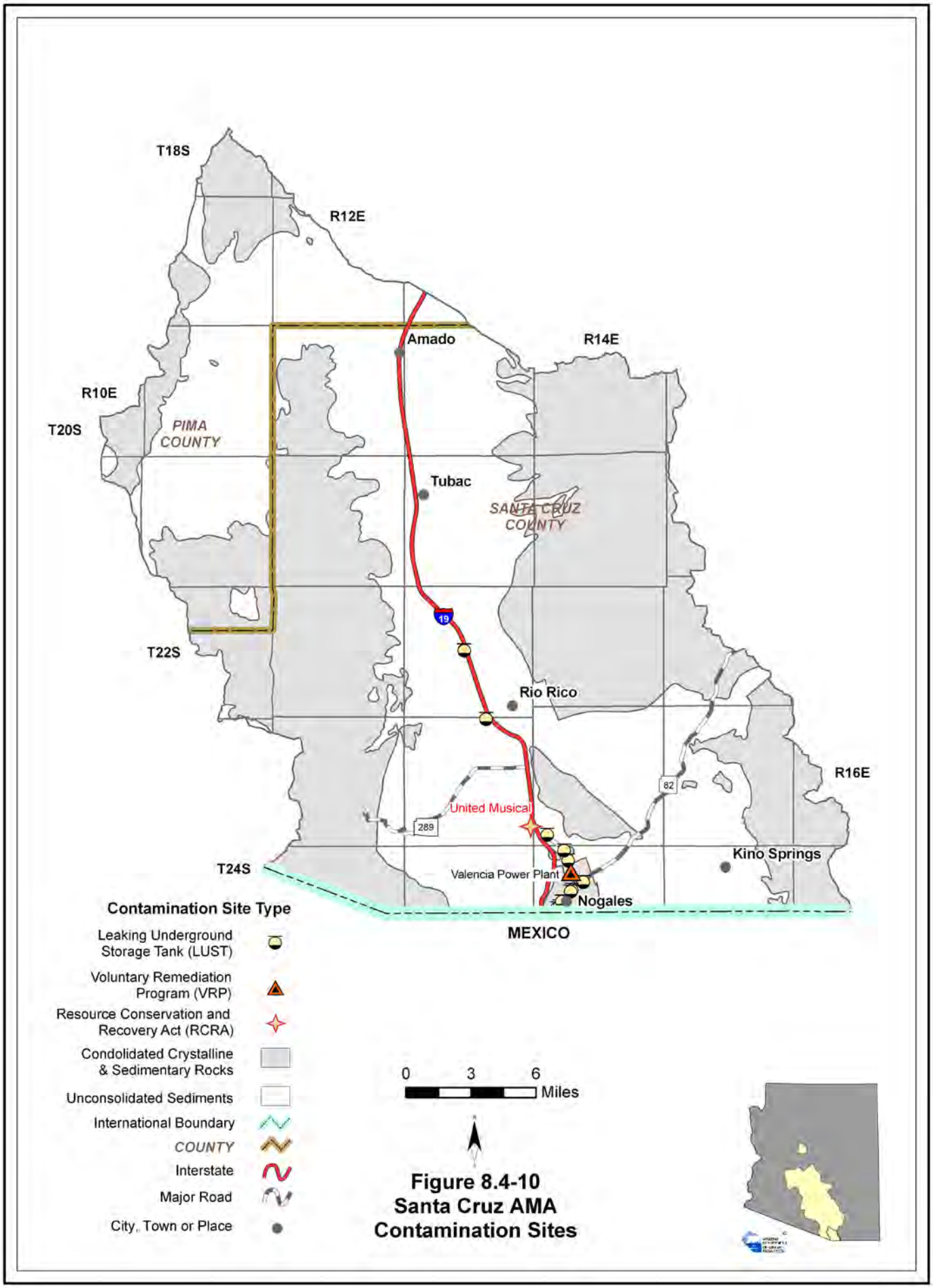


Figure 8.4-10
Santa Cruz AMA
Contamination Sites

8.4.8 Cultural Water Demands in the Santa Cruz AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.4-9. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.4-10. Figure 8.4-11 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.4-9 and Figure 8.4-11.
- Population in this AMA increased from 20,290 in 1980 to 37,049 in 2000 and projections suggest an increase to over 80,700 residents by 2050.
- Total average annual water use in the Santa Cruz AMA has increased slightly since the early 1990s; however, the proportional use by the 3 major demand sectors have stayed relatively constant.
- In 2001-2003 agricultural water demand accounted for approximately 59% of the total annual water demand, the municipal sector accounts for 35% and the industrial sector approximately 6%.
- Coordinated management of groundwater and surface water is practiced in the Santa Cruz AMA and use of non-groundwater supplies have not been separately reported.
- As of 2003 there were 1,117 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 589 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.4-10.
- Six wastewater treatment facilities were identified in the AMA.
- A variety of effluent disposal methods are used in the AMA but most is disposed of by discharge into the Santa Cruz River.
- More than 16,300 acre-feet of effluent is treated/generated annually in the AMA.

Table 8.4-9 Cultural Water Demands in the Santa Cruz AMA[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		695[5]	277[5]	NR			NR			ADWR[6] (1994)
1972										
1973										
1974										
1975										
1976				NR			NR			
1977										
1978										
1979										
1980	20,290									
1981	21,112	75	35	NR			NR			
1982	21,933									
1983	22,755									
1984	23,576									
1985	24,398									
1986	25,220	76	60	20,300			NR			ADWR (2008)
1987	26,041									
1988	26,863									
1989	27,684									
1990	28,506									
1991	29,360	89	93	7,100	1,300	11,400	NR	NR	NR	
1992	30,215									
1993	31,069									
1994	31,923									
1995	32,778									
1996	33,632	124	93	7,900	1,500	13,500	NR	NR	NR	
1997	34,486									
1998	35,340									
1999	36,195									
2000	37,049									
2001	38,138	58	31	8,300	1,500	14,000	NR	NR	NR	
2002	39,226									
2003	40,315									
2010	47,934									
2020	58,817									
2030	67,735									
2040	74,871									
2050	80,763									
ADDITIONAL WELLS:[7]		**17**	**0**							
WELL TOTALS:		**1,134**	**589**							

Notes:
NR = Not reported.
[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes Indian Demand
[3] Within the Santa Cruz AMA, water is not separately defined as surface water or groundwater so all volumes are reported under well pumpage.
[4] Agricultural demand does not include small exempt use after 1993.
[5] Includes all wells through 1980.
[6] Until 1994 the Santa Cruz AMA was part of the Tucson AMA. Water demand for the Santa Cruz AMA between 1971-1985 is included on Table 8.5-10, Tucson AMA Cultural Water Demand.
[7] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates or application dates. These wells are summed here.

Table 8.4-10 Effluent Generation in the Santa Cruz AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Arivaca Junction WWTF	Pima County	Arivaca Junction	840	68		X					X		X	Secondary	NA	2004
Kino Springs WWTF	City of Nogales	Nogales	176	22							X			Secondary	NA	2004
La Entrada De Tubac Plaza	Private	Tubac Plaza	NA	NA	NA									NA	NA	NA
Madera Canyon	NA	Madera Canyon	161	NA			X							NA	NA	NA
Nogales International WWTP	City of Nogales/IWBC	Noglaes	21,000[1]	16,221[2]	X									Secondary	NA	2004
Tubac WWTF	Private	Tubac	1,710	NA									X	NA	NA	NA
Total			**23,887**	**16,311**												

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, ADEQ's AZURITE Facility website, Nogales International WWTP data (2008)

[1] Population Served above for Nogales International WWTP is the US portion only, 2004 estimate of Non-US residents served exceeds 367,000.

[2] Total volume generated from WWTP, includes both US and Non-US portions

IBWC = International Boundary and Water Commission
WWTF=Wastewater Treatment Facility
WWTP=Wastewater Treatment Plant
NA=not available

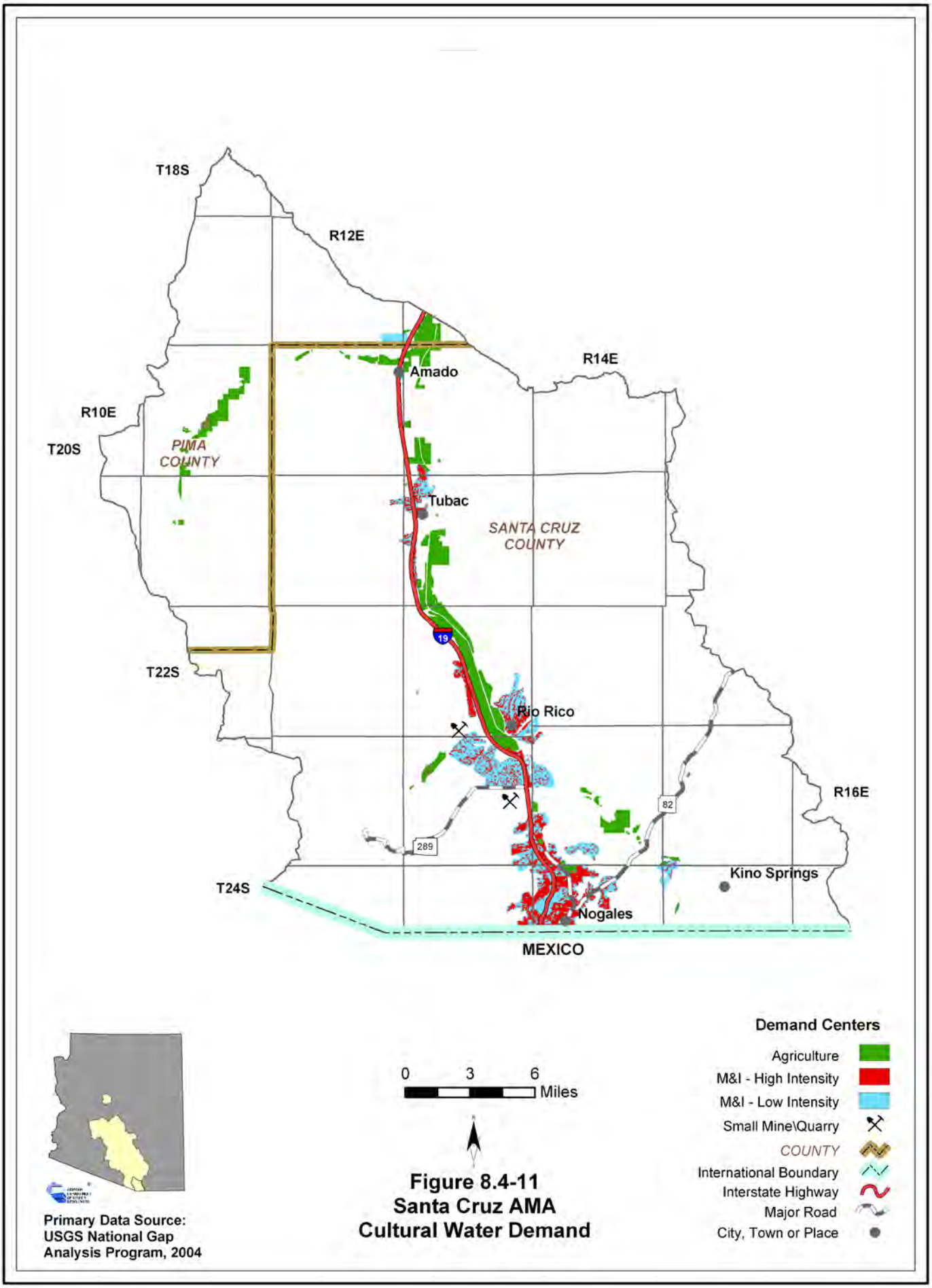


Figure 8.4-11
Santa Cruz AMA
Cultural Water Demand

8.4.9 Assured Water Supply Determinations in the Santa Cruz AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination and subdivision water provider are shown in Table 8.4-11A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.4-11D with date of application, date the designation was issued and projected or annual estimated demand. Figure 8.4-12 shows the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Water Supply Records

- See Table 8.4-11
- As of February 2008, 77 subdivisions with a total of 18,952 lots have been reviewed for an assured water supply determination. All but one of the determinations were in Santa Cruz County.
- 3,707 lots in 39 subdivisions received a Certificate of Assured Water Supply, 1,491 lots in 32 subdivisions received Water Adequacy Reports and 13,754 lots in six developments received an Analyses of Assured Water Supply.
- There are two designated providers, City of Nogales and Baca Float Water Company, Inc, with a total projected or estimated annual water use of 6,655 acre-feet.

Table 8.4-11 Assured Water Supply Determinations in the Santa Cruz AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
2	Lakewood Estates Lots 118-150	Pima	19 South	12 East	36	33	27-200175	04/06/83	Lakewood Water Company
3	Rio Cruz	Santa Cruz	20 South	13 East	31	21	27-400781	06/30/03	Arizona American Water Company - Tubac
4	Vistas at Sopori Ranch	Santa Cruz	21 South	12 East	1 & 11	322	27-500082	12/18/07	Sopori Domestic Water Improvement District
6	The Ranch at Aliso Springs, Lots 1-25	Santa Cruz	21 South	12 East	24	25	27-401280	12/23/04	Dry lot
7	Cerro Pelon	Santa Cruz	21 South	12 East	12	23	27-200047	02/07/94	Tubac Valley Water Company
7	Silver Spur Ranchettes	Santa Cruz	21 South	12 East	12	6	27-200314	08/06/98	Tubac Valley Water Company
8	Barrio de Tubac Phase I	Santa Cruz	21 South	13 East	7 & 18	141	27-300303	08/15/97	Baca Float Water Company, Inc.
8	San Miguel Patio Homes Phases II and III	Santa Cruz	21 South	13 East	18	9	27-401068	10/22/03	Baca Float Water Company, Inc.
8	Cielito Lindo de Tubac Phase II	Santa Cruz	21 South	13 East	18	31	27-401069	10/22/03	Baca Float Water Company, Inc.
8	Santiago at Barrio de Tubac Phase II	Santa Cruz	21 South	13 East	18	37	27-401070	10/22/03	Baca Float Water Company, Inc.
9	Palo Parada Estates	Santa Cruz	21 South	13 East	7	10	27-200215	06/16/92	Arizona American Water Company - Tubac
10	Estates de Anza	Santa Cruz	21 South	13 East	6	18	27-500038	03/22/07	Arizona American Water Company - Tubac
11	Tubac Valley C.C. Fairway Est. (1992)	Santa Cruz	21 South	13 East	5, 6 & 7	10	27-200359	05/28/92	Arizona American Water Company - Tubac
11	Tubac Golf Resort Development	Santa Cruz	21 South	13 East	6, 7 & 8	229	27-401104	03/07/05	Arizona American Water Company - Tubac
12	Tubac Ranch Properties Lmtd	Santa Cruz	21 South	13 East	5 & 6	111	27-200357	03/07/95	Arizona American Water Company - Tubac
13	Tubac Valley C.C. Fairway Est. (1984)	Santa Cruz	21 South	13 East	5 & 6	111	27-200358	04/19/84	Arizona American Water Company - Tubac
13	Tubac Golf Resort Homes Lots 1-60	Santa Cruz	21 South	13 East	5 & 6	60	27-400929	06/26/03	Arizona American Water Company - Tubac
15	Tubac 40	Santa Cruz	21 South	13 East	6	85	27-500085	03/19/07	Arizona American Water Company - Tubac
16	Palo Parado Hills	Santa Cruz	22 South	13 East	7, 8, 17 & 18	16	27-200216	02/05/85	Dry lot
21	Calabasas Rio Rico Unit 4, Lots 1-348 and a portion of Lot C	Santa Cruz	22 South	13 East	2, 3, 10 & 11	348	27-700357	09/06/07	Rio Rico Utilities
21	Rio Rico Unit 4, Lots A, B, D, F and a portion of Lot C	Santa Cruz	22 South	13 East	2, 3, 10 & 11	100	27-700358	09/06/07	Rio Rico Utilities
25	Rio Rico Villas Unit 5	Santa Cruz	22 South	13 East	24 & 25	1090	27-300331	04/28/99	Rio Rico Utilities
28	Rio Rico Ranchettes Unit 16	Santa Cruz	22 South	14 East	31, 32 & 33	259	27-300336	04/28/99	Rio Rico Utilities
29	Lake Patagonia Ranch	Santa Cruz	22 South	14 East	36	NA	27-200165	07/06/83	Dry lot
29	Lake Patagonia Ranch	Santa Cruz	22 South	14 East	36	NA	27-200169	01/25/89	Dry lot
30	Sonoita Creek Ranch	Santa Cruz	22 South	14 East	1, 2, 5, 6, 31 & 36	NA	27-200315	06/24/83	Dry lot
31	Lake Patagonia Ranch	Santa Cruz	22 South	15 East	31	NA	27-200166	07/06/83	Dry lot
31	Lake Patagonia Ranch	Santa Cruz	22 South	15 East	31	NA	27-200170	01/25/89	Dry lot
35	Pena Blanca Highlands	Santa Cruz	23 South	13 East	13, 24 & 25	127	27-200225	05/16/91	Valle Verde Water Co.
36	Coronado Estates	Santa Cruz	23 South	13 East	24 & 25	41	27-400934	07/28/03	Valle Verde Water Co.
37	Las Colinas Sagradas, Phase 1	Santa Cruz	23 South	13 East	24 & 25	264	27-700425	01/24/08	Valle Verde Water Co.
39	Las Minas Estates	Santa Cruz	23 South	13 East	25	NA	27-200176	09/10/81	Valle Verde Water Co.
39	Las Minas Estates	Santa Cruz	23 South	13 East	25	133	27-200177	06/10/82	Valle Verde Water Co.
39	Lopez Industrial Park	Santa Cruz	23 South	13 East	25	12	27-200185	04/10/86	Valle Verde Water Co.
48	Lake Patagonia Ranch	Santa Cruz	23 South	14 East	1 & 2	NA	27-200167	07/06/83	Dry lot
49	Lake Patagonia Ranch	Santa Cruz	23 South	14 East	1 & 2	NA	27-200171	01/25/89	Dry lot
50	Lake Patagonia Ranch	Santa Cruz	23 South	15 East	5 & 6	NA	27-200168	07/06/83	Dry lot
50	Lake Patagonia Ranch	Santa Cruz	23 South	15 East	5 & 6	NA	27-200172	01/25/89	Dry lot
51	Lake Patagonia Ranch #6B	Santa Cruz	23 South	15 East	5	35	27-200173	04/08/93	Dry lot

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application[3]
			Township	Range	Section					
3	Tubac Valley Villas	Santa Cruz	20 South	13 East	31	33	53-501582	Adequate	03/13/74	Arizona American Water Company - Tubac
7	Empty Saddle Estates	Santa Cruz	21 South	12 East	12	22	53-500613	Adequate	10/25/77	Arizona American Water Company - Tubac
10	Calle del Ayer	Santa Cruz	21 South	13 East	6	7	53-500377	Adequate	07/10/74	Tubac Valley Water Company
14	Rio Rico Villas Unit 14, lots 2, 20 & 53	Santa Cruz	21 South; 22 South	13 East; 14 East	32 & 33; 4 & 5	3	53-700379	Inadequate	07/27/07	Rio Rico Utilities
17	Ranchos Del Rio	Santa Cruz	22 South	13 East	9	55	53-401467	Inadequate	09/24/04	Rio Rico Utilities
18	Los Altos Subdivision	Santa Cruz	22 South	13 East	16	9	53-401465	Inadequate	09/02/04	Rio Rico Utilities

Table 8.4-11 Assured Water Supply Determinations in the Santa Cruz AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application[3]
			Township	Range	Section					
19	Rio Rico Villas #13	Santa Cruz	22 South	13 East	21, 22, 27, 28 & 34	298	53-501309	Inadequate	10/05/83	Rio Rico Utilities
20	Bella Vista North, Lots 109-121, 125-140, 174-227 & C.A.s "L" - "P"	Santa Cruz	22 South	13 East	34	83	53-401800	Inadequate	08/03/05	Rio Rico Utilities
22	Rio Rico Ranchettes #3	Santa Cruz	22 South	13 East	23, 24, 25 & 36	103	53-501308	Inadequate	10/05/83	Rio Rico Utilities
22	Rio Rico Ranchettes Unit 3, #4/Unit 10	Santa Cruz	22 South	13 East	23	7	53-400091	Inadequate	06/14/99	Rio Rico Utilities
23	Rio Rico Estates #3	Santa Cruz	22 South	13 East	25, 26, 35 & 36	49	53-501307	Inadequate	10/05/83	Rio Rico Utilities
24	Piedras Blancas	Santa Cruz	22 South	13 East	13	37	53-401295	Inadequate	04/26/04	Rio Rico Utilities
26	Rio Rico Estates Unit 10	Santa Cruz	22 South	13 East	35 & 36	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
27	Rio Rico Ranchettes Unit 18	Santa Cruz	22 South	14 East	31	4	53-700235	Adequate	02/15/07	Dry lot
32	Rio Rico Resort Terrace	Santa Cruz	23 South	13 East	3	199	53-700307	Inadequate	04/18/07	Rio Rico Utilities
33	Bella Vista Unit 7	Santa Cruz	23 South	13 East	2 & 3	118	53-400361	Inadequate	07/19/00	Rio Rico Utilities
33	Bella Vista North / Bella Vista III	Santa Cruz	23 South	13 East	2 & 3	234	53-401296	Inadequate	05/18/04	Rio Rico Utilities
34	Casitas De Anza	Santa Cruz	23 South	13 East	35	11	53-401527	Inadequate	11/03/04	Rio Rico Utilities
40	Meadow Hills Estates	Santa Cruz	23 South	13 East	36	35	53-500945	Adequate	09/17/73	Potrero Water Company
41	Rio Rico Estates Unit 10	Santa Cruz	23 South	13 East	1	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
42	Rio Rico Estates Unit 10	Santa Cruz	23 South	14 East	5, 6 & 7	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
43	Los Alamos	Santa Cruz	23 South	14 East	19	7	53-500915	Adequate	01/20/75	Valle Verde Water Co.
43	Estancias Rio Vista	Santa Cruz	23 South	14 East	19	12	53-401528	Inadequate	11/04/04	Rio Rico Utilities
44	Valle Verde #10	Santa Cruz	23 South	14 East	31	12	53-501595	Adequate	09/15/75	Valle Verde Water Co.
44	Mi Casa	Santa Cruz	23 South	14 East	31	47	53-500974	Adequate	09/22/76	Valle Verde Water Co.
44	Batiz Park	Santa Cruz	23 South	14 East	31	19	53-500308	Adequate	09/22/76	Valle Verde Water Co.
45	Los Robles	Santa Cruz	23 South	14 East	5	6	53-500929	Adequate	08/22/79	Valle Verde Water Co.
45	Rio Rico Ranchettes Unit II	Santa Cruz	23 South	14 East	5-8 & 17	7	53-400481	Inadequate	03/26/01	Rio Rico Utilities
46	River View Estates	Santa Cruz	23 South	14 East	17	9	53-401468	Inadequate	09/24/04	Rio Rico Utilities
47	Camino Cumbre	Santa Cruz	23 South	14 East	3 & 4	7	53-400950	Inadequate	06/02/03	Rio Rico Utilities
52	Buena Vista Mobile Home Park	Santa Cruz	24 South	15 East	18	0	53-500367	Adequate	07/30/84	Buena Vista Public Service
52	Buena Vista Mobile Estates	Santa Cruz	24 South	15 East	7 & 18	34	53-500366	Adequate	01/21/81	Buena Vista Public Service

C. Analyses ofAssured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
1	Sopori Ranch	Santa Cruz	19 South; 20 South; 20 South; 20 South; 21 South	12 East; 11 East; 12 East; 13 East; 11 East	33 & 34; 11-15, 22, 27 & 33-35; 1-9, 12, 13, 18, 23-25, 28, 30, 31 & 33; 31; 4, 5, 8 & 9	9150	28-700267	04/20/07	Undetermined
5	Alegria Canyon	Santa Cruz	21 South	12 East	12, 13 & 14	209	28-401961	03/07/06	Undetermined
10	Three Flags	Santa Cruz	21 South	13 East	6	200	28-401980	03/07/06	Arizona American Water Company - Tubac
32	Rio Rico Urban Unit 4	Santa Cruz	23 South	13 East	2, 3, 10 & 11	367	28-300335	08/27/98	Rio Rico Utilities
36	Pena Blanca Highlands	Santa Cruz	23 South	13 East	13, 24 & 25	2788	28-400010	07/23/99	Valle Verde Water Co.
38	Las Colinas Sagradas	Santa Cruz	23 South	13 East	24 & 25	1040	28-700426	01/24/08	Valle Verde Water Co.

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated	Year of Projected or Annual
A	Baca Float Water Company, Inc.	Santa Cruz	26-400800.0000	08/13/02	11/17/04	333	2011
B	City of Nogales	Santa Cruz	26-401358.0000	05/14/04	04/19/05	6,322	2009

[1] Includes water reports issued under the Water Adequacy program prior to 1980 implementation of the Assured Water Supply program.

[2] Adequacy determinations were based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. A determination of inadequacy could be due to insufficent physical or legal access to water or poor water quality. The Adequacy Program was replaced by the Assured Water Supply Program in the AMAs in 1980.

[3] Session law from 1981 (HB 2465, Chapter 203) exempts subdivisions from the Assured Water Supply program where "substantial capital investment toward construction prior to 6/12/80 in addition to original cost of buying the land" has occurred.

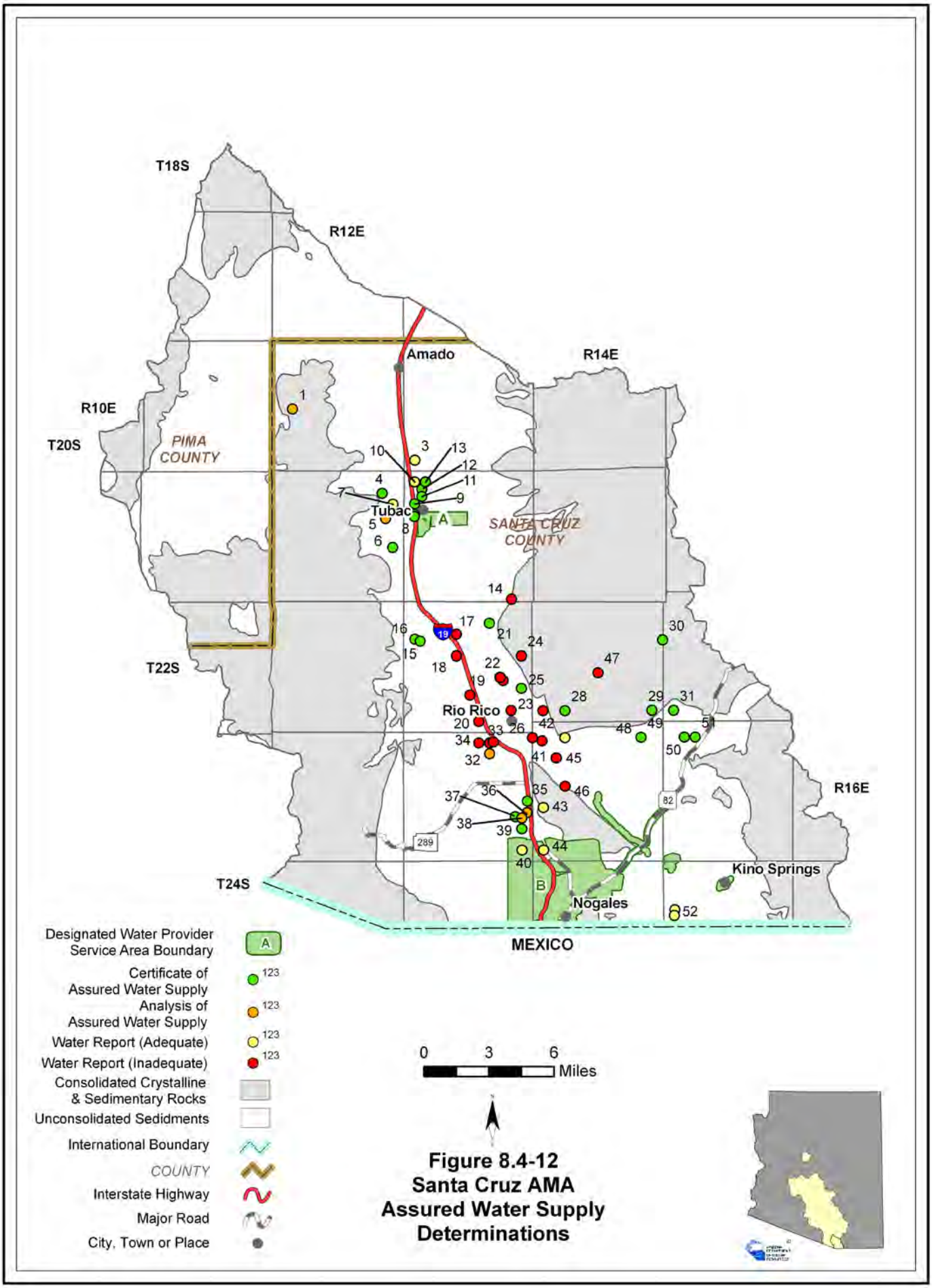


Figure 8.4-12
Santa Cruz AMA
Assured Water Supply
Determinations

Santa Cruz AMA
References and Supplemental Reading

References

A

Arizona Department of Economic Security (DES), 2005, Workforce Informer: Data file, accessed August 2005, http://www.workforce.az.gov.

Arizona Department of Environmental Quality, 2005, ADEQSWI: Data file, received September 2005.

_____, 2005, ADEQWATP: Data file, received May 2005.

_____, 2005, ADEQWWTP: Data file, received August 2005.

_____, 2005, Azurite: Data file, received September 2005.

_____, 2005, Effluent dependent waters: GIS cover, received December 2005.

_____, 2005, Impaired lakes and reaches: GIS cover, received January 2006.

_____, 2004, Water providers with arsenic concentrations in wells over 10ppb: Data file, received August 2004.

_____, 2004, Water quality exceedences by watershed: Data file, received June 2004.

_____, 2004, Water quality exceedences for drinking water providers in Arizona: Data file, received September 2004.

Arizona Department of Water Resources (ADWR), 2008, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006, Assured and adequate water supply applications: Project files, ADWR Hydrology Division.

_____, 2005, Automated recorder sites: Data files, ADWR Basic Data Unit.

_____, 2005, Assured and adequate water supply determinations: Database, ADWR Office of Assured and Adequate Water Supply.

_____, 2005, Flood warning gages: Database, ADWR Office of Water Engineering.

_____, 2005, Inspected dams: Database, ADWR Office of Dam Safety.

_____, 2005, Non-jurisdictional dams: Database, ADWR Office of Dam Safety.

_____, 2005, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.

_____, 2005, Registry of surface water rights: ADWR Office of Water Management.

_____, 2005, Wells55: Database.

_____, 2004, Annual withdrawal and use reports for the Santa Cruz AMA: ADWR Office of Water Management.

_____, 1999, Third Management Plan for the Santa Cruz Active Management Area 2000-2010.

_____, 1994, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.

_____, 1994, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.

Arizona Game and Fish Department (AGF), 2005, Arizona Waterways: Data file, received April 2005.

_____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.

Arizona Land Resource Information System (ALRIS), 2005, Springs: GIS cover, accessed January 2006 at http://www.land.state.az.us/alris/index.html.

_____, 2005, Streams: GIS cover, accessed 2005 at http://www.land. state.az.us/alris/index.html.

_____, 2005, Water features: GIS cover, accessed July 2005 at http://www.land. state.az.us/alris/

index.html.
_____, 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.

D

Diroll, M., and Marsh, D., 2006, Status of water quality in Arizona-2004 integrated 305(b) assessment and 303(d) listing report: ADEQ report.

E

Environmental Protection Agency (EPA), 2005, Surf Your Watershed: Facility reports, accessed April 2005 at http://oaspub.epa.gov/enviro/ef_home2.water.
_____, 2005, 2000 and 1996, Clean Watershed Needs Survey: datasets, accessed March 2005 at http://www.epa.gov/owm/mtb/cwns/index.htm.

K

Konieczki, A.D. and Wilson, R.P., 1992, Annual summary of ground-water conditions in Arizona, spring 1986 to spring 1987: USGS Open File Report 92-54.

M

McCormack, H.F., Fisk, G.G., Duet, N.R., Evans, D.W., Roberts, W.P., and Castillo, N.K., 2002, Water resources data Arizona, water year 2002: USGS Water Data Report AZ-02-1.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

U

US Army Corps of Engineers, 2004 and 2005, National Inventory of Dams: Arizona Dataset, accessed November 2004 to April 2005 at http://crunch. tec.army.mil/nid/webpages/nid.cfm
US Geological Survey (USGS), 2006, Average annual runoff in the United States, 1951-1980: Data file, accessed March 2006 at http://aa179.cr.usgs.gov/ metadata/wrdmeta/runoff.htm.
_____, 2006, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.
_____, 2006, National Hydrography Dataset: Arizona dataset, accessed at http://nhd. usgs.gov/.
_____, 2005, National Water Information System (NWIS): Arizona dataset, accessed December 2005 at http://waterdata.usgs.gov/nwis.
_____ 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file, accessed January 2005 at http://earth.gis.usu.edu/swgap.
_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

V

Valencia, R.A., Wennerlund, J.A., Winstead, R.A., Woods, S., Riley, L., Swanson, E.,

and Olson, S., 1993, Arizona riparian inventory and mapping project: Arizona Game and Fish Department.

W

Wahl, C.R., Boe, S.R., Wennerlund, R.A., Winstead, R.A., Allison, L.J., Kubly, D.M., 1997, Remote sensing mapping of Arizona intermittent stream riparian areas: Arizona Game and Fish Technical Report 112.

Western Regional Climate Center (WRCC), 2005, Pan evaporation stations: Data file accessed December 2005 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

_____, 2005, Precipitation and temperature stations: Data file, accessed December 2007 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

Weidner, C., 1996, ADEQ Pollution Prevention Report, Arizona Pollution Prevention. Spring/Summer 1996.

Supplemental Reading

Betancourt, J.L. and R.M. Turner. 1993. Tucson's Santa Cruz River and the arroyo legacy. Tucson, Arizona: University of Arizona Press.

Cella Barr Associates. 1991. Water adequacy study for the City of Nogales: unpublished report, 132p.

Coggeshall, M.C. 1990. Hydrologic assessment and computer model application in the Upper Santa Cruz River Basin, Santa Cruz County, Arizona: University of Arizona master's thesis.

Colby, B.G. and Jacobs, K.L eds, 2007, Arizona Water Policy: Management and Innovations in an Urbanizing, Arid Region: Resources for the Future, Washington D.C.

Good Neighbor Environmental Board, 2005, Water Resources Management on the U.S.-Mexico Border: Eighth Report to the President and Congress of the United States.

Governor's Drought Task Force, 2004, Arizona Drought Preparedness Plan. Draft. Phoenix.

Governor's Drought Task Force, 2004, Arizona Drought Management Plan. Draft. Phoenix

Governor's Water Management Commission, 2000, Briefing Book: Water Management Framework for AMAs, Groundwater Use Restrictions and Requirements. Phoenix: Arizona Department of Water Resources.

Governor's Water Management Commission, 2002, Final Report and Recommendations. Phoenix: Arizona Department of Water Resources.

Hammett, B.A. and Sicard, J.W., 1995, Maps showing Groundwater Conditions in the Santa Cruz and Tucson Active Management Areas Pima, Pinal and Santa Cruz Counties:

Arizona Department of Water Resources Open-File 8

Holway, J.M. and K.L. Jacobs, 2006, Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth: in Mays, L., eds., Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth. McGraw-Hill.

International Boundary and Water Commission. 1997. Memorandum from S. Tencza to F. Corkhill containing annual sewage inflow and outflow data for the Nogales International Wastewater Treatment Plant. Nogales, Arizona, United States Section.

Jacobs, K. L. and J. M. Holway, 2004, Lessons Learned from Twenty Years of Groundwater Management in Arizona, USA. Hydrogeology Journal. 12, No. 1.

Megdal, S. and Smith, Z., 2008, Evolution and Evaluation of the Active Management Area Management Plans, Water Resources Research Center, University of Arizona.

Megdal, S. and Colby, B., 2004, Arizona's Water Future: Challenges and Opportunities, 85th Arizona Town Hall Background Report, University of Arizona.

Nelson, K., 2007, Groundwater Flow Model of the Santa Cruz Active Management Area along the Effluent-Dominated Santa Cruz River: Santa Cruz and Pima Counties, Arizona, Arizona Department of Water Resources Modeling Report No. 14.

Nelson, K. and Erwin, G, 2001, Santa Cruz Active Management Area 1997-2001 Hydrologic Monitoring Report: Arizona Department of Water Resources.

Scott, P.S., MacNish, R.D., and T. Maddock III. 1996. Effluent recharge to the Upper Santa Cruz River floodplain aquifer, Santa Cruz County, Arizona, Arizona Research Laboratory for Riparian Studies at the University of Arizona, Tucson, Arizona. 75p.

Seventy-first Arizona Town Hall. 1997. Ensuring Arizona's Water Quantity and Quality into the 21st Century. Marshall A. Worden, editor. Phoenix: Arizona Town Hall.

Index to Section 8.0

Overview of the AMA Planning Area 3

Geography 5

Hydrology
- Groundwater Hydrology 7,10-11,12
- Surface Water Hydrology 17-18

Climate 20,21

Environmental Conditions
- Vegetation 23,24,26
- Arizona Water Protection Fund 28
- Instream Flow 28
- Endangered Species 31
- Protected Areas 34

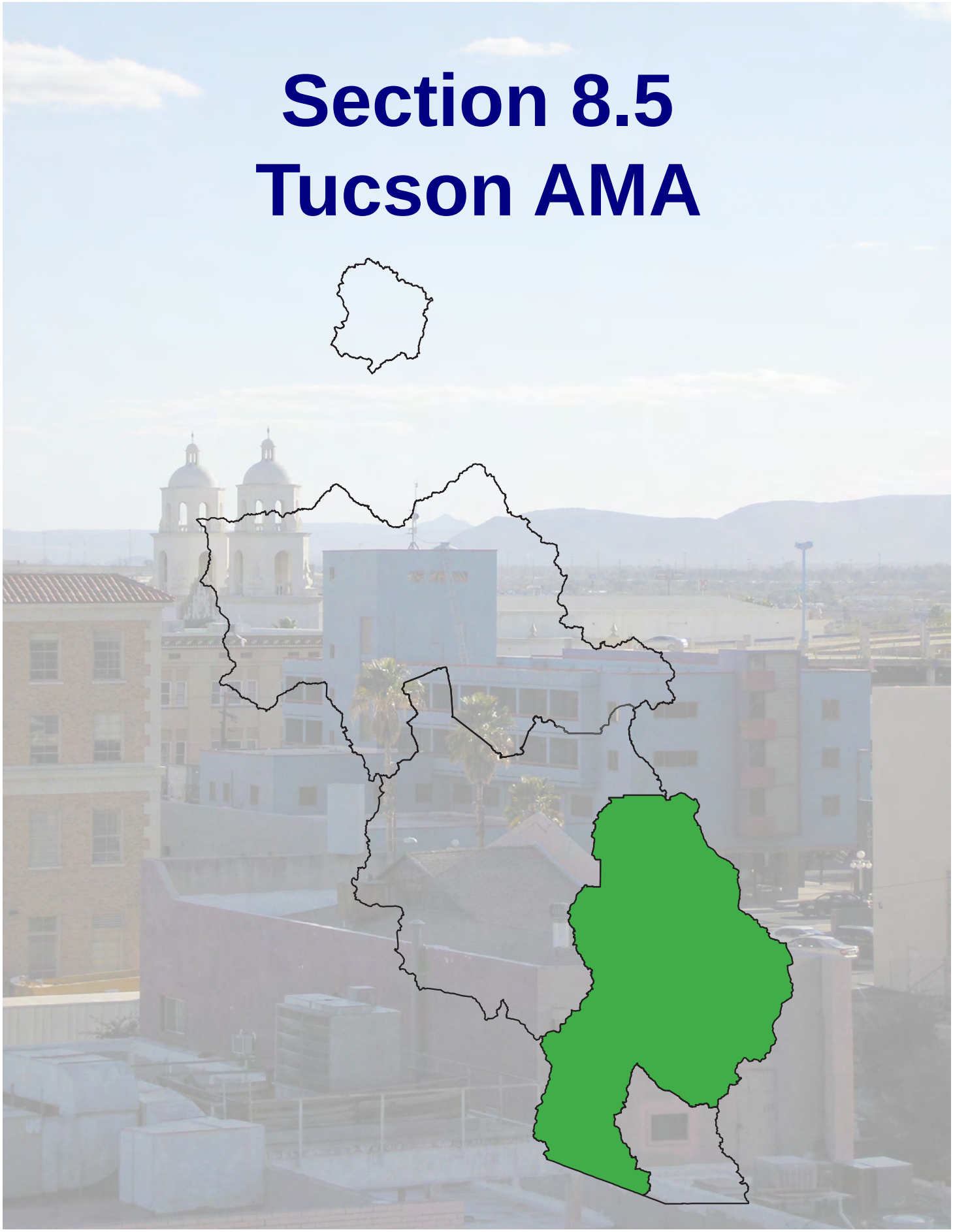
Population 36,38,41

Water Supply 43
- Groundwater 46
- Effluent 48
- Contamination Sites 49

Cultural Water Use 50,51,52
- Municipal Demand 56,58,61-62
- Agricultural Demand 68
- Industrial Demand 71

Water Resource Issues 71-75

Section 8.5
Tucson AMA



8.5.1 Geography of the Tucson AMA

The Tucson AMA is 3,869 square miles in area. Geographic features and principal communities are shown on Figure 8.5-1. The AMA is characterized by mid to high elevation mountains and broad alluvial basins. Vegetation types include Lower Colorado River and upland Sonoran desertscrub, southwestern grassland, southwestern interior chaparral, madrean evergreen woodland and small areas of petran montane conifer forest. Riparian vegetation is found along some watercourses, notably Sabino and Romero Creeks and at Arivaca Cienega (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.5-1 are:
    - The Santa Cruz River running south to north in the center.
    - Pantano Wash, Rillito Creek and Sabino Creek in the central eastern portion of the AMA and Altar and Brawley Wash in the west.
    - The Picacho Mountains and Black Mountain on the northern AMA boundary, the Santa Catalina, Rincon, and Santa Rita Mountains on the eastern boundary, the Sierrita and Santa Rita Mountains along the southern boundary, and the Baboquivari, Roskruge, Waterman and Silver Bell Mountains on the western boundary.
    - Altar Valley and Avra Valley in the western portion of the AMA and, though not specifically indicated, the Santa Cruz River Valley along the Santa Cruz River drainage in the center of the AMA.
    - The lowest point in the AMA at 1,770 feet, just north of Picacho Peak where Interstate 10 exits the AMA.
    - The highest point in the AMA at 9,453 feet at Mt. Wrightson in the Santa Rita Mountains.

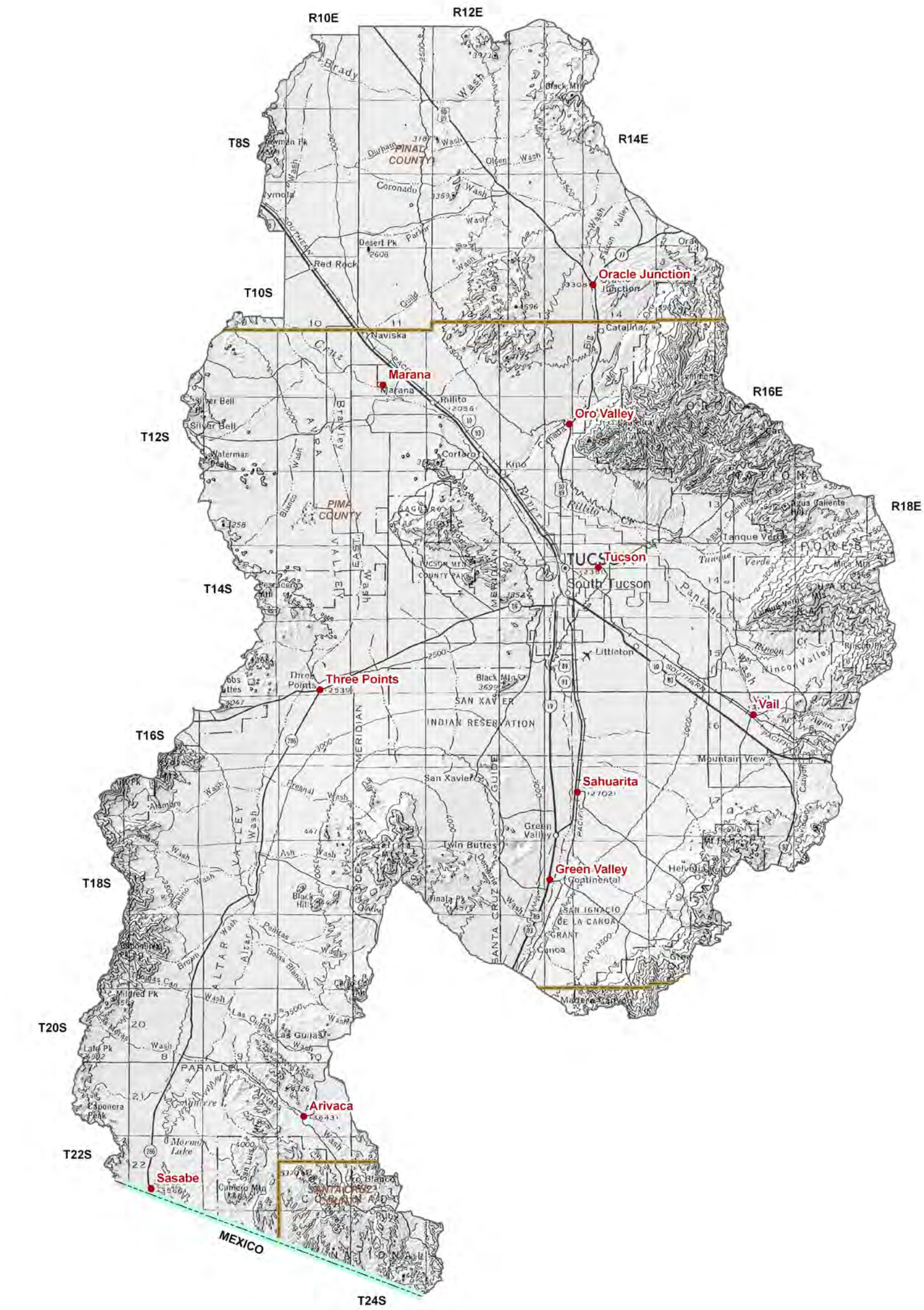


Figure 8.5-1
Tucson AMA
Geographic Features

8.5.2 Land Ownership in the Tucson AMA

Land ownership, including the percentage of ownership by category, for the Tucson AMA is shown in Figure 8.5-2. The principal feature of land ownership in the AMA is the relatively large proportion of State Trust lands. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of largest to smallest percentage in the AMA.

State Trust Land

- 37.8% of the land is held in trust for public schools and other beneficiaries under the State Trust Land system.
- Primary land use is grazing.

Private

- 31.2% of the land is private.
- Land uses include domestic, commercial and agriculture.

National Forest

- 11.6% of the land is federally owned and managed as the Coronado National Forest.
- The AMA contains the 7,550-acre Pajarita Wilderness, the 56,770-acre Pusch Ridge Wilderness, the 11,130-acre Rincon Mountain Wilderness and 10,320 acres of the 15,860-acre Mt Wrightson Wilderness (See Figure 8.0-13).
- Land uses include recreation, resource conservation and grazing.

U.S. Bureau of Land Management (BLM)

- 6.2% of the land is federally owned and managed by the Tucson Field Office of the Bureau of Land Management.
- This AMA includes the 2,740-acre Baboquivari Peak Wilderness and 4,480 acres of the 5,080-acre Coyote Mountain Wilderness. The AMA also includes a portion of the Ironwood National Monument (See Figure 8.0-13)
- Land uses include resource conservation, recreation and grazing.

Wildlife Refuge

- 4.6% of the land is federally owned and managed by U.S. Fish and Wildlife as the Buenos Aires National Wildlife Refuge.
- Land uses include resource conservation and recreation.

Indian Reservation

- 4.4% of the land is under tribal ownership as the Tohono O'odham and Pascua Yaqui Indian Reservations.
- Land uses include domestic, commercial and agriculture.

National Parks and Monuments

- 3.0% of the land is federally owned and managed by the National Park Service (NPS) as Saguaro National Park.

- 68,400 acres of the 83,000-acre Saguaro National Park is designated as the Saguaro Wilderness. (See Figure 8.0-13)
- Land uses include resource conservation and recreation.

Other

- 0.7% of the land is owned and managed by the U.S. Bureau of Reclamation (BOR) and Pima County.
- "Other" includes land in the western portion of the AMA managed by BOR for the Central Arizona Project canal and pumping stations as well as regional parks managed by Pima County.
- Land uses include water infrastructure and recreation.

U.S. Military

- 0.4% of the land is federally owned and managed by the U.S. Military as Davis-Monthan Air Force Base.
- Primary land use is military activity.

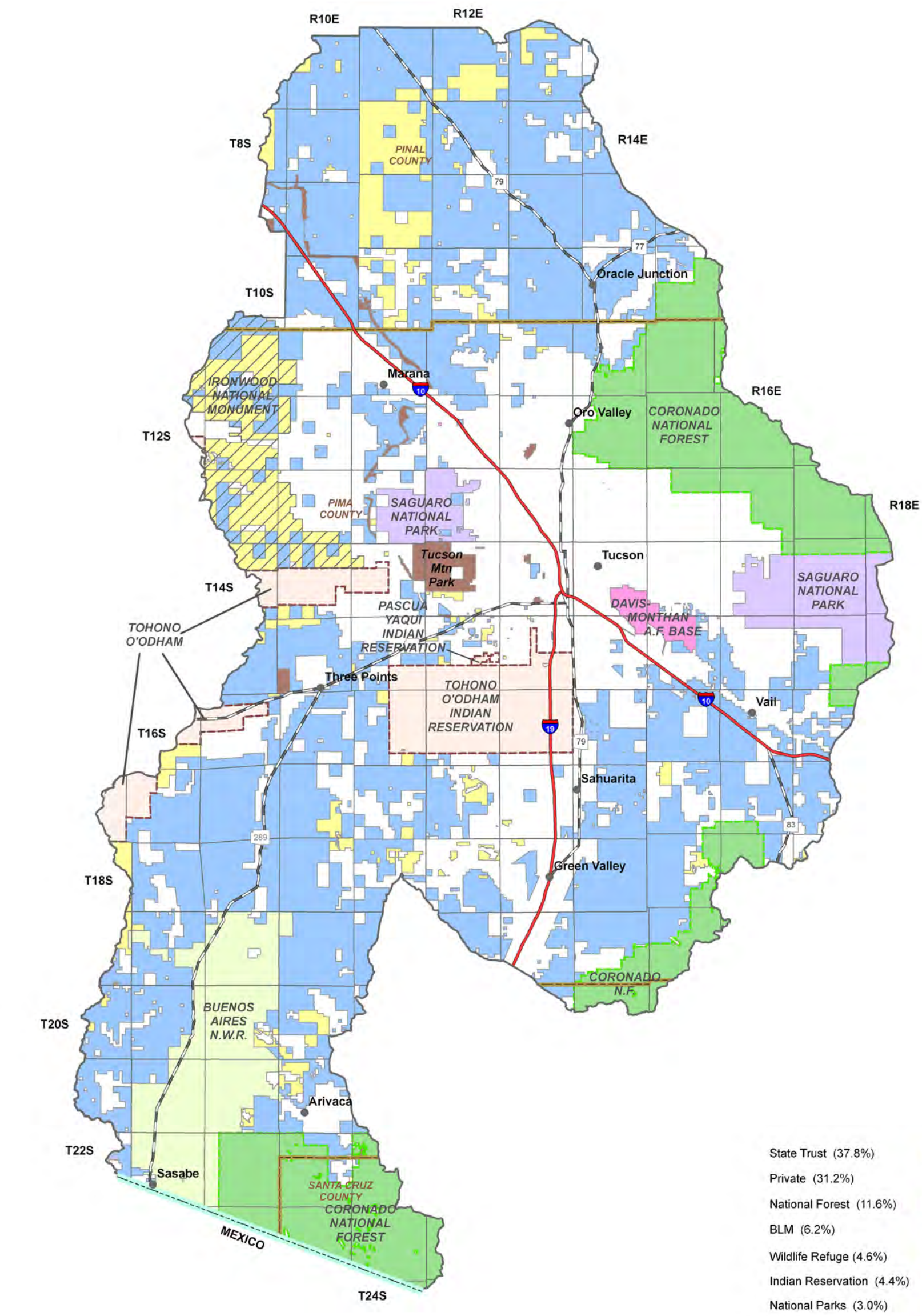


Figure 8.5-2
Tucson AMA
Land Ownership

8.5.3 Climate of the Tucson AMA

Climate data from NOAA/NWS Co-op Network, Evaporation Pan and AZMET stations are complied in Table 8.5-1 and the locations are shown on Figure 8.5-3. Figure 8.5-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Tucson AMA does not contain SNOTEL /Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.5-1A
- There are 16 NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July and is between 79.5°F and 88.5°F and the average monthly minimum temperature occurs in December or January and is between 46.9°F and 52.9°F.
- The highest seasonal rainfall occurs at most stations in the summer (July-September). For the period of record uses, the highest average annual precipitation is 23.41 inches at the Santa Rita Exp Range station and the lowest is 11.38 at the Cortaro station.

Evaporation Pan

- Refer to Table 8.5-1B
- There are two Evaporation Pan stations in the AMA. Elevation at the stations range from 2,300 feet to 2,435 feet and the corresponding annual average evaporation ranges from 111.1 inches to 103.5 inches.

AZMET

- Refer to Table 8.5-1C
- There are two AZMET stations in the AMA. Elevation at the stations range from 1,972 feet to 2,339 feet and the corresponding annual average evaporation rates are 81.77 inches and 76.85 inches.

SCAS Precipitation Data

- See Figure 8.5-3
- Additional precipitation data shows average annual rainfall as high as 38 inches on the AMA boundary at Mount Lemmon and as low as eight inches in the northwestern portion of the AMA near Marana.
- The Tucson AMA has the widest precipitation range of any of the AMAs in the planning area.

Table 8.5-1 Climate Data for the Tucson AMA

A. NOAA/NWS Co-op Network:[1]

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Anvil Ranch	2,750	1971-2000	84.5/Jul	49.6/Jan	2.44	0.81	6.62	2.74	12.61
Cortaro 3 SW	2,271	1948-1976[1]	87.9/Jul	50.6/Jan	1.96	0.91	4.66	3.85	11.38
Green Valley	2,940	1988-2006[1]	86.4/Jul	51.4/Dec	2.66	0.72	8.49	3.58	15.45
Helvetia Santa Rita	4,305	1916-1950	79.5/Jul	46.9/Jan	4.44	1.47	10.39	3.42	19.72
Oracle	4,603	1893-1949[1]	79.8/Jul	45.9/Jan	5.51	1.55	7.47	4.85	19.38
Ruby 4 NW	3,983	1895-1955	79.4/Jul	47.7/Jan	3.96	1.23	10.76	2.99	18.94
Sabino Canyon	2,640	1971-2000	86.2/Jul	52.9/Dec	3.46	0.75	6.24	3.16	13.61
Sahuarita 2 NW	2,690	1956-1972[1]	84.8/Jul	49/Jan	1.47	0.53	7.87	4.35	12.90
Santa Rita Exp Range	4,300	1971-2000	79.4/Jul	49/Jan	5.17	1.51	11.49	5.24	23.41
Sasabe 6 NNE	3,495	1987-2006[1]	80.4/Jul	46.9/Jan	4.09	0.68	8.62	3.83	17.22
Tucson 17 NW	2,560	1971-2000	87.7/Jul	52.6/Jan	3.15	0.69	5.82	2.92	12.58
Tucson Cp Ave Exp Fm	2,329	1971-2000	86.3/Jul	50.6/Jan	3.15	0.83	5.10	3.32	12.40
Tucson Intl Arpt	2,584	1971-2000	86.5/Jul	51.7/Jan	2.68	0.76	5.82	2.91	12.17
Tucson Magnetic Obsy	2,526	1971-2000	86.4/Jul	50.5/Jan	3.84	0.88	5.83	3.31	13.86
Tucson U of A # 1	2,300	1971-2000	87.7/Jul	52.2/Dec,Jan	2.98	0.68	5.01	2.74	11.41
Tucson U of Arizona	2,435	1971-2000	88.5/Jul	54.0/Jan	2.88	0.81	5.40	2.91	12.00

Source: WRCC
Notes:
[1]Stations with incomplete data not shown
[2]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
Tucson Univ of Arizona	2,435	1894-2005	103.51
Tucson University of Arizona #1	2,300	1982-2005	111.07

Source: WRCC

C. AZMET:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
Marana	1,972	1999 - current	81.77(*6*)
Tucson	2,339	1999 - current	76.85(*6*)

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

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

Source: NRCS, 2005

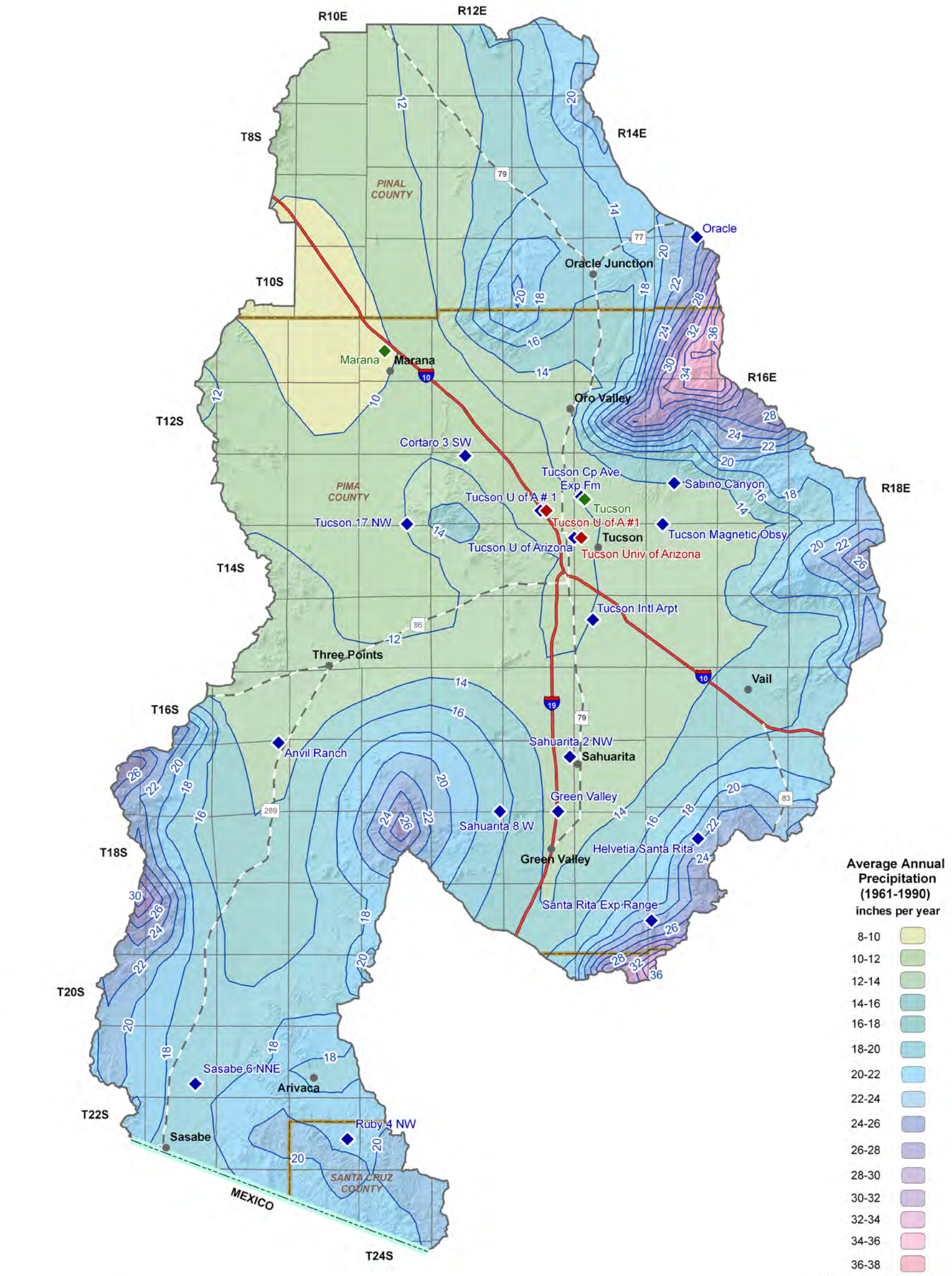


Figure 8.5-3
Tucson AMA
Meteorological Stations and Annual Precipitation

8.5.4 Surface Water Conditions in the Tucson AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.5-2. Flood ALERT equipment in the AMA is shown in Table 8.5-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.5-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 8.5-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.5-2.
- Data from 32 stations located at 18 watercourses are shown in the table and on Figure 8.5-4.
- Average seasonal flow is highest at most stations in the summer season (July-September), although watercourses originating in the Santa Catalina and Rincon mountains experience peak flows in the winter season (January-March).
- The largest annual flow recorded in the AMA is 182,136 acre-feet in 1993 at the Santa Cruz River at Cortaro gage with a contributing drainage area of 3,503 square miles.

Flood ALERT Equipment

- Refer to Table 8.5-3.
- There are 65 ALERT gages in the Tucson AMA.

Reservoirs and Stockponds

- Refer to Table 8.5-4.
- The AMA contains three large reservoirs. The largest, Arivaca, has a maximum storage of 2,915 acre-feet.
- All reservoirs are used for recreation. Other reservoir uses include fish and wildlife pond and water supply.
- Surface water is stored or could be stored in 36 small reservoirs.
- There are 1,538 registered stockponds in the Tucson AMA.

Runoff Contour

- Refer to Figure 8.5-4.
- Average annual runoff is highest, two inches per year or 106.7 acre-feet per square mile, in the eastern portion of the AMA and decreases to 0.1 inches, or five acre-feet per square mile, in the northwestern portion of the AMA.

Table 8.5-2 Streamflow Data for the Tucson AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9481770	Santa Cruz near Amado	NA	3,040	2003-current (real-time)	No statistics run, less than 3 years of data								
9482000	Santa Cruz River at Continental	1,682	2,820	1940-current (real-time)	23	0	45	32	147 (2001)	5,651	15,996	116,202 (1983)	51
9482400	Airport Wash at Tucson	15	2,460	1965-1981 (discontinued)	6	1	78	16	43 (1973)	164	301	976 (1970)	15
9482500	Santa Cruz River at Tucson	2,222	2,317	1998-current (real-time)	2	2	63	33	1,280 (2001)	4,683	9,780	30,878 (2000)	7
9482950	Railroad Wash at Tucson	2	2,430	1975-1983 (discontinued)	25	2	51	22	35 (1981)	132	155	307 (1982)	7
9483000	Tucson Arroyo at Vine Ave.	8	2,412	1944-1981 (discontinued)	14	2	65	19	17 (1947)	588	629	1,424 (1971)	36
9483010	High School Wash at Tucson	1	2,415	1973-1983 (discontinued)	22	4	56	18	42 (1981)	60	78	157 (1982)	9
9483100	Tanque Verde Creek near Tucson	43	2,720	1959-1974 (discontinued)	48	4	20	29	1,775 (1969)	5,430	6,615	14,781 (1965)	14
9483300	Sabino Creek near Mt Lemmon	3	NA	1951-1959 (discontinued)	46	23	20	11	86 (1956)	1,296	1,135	2,207 (1952)	7
9484000	Sabino Creek near Tucson	36	2,720	1987-current (real-time)	56	10	21	13	1,233 (2002)	9,994	14,709	40,846 (1993)	17
9484200	Bear Creek near Tucson	16	2,670	1959-1974 (discontinued)	55	4	11	30	1,531 (1961)	2,370	3,507	8,300 (1965)	14
9484500	Tanque Verde Creek at Tucson.	219	2,470	1940-current (real-time)	68	6	11	15	11 (2002)	8,323	17,050	97,636 (1993)	20
9484590	Davidson Canyon Wash near Vail	51	3,420	1968-1975 (discontinued)	5	4	86	5	0 (1973)	520	523	1,022 (1970)	6
9484600	Pantano Wash near Vail	457	3,205	1959-current (real-time)	21	7	59	14	1,170 (1997)	3,165	4,342	11,418 (1998)	30
9485000	Rincon Creek	45	3,120	1952-2003 (real-time)	59	5	19	17	14 (1956)	3,492	4,746	21,665 (1993)	35
9485390	Atterbury Wash Tributary at Tucson	5	2,710	1975-1983 (discontinued)	27	3	60	10	41 (1979)	134	153	361 (1982)	7

Table 8.5-2 Streamflow Data for the Tucson AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9485450	Pantano Wash at Broadway Blvd.	599	2,569	1998-current (real-time)	0	6	71	22	9 (2001)	373	2,410	7,055 (2000)	5
9485500	Pantano Wash near Tucson	602	2,494	1940-1977 (discontinued)	No statistics run, less than 3 years of data								
9485550	Arcadia Wash at Tucson	3	2,485	1975-1983 (discontinued)	35	4	51	10	58 (1977)	260	252	556 (1982)	7
9485700	Rillito Creek at Dodge Boulevard	871	2,380	1990-current (real-time)	62	4	20	14	1,585 (2002)	10,710	19,848	100,553 (1993)	14
9485850	Rillito Creek	892	NA	1913-1975 (discontinued)	34	1	40	25	266 (1924)	6,937	11,825	114,897 (1914)	60
9486055	Rillito Creek at La Cholla Blvd	922	2,260	1995-2006 (real-time)	19	3	57	21	0 (1997)	4,159	7,207	23,420 (2000)	10
9486100	Canada Del Oro near Oracle Junction	42	NA	1984-1991 (discontinued)	59	16	11	15	262 (1989)	2,717	3,041	7,983 (1985)	6
9486300	Canada Del Oro near Tucson	250	2,380	1965-1978 (discontinued)	6	0	34	59	39 (1968)	610	1,039	5,402 (1967)	12
9486350	Canada Del Oro below Ina Road	255	2,240	1995-current (real-time)	6	0	80	13	24 (2001)	690	1,285	5,520 (2003)	10
9486500	Santa Cruz River at Cortaro	3,503	2,100	1939-current (real-time)	27	10	39	24	1,706 (1956)	38,655	41,897	182,136 (1993)	53
9486520	Santa Cruz River at Trico Road	3,641	1,910	1989-current (real-time)	41	8	33	19	8,269 (1991)	28,352	30,931	92,787 (1993)	16
9486580	Arivaca Creek at Arivaca	57	3,600	1995-2001 (discontinued)	23	7	22	48	213 (1997)	520	642	1,505 (2000)	5
9486590	Arivaca Creek near Arivaca	NA	3,580	2002-current (real-time)	24	5	65	6	37 (2005)	112	103	160 (2003)	3
9486600	Arivaca Wash near Arivaca	78	NA	1967-1972 (discontinued)	16	4	32	48	320 (1970)	1,099	1,619	3,957 (1971)	4
9486800	Altar Wash near Three Points	463	2,975	1966-current (real-time)	2	4	90	4	363 (1995)	2,880	3,826	14,607 (1970)	21
9487000	Brawley Wash near Three Points	776	2,540	1992-current (real-time)	2	2	90	7	160 (2002)	2,421	3,828	13,499 (1999)	13

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal 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

Table 8.5-3 Flood ALERT Equipment in the Tucson AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
1010	Golder Ranch	Precipitation	3/1/1983	Pima Co FCD
1020	Oracle Ranger Station	Precipitation	3/1/1983	Pima Co FCD
1040	Dodge Tank	Precipitation	3/1/1983	Pima Co FCD
1050	Cherry Spring	Precipitation	3/1/1983	Pima Co FCD
1060	Pig Spring	Precipitation	3/1/1983	Pima Co FCD
1070	Catalina State Park	Precipitation	3/1/1983	Pima Co FCD
1080	Rancho Solano	Precip/Stage	3/1/1983	Pima Co FCD
1090	Mt. Lemmon WS	Weather Station	3/1/1983	Pima Co FCD
1100	Golder Ranch Road Bridge	Precip/Stage	3/1/1983	Pima Co FCD
1200	CDO Ina	Precip/Stage	3/1/1992	Pima Co FCD
1230	Oro Valley Public Works	Precipitation	10/1/2001	Pima Co FCD
1240	Moore Rd / La Cholla	Precipitation	10/1/2001	Pima Co FCD
1250	Pima Wash/Ina	Precip/Stage	NA	Pima Co FCD
1260	Big Wash / RV Blvd (Vistoso)	Precip/Stage	NA	Pima Co FCD
2020	Park Tank	Precipitation	12/1/1996	Pima Co FCD
2030	Italian Trap	Precipitation	7/1/1985	Pima Co FCD
2040	White Tank	Precipitation	6/1/1985	Pima Co FCD
2050	Bellota Ranch	Precipitation	6/1/1985	Pima Co FCD
2070	Chiva Tank	Precip/Stage	6/1/1986	Pima Co FCD
2080	Alamo Tank	Precipitation	6/1/1985	Pima Co FCD
2090	Tanque Verde Guest Ranch	Precip/Stage	6/1/1987	Pima Co FCD

Table 8.5-3 Flood ALERT Equipment in the Tucson AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
2100	Swan Rd	Precipitation	9/1/2000	Pima Co FCD
2110	Tanque Verde Rd @ TV Wash	Precip/Stage	2/1/1988	Pima Co FCD
2120	Tanque Verde Sabino Bridge	Precip/Stage	7/1/1987	Pima Co FCD
2150	Whitetail	Precipitation	7/1/1985	Pima Co FCD
2160	Sabino Dam	Precip/Stage	6/1/1990	Pima Co FCD
2170	Ventana Sunrise	Precip/Stage	11/1/1990	Pima Co FCD
2190	El Marah	Precipitation	8/1/1994	Pima Co FCD
2200	AC at Tanque Verde Road	Stage	3/1/1993	Pima Co FCD
2210	Catalina Booster	Precipitation	2/1/1999	Pima Co FCD
2220	AC Park	Precipitation	7/1/1994	Pima Co FCD
2230	Camino Rinconada	Precipitation	9/1/1994	Pima Co FCD
2240	Molino Canyon	Precipitation	9/1/1994	Pima Co FCD
2300	Well D-37	Precipitation	8/1/1994	Pima Co FCD
2310	Well E-23	Precipitation	8/1/1994	Pima Co FCD
2320	Well C-51	Precipitation	3/1/1993	Pima Co FCD
2330	Kolb Booster	Precipitation	10/1/1994	Pima Co FCD
2350	Rillito Dodge	Precip/Stage	7/1/1987	Pima Co FCD
2360	Rillito La Cholla	Precip/Stage	11/1/1994	Pima Co FCD
2370	Alamo	Precip/Stage	8/1/1986	Pima Co FCD
2380	Ruthraff	Precipitation	9/1/2000	Pima Co FCD
2390	Finger Rock Skyline	Precip/Stage	NA	Pima Co FCD
4100	Manning Camp WS	Weather Station	12/1/1989	Pima Co FCD

Table 8.5-3 Flood ALERT Equipment in the Tucson AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
4110	Rincon Creek	Precip/Stage	6/1/1990	Pima Co FCD
4160	Well E-8	Precipitation	10/1/1994	Pima Co FCD
4180	Pantano Houghton	Precipitation	2/1/1993	Pima Co FCD
4220	Rancho del Lago	Precipitation	3/1/1993	Pima Co FCD
4250	Pantano Vail	Precip/Stage	9/1/1987	Pima Co FCD
4310	Davidson Canyon	Precip/Stage	3/1/1993	Pima Co FCD
6020	Ina Road at SCR	Precip/Stage	4/1/1998	Pima Co FCD
6040	SCR Valencia	Precip/Stage	3/1/1993	Pima Co FCD
6050	SCR Continental	Precip/Stage	3/1/1993	Pima Co FCD
6080	Tubac	Precip/Stage	NA	Pima Co FCD
6110	Avra Valley Air Park	Precip/Stage	3/1/1993	Pima Co FCD
6230	Ajo Detention Basin	Precip/Stage	NA	Pima Co FCD
6240	Country Club/Ajo	Precipitation	9/1/2000	Pima Co FCD
6260	Tucson Electric Power	Precipitation	NA	Pima Co FCD
6270	Pima Air Museum	Precipitation	NA	Pima Co FCD
6280	Wilmot	Precipitation	10/1/2001	Pima Co FCD
6290	Corona	Precipitation	3/1/1993	Pima Co FCD
6310	Keystone Peak Repeater	Repeater/Precip	3/1/1993	Pima Co FCD
6320	Tinaja Ranch WS	Weather Station	3/1/1993	Pima Co FCD
6330	Anamax	Precipitation	3/1/1993	Pima Co FCD
6350	Elephant Head	Precipitation	3/1/1993	Pima Co FCD
6370	Arivaca	Precipitation	NA	Pima Co FCD

Table 8.5-4 Reservoirs and Stockponds in the Tucson AMA

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
1	Arivaca	AZ Game and Fish Dept	2,915	R	State

Source: U.S. Army Corps of Engineers 2005

B. Other Large Reservoirs (50 acre surface area or greater)[2]

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE[1]	JURISDICTION
2	Kino Environmental Restoration Project (KERP)	Pima County Flood Control	84	F,R,S	County
3	Aguirre	U.S.Fish and Wildlife Service	51	F,R	Federal

Source: USGS 2005

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

Total number: 8
Total maximum storage: 600 acre-feet

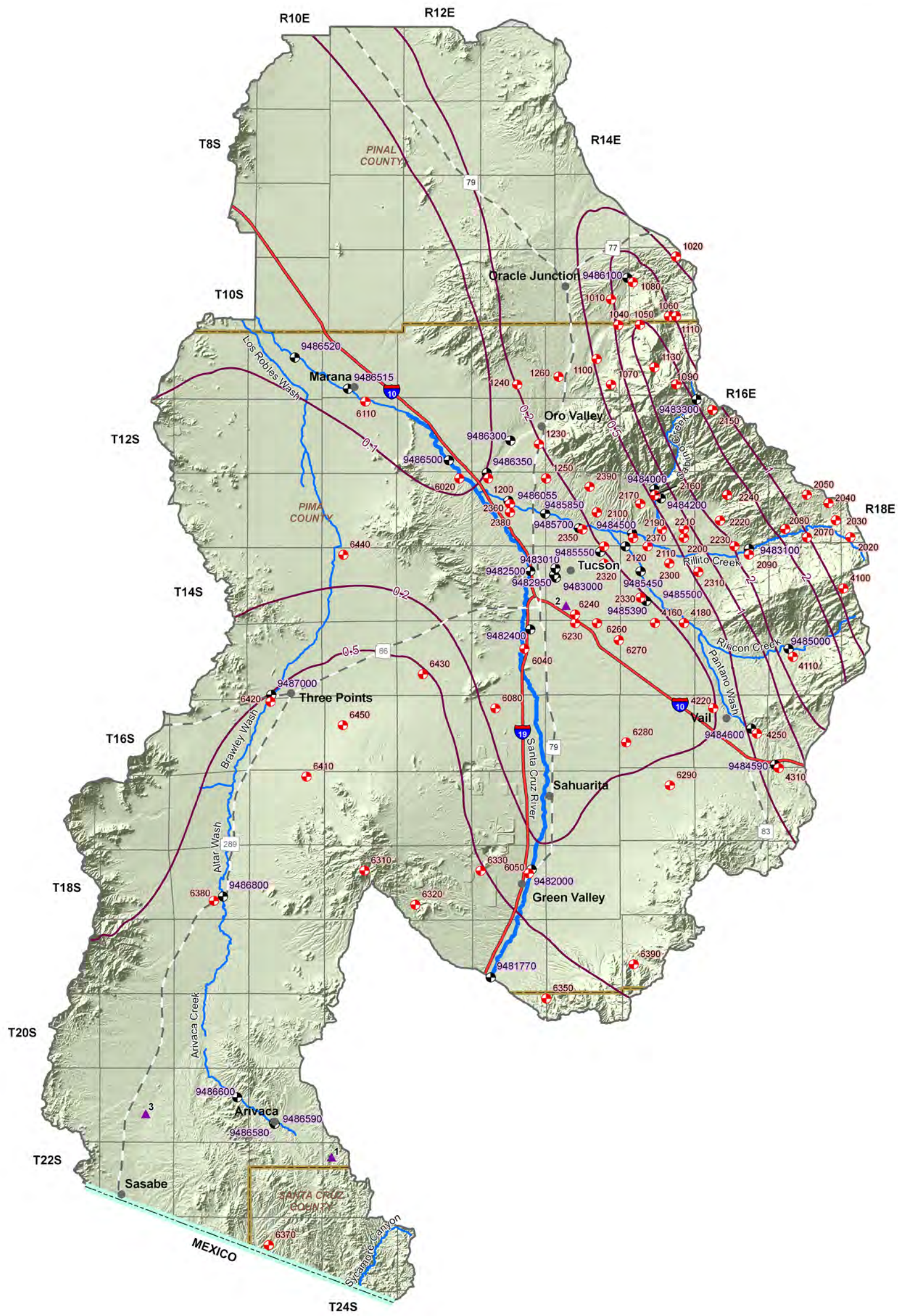
D. Other Small Reservoirs (between 5 and 50 acres surface area)[2]

Total number: 28
Total surface area: 338 acres

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

Total number: 1,538

Notes:
[1]F = Fish & Wildlife pond, R = Recreation, S = Water Supply
[2]Capacity data is not available to ADWR



USGS Annual Runoff Contour for 1951-1980 (in inches)
Stream Channel (width of line reflects stream order)
Large Reservoir
USGS Gage and Station ID
Flood ALERT Equip. & Station ID
International Boundary
COUNTY
Interstate Highway
Major Road
City, Town or Place

0 3 6 Miles

Stream Data Source: ALLRIS, 2005

Figure 8.5-4
Tucson AMA
Surface Water Conditions

8.5.5 Perennial/Intermittent Streams and Springs in the Tucson AMA

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the AMA are shown in Table 8.5-5. The locations of major springs and perennial and intermittent streams are shown on Figure 8.5-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- Perennial streams include Romero Canyon, Sabino Canyon, Cienega Creek and Sycamore Canyon. An approximately 9-mile effluent-dependent reach of the Santa Cruz River is perennial due to discharges from the Roger and Ina Road WWTPs.
- Intermittent streams include the Santa Cruz River in the center of the AMA, and stream segments near the eastern AMA boundary and in Santa Cruz County.
- There are eight major springs with a measured discharge of 10 gallons per minute (gpm) or greater at any time.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 8.5-5B. There are three minor springs.
- Listed discharge rates may not be indicative of current conditions. Measurement dates are not available for six springs and the remainder were measured during or prior to 1982.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from 162 to 187, depending on the database reference.

Table 8.5-5 Springs in the Tucson AMA

A. Major Springs (10 gpm or greater):

Map Key	Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
1	Agua Caliente	321652	1104348	250[2]	6/29/1942
2	Fraguita	313206	1112037	112	5/19/1981
3	Spring No 1	313427	1111925	42[3]	NA
4	Bobo Spring	315630	1103637	20[3]	NA
5	South Spring	315643	1103637	19[3]	NA
6	Bear Wallow	322517	1104352	17	6/29/1982
7	La Cebadilla	321442	1104116	>10[3]	NA
8	Mescal	315643	1103622	10[3]	NA

B. Minor Springs (1 to 10 gpm):

Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
Unnamed	315632	1103640	7	NA
Stone	313400	1104648	3	10/6/1941
Horse	321947	1104024	1	11/13/1952

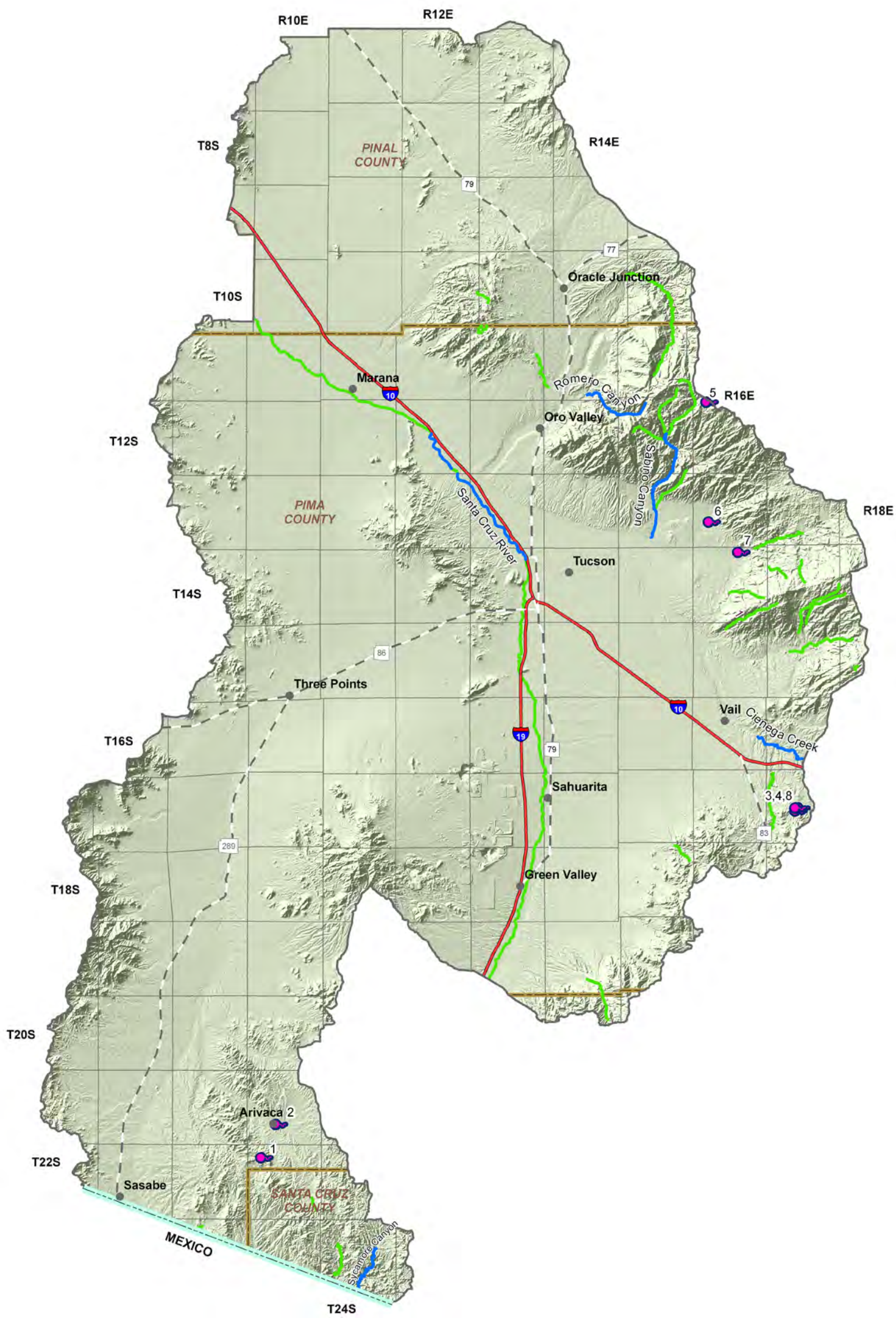
C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 162-187

Notes:

[1]Location datum is NAD 27

[2] More recent measurements range from 10-170 gpm but exact date of measurements are unknown

[3] Data obtained from Pima County



Stream Data Source: AZGF, 1993 & 1997

0 3 6 Miles

Figure 8.5-5
Tucson AMA
Perennial/Intermittent Streams and Major (>10 gpm) Springs

Major (>10 gpm) Springs
Intermittent Stream
Perennial Stream
International Boundary
COUNTY
Interstate Highway
Major Road
City, Town or Place

8.5.6 Groundwater Conditions of the Tucson AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.5-6. Figure 8.5-6 shows aquifer flow direction and water-level change between 1994-1995 and 2004-2005 for the entire Tucson AMA. Figures 8.5-6A-B show depth to water during 2004-2005 and water-level change between 1994-1995 and 2004-2005 for selected wells by sub-basin. Figure 8.5-7 contains hydrographs for selected wells shown on Figures 8.5-6A-B. Figure 8.5-8 shows well yields in five yield categories. Underground Storage Facilities (USF) and Groundwater Savings Facilities (GSF) are shown on Table 8.5-7 with facility name, facility permit number and type, permittee name, permitted acre-feet per year and water source. Locations of USFs and GSFs are shown on Figure 8.5-9. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.5-6 and Figure 8.5-6
- The major aquifers are recent stream alluvium and basin fill including the Fort Lowell Formation and the Tinaja Beds.
- In the Upper Santa Cruz sub-basin groundwater flows from the mountains along the eastern AMA boundary toward the center of the AMA then north-northwest. In the Avra Valley Sub-basin groundwater flows from south to north.

Well Yields

- Refer to Table 8.5-6 and Figure 8.5-8
- As shown on Figure 8.5-8, well yields are generally between 100 and 1,000 gallons per minute (gpm).
- One source of well yield information, based on 1,063 wells, indicates that the median well yield is 520 gpm.

Natural Recharge

- Refer to Table 8.5-6
- Natural recharge in the Tucson AMA is approximately 60,800 acre-feet per year.
- Principal sources of natural recharge are groundwater inflow from the south, infiltration of runoff into stream channels, and mountain front recharge.

Water Level

- Refer to Figure 8.5-6A-B. Water levels are shown for wells measured in 2004-2005.
- The Department annually measures 137 index wells in this AMA; hydrographs for nine index wells are shown on Figure 8.5-7.
- The deepest water level shown is 633 feet in the vicinity of Three Points in the Avra Valley sub-basin (Figure 8.5-6A), and the shallowest is four feet in the eastern portion of the Upper Santa Cruz sub-basin (Figure 8.5-7B).

Recharge Sites

- Refer to Table 8.5-7 and Figure 8.5-9.
- There are 10 active USFs and six active GSFs.
- Total permitted storage capacity for USFs is 293,000 acre-feet per year and total permitted storage capacity for GSFs is 82,986.

Table 8.5-6 Groundwater Data for the Tucson AMA

Basin Area, in square miles:	3,866	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill (Fort Lowell Formation)	
	Basin Fill (Tinaja Beds)	
Well Yields, in gal/min:	Range 1-4,249 Median 630 (879 wells measured)	ADWR GWSI
	Range 2 - 7,977 Median 520 (1,063 wells reported)	ADWR Wells55 (>10-inch diameter)
Estimated Natural Recharge, in acre-feet/year:	60,800	ADWR Tucson TMP
Current Number of Index Wells:	137	
Date of Last Water-level Sweep:	2005 (701 well measurements)	

TMP = Third Management Plan

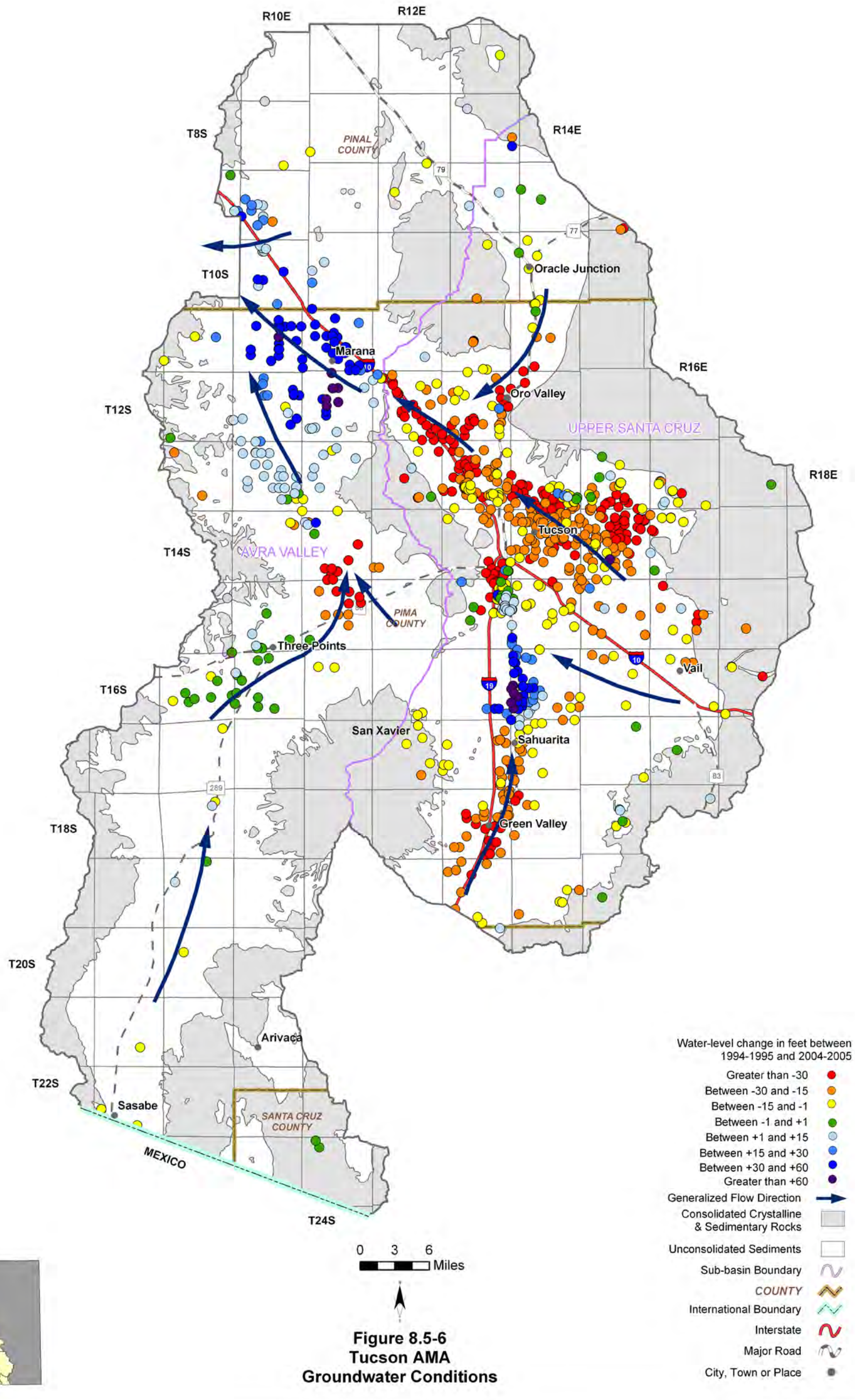


Figure 8.5-6
Tucson AMA
Groundwater Conditions

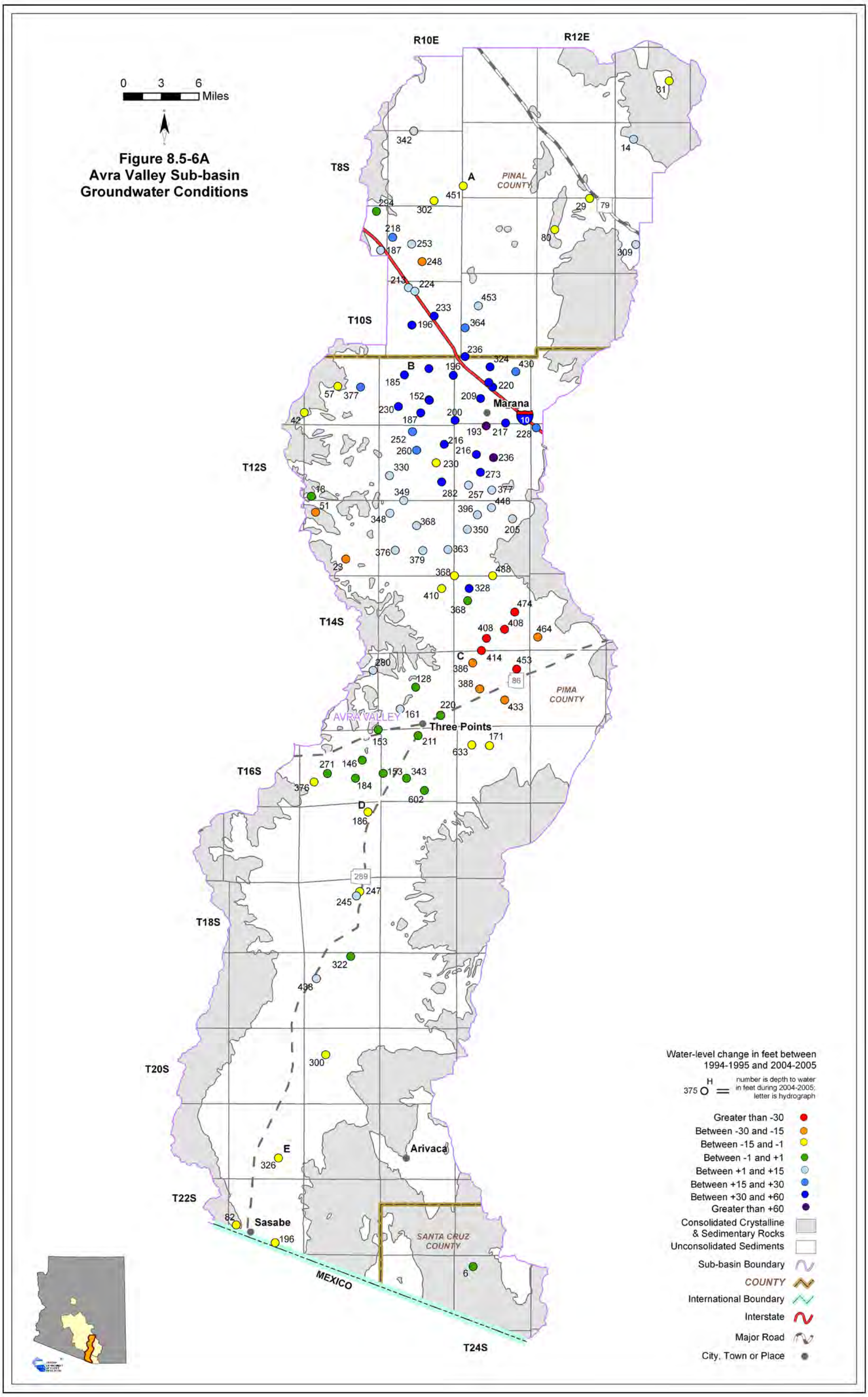


Figure 8.5-6A
Avra Valley Sub-basin
Groundwater Conditions
0 3 6
Miles
R10E
R12E
T8S
T10S
T12S
T14S
T16S
T18S
T20S
T22S
T24S
PINAL COUNTY
PIMA COUNTY
SANTA CRUZ COUNTY
AVRA VALLEY
Marana
Three Points
Arivaca
Sasabe
MEXICO
Water-level change in feet between 1994-1995 and 2004-2005
375 H = number is depth to water in feet during 2004-2005; letter is hydrograph
Greater than -30
Between -30 and -15
Between -15 and -1
Between -1 and +1
Between +1 and +15
Between +15 and +30
Between +30 and +60
Greater than +60
Consolidated Crystalline & Sedimentary Rocks
Unconsolidated Sediments
Sub-basin Boundary
COUNTY
International Boundary
Interstate
Major Road
City, Town or Place

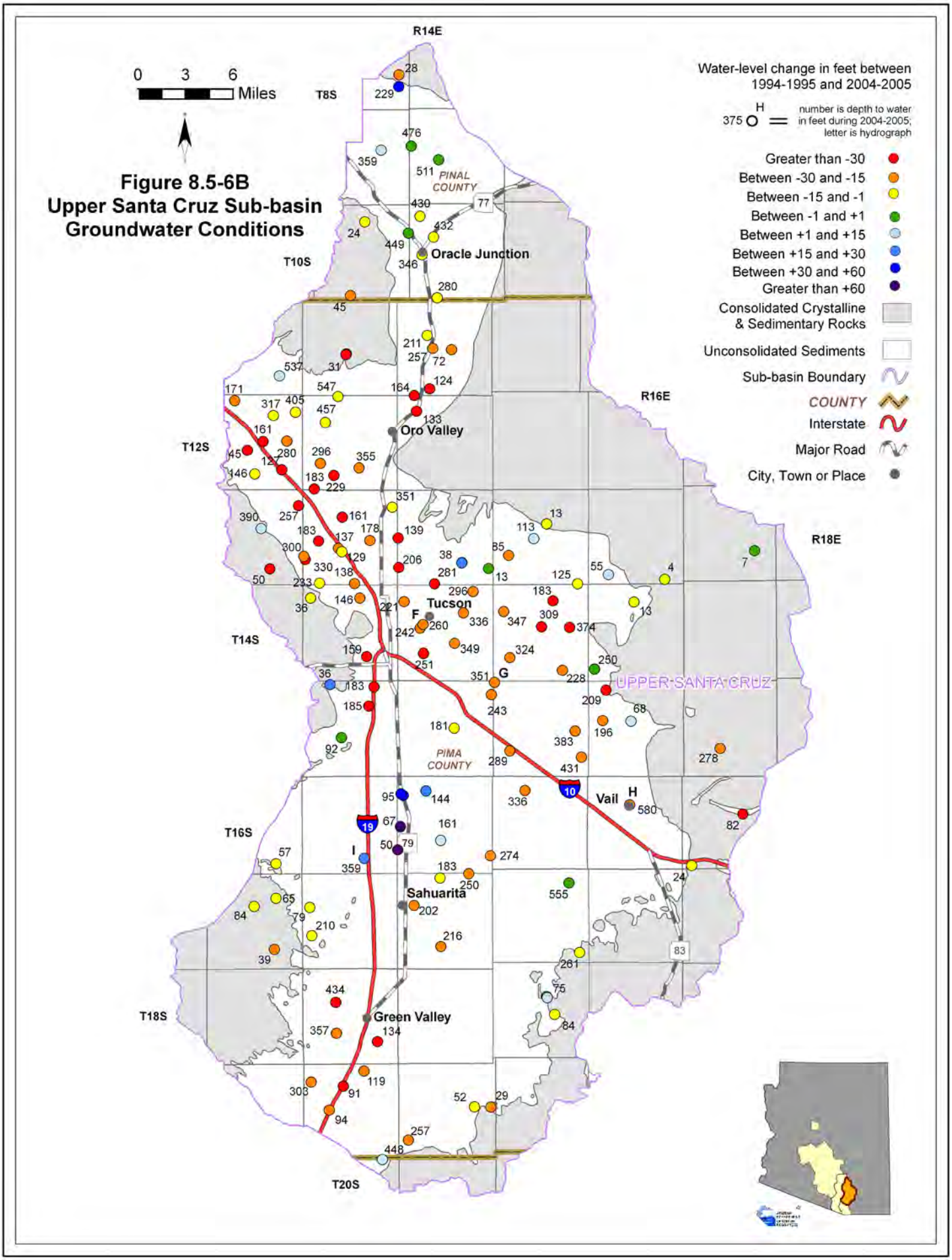


Figure 8.5-6B
Upper Santa Cruz Sub-basin
Groundwater Conditions
0 3 6 Miles
Water-level change in feet between 1994-1995 and 2004-2005
375 H number is depth to water in feet during 2004-2005; letter is hydrograph
Greater than -30
Between -30 and -15
Between -15 and -1
Between -1 and +1
Between +1 and +15
Between +15 and +30
Between +30 and +60
Greater than +60
Consolidated Crystalline & Sedimentary Rocks
Unconsolidated Sediments
Sub-basin Boundary
COUNTY
Interstate
Major Road
City, Town or Place
R14E
R16E
R18E
T8S
T10S
T12S
T14S
T16S
T18S
T20S
PINAL COUNTY
PIMA COUNTY
UPPER SANTA CRUZ
Oracle Junction
Oro Valley
Tucson
Vail
Sahuarita
Green Valley
F
G
H
I

Figure 8.5-7
Tucson Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

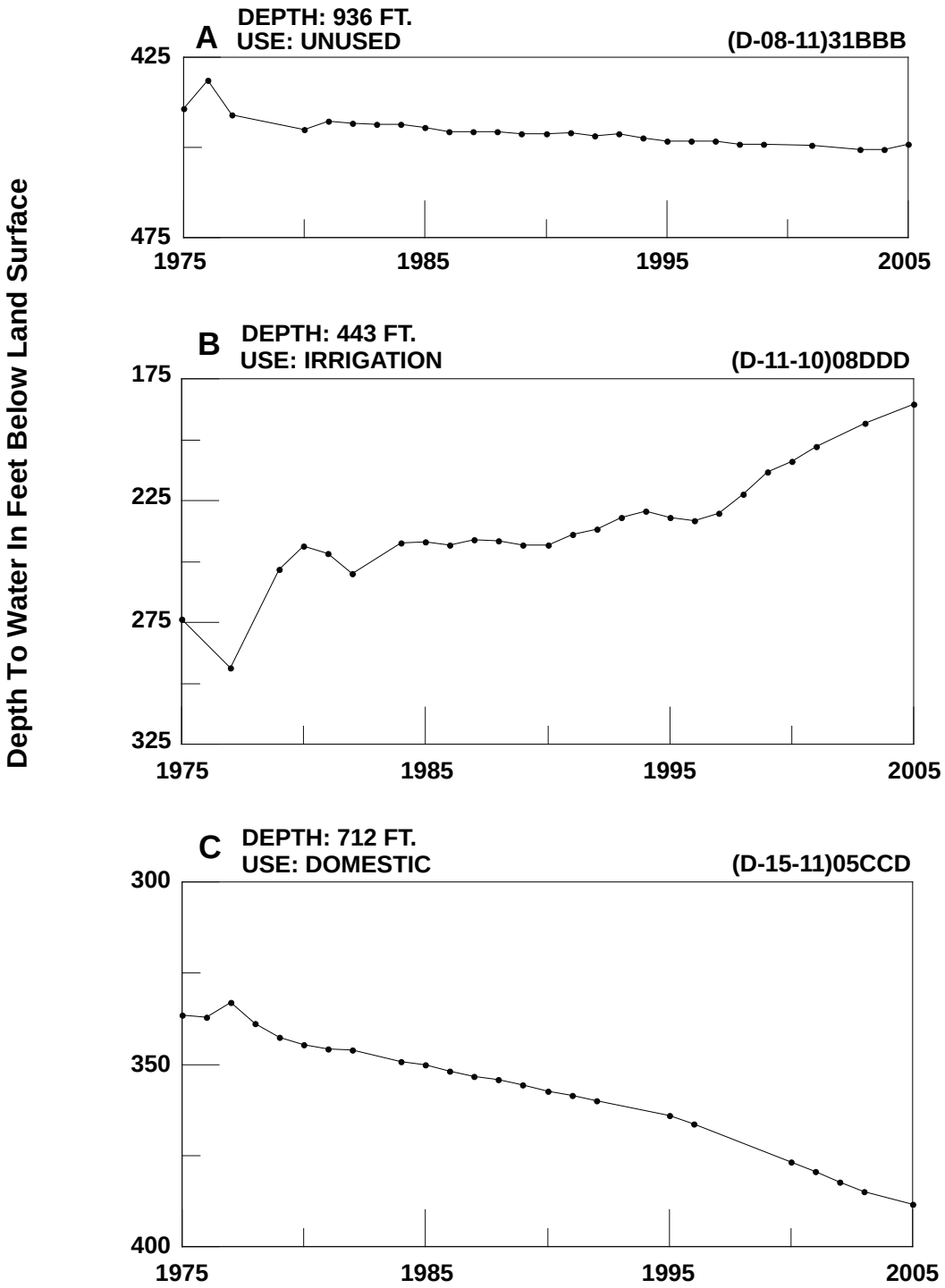


Figure 8.5-7 (cont)
Tucson Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

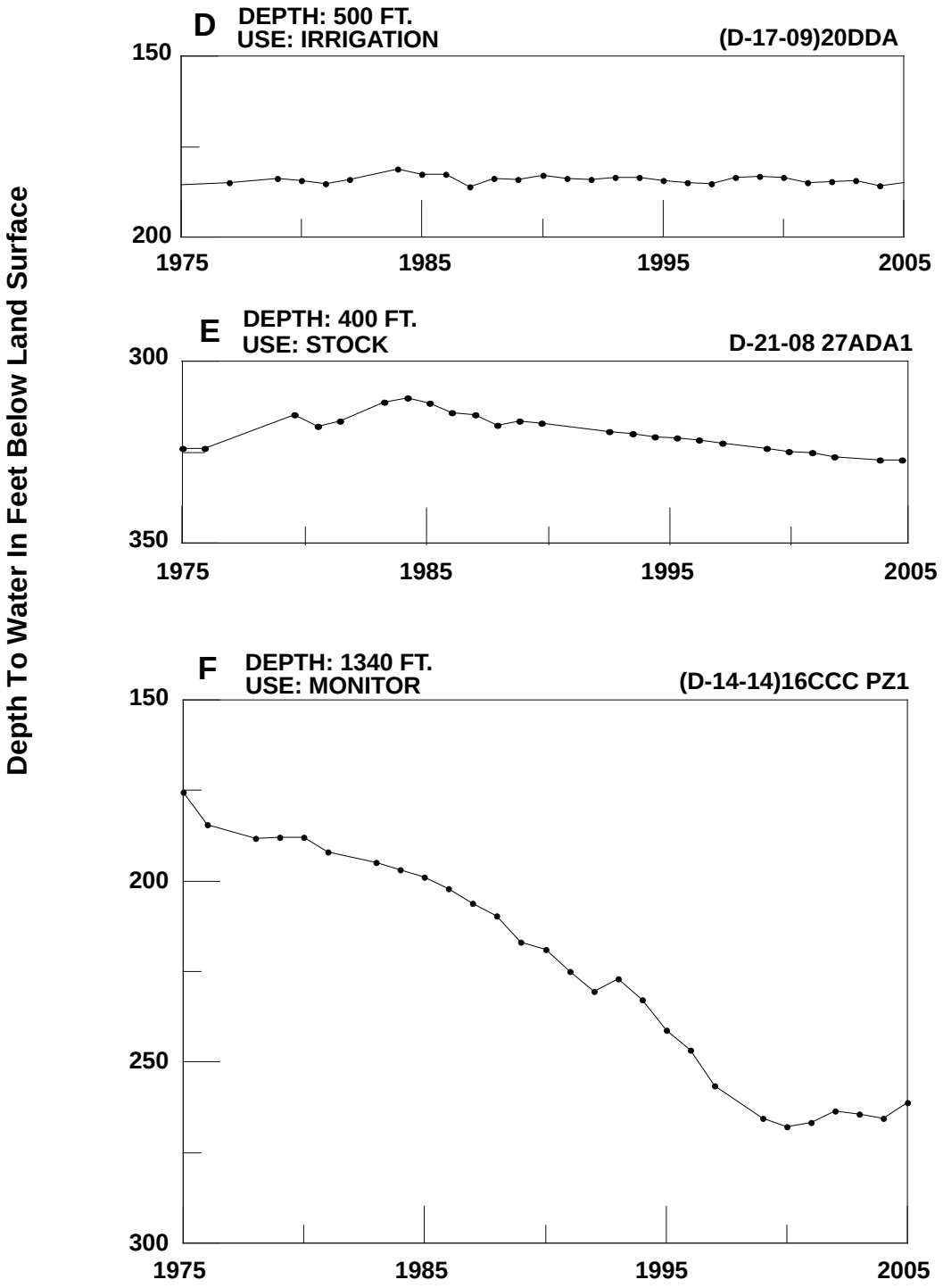
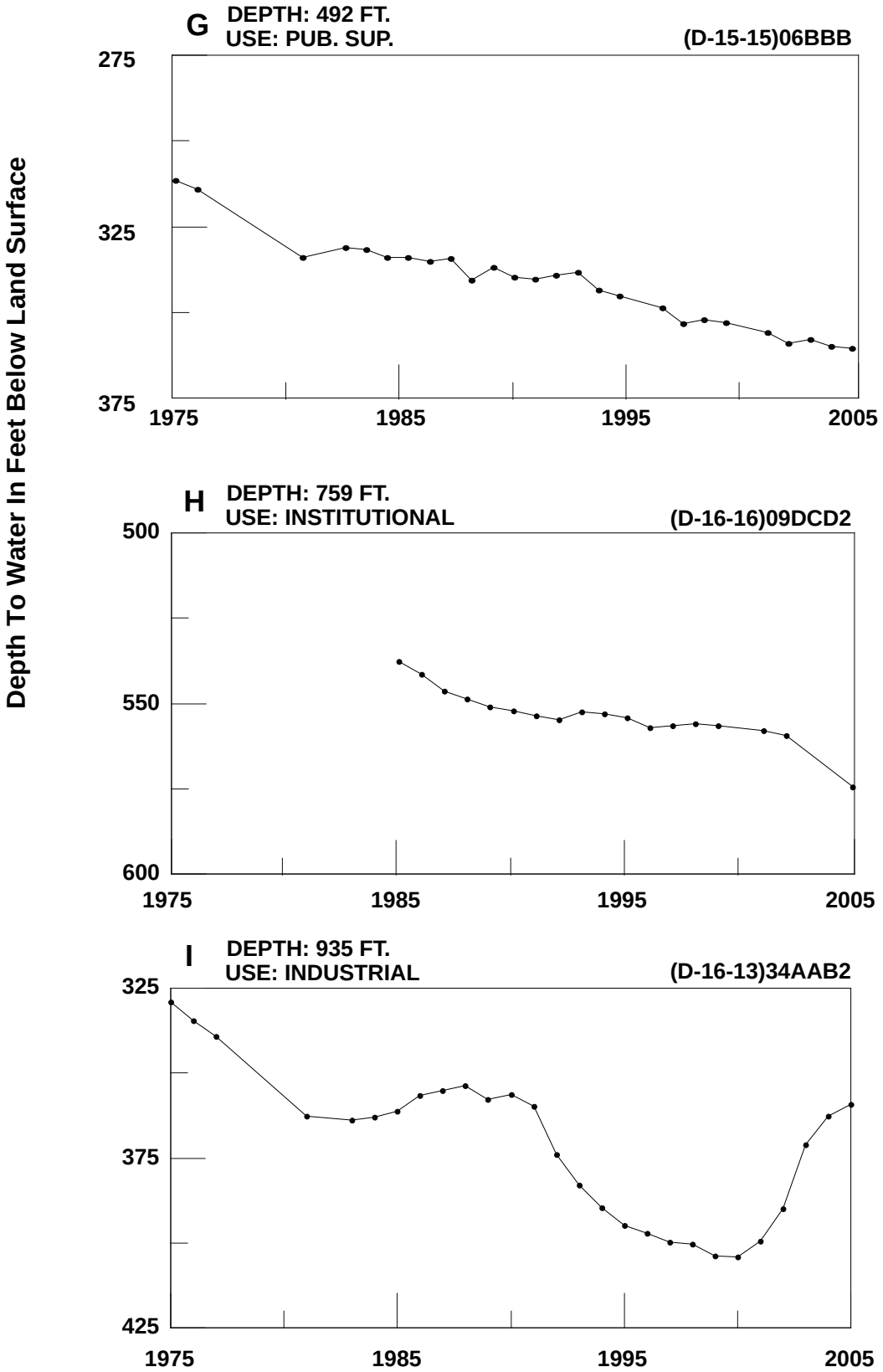


Figure 8.5-7 (cont)
Tucson Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



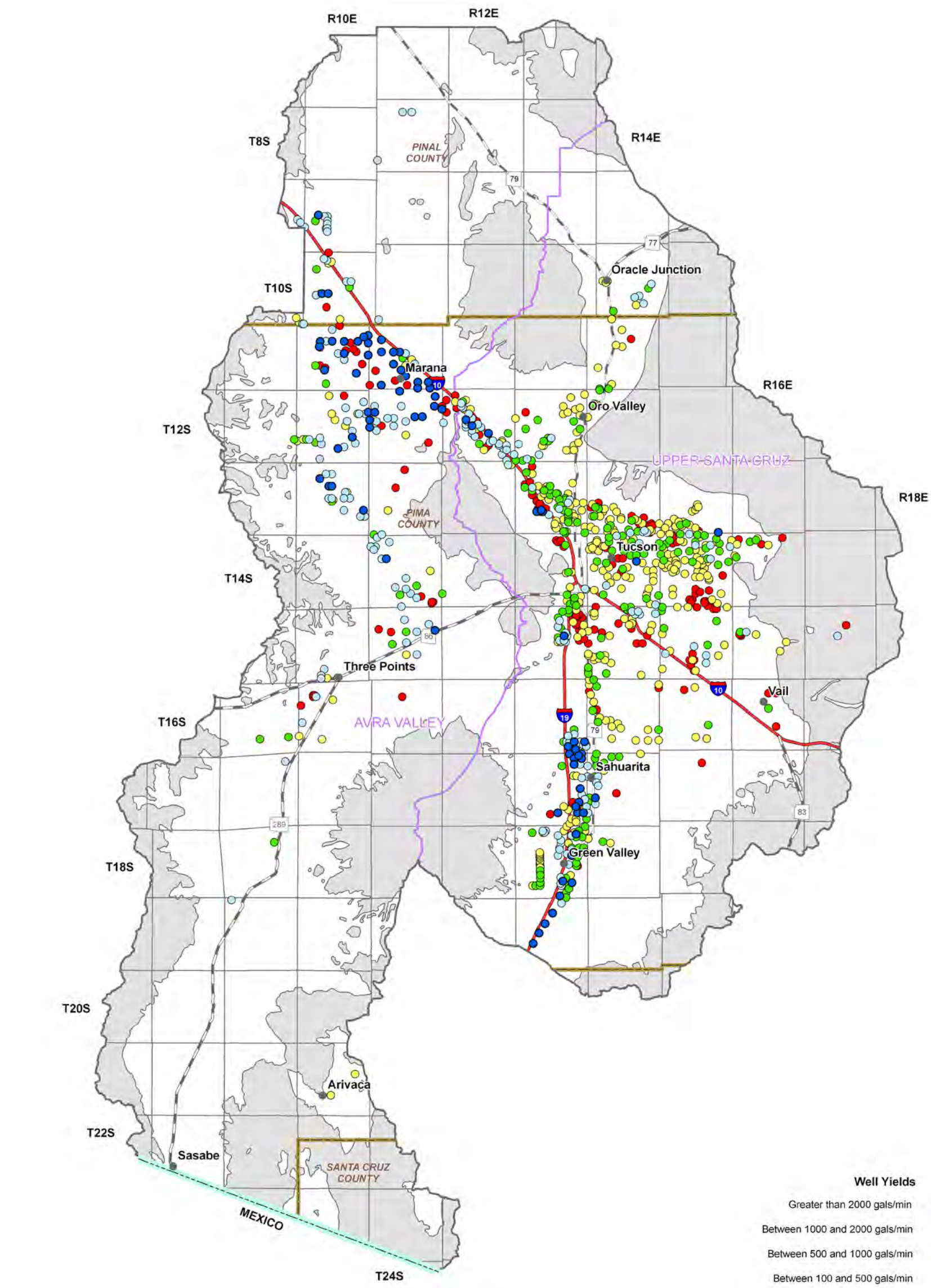


Figure 8.5-8
Tucson AMA
Well Yields

Table 8.5-7 Recharge Sites in the Tucson AMA

FACILITY NAME	FACILITY NUMBER	PERMITTEE NAME	FACILITY TYPE	PERMITTED AF/YEAR	WATER SOURCE
AVRA VALLEY	71-564896.0001	CAWCD	CONSTRUCTED	11,000	C
CENTRAL AVRA VALLEY STORAGE AND RECOVERY PROJECT (CAVSARP)	71-578806.0001	CITY OF TUCSON/TUCSON WATER	CONSTRUCTED	80,000	C
LOWER SANTA CRUZ CONSTRUCTED	71-561366.0002	PCFCD/CAWCD	CONSTRUCTED	50,000	C
LOWER SANTA CRUZ MANAGED	71-591928.0000	CITY OF TUCSON,MARANA,CMID, AVIDD,PIMA COUNTY, ET AL	MANAGED	43,000	E
MARANA HIGH PLAINS	71-563876.0002	PCFCD/TOWN OF MARANA	CONSTRUCTED	600	S,E
PIMA MINE ROAD	71-577501.0001	CAWCD	CONSTRUCTED	30,000	C
ROBSON RANCH QUAIL CREEK	71-581379.0001	ROBSON RANCH QUAIL CREEK	CONSTRUCTED	2,240	E
SANTA CRUZ MANAGED	71-545944.0001	CITY OF TUCSON/USBOR	MANAGED	9,307	E
SOUTHERN AVRA VALLEY STORAGE AND RECOVERY PROJECT (SAVSARP)	71-211276.0000	CITY OF TUCSON/TUCSON WATER	CONSTRUCTED	60,000	C
SWEETWATER	71-520083.0000	CITY OF TUCSON/TUCSON WATER	CONSTRUCTED	6,500	E
TOWN OF SAHUARITA WWTP	71-595209.0000	TOWN OF SAHUARITA	CONSTRUCTED	896	E

B. Groundwater Savings Facilities

PERMITEE/FACILITY NAME	FACILITY NUMBER	PERMITTED AF/YEAR	WATER SOURCE
BKW / MILEWIDE	72-563502.0001	627	C
BKW FARMS	72-538133.0002	16,615	C
CMID	72-538100.0004	20,000	C
FARMERS INVESTMENT COMPANY (FICO)	72-584465.0001	22,000	C
KAI - AVRA	72-564430.0001	12,513	C
KAI FARMS - RED ROCK	72-558092.0002	11,231	C

Notes:
C - CAP
E - Effluent
S - Surface Water
AVIDD - Avra Valley Irrigation and Drainage District
CAWCD - Central Arizona Water Conservation District

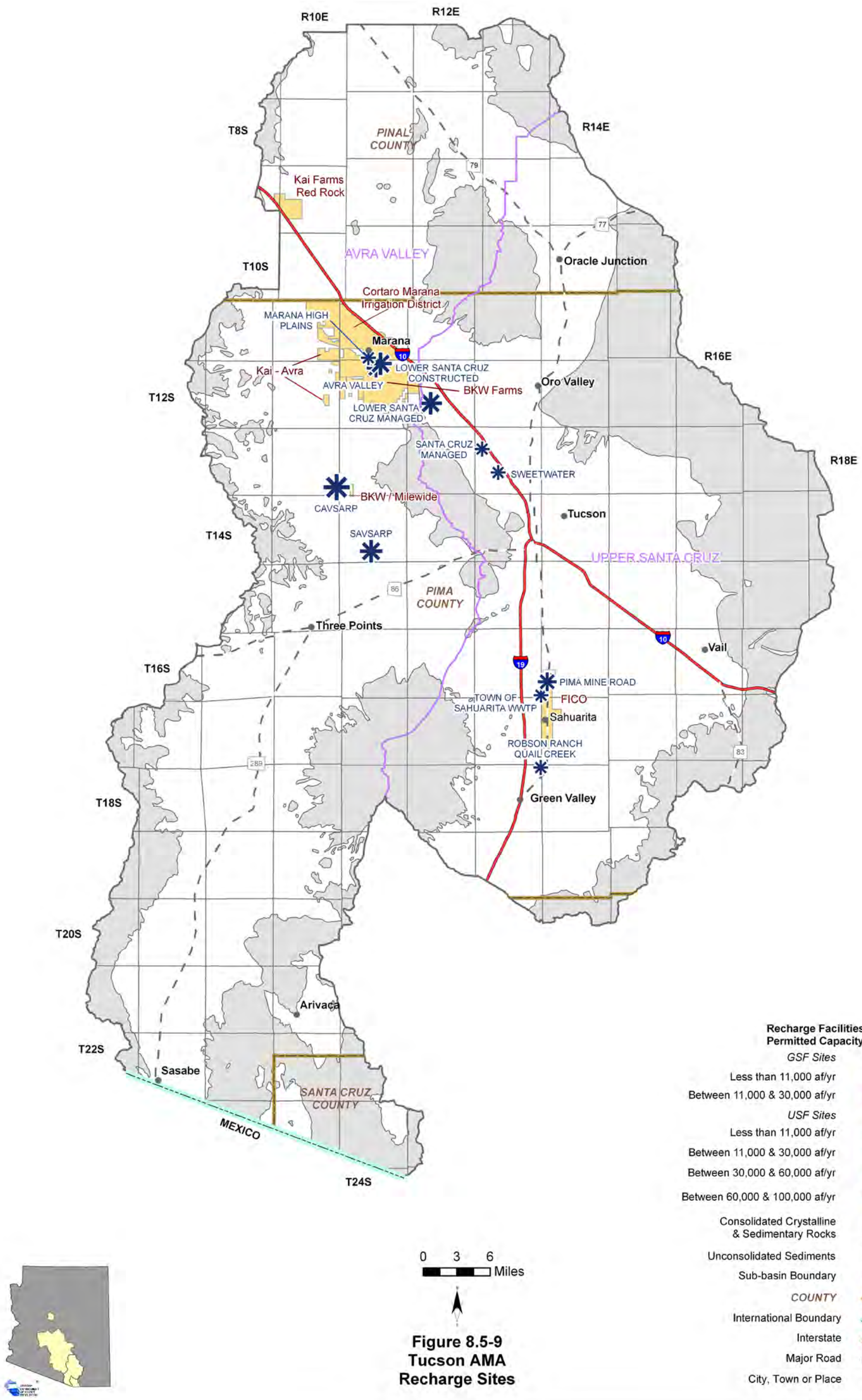


Figure 8.5-9
Tucson AMA
Recharge Sites

8.5.7 Water Quality Exceedences and Contamination Sites in the Tucson AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 8.5-8A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 8.5-8B. Figure 8.5-10 shows the location of water quality occurrences keyed to Table 8.5-8. Figure 8.5-11 shows the located of contamination sites in the Tucson AMA. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. All community water systems are regulated under the Safe Drinking Water Act and treat water supplies to meet drinking water standards. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Well, spring and mine sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 8.5-8A.
- Three hundred and seventy-one sites have parameter concentrations that have equaled or exceeded DWS.
- Parameters equaled or exceeded include arsenic, lead, nitrates, fluoride, beryllium, cadmium, organics, mercury, manganese, copper, chromium, zinc, total dissolved solids, radionuclides, selenium and nitrates.

Lakes and Streams with impaired waters

- Refer to Table 8.5-8B.
- Water quality standards were equaled or exceeded in three lakes.
- Arivaca and Rose Canyon Lakes are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) Program. The final TMDL document has been completed for both.

Effluent Dependent Reaches

- Refer to Figure 8.5-10
- A portion of the Santa Cruz River in this AMA is effluent dependent.

Contamination Sites

- Refer to Figure 8.5-11 and Table 8.5-9
- There are 38 Voluntary Remediation Program sites, seven Water Quality Assurance Revolving Fund sites, one active National Priority List site and one Department of Defense site.
- The most common contaminants are Volatile Organic Compounds (VOCs).

Table 8.5-8 Water Quality Exceedences in the Tucson AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	7 South	10 East	1	1	As, Pb
2	9 South	10 East	5	1	F
3	9 South	10 East	18	1	As, F
4	9 South	9 East	24	2	NO3
5	9 South	10 East	28	1	As
5	9 South	10 East	29	1	F
6	10 South	11 East	15	1	As
7	10 South	14 East	19	1	Cd
8	10 South	14 East	23	2	Cd
9	10 South	14 East	27	1	Cd
9	10 South	14 East	34	1	Cd
10	11 South	14 East	10	1	Cd, NO3, Pb
10	11 South	14 East	11	1	Pb
11	10 South	10 East	34	3	NO3
12	10 South	10 East	32	1	Be, NO3
13	11 South	11 East	18	1	NO3
13	11 South	11 East	19	1	NO3
14	11 South	10 East	14	1	NO3, Pb
15	11 South	11 East	20	1	Organics
15	11 South	11 East	29	1	As
16	11 South	11 East	21	1	As
17	11 South	13 East	22	1	Mn
18	11 South	10 East	24	2	NO3
19	11 South	11 East	28	1	NO3
20	11 South	9 East	27	1	NO3
21	11 South	11 East	30	1	NO3
22	11 South	11 East	31	1	NO3
23	11 South	11 East	35	2	NO3, Organics
23	12 South	11 East	2	1	NO3
24	12 South	12 East	6	1	NO3
25	12 South	13 East	1	1	Be
26	12 South	14 East	7	1	Be, Cd
27	12 South	12 East	8	1	Organics
28	12 South	13 East	11	1	Be
28	12 South	13 East	15	1	Be
29	12 South	13 East	12	2	Be, Cd
30	12 South	11 East	9	1	NO3
31	12 South	12 East	11	1	F
31	12 South	12 East	13	1	As, F
32	12 South	10 East	9	1	Organics
33	12 South	13 East	13	1	Be
33	12 South	14 East	18	1	Be, Cd
34	12 South	11 East	17	1	NO3
35	12 South	12 East	21	1	Organics
36	12 South	12 East	24	2	Be
36	12 South	12 East	25	1	Organics
36	12 South	12 East	26	1	Organics
37	12 South	11 East	26	1	Cd, NO3
38	12 South	13 East	35	2	Be
38	13 South	13 East	2	1	Mn
39, 41	13 South	13 East	6	2	Be, Mn
40	13 South	11 East	4	1	Pb
42	13 South	13 East	8	2	Cd, NO3
42	13 South	13 East	9	1	NO3
42	13 South	13 East	17	1	Mn
42, 44	13 South	13 East	16	2	Cd, Mn
43	13 South	13 East	20	3	Cd, Cr, Mn, NO3
43	13 South	13 East	21	3	Mn, NO3
43, 46	13 South	13 East	29	3	As, Cd, Cr, Hg, Mn, NO3, Pb, Se
44	13 South	13 East	15	1	F, Mn
45	13 South	13 East	23	1	Organics
46	13 South	13 East	28	11	As, Cd, Cu, Hg, Mn, NO3, Pb, Se

Table 8.5-8 Water Quality Exceedences in the Tucson AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
46	13 South	13 East	33	3	Hg, Mn, NO3
46	13 South	13 East	34	2	Mn, NO3, Pb
47	13 South	14 East	19	1	Organics
47	13 South	14 East	29	1	Be
48	13 South	14 East	28	2	NO3, Organics
48	13 South	14 East	32	2	Be, Mn
49	13 South	11 East	29	1	Pb
50	13 South	13 East	27	2	As, Organics
51	13 South	14 East	26	6	Mn, NO3
51	13 South	14 East	34	1	Pb
52	13 South	16 East	28	1	F
53	14 South	13 East	3	3	Mn, Pb
54	13 South	13 East	26	1	Pb
55	13 South	11 East	31	3	Mn, NO3, Pb
56	14 South	11 East	5	2	Cd, Mn, NO3
56	14 South	11 East	8	2	As
57	13 South	14 East	31	1	As, Mn
58	13 South	14 East	36	1	Mn
58	14 South	14 East	1	1	Be
59	14 South	14 East	2	1	Mn, Pb, Zn
60	14 South	15 East	5	4	Mn, Pb, Zn
60	14 South	15 East	8	7	Cr, Mn, Pb, Se
60	14 South	15 East	17	2	Mn, Pb, Zn
60, 61	14 South	15 East	7	8	Cd, Mn, Organics, Pb, Zn
61	14 South	14 East	11	2	Mn, Pb
61	14 South	14 East	12	2	Mn, Pb
62	14 South	15 East	6	2	Mn
63	14 South	14 East	16	3	Mn, NO3, Pb
64	14 South	14 East	4	4	Cu, Mn, Pb
64	14 South	14 East	5	1	Pb
64	14 South	14 East	8	1	NO3
64	14 South	14 East	9	2	Pb
65	14 South	15 East	4	1	Pb
66	14 South	15 East	11	1	Pb
67	14 South	16 East	6	1	As, Mn, TDS
68	13 South	15 East	32	1	Pb
69	14 South	14 East	21	1	Mn, Pb
69	14 South	14 East	22	1	Pb
70	14 South	13 East	11	1	Mn, NO3
70	14 South	13 East	12	2	Organics
70	14 South	13 East	14	7	As, Mn, NO3, Pb
70	14 South	13 East	23	2	As, F
71	14 South	15 East	15	1	Mn, Pb
71	14 South	15 East	22	1	Pb
72	14 South	14 East	20	1	Cd
73	14 South	14 East	25	1	Mn
74	14 South	12 East	30	1	As
75	14 South	14 East	29	2	As, Mn, Pb
76	14 South	13 East	34	1	NO3
76	14 South	13 East	35	2	Mn, NO3
76	14 South	13 East	36	1	Pb
76	15 South	13 East	1	8	As, Organics
76	15 South	13 East	2	7	As, Mn, Organics
76	15 South	13 East	11	7	As, Organics
76	15 South	14 East	7	1	Organics
76, 83	15 South	13 East	12	11	As, Organics
77	14 South	13 East	25	2	As
77	14 South	14 East	30	1	F
77	14 South	14 East	31	2	NO3
78	14 South	15 East	34	6	Cd, Hg, Mn, Pb, TDS, Zn
78	14 South	15 East	35	1	Pb
78	15 South	15 East	2	4	Mn, Pb

Table 8.5-8 Water Quality Exceedences in the Tucson AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
78	15 South	15 East	3	1	Mn, Pb, Zn
79	14 South	15 East	33	3	Mn
80	15 South	14 East	2	1	Be, Mn
80	15 South	14 East	3	5	Be, Cr, Mn
81	15 South	14 East	4	1	As
81	15 South	14 East	9	1	As, Mn
82	15 South	13 East	10	1	NO3
83	15 South	13 East	13	17	As, F, Mn, Organics
83	15 South	14 East	18	5	As, F, NO3
83	15 South	14 East	19	2	As, Organics
84	15 South	15 East	6	1	NO3
85	15 South	11 East	15	1	Pb
86	15 South	14 East	17	3	As, Organics
87	15 South	13 East	23	1	As
88	15 South	17 East	16	1	Mn
88	15 South	17 East	21	1	F
89	15 South	14 East	13	2	Mn, Pb
89	15 South	14 East	15	2	As, Be
89	15 South	14 East	22	1	As
89	15 South	14 East	23	4	As, Cd, Cr, Mn, Pb, Zn
90	15 South	16 East	18	3	Mn, Pb
91	15 South	16 East	29	1	As, Mn
92	15 South	13 East	26	1	As
92	15 South	13 East	27	3	As, Mn
93	15 South	15 East	29	1	As
94	15 South	10 East	35	1	Cd
95	15 South	10 East	33	1	NO3
96	16 South	10 East	8	3	NO3, TDS
97	15 South	13 East	35	1	As
97	16 South	13 East	2	1	As
98	16 South	15 East	6	1	NO3
98	16 South	15 East	7	1	NO3
99	15 South	14 East	31	2	NO3
99	16 South	14 East	6	5	As, NO3
99, 100	16 South	14 East	7	3	NO3
100	16 South	14 East	17	1	NO3
100	16 South	14 East	18	1	NO3
101	16 South	14 East	20	1	NO3
101	16 South	14 East	21	1	NO3
101	16 South	14 East	28	1	NO3
101	16 South	14 East	29	1	NO3
102	17 South	15 East	6	1	Pb
103	17 South	14 East	6	2	NO3, Organics
104	17 South	14 East	2	1	Pb
105	17 South	14 East	4	1	NO3
106	17 South	10 East	13	2	Mn, Rad
107	17 South	14 East	9	1	NO3
108	17 South	12 East	11	1	NO3
109	17 South	13 East	12	1	As
109	17 South	13 East	13	1	As
109	17 South	13 East	14	1	Mn
109	17 South	14 East	7	1	F
110	17 South	14 East	17	1	NO3
111	17 South	8 East	9	1	Mn
112	17 South	13 East	19	1	As
113	17 South	14 East	21	3	NO3
114	17 South	14 East	22	1	As
115	17 South	13 East	24	1	NO3
115	17 South	13 East	25	1	As
115	17 South	13 East	26	2	NO3, Organics
116	17 South	14 East	19	2	As, F
117	17 South	8 East	19	1	Mn

Table 8.5-8 Water Quality Exceedences in the Tucson AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
118	18 South	13 East	12	1	NO3
119	18 South	13 East	22	1	Organics
119	18 South	13 East	23	1	As
119	18 South	13 East	24	2	NO3
120	18 South	13 East	13	2	NO3, Organics
121	18 South	15 East	22	1	F
122	18 South	15 East	34	1	F
123	19 South	11 East	8	1	As
124	20 South	8 East	35	1	As, F
125	22 South	10 East	15	1	Mn

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[3]	Parameter(s) Exceeding Use Standard[2]
a	Lake	Rose Canyon Lake	NA	7.2	A&W, Agl, FBC	pH
b	Lake	Lakeside Lake	NA	15	FC	DO, Ammonia, N, P, Chlorophyll
c	Lake	Arivaca Lake	NA	118	FC	Hg

Notes:

[1] Water quality samples collected between 1975 and 2004.

[2] As = Arsenic
Be = Beryllium
Cd = Cadmium
Cr = Chromium
Cu = Copper
DO = Dissolved Oxygen
F = Fluoride
Hg = Mercury
Mn = Manganese
N = Nitrogen
P = Phosphorus
Pb = Lead
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = radionuclides
Se = Selenium
TDS = Total Dissolved Solids
Zn = Zinc

[3] A&W = Aquatic and Wildlife
Agl = Agriculture
FBC = Full Body Contact
FC = Fish Consumption

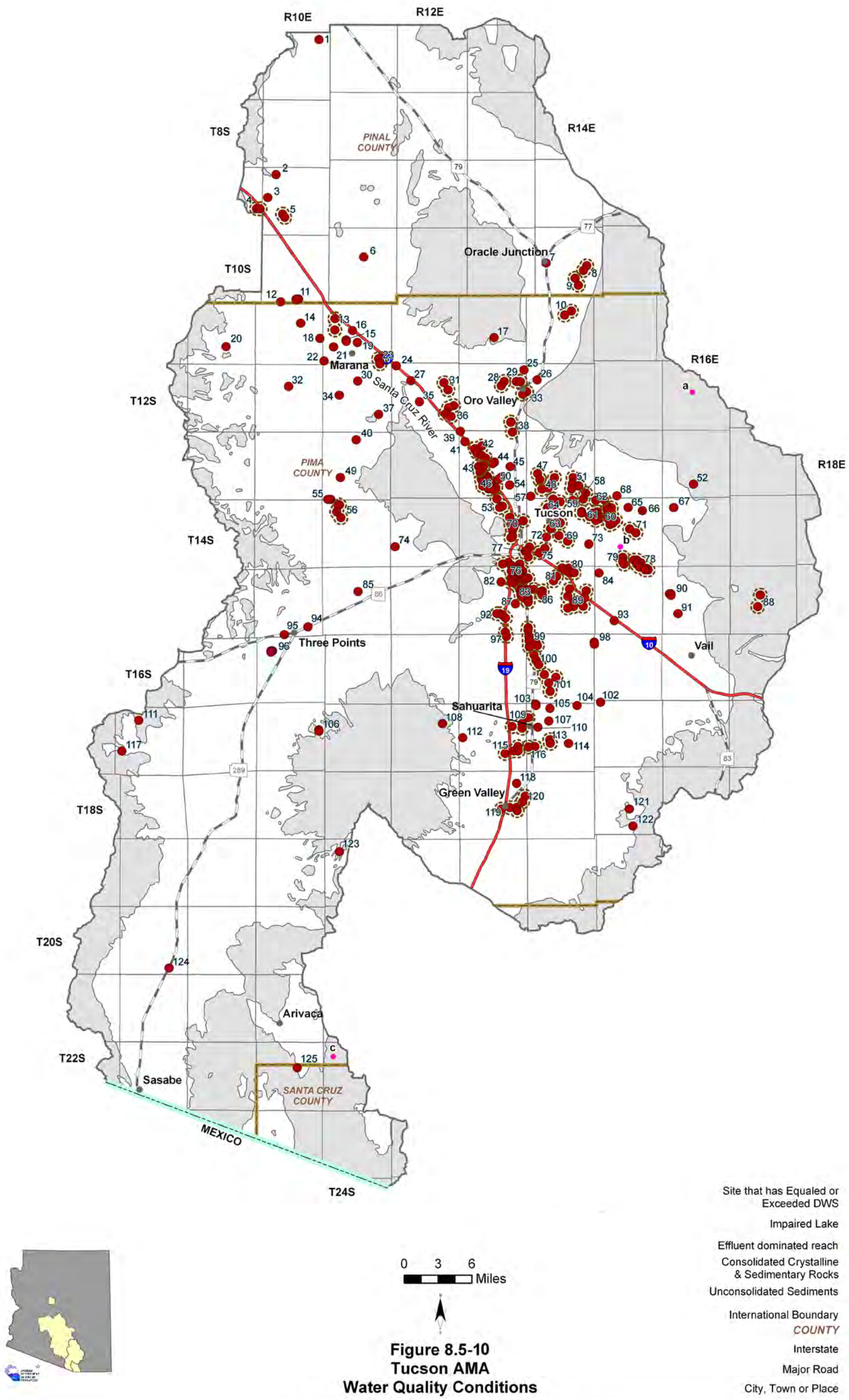


Figure 8.5-10
Tucson AMA
Water Quality Conditions

Table 8.5-9 Contamination Sites in the Tucson AMA

Map Key	SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites		
H	35 E. Toole	Soil/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX), and Polycyclic aromatic hydrocarbons (PAHs) Groundwater/To be determined
J	7500 East Broadway	Soil/Tetrachloroethene (PCE) and Trichloroethene (TCE)
O	Ansell Inc.	Groundwater/Chromium
none	AZ Portland Cement Co.	Soil/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX) and Polycyclic aromatic hydrocarbons (PAHs)
S	Former Circle K Store #01046	Soil/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX) and Hydrocarbons
P	HILP Dross	Soil/Aluminum dross
T	Los Reales/Southwest Disposal Area	Soil/Dichloroethene (DCE)
H	Rio Nuevo Landfill Stabilization Project	Soil/To be determined
D	SFFP Silvercroft Wash Release	Soil & Groundwater/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX)
none	Silver Creek II Subdivision	Soil & Groundwater/Benzene, Toluene, Ethyl benzene, and Xylene (BTEX), Methyl Tertiary-butyl ether (MTBE) and Gasoline additives
none	Tucson Compressor Station	Soil & Groundwater/Chromium
K	Union Pacific Railroad 22nd St. Yard	Soil/Diesel fuel
L	Union Pacific Railroad 31st Street	Soil & Groundwater/Diesel fuel
L	Union Pacific Railroad 34th Street	Soil & Groundwater/Diesel fuel
L	Union Pacific Railroad 36th Street	Soil/Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl benzene, and Xylene (BTEX), Polycyclic aromatic hydrocarbons (PAHs) and Benzene

Table 8.5-9 Contamination Sites in the Tucson AMA (cont)

MAP KEY	SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Water Quality Assurance Revolving Fund (WQARF) Sites		
E	7th Street and Arizona Avenue	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE) and Dichloroethene (DCE)
G	Broadway-Pantano	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE), and Vinyl chloride
R	Los Reales Landfill	Groundwater/Tetrachloroethene (PCE) and Trichloroethene (TCE)
B	Miracle Mile	Groundwater/Trichloroethene (TCE) and Chromium
F	Park-Euclid	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE) and Dichloroethene (DCE)
A	Shannon Road El Camino de Cerro	Soil/Lead Groundwater/Tetrachloroethene (PCE), trichloroethene (TCE), Dichloroethene (DCE), Vinyl chloride and Benzene
C	Silverbell Jail Annex Landfill	Groundwater/Tetrachloroethene (PCE), Trichloroethene (TCE), Dichloroethene (DCE) and Vinyl chloride
National Priority List (NPL) Superfund Sites		
Q	Tucson International Airport Area[1]	Soil/Polychlorinated biphenyls (PCBs) and Metals Groundwater/Trichloroethene (TCE), Dichloroethene (DCE), Chloroform and Chromium
Department of Defense (DOD) Sites		
N	Davis-Monthan Air Force Base	Soil/Petroleum hydrocarbons, Benzene, Toluene, Ethyl benzene, and Xylene (BTEX), Methane gas, Volatile Organic Compounds (VOCs) and Metals

Table 8.5-9 Contamination Sites in the Tucson AMA (cont)

MAP KEY	SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Resource Conservation and Remediation Act Sites		
U	Hughes/Raytheon/USAF	Groundwater & Soil/Volatile Organic Compounds (VOCs), Metals
M	Kinder Morgan	Groundwater/Petroleum

Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

[1] Tucson International Airport Area Site includes: Air Force Plant 44 (AFP-44)/Raytheon Project Area, Airport Property Project Area, Arizona Air National Guard (AANG) 162nd Project Area, Texas Instruments (formerly Burr-Brown) Project Area, Tucson Airport Remediation Project (TARP), West-Cap Project Area and West Plume B Project Area

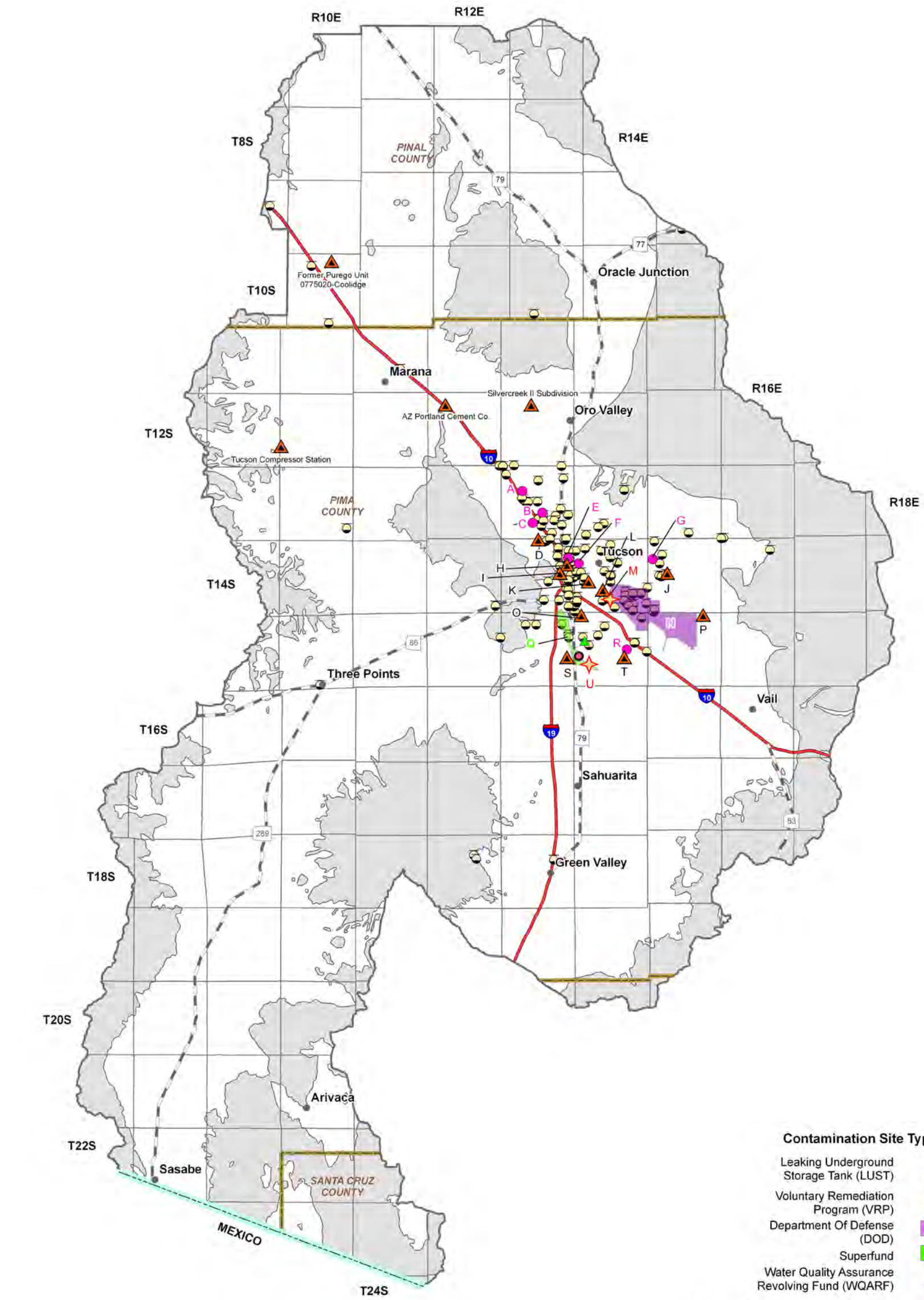


Figure 8.5-11
Tucson AMA
Contamination Sites

8.5.8 Cultural Water Demands in the Tucson AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.5-10. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.5-11. Figure 8.5-12 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.5-10 and Figure 8.5-12.
- Population increased from 518,438 in 1980 to 853,423 in 2000 and projections suggest an increase to over 1.7 million residents by 2050.
- Industrial water demand has and continues to be met almost exclusively by groundwater supplies. The major industrial users in the AMA are metal mines. In 2003 metal mines accounted for approximately 57% of the AMA's total industrial water demand.
- Municipal water demand is the major demand sector and is steadily growing, however; much of that growth is being offset with non-groundwater sources. The 1991-1995 average annual non-groundwater use in the municipal sector reflects direct delivery of CAP water. The 2001-2003 non-groundwater average annual use reflects CAP use through recharge and recovery. Effluent is also used to meet municipal demand.
- Agricultural demand accounts for approximately 30% of the water demand in the AMA.
- As of 2003 there were 6,443 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 4,930 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.5-11.
- 24 wastewater treatment facilities were identified in the AMA.
- A variety of effluent disposal methods are used in the AMA, with the majority of effluent discharged into the Santa Cruz River, stored at permitted recharge projects and used for golf course irrigation.
- More than 74,000 acre-feet of effluent is treated/generated annually in the AMA.

Table 8.4-10 Cultural Water Demands in the Tucson AMA[1]

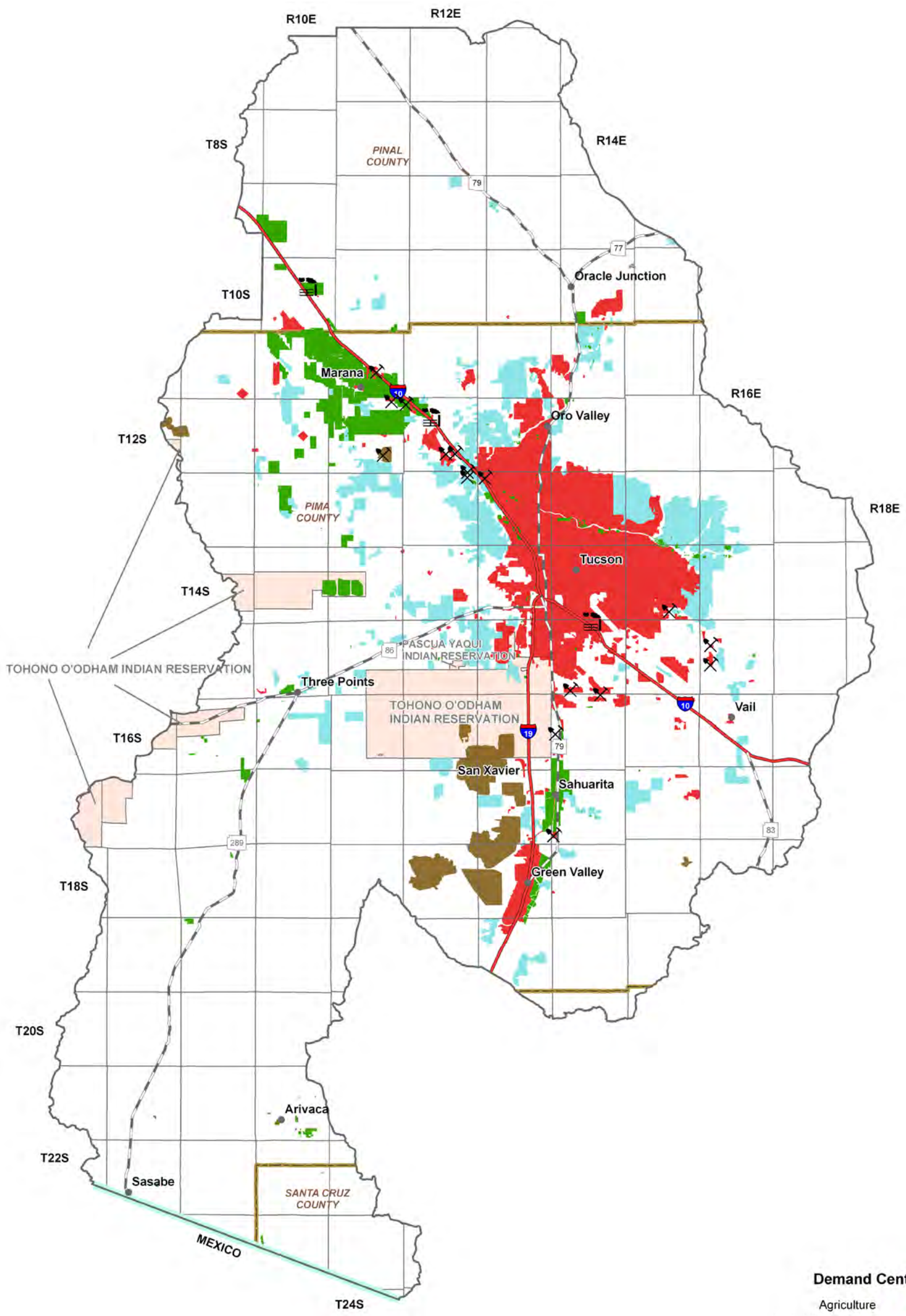
Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		3,240[5]	1,769[5]	409,000			<1,000			ADWR[6] (1994)
1972										
1973										
1974										
1975										
1976				329,000			<1,000			
1977										
1978										
1979										
1980	518,438									
1981	532,131	485	268	264,000			<1,000			
1982	545,824									
1983	559,517									
1984	573,211									
1985	579,444									
1986	605,842	422	621	274,400			6,600			ADWR (2008)
1987	633,324									
1988	641,562									
1989	652,891									
1990	660,709									
1991	668,402	554	876	122,300	60,900	85,000	20,100	60	5,700	
1992	688,855									
1993	708,890									
1994	743,184									
1995	773,665									
1996	777,907	979	944	157,800	62,800	82,300	9,100	100	24,900	
1997	809,509									
1998	831,094									
1999	840,584									
2000	853,423									
2001	867,088	763	452	141,800	52,000	76,600	40,400	700	27,800	
2002	888,724									
2003	921,607									
2010	1,064,619									
2020	1,270,256									
2030	1,445,641									
2040	1,594,100									
2050	1,722,121									
ADDITIONAL WELLS:[7]		**55**	**0**							
WELL TOTALS:		**6,498**	**4,930**							

Notes:
NR = Not reported.
[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes Indian Demand
[3] Non-Groundwater supplies may include surface water, CAP, effluent, spill water or tail water.
[4] Agricultural demand does not include small exempt use after 1993.
[5] Includes all wells through 1980.
[6] Water demand from 1971-1985 includes demand from the Santa Cruz AMA.
[7] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.

Table 8.5-11 Effluent Generation in the Tucson AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Adonis Mobile Home Park	Adonis MHP HOA	Marana	NA	NA	NA									NA	NA	NA
Arizona-Sonoran Desert Museum WWTF	Pima County	Tucson	NA	NA	NA									NA	NA	NA
ASPC - Tucson WWTF	Arizona Department of Corrections	Tucson	2,086	504						X				Secondary	36	2004
Avra Valley WWTF	Pima County	Avra Valley	10,600	1,120	X	X	X				X			Advanced Treatment I with Nutrient Removal	NA	2004
Biosphere 2 Center	University of Arizona	Oracle	NA	NA	NA									NA	NA	NA
Corona De Tucson WWTF	Pima County	Corona De Tucson	765	72		X								Secondary	NA	2003
Green Valley WWTF	Pima County	Green Valley	18,000	1,904			X				P	X		Secondary	NA	2004
Ina Road WPCF	Pima County	Tucson	217,888	34,723	P			X			P			Advanced Treatment I with Nutrient Removal	NA	2004
Marana Community Correctional Facility	Management Training Corporation	Marana	NA	NA	NA									NA	NA	NA
Marana High School	Marana Unified School District	Marana	NA	NA	NA									NA	NA	NA
Marana WWTF	Pima County	Marana	2,600	56	X							X		Secondary	5,000	2004
Milagro Subdivision	Milagro HOA	Tucson	50	NA			X						X	NA	NA	NA
Mt. Lemmon WWTP	Pima County	Summerhaven	NA	2			X							Secondary	NA	NA
Pima County Fair Grounds	Pima County	Tucson	NA	NA		X					X			NA	NA	NA
Pinal Air Park	Evergreen International Aviation	Evergreen Air Center	NA	NA	NA									NA	NA	NA
Randolph Park WRF	Pima County	Tucson	30,000	3,360				X				X		Advanced Treatment I with Nutrient Removal	NA	2004
Red Rock Village WWTF	NA	Red Rock	NA	NA	NA									NA	NA	NA
Rillito Vista WWTF	Pima County	Tucson	156	11		X					X			NA	NA	2,002
Roger Rd WWTP	City of Tucson	Tucson	277,000	32,483	P			X	X		P			Advanced Treatment I	NA	2004
Saddlebrooke Utility - WWTF	Saddlebrooke Utility Company	Saddlebrooke	NA	NA	NA									NA	NA	NA
Sahuarita High School Wetlands	Sahuarita School District	Sahuarita	NA	NA					X					NA	NA	NA
Sahuarita WWTF	Pima County	Sahuarita	2,380	NA							P			Treatment 1 with Nutrient Removal	NA	2,005
U of A Science & Tech Park	University of Arizona	Tucson	NA	NA								X		NA	NA	NA
U.S.F.S. Palisades Ranger Station	United States Forest Service	Tucson	NA	NA		X	X							NA	NA	NA
Total			**561,525**	**74,235**												

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, The Pima Effluent Generation and Utilization Report (2004), Pima Association of Government's (PAG's) Section 208 Areawide Water Quality Management Plan (2006), AZURITE (2008)
P=Permitted Underground Recharge Facility
NA=not available
WWTF=Wastewater Treatment Facility
WPCF=Water Pollution Control Facility
WWTP=Wastewater Treatment Plant
WRF=Wastewater Reclamation Facility



Primary Data Source: USGS National Gap Analysis Program, 2004

Figure 8.5-12
Tucson AMA
Cultural Water Demand

8.5.9 Assured Water Supply Determinations in the Tucson AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination, subdivision water provider and Central Arizona Groundwater Replenishment District (CAGRD) membership status are shown in Table 8.5-12A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.5-12D with date of application, date the designation was issued and projected or annual estimated demand. Figure 8.5-13 shows the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Water Supply Records

- See Table 8.5-12
- As of February 2008, 336 subdivisions with a total of 137,938 lots have been reviewed for an assured water supply determination. 93% of the determinations were in Pima County.
- 44,366 lots in 230 subdivisions received a Certificate of Assured Water Supply, 11,467 lots in 90 subdivisions received Water Adequacy Reports and 82,105 lots in 16 developments received an Analyses of Assured Water Supply.
- Of the 230 subdivisions with a Certificate of Assured Water Supply, 73 are CAGRD members.
- There are nine designated providers with a total projected or estimated annual water use of 231,706 acre-feet.

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
2	SaddleBrooke Ranch	Pinal	9 South	14 East	32	5,619	27-400761	02/06/03	Arizona Water Co - SaddleBrooke	Y
4	Coronado Ridge	Pinal	9 South	15 East	33 & 34	60	27-300280	12/10/97	Arizona Water Company - Oracle System	N
5	Red Rock Village IIA (formerly known as 'Red Rock Village 1 Model Complex')	Pinal	10 South	10 East	8	20	27-402062	09/11/06	Red Rock Utilities	Y
5	Red Rock Village 1	Pinal	10 South	10 East	8	453	27-402063	09/11/06	Red Rock Utilities	Y
5	Red Rock Village 2	Pinal	10 South	10 East	5, 8 & 9	552	27-402064	03/09/07	Red Rock Utilities	Y
7	Red Rock Village IV	Pinal	10 South	10 East	8	105	27-700237	07/20/07	Red Rock Utilities	Y
7	Red Rock Village III	Pinal	10 South	10 East	8	87	27-700362	01/14/08	Red Rock Utilities	Y
7	Red Rock Village V	Pinal	10 South	10 East	8	116	27-700363	01/07/08	Red Rock Utilities	Y
8	Desert Living Estates	Pinal	10 South	11 East	30	60	27-401392	12/09/05	NA	N
9	Saddlebrooke #14, 15, 17 expansion	Pinal	10 South	14 East	23	452	27-200300	07/18/94	Lago del Oro Water Company	N
9	SaddleBrooke Unit 51, Lots 1-7	Pinal	10 South	14 East	23	7	27-401753	10/07/05	Lago del Oro Water Company	Y
10	Eagle Crest Ranch	Pinal	10 South	14 East	32	975	27-200109	05/25/90	NA	N
11	Saddlebrooke Units 46-50	Pinal	10 South	14 East	33	770	27-400552	11/15/01	Lago del Oro Water Company	N
11	SaddleBrooke Unit 48 A	Pinal	10 South	14 East	33	5	27-401043	03/24/04	Lago del Oro Water Company	N
12	Saddlebrooke Units 42-45	Pima	10 South	14 East	13, 23-25	525	27-400478	06/03/02	NA	Y
13	Saddlebrooke #5-20	Pinal	10 South	14 East	22, 23, 26, 27 & 35	2095	27-200305	05/09/89	Lago del Oro Water Company	N
14	Saddlebrooke #4	Pinal	10 South	14 East	23, 26 & 27	383	27-200304	02/02/89	Lago del Oro Water Company	N
15	Saddlebrooke Unit 21	Pinal	10 South	14 East	25 & 26	215	27-400413	10/24/01	NA	Y
16	Saddlebrooke #1	Pinal	10 South	14 East	26 & 27	165	27-200299	02/27/87	Lago del Oro Water Company	N
16	Saddlebrooke #2	Pinal	10 South	14 East	26 & 27	130	27-200301	10/22/87	Lago del Oro Water Company	N
16	Saddlebrooke #3	Pinal	10 South	14 East	26 & 27	221	27-200303	03/09/88	Lago del Oro Water Company	N
17	Saddlebrooke #22-36, Phase II	Pinal	10 South	14 East	27, 28, 33 & 34	1647	27-200302	04/27/95	Lago del Oro Water Company	N
20	Coronado Reserve Lots 1-260 (excluding lots 86-88, 90-95, 97-105)	Pinal	10 South	15 East	2 & 3	242	27-401640	09/23/05	Arizona Water Company - Oracle System	Y
22	Copper Hill Estates	Pinal	10 South	15 East	5 & 6	61	27-401208	10/19/04	Arizona Water Company - Oracle System	Y
23	White Farms	Pima	11 South	11 East	18	NA	27-200405	11/15/84	NA	N
23	White Farms	Pima	11 South	11 East	18	235	27-200406	03/11/86	NA	N
24	La Mirage Estates	Pima	11 South	11 East	26	510	27-200162	11/16/94	NA	N
24	Tucnix Industrial Park	Pima	11 South	11 East	22	6	27-200360	12/02/81	NA	N
25	Unnamed property, Pima Co.	Pima	11 South	11 East	27	4	27-200368	04/19/84	NA	N
26	Marana Gardens	Pima	11 South	11 East	28	46	27-200193	05/25/89	NA	N
27	The Estate Lots at Tortolita Preserve by Garden Es	Pima	11 South	12 East	26	26	27-400982	01/08/04	Tortollita Water Co.	N
28	Mountain Vista Estates	Pima	11 South	14 East	2	38	27-200202	08/04/82	Lago del Oro Water Company	N
29	Sanmaniego Estates	Pima	11 South	14 East	3	20	27-299998	10/22/81	Lago del Oro Water Company	Y
30	Twin Lakes Lots 1-35	Pima	11 South	14 East	9	35	27-200361	05/05/81	Lago del Oro Water Company	N
30	Twin Lakes Lots 114-144	Pima	11 South	14 East	9	31	27-200362	08/05/94	Lago del Oro Water Company	N
30	Twin Lakes Lots 149-162	Pima	11 South	14 East	9	14	27-200363	11/17/82	Lago del Oro Water Company	N
30	Twin Lakes Lots 163-193	Pima	11 South	14 East	9	33	27-200364	04/21/89	Lago del Oro Water Company	N
30	Twin Lakes Lots 194-231	Pima	11 South	14 East	9	38	27-200365	03/09/90	Lago del Oro Water Company	N
30	Twin Lakes Lots 232-254	Pima	11 South	14 East	9	23	27-300307	07/14/97	Lago del Oro Water Company	N
31	Garden of Eden, Lots 1-18	Pima	11 South	14 East	10	18	27-300044	12/22/95	Lago del Oro Water Company	N
32	Chaparral Estates #2	Pima	11 South	14 East	15	2	27-200050	11/28/80	Los Cerros Water Co	N

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
33	Black Horse	Pima	11 South	14 East	15 & 16	414	27-400705	11/05/02	Los Cerros Water Co	N
34	Arcadia, Lots 1-40 (Phase I) & Lots 41-190 (Phase II) and Common Areas A & B	Pima	11 South	14 East	3 & 10	190	27-402109	11/17/06	Lago del Oro Water Company	Y
35	Avra Vista 1-64	Pima	12 South	10 East	15	64	27-401073	12/15/03	Metropolitan Domestic Water Improvement District	Y
36	Tierra Linda	Pima	12 South	11 East	29	44	27-200350	06/16/95	NA	N
36	Tierra Linda Nueva	Pima	12 South	11 East	29	199	27-401063	09/09/04	NA	Y
37	Rancho Del Rio Estates, Lots 1-185 and Common Areas A & B	Pima	12 South	11 East	33	185	27-401968	07/05/06	Avra Water Co-op	Y
38	Vista del Sol, Lots 1-15 and Common Area "A"	Pima	12 South	11 East	34	15	27-402258	02/08/08	Avra Water Co-op	Y
42	Shannon Acres	Pima	12 South	13 East	4	8	27-200313	05/11/95	NA	N
56	Tucson Avra West Lots 1-168	Pima	13 South	10 East	15	164	27-300234	03/12/97	Anway Manville LLL Water Co	N
56	Tucson Avra West II, Lots 1-8	Pima	13 South	10 East	15	8	27-400470	06/28/01	Anway Manville LLL Water Co	N
56	Tucson Avra West III, Lots 1-71 & Block A	Pima	13 South	10 East	15	71	27-400981	10/14/03	Anway Manville LLL Water Co	N
57	Rancho Tierra Blanca	Pima	13 South	10 East	21		27-200283	06/11/86	NA	N
58	Desert View Estates	Pima	13 South	11 East	1		27-200102	07/24/84	Avra Water Co-op	N
59	Picture Rocks West	Pima	13 South	11 East	3	65	27-200229	11/22/94	Avra Water Co-op	N
60	Howrey	Pima	13 South	11 East	8	6	27-200146	04/29/85	NA	N
61	Montanas Del Sol, Lots 1-48 and Common Areas "A" & "B"	Pima	13 South	11 East	1 & 12	48	27-700264	12/06/07	Avra Water Co-op	Y
64	Sweetwater Canyon, Lots 1-46 and Common Areas A & B	Pima	13 South	12 East	25	46	27-500012	04/26/07	Lazy C Water Service	Y
71	Brookwood	Pima	13 South	13 East	22	36	27-200014	04/07/91	Flowing Wells Irrigation District	N
71	Trails West Resort	Pima	13 South	13 East	22	117	27-200354	11/17/82	Flowing Wells Irrigation District	N
71	Westbrooke	Pima	13 South	13 East	22	61	27-200400	05/23/94	Flowing Wells Irrigation District	N
71	Sagewood	Pima	13 South	13 East	22	58	27-400348	10/05/00	Flowing Wells Irrigation District	N
72	Roger Square Townhomes	Pima	13 South	13 East	26	10	27-300366	01/16/98	Flowing Wells Irrigation District	N
73	Kilburn Terrace Condominiums, Units 1101, 1102, 1103, 2101, 2102, 2103 & 2104	Pima	13 South	13 East	27	7	27-402050	06/23/06	Flowing Wells Irrigation District	Y
73	Kilburn Place Condominiums, Units 1101, 1102, 1103, 2101, 2102, 2103 & 2104	Pima	13 South	13 East	27	7	27-402057	06/23/06	Flowing Wells Irrigation District	Y
73	Kilburn Manor Condominiums, Units 1101,1102,1103,2101,2102,2103 and 2104	Pima	13 South	13 East	27	7	27-402118	10/04/06	Flowing Wells Irrigation District	Y
73	Kilburn View Condominiums, Units 1101,1102,1103,2101,2102,2103 and 2104	Pima	13 South	13 East	27	7	27-402119	09/21/06	Flowing Wells Irrigation District	Y
75	Shamrock Center Block 1, Lots 1-16 and Common Areas A & B	Pima	13 South	13 East	15 & 22	16	27-401639	01/30/06	Flowing Wells Irrigation District	Y
76	Canyon Ranch Hacienda Lifeshar	Pima	13 South	15 East	21	8	27-200021	12/04/84	Hub Water Company	N
76	Casa del Oso	Pima	13 South	15 East	21	6	27-200041	10/10/89	Hub Water Company	N
77	Villas at Sabino Canyon, The	Pima	13 South	15 East	22	122	27-200383	06/12/87	NA	N
79	Hacienda del Joven Estates	Pima	13 South	15 East	28	40	27-200135	12/08/88	Hub Water Company	N
79	Canyon Ranch Estates II	Pima	13 South	15 East	28	20	27-400666	06/10/02	Hub Water Company	N
80	Sabino Creek	Pima	13 South	15 East	29	98	27-200296	06/18/92	Hub Water Company	N
80	Mountain Cove Estates	Pima	13 South	15 East	29	18	27-300016	11/10/95	Hub Water Company	N
81	Riverbend-Sabino Canyon Road	Pima	13 South	15 East	30	97	27-200290	12/07/81	Hub Water Company	N
82	Desert Anchors	Pima	13 South	15 East	32		27-200090	11/24/80	NA	N
82	Estates at River Ranch	Pima	13 South	15 East	32	78	27-200116	10/17/88	NA	N
82	Villa del Rio	Pima	13 South	15 East	32		27-200377	02/06/78	NA	N
82	Villages at Rancho del Rio	Pima	13 South	15 East	32	65	27-200381	06/13/85	NA	N
82	Villages at Rancho del Rio,#2	Pima	13 South	15 East	32	68	27-200382	05/08/87	NA	N
82	Vista del Rio	Pima	13 South	15 East	32	10	27-200390	12/15/80	NA	N

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
82	Vista del Rio	Pima	13 South	15 East	32	73	27-200391	03/24/94	NA	N
82	Vista del Rio #2	Pima	13 South	15 East	32	16	27-200392	12/23/80	NA	N
83	Sabino Terrace #2	Pima	13 South	15 East	20 & 21	290	27-200297	01/10/83	Hub Water Company	N
84	Sabino Vista Hills #4	Pima	13 South	15 East	21 & 28	18	27-200298	08/21/86	Hub Water Company	N
85	Canyon Ranch Casitas	Pima	13 South	15 East	21, 22 & 28	56	27-200019	09/26/95	Hub Water Company	N
85	Canyon Ranch Estates	Pima	13 South	15 East	21, 22 & 28	166	27-200020	02/11/82	Hub Water Company	N
88	Ranchita Avra	Pima	14 South	11 East	9	39	27-200274	10/10/80	NA	N
88	Ranchita Avra	Pima	14 South	11 East	9	60	27-200275	03/11/87	NA	N
90	Copper Crest	Pima	14 South	12 East	28	126	27-200078	01/02/87	NA	N
91	Millstone Manor #6	Pima	14 South	12 East	30		27-200199	05/08/85	NA	N
92	R.B. Rumney Ranch	Pima	14 South	12 East	33	11	27-200271	05/08/85	NA	N
92	San Joaquin Oeste	Pima	14 South	12 East	33	48	27-200308	06/18/82	NA	N
92	San Joaquin Oeste	Pima	14 South	12 East	33	78	27-200309	01/18/86	NA	N
93	Tierra Bonita #2	Pima	14 South	12 East	34	66	27-200345	01/10/84	NA	N
93	Tierra Bonita #3	Pima	14 South	12 East	34	38	27-200346	07/05/83	NA	N
94	Kolb Executive Park Condos	Pima	14 South	15 East	5	118	27-200158	03/20/81	NA	N
94	Tanque Verde Estates	Pima	14 South	15 East	5	331	27-200342	10/17/80	NA	N
96	Halcyon Highlands Estates	Pima	14 South	15 East	15	13	27-200136	09/08/83	Halcyon Acres Annex No. 2	N
96	Presidio Trail, Lots 1-50 & Common Areas "A-1" - "A-5" & "B-1"	Pima	14 South	15 East	15	50	27-402074	10/02/06	Halcyon Acres Annex No. 2	Y
96	Camino Seco Village, Lots 1-35 & Common Areas A & B	Pima	14 South	15 East	15	35	27-402098	08/17/06	Halcyon Acres Annex No. 2	Y
98	Voyager Homes Phase "C", Lots 158-235	Pima	14 South	15 East	29	78	27-300359	02/04/98	Voyager Water Company	N
99	Rancho La Linda	Pima	14 South	15 East	36	36	27-200277	08/25/80	NA	N
100	Kolb Executive Park	Pima	14 South	15 East	5 & 6		27-200157	11/10/80	NA	N
101	Forty Niners Country Club Estates II,The	Pima	14 South	16 East	5	17	27-300263	06/03/97	Forty-Niner Water Company	N
102	Robles Junction, 11 Parcels	Pima	15 South	10 East	20, 21, 28 & 29	11	27-200291	08/12/83	NA	N
103	Eagle Point Estates	Pima	15 South	12 East	8	273	27-400664	04/17/02	Diablo Village Water Co	Y
103	Sonoran Ranch Estates II, Lots 1-578 and Common Areas A and B	Pima	15 South	12 East	8	578	27-401525	02/10/05	Diablo Village Water Co	Y
103	Sonoran Ranch Estates II, Lots 1-572 & Common Areas A & B	Pima	15 South	12 East	8	572	27-401812	10/06/05	Diablo Village Water Co	Y
104	Tucson Mountain Ranch, Lots 1-50	Pima	15 South	12 East	9	50	27-400332	10/05/00	Diablo Village Water Co	N
104	Tucson Mountain Ranch, Lots 51-182	Pima	15 South	12 East	9	132	27-400442	03/03/01	Diablo Village Water Co	N
104	Tucson Mountain Ranch Phase 1	Pima	15 South	12 East	9	50	27-400503	06/21/01	Diablo Village Water Co	N
105	Caddis Haley Estates	Pima	15 South	12 East	16	161	27-401269	08/30/04	Diablo Village Water Co	Y
105	Diablo Village Estates Townhouses, Lots 1-59	Pima	15 South	12 East	16	59	27-401520	02/22/05	Diablo Village Water Co	Y
105	Diablo Village Estates, Lots 115-178, 209-222 & 254-511	Pima	15 South	12 East	16	336	27-401606	08/15/05	Diablo Village Water Co	Y
106	Sonoran Ranch Estates	Pima	15 South	12 East	17	214	27-400971	12/10/03	Diablo Village Water Co	N
106	Sonoran Ranch Villages	Pima	15 South	12 East	17	110	27-400994	12/10/03	Diablo Village Water Co	N
108	Drexel Manor	Pima	15 South	14 East	4	140	27-400841	04/16/03	Ray Water Company	Y
108	Drexel Manor	Pima	15 South	14 East	4	137	27-401181	05/19/04	Ray Water Company	Y
109	Silver Moon Estates	Pima	15 South	14 East	10	40	27-300163	05/26/98	Ray Water Company	N
109	Desert Vista Estates	Pima	15 South	14 East	10	157	27-300361	12/01/97	Ray Water Company	N
109	Silvermoon Estates	Pima	15 South	14 East	10	40	27-400467	03/02/01	Ray Water Company	N

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
109	Desert Vista Terrace	Pima	15 South	14 East	10	183	27-400777	11/04/02	Ray Water Company	N
109	Desert Point Estates, Lots 1-76	Pima	15 South	14 East	10	76	27-401319	12/02/04	Ray Water Company	Y
109	Cantera, an RCP Subdivision, Lots 1-143; Common Areas A, B & C; Blocks A & B	Pima	15 South	14 East	10	143	27-401727	11/15/05	Ray Water Company	Y
109	Desert Point 2, Lots 1 - 45 and Common Areas "A" & "B"	Pima	15 South	14 East	10	45	27-402265	03/30/07	Ray Water Company	Y
109	Desert View Plaza, Lots 1-7	Pima	15 South	14 East	10	7	27-500022	05/30/07	Ray Water Company	Y
110	Voyager Homes	Pima	15 South	15 East	29	85	27-200393	04/03/95	Voyager Water Company	N
110	Voyager Homes Phase "B", Lots 86-157	Pima	15 South	15 East	29	72	27-300185	09/22/96	Voyager Water Company	N
110	Voyager Homes Phase "D", Lots 232-289	Pima	15 South	15 East	29	58	27-400491	04/10/01	Voyager Water Company	N
111	Sycamore Park, Villages 1 thru 7 C.A. "A", "B", "C" & "D"	Pima	15 South	15 East	32	733	27-401414	03/03/05	Voyager Water Company	Y
112	Thunderhead Ranch	Pima	15 South	16 East	8	116	27-200344	07/10/80	NA	N
115	Bluff Creek, Lots 1-40 and Common Areas A and B	Pima	15 South	16 East	24	40	27-500011	09/20/07	Saguaro Water Co.	Y
116	The Estates at Old Spanish Trail	Pima	15 South	16 East	26	116	27-401189	10/07/04	Saguaro Water Co.	Y
117	Spanish Hills	Pima	15 South	16 East	27	63	27-200316	02/02/82	NA	N
117	Spanish Trail Estates	Pima	15 South	16 East	27	121	27-400871	06/09/03	Saguaro Water Co.	Y
118	Jacaranda Village at Tewa Trail	Pima	15 South	16 East	33	36	27-401179	08/30/04	Saguaro Water Co.	Y
119	Rincon Trails	Pima	15 South	16 East	34	505	27-400492	07/02/02	Saguaro Water Co.	N
119	Whisper Ranch	Pima	15 South	16 East	34	46	27-400803	12/17/02	Saguaro Water Co.	Y
119	Rancho Loma Alta	Pima	15 South	16 East	34	24	27-401121	03/24/04	Saguaro Water Co.	N
120	Mountain Creek Ranch	Pima	15 South	16 East	36	64	27-400201	07/16/01	NA	N
121	Coyote Creek	Pima	15 South	16 East	23, 25 & 26	395	27-400095	12/10/99	Saguaro Water Co.	N
122	Rocking K Ranch	Pima	15 South	16 East	8-10, 15-17, 21, 22 & 27	2737	27-200292	06/06/95	NA	N
124	Casitas de Valle #2	Pima	16 South	14 East	5	34	27-200043	08/23/90	NA	N
127	Rincon Desert Estates	Pima	16 South	16 East	22 & 27	45	27-200288	06/15/94	Saguaro Water Co.	N
128	Rancho del Lago	Pima	16 South	16 East	3, 4, 8-10, 15 & 16	234	27-200285	10/21/83	NA	N
128	Vail Valley Ranch	Pima	16 South	16 East	3, 4, 8, 10, 15 & 16	4945	27-200370	07/23/90	NA	N
129	Rancho Buena Vista	Pima	17 South	13 East	22	29	27-200276	08/09/99	Las Quintas Serenas Water Company	N
130	La Canada Norte (1989)	Pima	17 South	13 East	26	50	27-200160	07/25/89	Las Quintas Serenas Water Company	N
130	La Canada Norte (1994)	Pima	17 South	13 East	26	69	27-200161	09/16/94	Las Quintas Serenas Water Company	N
130	Mesquite Heights (1997)	Pima	17 South	13 East	26	42	27-200197	03/04/97	Las Quintas Serenas Water Company	N
130	Santa Cruz Meadows Lots 1-239	Pima	17 South	13 East	26	239	27-200311	09/16/94	Las Quintas Serenas Water Company	N
130	Valle Verde del Norte	Pima	17 South	13 East	26	5	27-200372	08/15/84	Valle Verde Water Co.	N
130	Valle del Sol	Pima	17 South	13 East	25	19	27-200373	09/29/80	NA	N
131	Colonias La Canada Lots 1-82	Pima	17 South	13 East	27	82	27-200072	10/14/93	Las Quintas Serenas Water Company	N
131	Colonias La Canada, Lots 83-219	Pima	17 South	13 East	27	137	27-300386	04/03/98	Las Quintas Serenas Water Company	N
131	Estates at La Canada Norte, Lots 1-41	Pima	17 South	13 East	27	41	27-401012	10/22/03	Las Quintas Serenas Water Company	N
132	La Joya Verde II	Pima	17 South	13 East	35	105	27-300311	09/10/97	Community Water Company of Green Valley	N
132	Santo Tomas Villas	Pima	17 South	13 East	35	355	27-400369	01/30/01	Community Water Company of Green Valley	N
132	La Joya Verde III, Lots 130-226	Pima	17 South	13 East	35	97	27-400885	07/15/03	Community Water Company of Green Valley	Y
132	La Joya Verde III, Lots 1-65	Pima	17 South	13 East	35	65	27-400886	07/15/03	Community Water Company of Green Valley	Y
132	La Joya Verde III, Lots 66-129	Pima	17 South	13 East	35	64	27-400887	07/15/03	Community Water Company of Green Valley	Y
132	A Resubdivision of Block B of La Joya Verde, Lots 1-84 & Common Areas A & B	Pima	17 South	13 East	35	84	27-401602	07/25/05	Community Water Company of Green Valley	Y

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
134	Curly Horn Ranches (1985)	Pima	17 South	13 East	17 & 18	9	27-200085	06/16/85	NA	N
135	Los Arroyos Del Este	Pima	17 South	13 East	25 & 26	503	27-400808	02/14/03	Community Water Company of Green Valley	Y
135	Los Arroyos Resubdivision, Lots 1-145 & 150-167 & Common Areas "A1-A3" & "B1-B2"	Pima	17 South	13 East	26	163	27-401975	05/30/06	Community Water Company of Green Valley	Y
136	Santa Rita Villas Lots 1-218, Block 1, Common Areas A, B and C	Pima	17 South	13 East	35	218	27-500004	11/17/06	Community Water Company of Green Valley	Y
136	La Joya Verde Rancho Abrego III, Lots 1-15 and Common Area "A"	Pima	17 South	13 East	35	15	27-700295	10/01/07	Community Water Company of Green Valley	Y
138	Sahuarita Acres, Lots 1-71 and Common Area "A"	Pima	17 South	14 East	8	71	27-500023	04/09/07	Farmers Water Company	Y
139	Sahuarita Highlands, Lots 1-153, Block 1 and Common Area 'A' - Cons. Nat. Area	Pima	17 South	14 East	28	153	27-401190	12/01/04	Farmers Water Company	Y
140	Duval 19 Commercial Center	Pima	17 South	14 East	35	8	27-200106	11/22/89	Community Water Company of Green Valley	N
141	Sycamore Canyon Estates	Pima	17 South	15 East	17	19	27-300174	12/20/96	NA	N
142	Entrada	Pima	17 South	15 East	18	48	27-200112	07/23/93	NA	N
143	Entrada	Pima	17 South	15 East	18, 19 & 30	48	27-200111	05/24/88	NA	N
144	New Tucson # 23	Pima	17 South	16 East	4	234	27-200203	04/27/87	NA	N
144	New Tucson #22, 23	Pima	17 South	16 East	4	20	27-200204	10/14/93	NA	N
144	New Tucson #22, 23	Pima	17 South	16 East	4	16	27-200205	04/04/94	NA	N
144	New Tucson #22, 23, 24	Pima	17 South	16 East	4	12	27-200206	06/10/94	NA	N
144	New Tucson #22, 23, 24	Pima	17 South	16 East	4	18	27-200207	12/12/94	NA	N
147	Las Campanas Block K	Pima	18 South	13 East	10	113	27-300082	05/21/96	Community Water Company of Green Valley	N
147	Las Campanas Block G	Pima	18 South	13 East	10	95	27-300098	06/28/96	Community Water Company of Green Valley	N
147	Las Campanas Block G2	Pima	18 South	13 East	10	121	27-300346	11/03/97	Community Water Company of Green Valley	N
147	Las Campanas Block H, Lots 1-84	Pima	18 South	13 East	10	84	27-400186	01/19/00	Community Water Company of Green Valley	N
147	Las Campanas Block M, Lots 1-219	Pima	18 South	13 East	10	219	27-400376	03/02/01	Community Water Company of Green Valley	N
147	Las Campanas Block F	Pima	18 South	13 East	10	95	27-400455	08/21/02	Community Water Company of Green Valley	N
147	Las Campanas Block L, Lots 1-67 & Common Area A	Pima	18 South	13 East	10	67	27-401317	09/09/04	Community Water Company of Green Valley	N
149	La Posada II	Pima	18 South	13 East	13	6	27-400365	02/07/01	Farmers Water Company	N
153	De Anza Links	Pima	18 South	13 East	34	22	27-401136	02/13/04	Farmers Water Company	N
153	De Anza Links II, Lots 1-17 and Common Areas A & B	Pima	18 South	13 East	34	17	27-401810	01/30/06	Farmers Water Company	Y
154	Springs II at Santa Rita, The	Pima	18 South	13 East	34; and 19 South 13 East 3	114	27-300344	11/04/97	Farmers Water Company	N
154	Springs II Resubdivision, The	Pima	18 South	13 East	34; and 19 South 13 East 3	51	27-400084	08/19/99	Farmers Water Company	N
155	Quail Creek Phase II	Pima	18 South	13 East	1, 2, 5-7	1504	27-400699	11/01/02	Quail Creek Water Co	N
156	Las Campanas Blocks D & E, Lots 1-268 & Common Area A	Pima	18 South	13 East	10	268	27-401825	01/03/06	Community Water Company of Green Valley	Y
156	Las Campanas, Block C, Lots 1-283 and Common Area "A"	Pima	18 South	13 East	10	283	27-700275	10/01/07	Community Water Company of Green Valley	Y
157	Las Campanas Block B, Lots 1-118	Pima	18 South	13 East	10	118	27-401398	12/17/04	Community Water Company of Green Valley	Y
160	Madera Highlands, Villages 1-10 & 15	Pima	18 South	13 East	12 & 13; and 18 South 14 East 7 & 18	757	27-402096	09/05/06	Farmers Water Company	Y
160	Madera Highlands, Villages 27 and 29, and Common Areas "D", "E", "F" and "G"	Pima	18 South	13 East	13; and 18 South 14 East 18	119	27-700354	11/15/07	Farmers Water Company	Y
161	Madera Reserve	Pima	18 South	13 East	13, 18, 19 & 24	159	27-300142	08/21/96	Farmers Water Company	N
162	Paseo Tierra Townhomes	Pima	18 South	13 East	15	18	27-400131	11/10/99	Community Water Company of Green Valley	Y
164	Solar Del Viejo, Lots 1-81, Common Areas A & B	Pima	18 South	13 East	22 & 27	81	27-401607	03/17/05	Green Valley Domestic Water Improvement District	Y
165	Madera Foothills Estates, Lots 26-67	Pima	18 South	13 East	23, 24 & 25	42	27-400456	06/12/01	Farmers Water Company	Y
166	Madera Foothills Estates	Pima	18 South	13 East	24 & 35	25	27-300116	07/08/96	Farmers Water Company	N
167	Pasadera, Lots 1-29	Pima	18 South	13 East	25 & 26	29	27-400380	02/07/01	Farmers Water Company	N

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application	GRD Member
			Township	Range	Section					
167	Colonia Real Lots 1-50	Pima	18 South	13 East	25 & 26	50	27-401210	07/01/04	Farmers Water Company	Y
168	Links at Santa Rita Springs	Pima	18 South	13 East	27	94	27-300266	06/25/97	Farmers Water Company	N
168	Presidio at Santa Rita Springs, The	Pima	18 South	13 East	27	252	27-300424	06/23/98	Farmers Water Company	N
168	Parcel E at Santa Rita Springs	Pima	18 South	13 East	27	35	27-400148	12/15/99	Farmers Water Company	N
170	Duval Commerce Park	Pima	18 South	13 East	3	15	27-300244	02/09/99	Community Water Company of Green Valley	N
171	Greens at Santa Rita Springs, The	Pima	18 South	13 East	34	47	27-300233	02/12/97	Farmers Water Company	N
171	Greens at Santa Rita Springs, Lots 226-2	Pima	18 South	13 East	34	9	27-300365	11/04/97	Farmers Water Company	N
172	Stone House	Pima	18 South	14 East	8	222	27-401424	01/25/05	Quail Creek Water Co	Y
173	Madera Highlands: Villages 11,12,13,14 & 16 - 23	Pima	18 South	14 East	18	617	27-401612	05/02/05	Farmers Water Company	Y
174	Pozo Nueva Ranch Estates	Pima	19 South	9 East	22 & 23	12	27-200238	01/28/90	NA	N
174	Pozo Nuevo Ranch Estates	Pima	19 South	9 East	22 & 23	12	27-200239	01/28/90	NA	N
175	San Ignacio Villas	Pima	19 South	13 East	4	45	27-300181	11/20/96	Green Valley Domestic Water Improvement District	N
175	San Ignacio Vistas II, Resub.	Pima	19 South	13 East	4	32	27-300192	11/20/96	Green Valley Domestic Water Improvement District	N
175	San Ignacio Heights Resb,Lots1,2&157-165	Pima	19 South	13 East	4	11	27-300275	07/10/97	Green Valley Domestic Water Improvement District	N
175	San Ignacio Vista II	Pima	19 South	13 East	4	72	27-300279	06/05/97	Green Valley Domestic Water Improvement District	N
175	San Ignacio Vistas II, Phase 2	Pima	19 South	13 East	4	130	27-300347	11/04/97	Green Valley Domestic Water Improvement District	N
176	Canoa Northwest Lots 1-84 & 1-58,A,B&C	Pima	19 South	13 East	9	58	27-400242	04/27/00	Green Valley Domestic Water Improvement District	N
178	Canoa Preserve	Pima	19 South; 18 South	13 East; 13 East	2;35 & 36	80	27-401781	09/13/07	Farmers Water Company	Y
179	Canoa Northwest Lots 1 thru 167	Pima	19 South	13 East	5, 8 & 9	167	27-400144	11/12/99	Green Valley Domestic Water Improvement District	N
179	Canoa Northwest Lots 167 thru 329	Pima	19 South	13 East	5, 8 & 9	163	27-400289	06/13/00	Green Valley Domestic Water Improvement District	N
180	Canoa Ranch Block 28	Pima	19 South	13 East	8, 9, 16, 17 & 19	193	27-400935	12/24/03	Green Valley Domestic Water Improvement District	Y
180	Canoa Ranch Blocks 8, 9, &15	Pima	19 South	13 East	8, 9 & 10	15	27-401188	08/08/05	Green Valley Domestic Water Improvement District	Y
180	Canoa Ranch, Block 22 & a portion of Block 27, Lots 1-140, Common Areas A & B	Pima	19 South	13 East	8	140	27-401564	08/15/05	Green Valley Domestic Water Improvement District	Y
181	Canoa Ranch Block 21	Pima	19 South	13 East	9	60	27-400875	04/24/03	Green Valley Domestic Water Improvement District	N
181	Canoa Ranch Blocks 19 & 20, Lots 1-99 CA A&B	Pima	19 South	13 East	9	100	27-400883	08/27/03	Green Valley Domestic Water Improvement District	Y
181	Canoa Ranch Block 11	Pima	19 South	13 East	9	17	27-400896	01/20/04	Green Valley Domestic Water Improvement District	Y

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
3	Rancho Robles	Pinal	9 South	15 East	35	17	53-501269	Adequate	08/09/79	Arizona Water Company - Oracle System
3	Two O'Clock Hill	Pinal	9 South	15 East	35	20	53-501587	Adequate	10/15/74	Arizona Water Company - Oracle System
19	Coronado Reserve formerly known as Mountain House	Pinal	10 South	15 East	2	18	53-401648	Adequate	08/04/05	Arizona Water Company - Oracle System
28	Mountain Vista Estates	Pima	11 South	14 East	2	41	53-501037	Adequate	09/21/73	Lago del Oro Water Company
39	Countryside	Pima	12 South	12 East	24	2600	53-500529	Adequate	04/16/79	Tortollita Water Co.
40	Oshrin Park	Pima	12 South	12 East	25 & 26	30	53-501089	Adequate	06/17/74	NA
40	Oshrin Park	Pima	12 South	12 East	25 & 26	25	53-501090	Adequate	11/12/75	NA
40	Oshrin Park	Pima	12 South	12 East	25 & 26	58	53-501091	Adequate	02/26/76	NA
41	Tangerine Hills	Pima	12 South	13 East	1	117	53-501536	Adequate	01/18/80	NA
43	Monte del Oro	Pima	12 South	13 East	12	187	53-501006	Adequate	06/08/80	NA
44	Oro Valley Heights	Pima	12 South	13 East	13	45	53-501088	Adequate	10/03/78	NA
45	Placita del Oro	Pima	12 South	13 East	14	3	53-501199	Adequate	12/27/79	Doney Park Water Company
46	Chaparral Heights	Pima	12 South	13 East	16	73	53-500441	Inadequate	10/23/79	NA
47	Ironwood Mesa Estates	Pima	12 South	13 East	21	10	53-500816	Adequate	06/15/79	NA
48	La Estancia	Pima	12 South	13 East	27	20	53-500852	Inadequate	01/30/79	NA
48	La Estancia	Pima	12 South	13 East	27	20	53-500853	Adequate	06/15/79	NA
48	Ranchos de la Canada #2	Pima	12 South	13 East	27	39	53-501280	Adequate	07/05/79	NA
48	Ranchos de la Canada #3	Pima	12 South	13 East	27	31	53-501281	Adequate	06/19/79	NA
49	Tucson National Townhomes West	Pima	12 South	13 East	28	82	53-501584	Adequate	12/27/79	NA
50	Moondance	Pima	12 South	13 East	29	208	53-501013	Adequate	10/03/78	NA
51	Heritage Hills #2 Lots 222-424	Pima	12 South	13 East	32	203	53-500780	Adequate	07/25/78	NA
51	Heritage Hills #2 Lots 425-557	Pima	12 South	13 East	32	133	53-500781	Adequate	08/21/78	NA
51	Heritage Hills #2 Lots 558-740	Pima	12 South	13 East	32	183	53-500782	Adequate	09/19/78	NA
51	Metropolitan Estates #1	Pima	12 South	13 East	32	59	53-500972	Adequate	01/29/74	NA
52	Las Quintas Townhouses	Pima	12 South	13 East	35	57	53-500898	Adequate	02/19/74	NA
52	Vista de la Canada	Pima	12 South	13 East	35	56	53-501642	Adequate	12/26/73	NA
53	Rancho Feliz Lots 390-441	Pima	12 South	13 East	15 & 22	357	53-501258	Adequate	07/11/78	NA
54	Canada Verde	Pima	12 South	13 East	22 & 23	39	53-500389	Adequate	07/11/78	NA
55	Pusch Ridge Estates	Pima	12 South	14 East	18	65	53-501230	Adequate	05/06/80	NA
62	Casas Arroyo	Pima	13 South	12 East	1	20	53-500414	Adequate	01/29/80	NA
63	Picture Rocks Vista	Pima	13 South	12 East	4	6	53-501145	Adequate	05/07/79	NA
65	Chula Vista Villas	Pima	13 South	13 East	2	12	53-500454	Adequate	06/15/79	NA
65	Orange Grove Manor Townhouses2	Pima	13 South	13 East	2	65	53-501078	Adequate	09/28/78	NA
66	Angelo Estates	Pima	13 South	13 East	3	7	53-500270	Adequate	09/18/73	Metropolitan Domestic Water Improvement District
67	Casas Adobes West #2	Pima	13 South	13 East	4	82	53-500413	Adequate	06/15/79	NA
68	Casa Adobes Park	Pima	13 South	13 East	9	125	53-500399	Adequate	08/22/78	NA

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
68	Casas Adobes Park	Pima	13 South	13 East	9	194	53-500411	Adequate	11/20/73	NA
68	Casas Adobes Park #3	Pima	13 South	13 East	9	103	53-500412	Adequate	09/26/79	NA
68	El Leah	Pima	13 South	13 East	9	117	53-500606	Adequate	07/28/78	NA
68	Vaquero Villa	Pima	13 South	13 East	9	17	53-501607	Adequate	11/23/73	NA
69	Vista de Luces	Pima	13 South	13 East	10	30	53-501643	Adequate	10/04/78	NA
70	Orange Grove Pueblo #1	Pima	13 South	13 East	11	53	53-501084	Adequate	07/03/79	NA
71	Casitas del Valle #2	Pima	13 South	13 East	22	69	53-500418	Inadequate	03/23/81	Flowing Wells Irrigation District
71	Casitas del Valle Townhouses 2	Pima	13 South	13 East	22	110	53-500419	Inadequate	08/23/79	NA
74	Barcelona Manor Condominiums	Pima	13 South	13 East	1, 2, 11 & 12	240	53-500307	Adequate	12/24/79	NA
78	Millstone Manor East	Pima	13 South	15 East	25	11	53-500977	Adequate	07/28/78	NA
81	San Domingo	Pima	13 South	15 East	30	0	53-501359	Adequate	09/07/76	NA
86	La Cienega	Pima	13 South	15 East	28 & 33	17	53-500851	Inadequate	03/27/74	Hub Water Company
87	San Domingo Lots 23-46	Pima	13 South	16 East	30	15	53-501360	Adequate	12/06/77	NA
87	San Domingo Lots 27-37	Pima	13 South	16 East	30	11	53-501361	Adequate	10/17/79	NA
89	Tucson Saguaro Estates	Pima	14 South	11 East	24	34	53-501585	Adequate	06/20/79	NA
91	Tucson Mountain Park Estates	Pima	14 South	12 East	30	22	53-501583	Adequate	09/25/79	NA
94	Pio Decimo Estates	Pima	14 South	15 East	5	6	53-501194	Adequate	07/17/78	NA
94	Samprese Estates	Pima	14 South	15 East	5	119	53-501356	Adequate	05/01/79	NA
94	Tanque Verde Estates	Pima	14 South	15 East	5	70	53-501538	Adequate	02/05/80	NA
95	Pantano Townhomes	Pima	14 South	15 East	6	118	53-501099	Adequate	11/06/78	NA
95	Pantano Townhomes #2	Pima	14 South	15 East	6	92	53-501100	Adequate	06/19/79	NA
96	Stefan Estates	Pima	14 South	15 East	15	5	53-501458	Adequate	09/11/78	Halcyon Acres Annex No. 2
97	Aldea de Pascua	Pima	14 South	15 East	25	11	53-500256	Adequate	01/30/78	NA
109	Sunhaven of Tucson	Pima	15 South	14 East	10	201	53-501497	Adequate	07/17/73	Ray Water Company
113	Thunderhead Ranch	Pima	15 South	16 East	9	110	53-501544	Adequate	08/16/79	NA
114	Caserio Viejo	Pima	15 South	16 East	15	11	53-500417	Adequate	07/31/75	Chaparral City Water Co
123	Mira Bell	Pima	16 South	10 East	24	60	53-500982	Adequate	07/03/79	NA
130	Mountain View Acres	Pima	17 South	13 East	26	12	53-501028	Adequate	01/30/76	Las Quintas Serenas Water Company
137	Green Valley Country Club North	Pima	17 South	13 East	35 & 36	145	53-500734	Adequate	01/06/77	NA
145	Fairfield Green Valley Townhouses	Pima	18 South	13 East	2	258	53-500628	Adequate	08/29/73	NA
145	Green Valley Commercial Block	Pima	18 South	13 East	2	8	53-500731	Adequate	08/21/73	NA
145	Green Valley Commercial Block 2	Pima	18 South	13 East	2	5	53-500732	Adequate	11/20/75	NA
145	Green Valley Mobile Estates (1976)	Pima	18 South	13 East	2	125	53-500749	Adequate	09/14/76	NA
146	Colonia de Los Alamos (1974)	Pima	18 South	13 East	3	1066	53-500485	Adequate	05/17/74	NA
148	Green Valley Community Complex	Pima	18 South	13 East	11	11	53-500733	Adequate	07/15/75	NA
148	Green Valley County Club Vista	Pima	18 South	13 East	11	30	53-500735	Adequate	06/19/78	Community Water Company of Green Valley

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section					
148	Green Valley Desert Meadows	Pima	18 South	13 East	11	223	53-500740	Adequate	01/06/77	NA
148	Green Valley South Acres	Pima	18 South	13 East	11	73	53-500752	Adequate	12/12/77	NA
148	Green Valley Townhouses #6	Pima	18 South	13 East	11	84	53-500754	Adequate	02/21/74	NA
149	Green Valley Mobile Estates (1975)	Pima	18 South	13 East	13	16	53-500748	Adequate	04/30/75	NA
150	Green Valley Esperanza Estates Lots 1-100	Pima	18 South	13 East	15	100	53-500741	Adequate	08/11/76	Community Water Company of Green Valley
150	Green Valley Esperanza Estates Lots 206-258	Pima	18 South	13 East	15	53	53-500742	Adequate	10/12/78	Community Water Company of Green Valley
150	Green Valley Esperanza Estates Lots 259-368	Pima	18 South	13 East	15	110	53-500743	Adequate	01/03/79	Community Water Company of Green Valley
150	Green Valley Foothills Townhouses	Pima	18 South	13 East	15	35	53-500747	Adequate	08/14/79	NA
151	Green Valley Desert Hills #1	Pima	18 South	13 East	27	49	53-500736	Adequate	01/23/80	NA
151	Green Valley South Clusters	Pima	18 South	13 East	27	44	53-500753	Adequate	01/26/78	NA
152	Green Valley Desert Hills #3	Pima	18 South	13 East	28	753	53-500738	Adequate	02/01/79	NA
152	Green Valley Desert Hills #6	Pima	18 South	13 East	28	107	53-500739	Adequate	01/04/80	NA
152	Green Valley Retirement Apts	Pima	18 South	13 East	28	110	53-500751	Adequate	10/12/78	Community Water Company of Green Valley
157	Green Valley Townhouses #7 Lots 1-185	Pima	18 South	13 East	11, 27 & 28	185	53-500755	Adequate	07/23/74	Community Water Company of Green Valley
158	Green Valley Townhouses #7 Lots 186-385	Pima	18 South	13 East	11, 27 & 28	199	53-500756	Adequate	01/16/78	Community Water Company of Green Valley
163	Clara Vista del Valle	Pima	18 South	13 East	15 & 22	21	53-500462	Adequate	01/16/78	Community Water Company of Green Valley
169	Green Valley Desert Hills #2	Pima	18 South	13 East	27 & 28	613	53-500737	Adequate	08/24/78	NA
169	Green Valley South Acres	Pima	18 South	13 East	27 & 28	73	53-500752	Adequate	12/12/77	NA

Table 8.5-12 Assured Water Supply Determinations in the Tucson AMA[1]

C. Analyses of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
1	Willow Springs Ranch South Village	Pinal	8 South	13 East	8, 9, 14, 15, 22, 23, 25, 26 & 27; and 8 South 14 East 20, 29 & 30	6,560	28-401289	10/14/04	Willow Springs Utilities
6	Red Rock Village	Pinal	10 South	10 East	4, 5, 8, 9 & 10	3,808	28-400918	11/02/04	Red Rock Utilities
18	Saddlebrooke Ranch	Pinal	10 South	14 East	4, 5, 7 & 8	6,000	28-400263	03/21/02	Arizona Water Company - Oracle System
21	B_2 Ranch	Pinal	10 South	14 East	1; and 10 South 15 East 5	1,553	28-401962	09/12/06	Undetermined
104	Tucson Mountain Ranch & Valencia Ranch	Pima	15 South	12 East	9	887	28-500065	07/24/07	Diablo Village Water Co
107	Pomegranate Farms	Pima	15 South	12 East	18	3,908	28-700315	03/28/08	Diablo Village Water Co
111	Voyager Expansion	Pima	15 South	15 East	32	1,200	28-400732	10/11/02	Voyager Water Company
125	Swan Southlands Development	Pima	16 South	14 East	10, 12, 13, 14 & 15	8,525	28-401840	06/12/06	NA
126	Sahuarita Farms (N. half) and Continental Farms (S. half)	Pima	16 South; 17 South; 17 South; 18 South	14 East; 13 East; 14 East; 13 East	31;12, 13, 24 & 25;5-8, 17-19 & 30;24	31,029	28-500050	07/30/07	Farmers Water Company
133	Rancho Sahuarita	Pima	17 South	13 East	1, 11-14, 23	10,800	28-300120	07/23/96	NA
135	Sahuarita West & East Property	Pima	17 South	13 East	25, 26 & 35	788	28-400352	02/07/01	Community Water Company of Green Valley
159	Madera Highlands (2000)	Pima	18 South	13 East	7, 12, 13 & 18	1,800	28-400259	07/13/00	Farmers Water Company
159	Madera Highlands (2002)	Pima	18 South	13 East	12 & 13; and 18 South 14 East 7 & 18	1,800	28-400616	04/15/02	Farmers Water Company
171	Santa Rita Springs	Pima	18 South	13 East	26, 27 & 34	1,081	28-300194	10/03/96	Farmers Water Company
177	Canoa Ranch	Pima	19 South	13 East	8, 9 10, 17 & 18	2,200	28-400615	01/16/02	Green Valley Domestic Water Improvement District
182	Ridgeline Estates	Pima	19 South	14 East	18, 19, 20, 29 & 30	166	28-700397	02/15/08	NA

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated Demand (af/yr)	Year of Projected or Annual Estimated Demand
A	City of Tucson	Pima	26-400957.0000	04/29/03	06/12/07	183,956	2015
B	Marana Municipal Water System	Pima	26-402254.0000	07/31/06	05/07/07	7,580	2017
C	Metropolitan Domestic Water Imp. Dist. - West	Pima	26-401922.0000	10/20/05	09/25/06	1,014	2016
D	Metropolitan Domestic Water Improvement District	Pima	26-401062.0000	09/02/03	07/31/06	13,302	2016
E	Sahuarita Water Company	Pima	26-401203.0000	01/06/04	12/01/04	2,578	2014
F	Spanish Trail WC	Pima	26-0001170.0000	07/18/97	04/16/96	1,843	2005
G	Town of Oro Valley	Pima	26-400765.0000	07/01/02	06/26/03	15,049	2013
H	Vail Water Company	Pima	26-401752.0000	05/03/05	11/10/05	3,749	2015
I	Willow Springs Utilities Company	Pinal	26-402225.0000	07/06/06	04/15/08	2,635	2017

[1] Includes water reports issued under the Water Adequacy program prior to 1980 implementation of the Assured Water Supply program.

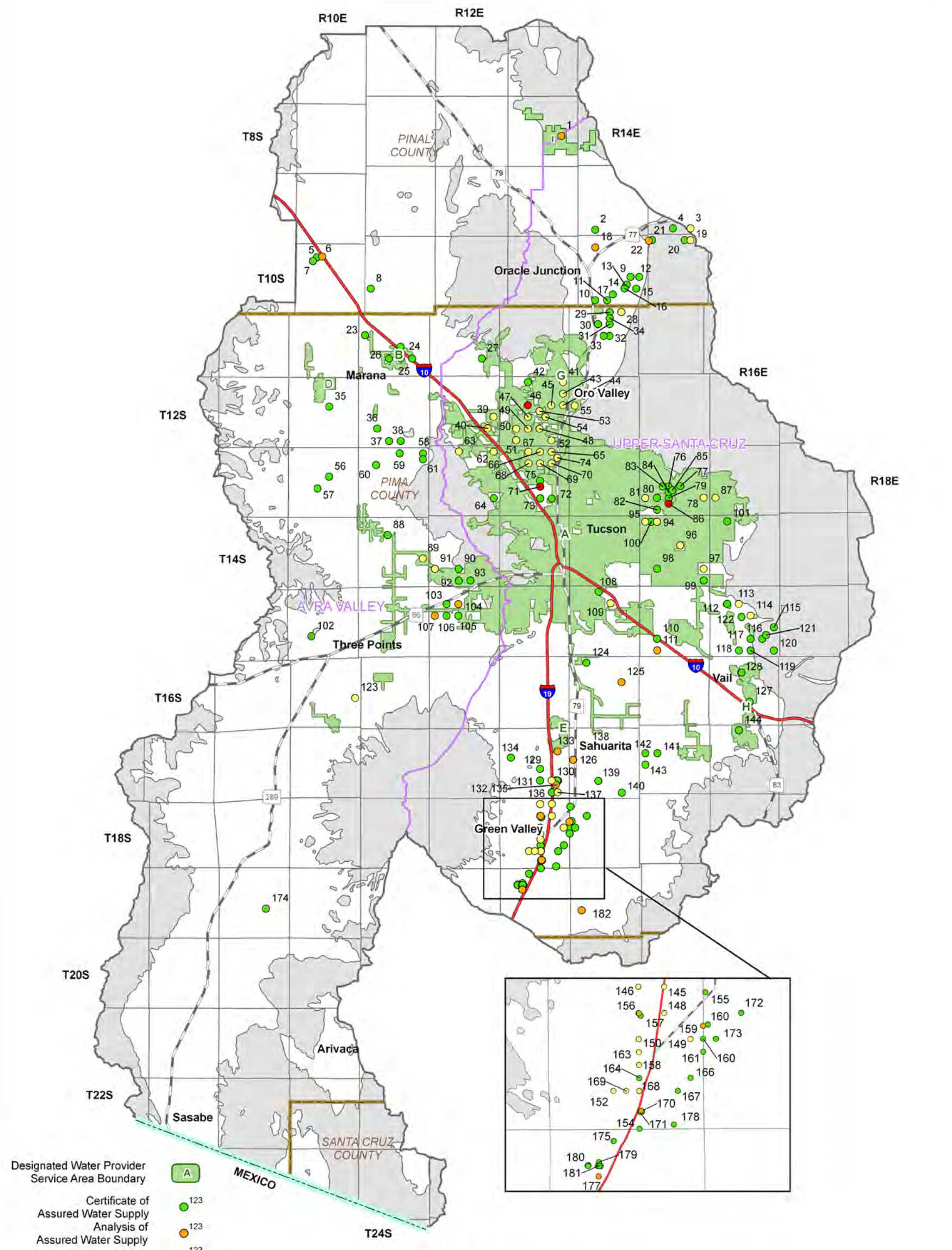


Figure 8.5-13
Tucson AMA
Assured Water Supply Determinations

Tucson AMA
References and Supplemental Reading

References

A

Arizona Department of Economic Security (DES), 2005, Workforce Informer: Data file, accessed August 2005, http://www.workforce.az.gov.

Arizona Department of Environmental Quality, 2005, ADEQSWI: Data file, received September 2005.

_____, 2005, ADEQWATP: Data file, received May 2005.

_____, 2005, ADEQWWTP: Data file, received August 2005.

_____, 2005, Azurite: Data file, received September 2005.

_____, 2005, Effluent dependent waters: GIS cover, received December 2005.

_____, 2005, Impaired lakes and reaches: GIS cover, received January 2006.

_____, 2004, Water providers with arsenic concentrations in wells over 10ppb: Data file, received August 2004.

_____, 2004, Water quality exceedences by watershed: Data file, received June 2004.

_____, 2004, Water quality exceedences for drinking water providers in Arizona: Data file, received September 2004.

Arizona Department of Water Resources (ADWR), 2007, Estimated cultural water demand in the AMA Planning Area: Unpublished Analysis, ADWR Office of Data Management.

_____, 2006, Assured and adequate water supply applications: Project files, ADWR Hydrology Division.

_____, 2005, Automated recorder sites: Data files, ADWR Basic Data Unit.

_____, 2005, Assured and adequate water supply determinations: Database, ADWR Office of Assured and Adequate Water Supply.

_____, 2005, Flood warning gages: Database, ADWR Office of Water Engineering.

_____, 2005, Inspected dams: Database, ADWR Office of Dam Safety.

_____, 2005, Non-jurisdictional dams: Database, ADWR Office of Dam Safety.

_____, 2005, Groundwater Site Inventory (GWSI): Database, ADWR Hydrology Division.

_____, 2005, Registry of surface water rights: ADWR Office of Water Management.

_____, 2005, Wells55: Database.

_____, 2004, Annual withdrawal and use reports for the Tucson AMA: ADWR Office of Water Management.

_____, 1999, Third Management Plan for the Tucson Active Management Area 2000-2010.

_____, 1994, Arizona Water Resources Assessment, Vol. I, Inventory and Analysis.

_____, 1994, Arizona Water Resources Assessment, Vol. II, Hydrologic Summary.

Arizona Game and Fish Department (AGF), 2005, Arizona Waterways: Data file, received April 2005.

_____, 1997 & 1993, Statewide riparian inventory and mapping project: GIS cover.

Arizona Land Resource Information System (ALRIS), 2005, Springs: GIS cover, accessed January 2006 at http://www.land.state.az.us/alris/index.html.

_____, 2005, Streams: GIS cover, accessed 2005 at http://www.land. state.az.us/alris/index.html.

_____, 2005, Water features: GIS cover, accessed July 2005 at http://www.land. state.az.us/alris/

index.html.
_____, 2004, Land ownership: GIS cover, accessed in 2004 at http://www.land.state.az.us/alris/index.html.

D

Diroll, M., and Marsh, D., 2006, Status of water quality in Arizona-2004 integrated 305(b) assessment and 303(d) listing report: ADEQ report.

E

Environmental Protection Agency (EPA), 2005, Surf Your Watershed: Facility reports, accessed April 2005 at http://oaspub.epa.gov/enviro/ef_home2.water.
_____, 2005, 2000 and 1996, Clean Watershed Needs Survey: datasets, accessed March 2005 at http://www.epa.gov/owm/mtb/cwns/index.htm.

K

Konieczki, A.D. and Wilson, R.P., 1992, Annual summary of ground-water conditions in Arizona, spring 1986 to spring 1987: USGS Open File Report 92-54.

M

McCormack, H.F., Fisk, G.G., Duet, N.R., Evans, D.W., Roberts, W.P., and Castillo, N.K., 2002, Water resources data Arizona, water year 2002: USGS Water Data Report AZ-02-1.

O

Oregon State University, Spatial Climate Analysis Service (SCAS), 2006, Average annual precipitation in Arizona for 1961-1990: PRISM GIS cover, accessed in 2006 at www.ocs.orst.edu/prism.

P

Pima County, 2004, The Pima County Effluent Generation and Utilization Report 2004.
Pima County Association of Governments, 2006, Pima Association of Government's (PAG's) Section 208 Area-wide Water Quality Management Plan 2006.

U

US Army Corps of Engineers, 2004 and 2005, National Inventory of Dams: Arizona Dataset, accessed November 2004 to April 2005 at http://crunch. tec.army.mil/nid/webpages/nid.cfm
US Geological Survey (USGS), 2006, Average annual runoff in the United States, 1951-1980: Data file, accessed March 2006 at http://aa179.cr.usgs.gov/ metadata/wrdmeta/runoff.htm.
_____, 2006, Springs and spring discharges: Dataset, received November 2004 and January 2006 from USGS office in Tucson, AZ.
_____, 2006, National Hydrography Dataset: Arizona dataset, accessed at http://nhd.usgs.gov/.
_____, 2005, National Water Information System (NWIS): Arizona dataset, accessed December 2005 at http://waterdata.usgs.gov/nwis.
_____ 2004, Southwest Regional Gap analysis study- land cover descriptions: Electronic file, accessed January 2005 at http://earth.gis.usu.edu/swgap.

_____, 1981, Geographic digital data for 1:500,000 scale maps: USGS National Mapping Program Data Users Guide.

V

Valencia, R.A., Wennerlund, J.A., Winstead, R.A., Woods, S., Riley, L., Swanson, E., and Olson, S., 1993, Arizona riparian inventory and mapping project: Arizona Game and Fish Department.

W

Wahl, C.R., Boe, S.R., Wennerlund, R.A., Winstead, R.A., Allison, L.J., Kubly, D.M., 1997, Remote sensing mapping of Arizona intermittent stream riparian areas: Arizona Game and Fish Technical Report 112.

Western Regional Climate Center (WRCC), 2005, Pan evaporation stations: Data file accessed December 2005 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

_____, 2005, Precipitation and temperature stations: Data file, accessed December 2007 at http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~GetCity~USA.

Weidner, C., 1996, ADEQ Pollution Prevention Report, Arizona Pollution Prevention. Spring/Summer 1996.

Supplemental Reading

Betancourt, J.L. and R.M. Turner. 1993. Tucson's Santa Cruz River and the arroyo legacy. Tucson, Arizona: University of Arizona Press.

Colby, B.G. and Jacobs, K.L eds, 2007, Arizona Water Policy: Management and Innovations in an Urbanizing, Arid Region: Resources for the Future, Washington D.C.

Fonseca, J., 2008, Aquifer Monitoring for Groundwater-Dependent Ecosystems, Pima County Arizona: Office of Conservation Science, Pima County, Natural Resources, Parks and Recreation.

Galyean, Ken, 1996. Infiltration of Wastewater Effluent in the Santa Cruz Rive Channel, Pima County, Arizona. United States Geological Survey Water-Resources Investigations Report 96-4021. Prepared in cooperation with the City of Tucson, Tucson, AZ 1996

Good Neighbor Environmental Board, 2005, Water Resources Management on the U.S.-Mexico Border: Eighth Report to the President and Congress of the United States.

Governor's Drought Task Force, 2004, Arizona Drought Preparedness Plan. Draft. Phoenix.

Governor's Drought Task Force, 2004, Arizona Drought Management Plan. Draft. Phoenix

Governor's Water Management Commission, 2000, Briefing Book: Water Management Framework for AMAs, Groundwater Use Restrictions and Requirements. Phoenix: Arizona Department of Water Resources.

Governor's Water Management Commission, 2002, Final Report and Recommendations Phoenix: Arizona Department of Water Resources.

Hill, E., Fonseca, J. and Schorr, S, 2000, Groundwater Level Changes in the Tanque Verde Valley: Sonoran Desert Conservation Plan, Pima County, Arizona.

Hammett, B.A. and Sicard, J.W., 1995, Maps showing Groundwater Conditions in the Santa Cruz and Tucson Active Management Areas Pima, Pinal and Santa Cruz Counties: Arizona Department of Water Resources Open-File 8

Hammett, B.A. and J.W. Sicard, 1997. Groundwater conditions in the Santa Cruz and Tucson Active Management Areas, Pima, Pinal and Santa Cruz Counties, 1995. Arizona Department of Water Resources, Open-File Report No. 8.

Hanson, R.T., S.R. Anderson, and D.R. Pool, 1990. Simulation of ground-water flow and potential land subsidence, Arva Valley, Arizona. United States Geological Survey Water-Resources Investigations Report 90-4178, 41pp.

Hanson, R.T. and J.F. Benedict, 1994. Simulation of ground-water flow and potential land subsidence, Upper Santa Cruz Basin, Arizona. United States Geological Survey Water-Resources Investigation Report 93-4196, 47pp.

Hoffman, J.P., D.R. Pool, A.D. Konieczki and M.C. Carpenter, 1997. Investigation of the Causes of Sinks in the San Xavier District, Tohono O'odham Nation, Pima County, Arizona. United States Geological Survey Open File Report 97-19.

Holway, J.M. and K.L. Jacobs, 2006, Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth: in Mays, L., eds., Managing for Sustainability in Arizona, USA: Linking Climate, Water Management and Growth. McGraw-Hill.

International Boundary and Water Commission. 1997. Memorandum from S. Tencza to F. Corkhill containing annual sewage inflow and outflow data for the Nogales International Wastewater Treatment Plant. Nogales, Arizona, United States Section.

Jacobs, K. L. and J. M. Holway, 2004, Lessons Learned from Twenty Years of Groundwater Management in Arizona, USA. *Hydrogeology Journal*. 12, No. 1.

Malcolm Pirnie, 1995. Regional Effluent Utilization Plan, Phase B. Produced for Pima County Wastewater Management Department and Tucson Water, June 1995.

Malcolm Pirnie, 1996. Tucson Water Department Application for Designation of Assured Water Supply. Filed with Arizona Department of Water Resources, December 1996.

Megdal, S. and Lien, A., 2008, Tucson Regional Water Planning Perspectives Study, Water Resources Research Center, University of Arizona.

Megdal, S. and Smith, Z., 2008, Evolution and Evaluation of the Active Management Area Management Plans, Water Resources Research Center, University of Arizona.

Megdal, S., 2006, Water Resource Availability for the Tucson Metropolitan Area, Water Resources Research Center, University of Arizona.

Megdal, S. and Colby, B., 2004, Arizona's Water Future: Challenges and Opportunities, 85th Arizona Town Hall Background Report, University of Arizona.

Megdal, S. , 2003, How Water Management in Tucson, Arizona Has Affected the Desert's Landscape: Water Resources Research Center, University of Arizona.

Murphy, B.A. and J.D. Hedley, 1984. Maps showing groundwater conditions in the Upper Santa Cruz Basin area, Pima, Santa Cruz, Pinal and Cochise Counties, Arizona, 1982. Arizona Department of Water Resources Hydrologic Map Series Report Number 11, 3 sheets.

Pima Association of Governments, 1994, Water Quality State of the Region Report, December 1994.

Pima Association of Governments, 1995, 1995 Pima Association of Governments Water Quality Documents, Summaries and Information Index, December 1995

Pima County, 1999, Water Resources and the Sonoran Desert Conservation Plan.

Scott, P.S., MacNish, R.D., and T. Maddock III. 1996. Effluent recharge to the Upper Santa Cruz River floodplain aquifer, Santa Cruz County, Arizona, Arizona Research Laboratory for Riparian Studies at the University of Arizona, Tucson, Arizona. 75p.

Seventy-first Arizona Town Hall. 1997. Ensuring Arizona's Water Quantity and Quality into the 21st Century. Marshall A. Worden, editor. Phoenix: Arizona Town Hall.

Slaff, Steven. 1993. Land Subsidence and Earth Fissures in Arizona. Arizona Geological Survey, Down-to-Earth Series 3.

Sprouse, T.W., 2005, Water Issues on the Arizona-Mexico Border: The Santa Cruz, San Pedro and Colorado Rivers, Water Resources Research Center, University of Arizona.

Tucson Water, 2008, 2008 Update to Water Plan 2000-2050: City of Tucson, Arizona.

Tucson Water, 2007, Reclaimed Water System Status Report -2007: City of Tucson, Arizona

Tucson Water, 1997, Annual Static Water Level Basin Data Report, Tucson Basin and Avra Valley, Pima County, Arizona, 1995. City of Tucson, Tucson Water, Planning and Engineering Division, Research and Technical Support Section, June 1997.

Index to Section 8.0

Geography 5

Hydrology
- Groundwater Hydrology 11-12
- Surface Water Hydrology 17-18

Climate 19,21,22

Environmental Conditions
- Vegetation 23,24,26,27
- Arizona Water Protection Fund 28
- Instream Flow 28
- Endangered Species 30,31
- Protected Areas 30,34

Population 35,37,41

Water Supply 43
- Central Arizona Project 43
- Surface Water 45
- Groundwater 46
- Effluent 47-48
- Contamination Sites 49

Cultural Water Use 50,51,52
- Tribal Demand 54-56
- Municipal Demand 56,62-63
- Agricultural Demand 67,68-69
- Industrial Demand 71

Water Resource Issues 71-75

ACRONYMS AND ABBREVIATIONS

ACC	Arizona Corporation Commission
ADMMR	Arizona Department of Mines and Mineral Resources
ADWR	Arizona Department of Water Resources
ADEQ	Arizona Department of Environmental Quality
ADOC	Arizona Department of Commerce
ALERT	Automated Local Evaluation in Real Time
ALRIS	Arizona Land Resource Information System
AMA	Active Management Area
AMP	Adaptive Management Program
APS	Arizona Public Service
ARS	Arizona Revised Statute
ASLD	Arizona State Land Department
AWBA	Arizona Water Banking Authority
AWCCG	Arizona Water Company - Casa Grande System
AWPF	Arizona Water Protection Fund
AZDA	Arizona Department of Agriculture
AZGF	Arizona Game and Fish Department
AZMET	Arizona Meteorological Network
BIA	United States Bureau of Indian Affairs
bls	Below land surface
BLM	United States Bureau of Land Management
BMP	best management practices
CAGRD	Central Arizona Groundwater Replenishment District
CAIDD	Central Arizona Irrigation and Drainage District
CAP	Central Arizona Project
CAVSRP	Central Avra Valley Storage and Recovery Project
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CLIMAS	Climate Assessment for the Southwest
CMID	Cortaro-Marana Irrigation District
CVID	Chino Valley Irrigation District
DES	Arizona Department of Economic Security
DOD	United States Department of Defense
DWID	Domestic Water Improvement District
DWS	Drinking Water Standards
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FICO	Farmers Investment Company
FR	Federal Register
GIS	Geographic Information System
gpcd	Gallons per capita per day
gpm	Gallons per minute
GRIC	Gila River Indian Community

GSF	Groundwater Savings Facility
GSP Act	Growing Smarter Plus Act
GUAC	Groundwater Users Advisory Council
GWSI	Groundwater Site Inventory System
HIA	Historically Irrigated Acres
HIDD	Hohokam Irrigation and Drainage District
HSR	Hydrographic Survey Report
HUC	Hydrologic Unit Code
ID	Irrigation District
IDD	Irrigation and Drainage District
IGA	Intergovernmental agreement
INA	Irrigation Non-Expansion Area
ITCA	Intertribal Council of Arizona
M&I	Municipal and Industrial
MSCP	Multi-Species Conservation Plan
MSIDD	Maricopa-Stanfield Irrigation and Drainage District
LDIG	Local Drought Impact Group
LUST	Leaking Underground Storage Tank
maf	Million acre-feet
MWD	Maricopa Water District
NAU	Northern Arizona University
NHD	National Hydrography Dataset
NIWWTP	Nogales International Wastewater Treatment Plant
NMIDD	New Magma Irrigation and Drainage District
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List (Superfund)
NPS	United States National Park Service
NRCD	Natural Resources Conservation District
NRCS	Natural Resources Conservation Service
NWIS	National Water Information System
NWR	National Wildlife Refuge
NWS	National Weather Service
Pan ET	Pan Evaportranspiration
PCE	Tetrachloroethene
PCWAA	Pinal County Water Augmentation Authority
PDO	Pacific Decadal Oscillation
RCRA	Resource Conservation and Recovery Act
RID	Roosevelt Irrigation District
ROD	Record of Decision
RW	Recovery well
RWCD	Roosevelt Water Conservation District
SAVSRP	Southern Avra Valley Storage and Recovery Project
SAWRSA	Southern Arizona Water Rights Settlement Act
SB	Senate Bill
SCIDD	San Carlos Irrigation and Drainage District

SCIP	San Carlos Irrigation Project
SDCP	Sonoran Desert Conservation Plan
SNOTEL	SNOpack TELemetry
SRP	Salt River Project
SRPMIC	Salt River Pima-Maricopa Indian Community
TCE	Trichloroethylene
TDS	Total Dissolved Solids
USBOR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USDOI	United States Department of Interior
USF	Underground Storage Facility
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds
VRP	Voluntary Remediation Program
WIFA	Water Infrastructure Finance Authority
WC&DD	Water Conservation and Drainage District
WQARF	Water Quality Assurance Revolving Fund
WRCC	Western Regional Climate Center
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

APPENDIX A

Appendix A: Arizona Water Protection Fund Projects in the AMA Planning Area through 2005

ACTIVE MANAGEMENT AREA PLANNING AREA				
AMA	**Map Number**	**AWPF Grant #**	**Project Title**	**Project Category**
Phoenix AMA	16	95-010	Assessment of the Role of Effluent Dominated Rivers in Supporting Riparian Functions	Research
Phoenix AMA	101	96-0005	Tres Rios River Management & Constructed Wetlands Project	Research
Phoenix AMA	171	97-038	Tres Rios Wetland Heavy Metal Bioavailability Design for Denitrification and Microbial Water Quality	Research
Phoenix AMA	180	97-042	Queen Creek Restoration and Management Plan	Research
Phoenix AMA	259	99-098	Rio Salado Habitat Restoration Project	Constructed Wetland & Revegetation
Phoenix AMA	278	00-114	The Papago Park Greenline Project	Exotic Species Control & Revegetation
Pinal AMA	12	95-008	Picacho Reservoir Riparian Enhancement Project	Habitat Protection
Prescott AMA	19	95-012	The Comprehensive Plan for the Watson Woods Riparian Preserve	Feasibility Study
Prescott AMA	118	96-0008	Watson Woods Vegetation Inventory	Research
Prescott AMA	119	96-0009	Watson Woods Riparian Preserve Visitor Management	Research
Prescott AMA	235	99-076	Watson Woods Preserve Herpetological Interpretive Guide and Checklist	Research
Prescott AMA	296	04-121	Lynx Creek Restoration	Stream Restoration
Prescott AMA	299	04-122	Watson Woods Riparian Preserve Restoration Feasibility Project	Feasibility Study

ACTIVE MANAGEMENT AREA PLANNING AREA				
AMA	**Map Number**	**AWPF Grant #**	**Project Title**	**Project Category**
Tucson AMA	5	95-002	Partnership for Riparian Conservation in Northeastern Pima County	Research
Tucson AMA	26	95-007	High Plains Effluent Recharge Project	Wetland Restoration
Tucson AMA	69	95-023	Sabino Creek Riparian Ecosystem Protection Project	Research
Tucson AMA	90	96-0010	Rehabilitating the Puertocito Wash on the Buenos Aires National Wildlife Refuge	Stream Restoration
Tucson AMA	133	96-0026	Riparian Restoration on the San Xavier Indian Reservation Community	Habitat Restoration & Revegetation
Tucson AMA	161	97-031	Lincoln Park Riparian Habitat Project (f.k.a. Atturbury Wash Project)	Habitat Restoration
Tucson AMA	163	97-033	Proctor Vegetation Modification	Exotic Species Control
Tucson AMA	215	98-062	Partnership for Riparian Conservation in Northeastern Pima County II	Revegetation
Tucson AMA	231	99-072	Leopard Frog Habitat and Population Conservation at Buenos Aires National Wildlife Refuge	Habitat Restoration
Tucson AMA	239	99-080	Cortaro Mesquite Bosque	Habitat Restoration & Revegetation
Tucson AMA	246	99-087	Rillito Creek Habitat Restoration Project	Habitat Restoration & Revegetation
Tucson AMA	253	99-094	Santa Cruz River Park Extension	Habitat Restoration & Revegetation

ACTIVE MANAGEMENT AREA PLANNING AREA				
AMA	**Map Number**	**AWPF Grant #**	**Project Title**	**Project Category**
Tucson AMA	279	00-115	Tucson Audubon Society North Simpson Farm Riparian Recovery Project	Revegetation
Tucson AMA	300	04-123	Tucson Audubon Society, Santa Cruz River Habitat Project, North Simpson Site, Phase 2	Revegetation
Tucson AMA	310	05-130	Riparian Restoration on the San Xavier District – Project Two	Revegetation
Santa Cruz AMA	80	95-024	Potrero Creek Wetland Characterization and Management Plan	Research
Santa Cruz AMA	178	97-041	Altar Valley Watershed Resource Assessment	Research
Santa Cruz AMA	265	00-103	Riparian Restoration on the Santa Cruz River – Santa Fe Ranch	Fencing & Revegetation
Santa Cruz AMA	314	05-132	Esperanza Ranch Riparian Restoration Project	Fencing & Revegetation

APPENDIX B

Appendix B: Central Arizona Project Subcontracts

CAP SUBCONTRACTS

Municipal and Industrial Subcontracts

Subcontrator Name	Date of Contract	Entitlement (Acre-feet per year)
Arizona-American Water Co. (Agua Fria)	July 15, 1985	11,093 [1]
Arizona-American Water Co. (Paradise Vly)	July 12, 1985	3,231 [2]
Arizona-American Water Co. (Sun City)	Aug. 13, 1985	4,189 [3]
Arizona-American Water Co. (Sun City West)	June 19, 1999	2,372 [4]
Arizona State Land Dept.	Nov. 25, 1986	32,076 [5]
Arizona Water Co. (Apache Jct.)	March 15, 1985	6,000
Arizona Water Co. (Casa Grande)	March 15, 1985	8,884
Arizona Water Co. (Coolidge System	March 15, 1985	2,000
Arizona Water Co. (White Tank System)	March 15, 1985	968
ASARCO Incorporated (Ray Mine)	March 1, 1993	21,000 [6/]
Avondale	Dec. 6, 1984	5,416 [7/]
AVRA Water Co-op, Inc.	Nov. 13, 2007	808
Buckeye	Nov. 21, 1984	25 [8/]
Carefree Water Co.	Jan. 2, 1990	1,300 [9/]
Cave Creek Water Co.	May 28, 1985	2,606 [10/]
Central Arizona Water Conservation District (for Central Arizona Groundwater Replenishment District)		7,746 [11/]
Chandler	Nov. 20, 1984	8,654

Subcontrator Name	Date of Contract	Entitlement (Acre-feet per year)
Chandler Heights Citrus I.D.	Jan. 24, 1985	315
Chaparral City Water Co.	Oct. 2, 1984	8,909
Circle City Water Co.	Aug. 6, 1999	3,932 [12]
Community Water Co. (Grn. Vly.)	May 17, 1985	2,858 [13]
El Mirage, City of	July 19, 2007	508
Eloy	Dec. 18, 1984	2,171
Florence	Dec. 21, 1984	2,048 [14]
Flowing Wells Irrigation District	June 19, 1985	4,354
Gilbert	Jan. 22, 1985	7,235
Glendale	Oct. 25, 1984	17,236 [15]
Goodyear	Nov. 21, 1984	10,742 [16]
Green Valley Domestic Water Improvement Dist.	June 18, 1985	1,900 [17]
H2O Water Co.	Nov. 5, 2007	147
Marana, Town of	April 6, 1999	47 [18]
Maricopa County Parks & Rec.	April 8, 1993	665
Mesa	Oct. 25, 1984	43,503 [19]
Metropolitan Domestic Water Improvement District	May 8, 1998	13,460 [20]
Oro Valley, Town of	Jan. 18, 1997	10,305 [21]
Peoria	Nov. 23, 1984	25,236 [22]
Phelps Dodge Miami, Inc.	March 1, 1993	2,906 [23]
Phoenix	Oct. 25, 1984	122,120 [24]
Phoenix Memorial Park	March 20, 1985	84

Subcontrator Name	Date of Contract	Entitlement (Acre-feet per year)
Pine Water Company	Aug. 6, 1999	161 [25]
Queen Creek Water Co.	June 26, 1995	348 [26]
Rio Verde Utilities, Inc.	Sept .16, 1992	812
San Tan Irrigation District	Dec. 11, 1984	236
Scottsdale	Oct. 15, 1984	52,810 [27]
Spanish Trail Water Co.	Nov. 16, 1990	3,037 [28]
Superior, Town of	June 19, 2007	285
Surprise	Feb. 8, 1995	10,249 [29]
Tempe	Dec. 10, 1984	4,315
Tonto Hills Utility Co.	July 20, 2001	71 [30]
Tucson	Feb. 1, 1985	144,172 [31]
Vail Water Company	Dec. 27, 1984	1,857 [32]
Valley Utilities Water Co.	May 10, 2007	250
Water Utilities Community Facilities District	Aug. 7, 1996	2,919 [33]
Water Utility of Greater Buckeye	Sept. 24, 1987	43 [34]
Water Utility of Greater Tonopah	Sept. 24, 1987	64 [35]
		620,678

NOTES:

1 Formerly Agua-Fria (Citizens Utilities Company). Sun City Water Company (Citizens Utilities Company) transferred 9,654 acre-feet of its entitlement to Agua Fria. Agua Fria then transferred the entitlement to Arizona-American Water Company.

2 Arizona-American Water Company (Paradise Valley) formerly Paradise Valley Water Company.

3 Formerly Sun City Water Co. (Citizens Utilities Company) and Sun City Water Co. (Youngtown). Sun City Water Co. (Youngtown) acquired Youngtown's CAP allocation of 380 acre-feet. Sun City Water Company previously assigned 2,372 acre-feet of its CAP water entitlement to Sun City West Utilities Company and 9,654 acre-feet to Agua Fria. Sun City Water Co. then transferred the remainder of its entitlement and the Sun City (Youngtown) entitlement to Arizona-American Water Company (Sun City).

4 Formerly Sun City West Utilities Company. Sun City Water Company assigned 2,372 acre-feet of its CAP water entitlement to Sun City West Utilities Company (SCWUC). SCWUC then transferred its entitlement to Arizona-American Water Co. (Sun City West).

5 This amount includes Amendment No. 1 to the Arizona State Land Department's (ASLD) CAP subcontract executed on March 12, 1997, decreasing its entitlement from 39,006 to 38,476 acre-feet per year in light of ASLD transferring 530 acre-feet of its CAP water entitlement to the City of Scottsdale. Amendment No. 2 to the ASLD's CAP subcontract executed on July 24, 1998, decreases its entitlement from 38,476 to 34,576 acre-feet per year in light of ASLD transferring an additional 3,900 acre-feet of its CAP water entitlement to the City of Scottsdale. Amendment No. 3 to the ASLD's CAP subcontract executed on May 4, 2000, decreases its entitlement from 34,576 to 33,076 acre-feet per year in light of ASLD's transferring 1,500 acre-feet of its CAP water entitlement to the City of Mesa. Amendment No. 4 to ASLD's CAP subcontract decreases its entitlement from 33,076 to 32,076 acre-feet per year in light of ASLD's transferring 1,000 acre-feet of its CAP water entitlement to the City of Peoria.

6 Figure for the year 2034. Includes allocation to Hayden Smelter. ASARCO elected to contract for 21,000 acre-feet of its original 22,610 acre-foot allocation of CAP water.

7 This amount includes Amendment No. 1 to Avondale's CAP subcontract executed on December 3, 1997, increasing Avondale's entitlement from 4,099 to 4,746 acre-feet per year in light of McMicken Irrigation District transferring 647 acre-feet of its CAP M&I water entitlement to Avondale. Amendment No. 2 to Avondale's CAP subcontract executed on January 5, 2005, increasing its entitlement from 4,746 to 5,416 acre-feet per year in light of Litchfield Park Service Co. transferring 670 acre-feet of its CAP M&I water entitlement to Avondale.

8 Figure for the year 2034.

9 This amount includes Amendment No. 1 to Carefree Water Company's CAP subcontract executed on July 20, 2001, increasing its entitlement from 400 to 1,300 acre-feet per year in light of BHP Copper Inc's (formerly Cities Services Co. & Magma Copper Co.) transferring 900 acre-feet of its CAP M&I water entitlement to Carefree.

10 This amount includes Amendment No. 1 to Cave Creek Water Company's CAP subcontract executed on September 7, 2006, increasing its entitlement from 1600 to 1800 acre-feet per year in light of Berneil Water Company transferring 200 acre-feet of its CAP M&I water entitlement to Cave Creek Water Company.

11 Amendment No. 1, Supplement No. 1 to Contract No. 14-06-W-245 is pending U.S. approval. CAP M&I water was assigned to CAWCD for CAGRD use by Litchfield Park Service Co. (4,760 acre-feet), New River Utility Co. (1,885 acre-feet), Sunrise Water Co. (944 acre-feet) and West End Water Co. (157 acre-feet).

12 As part of a corporate restructuring, Brooke Water assigned its CAP water entitlement of 3,932 acre-feet to Circle City Water Company. The subcontract for Circle City was executed on December 17, 1999. Brooke Water originally acquired the entitlement from Consolidated Water Utilities (Maricopa) in 1996 through bankruptcy proceedings.

13 This amount includes Amendment No. 1 to Community Water Company of Green Valley's CAP subcontract executed on May 27, 1997, increasing its entitlement from 1,100 to 1,337 acre-feet per year in light of New Pueblo Water Company transferring its CAP water entitlement of 237 acre-feet to Community Water Company.

14 This amount includes Amendment No. 1 to the Town of Florence's CAP subcontract executed on February 2, 1995, increasing its entitlement from 1,641 to 2,048 acre-feet per year in light of Florence's acquisition of Arizona Sierra Utility Company's CAP water entitlement of 407 acre-feet.

15 This amount includes Amendment No. 1 to the City of Glendale's CAP subcontract executed on October 12, 1993, increasing its entitlement from 14,083 to 14,183 acre-feet per year in light of Glendale's assumption of 100 acre-feet of New River Utility's CAP entitlement.

16 This amount includes Amendment No. 1 to the City of Goodyear's CAP subcontract executed on October 26, 1999, increasing its entitlement from 2,374 to 3,381 acre-feet per year in light of McMicken Irrigation District4

assigning 1,007 acre-feet of its CAP M&I entitlement to Goodyear; Amendment No. 2 to Goodyear's CAP subcontract executed on January 5, 2005, increasing its entitlement from 3,381 to 3,531 acre-feet per year in light of Litchfield Park Service Co. transferring 150 acre-feet of its CAP M&I water entitlement to Goodyear.

17 Green Valley Domestic Water Improvement District was formerly Green Valley Water Co.

18 The subcontract for Town of Marana was executed on October 12, 1999. The Town of Marana acquired Cortaro-Marana Irrigation District's CAP allocation of 47 acre-feet.

19 This amount includes Amendment No. 1 to the City of Mesa's CAP subcontract executed on October 9, 1986, increasing Mesa's entitlement from 20,129 to 29,527 acre-feet per year in light of Mesa's acquisition of the water utility systems of Desert Sage Water Company, Desert Sands Water Company, and Crescent Valley Utility Company; Amendment No. 2 to Mesa's CAP subcontract executed on August 22, 1991, increasing Mesa's entitlement from 29,527 to 33,459 acre-feet in light of Mesa's acquisition of Turner Ranches Water Co.; Amendment No. 3 to Mesa's CAP subcontract executed on November 17, 1993, increasing Mesa's entitlement from 33,459 to 34,292 acre-feet in light of Mesa's assumption of Williams Air Force Base's CAP allocation; Amendment No. 4 to Mesa's CAP subcontract executed on December 20, 1995, increasing Mesa's entitlement from 34,292 to 34,888 acre-feet in light of Mesa's acquisition of 596 acre-feet of Queen Creek Irrigation District's CAP M&I allocation. Amendment No. 5 to Mesa's CAP subcontract executed on May 4, 2000, increasing Mesa's entitlement from 34,888 to 36,388 acre-feet in light of Mesa's acquisition of 1,500 acre-feet of ASLD's CAP water allocation.

20 In September 1998, Tucson transferred 8,858 acre-feet to First Trust of Arizona (now US Bank Arizona) for the benefit of Metropolitan Domestic Water Improvement District (MDWID). That entitlement was transferred from the Trust to MDWID on March 1, 2004.

21 On April 21, 1997, the Town of Oro Valley (Oro Valley) executed a subcontract for 1,652 acre-feet of CAP M&I water entitlement formerly held by Foothills Water Co. and later Canada Hills. In September 1998, the City of Tucson transferred 642 acre-feet to First Trust of Arizona (now US Bank Arizona) for the benefit of Oro Valley. That entitlement was transferred from the Trust to Oro Valley on March 31, 2003. In October 2003, Tucson transferred 4,454 acre-feet of its CAP water entitlement to Wells Fargo Bank Arizona as Trustee for Oro Valley. That entitlement was transferred from the Trust to Oro Valley on June 29, 2004.

22 This amount includes Amendment No. 1 to the City of Peoria's CAP subcontract executed on July 11, 1989, increasing Peoria's entitlement from 15,000 to 17,849 acre-feet per year in light of Peoria's condemnation of the water utility system of Clearwater Water Co.; Amendment No. 2 to Peoria's CAP subcontract executed on September 27, 1993, increasing Peoria's entitlement from 17,849 to 18,233 acre-feet per year which reflects Peoria's assumption of 374 acre-feet of New River Utility Co.'s CAP allocation; Amendment No. 3 to Peoria's CAP subcontract executed on April 10, 2000, increasing Peoria's entitlement from 18,223 to 18,709 acre-feet per year in light of Peoria's assumption of 486 acre-feet of McMicken Irrigation District's CAP M&I allocation; Amendment No. 4 to Peoria's CAP subcontract executed on April 23, 2002, increasing Peoria's entitlement from 18,709 to 19,709 acre-feet per year in light of Peoria's assumption of 1,000 acre-feet of ASLD's CAP M&I allocation.

23 Figure for the year 2034. Formerly Inspiration Consolidated Copper Co. and Cyprus Miami Mining Corp.

24 This amount includes Amendment No. 1 to the City of Phoenix's CAP subcontract executed on February 19, 1998, increasing its entitlement from 113,882 to 113,914 acre-feet per year which reflects the transfer by Berneil Water Co. of 32 acre-feet of its CAP entitlement.

25 As part of a corporate restructuring, E&R Water Company has assigned its CAP water entitlement of 161 acre-feet to Pine Water Company. The subcontract for Pine Water Company was executed on December 23, 1999. E&R Water Company was formerly Pine Improvement Association.

26 By subcontract executed on December 20, 1995, Queen Creek Water Company has acquired 348 acre-feet of Queen Creek Irrigation District's CAP M&I water entitlement.

27 The City of Scottsdale's original CAP allocation and subcontract was for 19,702 acre-feet. Amendment No.1 to Scottsdale's CAP subcontract was executed on December 12, 1990, and increased Scottsdale's entitlement to 20,488 acre-feet per year in light of Scottsdale's acquisition of the water utility systems of Ironwood Water

Company and North Valley Water Company. Amendment No. 2 to Scottsdale's CAP subcontract was executed on August 20, 1993, and increased Scottsdale's entitlement to 21,442 acre-feet per year in light of Scottsdale's acquisition of Carefree Ranch Water Co. Amendment No. 3 to Scottsdale's CAP subcontract was executed on January 21, 1994, and increased Scottsdale's entitlement to 26,437 acre-feet per year in light of Scottsdale's acquisition of the Town of Payson's CAP entitlement. Amendment No. 4 to Scottsdale's CAP subcontract was executed on December 8, 1994, and increased Scottsdale's entitlement to 26,576 acre-feet per year in light of Scottsdale's acquisition of Desert Ranch Water Co. Amendment No. 5 to Scottsdale's CAP subcontract was executed on September 27, 1996, and increased Scottsdale's entitlement to 34,203 acre-feet per year in light of Scottsdale's acquisition of the CAP entitlements of the City of Prescott (7,127 acre-feet) and the Yavapai-Prescott Indian Tribe (500 acre-feet). Scottsdale does not pay M&I capital charges to CAWCD for the 500 acre-feet assigned by the Yavapai-Prescott Indian Tribe, and that water is still considered Indian water for purposes of determining the allocation and repayment of CAP costs. The total allocation shown in this section of the report represents M&I water only and does not include the 500 acre-feet received from Yavapai-Prescott Indian Tribe. Amendment No. 6 to Scottsdale's CAP subcontract was executed on September 27, 1996, and increased Scottsdale's entitlement to 36,886 acre-feet per year in light of Scottsdale's acquisition of the CAP entitlement of Rio Rico Utilities, Inc. Amendment No. 7 to Scottsdale's CAP subcontract was executed on March 12, 1997, and increased Scottsdale's entitlement to 36,916 acre-feet per year in light of Scottsdale's acquisition of 530 acre-feet from Arizona State Land Department. Amendment No. 8 to Scottsdale's CAP subcontract was executed on March 12, 1997, and increased Scottsdale's entitlement to 41,197 acre-feet per year in light of Scottsdale's acquisition of the CAP entitlements of the City of Nogales (3,949 acre-feet) and Mayer Domestic Water Improvement District (332 acre-feet). Amendment No. 9 to Scottsdale's CAP subcontract was executed on April 29, 1998, and increased Scottsdale's entitlement to 41,397 acre-feet per year in light of Scottsdale's acquisition of 200 acre-feet from Berneil Water Co. Amendment No. 10 to Scottsdale's CAP subcontract was executed on July 24, 1998, and increased Scottsdale's entitlement to 45,297 acre-feet per year in light of Scottsdale's acquisition of an additional 3,900 acre-feet from Arizona State Land Department. Amendment No. 11 to Scottsdale's CAP subcontract was executed on August 24, 1998, and increased Scottsdale's entitlement to 48,529 acre-feet per year in light of Scottsdale's acquisition of Camp Verde's CAP allocation of 1,443 acre-feet and Cottonwood's CAP allocation of 1,789 acre-feet. Amendment No. 12 to Scottsdale's CAP subcontract was executed on September 13, 2001, and increased Scottsdale's entitlement to 49,829 acre-feet per year in light of Scottsdale's acquisition of 1,300 acre-feet of BHP Copper Inc's (formerly Cities Services Co. & Magma Copper Co.) CAP water entitlement.

28 Formerly Ranchlands, Inc.

29 By subcontract executed on November 1, 1996, Surprise acquired 7,373 acre-feet of CAP M&I water from McMicken Irrigation District.

30 By subcontract executed on July 20, 2001, Tonto Hills acquired 71 acre-feet of CAP M&I water from BHP Copper Inc. (formerly Cities Services Co. & Magma Copper Co.).

31 The City of Tucson's original CAP allocation and subcontract was for 148,420 acre-feet. Amendment No. 1 to Tucson's subcontract executed on September 28, 1998, decreased Tucson's entitlement to138,920 acre-feet per year after Tucson transferred 9,500 acre-feet to First Trust of Arizona (now US Bank Arizona) for the benefit of Metropolitan Domestic Water Improvement District (MDWID) and the Town of Oro Valley (Oro Valley). Amendment No. 2 to Tucson's subcontract, executed on October 28, 2003, decreased Tucson's entitlement from 138,920 to 134,466 acre-feet per year in light of Tucson's transfer of 4,454 acre-feet to Wells Fargo Bank Arizona, as Trustee for Oro Valley. Amendment No. 3 to Tucson's subcontract, executed on February 10, 2004, increased Tucson's entitlement from 134,466 to 135,966 acre-feet per year in light of Midvale Farms Water Co. transferring its CAP water entitlement of 1,500 acre-feet to Tucson.

32 Vail Water Company formerly Del Lago Water Company.

33 In 1997, Water Utilities Community Facilities District (Apache Junction) acquired the Consolidated Water Utilities (Pinal County) entitlement through bankruptcy proceedings. This allocation was formerly held by Palm Springs Water Company.

34 Formerly West Phoenix Water Company.

35 Formerly Sunshine Water Company.

CAP Non-Indian Agricultural Subcontracts

Subcontrator Name	Entitlement (Acre-feet per year)
Arizona State Land Department	9,026 [1/]

NOTES:

1 This entitlement was originally part of MSIDD's CAP subcontract. The CAP subcontract with Arizona State Land Department is pending and is subject to the satisfaction of certain specified conditions, including the ultimate effectiveness of the Arizona Water Settlement Agreement and Arizona Water Settlements Act.

CAP Indian Contracts

Subcontrator Name	Intended Use	Entitlement (Acre-feet per year)	
Ak-Chin Indian Community	Irrigation	75,000	1
Camp Verde (Yavapai-Apache)	Tribal Homeland	1,200	
Fort McDowell Indian Community	Tribal Homeland	18,233	2
Gila River Indian Community	Irrigation	311,800	3
Pascua Yaqui Tribe	Tribal Homeland	500	
Salt River Pima-Maricopa Indian Community	Irrigation	13,300	
San Carlos-Apache Tribe	Irrig. & Tr. Homeland	61,645	4
Tohono O'Odham Nation (formerly Papago Tribe)			
Chui Chu	Irrigation	8,000	
San Xavier	Tribal Homeland	50,000	5
Schuk Toak	Tribal Homeland	16,000	6
Tonto-Apache Tribe	Tribal Homeland	128	
		555,806	

NOTES:

1 The Ak-Chin Indian Community was allocated 58,300 acre-feet in 1983. Under the Ak-Chin Indian Community Water Rights Settlement Act of 1984, Pub. L. 98-530, the United States acquired 50,000 acre-feet (before losses) of Colorado River water from the Yuma-Mesa Division of the Gila Project, which was added to the CAP supply. Under the 1984 settlement, the Ak-Chin Indian Community is entitled to delivery of 75,000 acre-feet in a normal Colorado River water year, 85,000 acre-feet in a surplus year, and not less than 72,000 acre-feet in a shortage year. That obligation is met using first the former Yuma-Mesa water (quantified at 47,500 acre-feet after system losses) and thereafter as much of the original Ak-Chin allocation as is needed (27,500 acre-feet in a normal year). Whatever portion of the original Ak-Chin CAP allocation is not needed to satisfy delivery obligations to the Ak-Chin Indian Community (30,800 acre-feet in a normal year) is available for delivery to the San Carlos Apache Tribe (see note 3 below).

2 The Fort McDowell Indian Community was allocated 4,300 acre-feet in 1983. The Fort McDowell Indian Community Water Rights Settlement Act of 1990, Pub. L. 101-628, authorized the Secretary of the Interior to acquire the CAP non-Indian agricultural entitlement of the Harquahala Valley Irrigation District (originally 7.67% of the available agricultural supply) and convert it to 33,251 acre-feet of CAP Indian priority water. The Fort McDowell Indian Community received 13,933 acre-feet of the former HVID entitlement; the Gila River Indian Community received 18,100 acre-feet, and the remaining 1,218 acre-feet may only be used to settle water rights claims of other Indian tribes having claims to the water in the Salt and Verde River system.

3 The Gila River Indian Community was allocated 173,100 acre-feet of irrigation water in 1983. Under an August 7, 1992 agreement among RWCD, the United States, and the Gila River Indian Community, RWCD purportedly relinquished the remainder of its CAP entitlement for the use and benefit of GRIC. The relinquished entitlement was quantified as 18,600 acre-feet and reallocated to the Community under §204(b)(1)(A) of the Arizona Water Settlements Act, Pub. L. 108-451. The Act also reallocated to the Community 18,100 acre-feet of the former HVID entitlement and 102,000 acre-feet of non-Indian agricultural priority water relinquished pursuant to the Arizona Water Settlement Agreement. See Pub. L. 108-451, §§204(b)(1)(B) and 204(b)(1)(D).

4 The San Carlos Apache Tribe was allocated 12,700 acre-feet in 1983. Of that total, 2,700 acre-feet was designated as irrigation water and 10,000 acre-feet was designated as tribal homeland water. Under the San Carlos Apache Tribe Water Rights Settlement Act of 1992, Title 37 of Pub. L. 102-575, the Secretary reallocated to the San Carlos Apache Tribe 14,665 acre-feet of CAP M&I water originally allocated to the Phelps Dodge Corporation, 3,480 acre-feet of CAP M&I water originally allocated to the City of Globe, and the portion of the original Ak-Chin CAP allocation not needed to meet delivery obligations to the Ak-Chin Indian Community (see note 1 above). In a normal water supply year on the Colorado River—i.e., when no more than 27,500 acre-feet of the original Ak-Chin allocation is needed for delivery to the Ak-Chin Indian Community—the San Carlos Apache Tribe allocation is 61,645 acre-feet. The former Phelps Dodge water and the former Globe water retain their original M&I CAP priority.

5 San Xavier was originally allocated 27,000 acre-feet and received an additional 23,000 acre-feet of non-Indian agricultural priority water relinquished pursuant to the Arizona Water Settlement Agreement. See §306(a)(1) of the Southern Arizona Water Rights Settlement Amendments Act of 2004 (Title 3 of the Arizona Water Settlements Act, Pub. L. 108-451).

6 Schuk Toak was originally allocated 10,800 acre-feet and received an additional 5,200 acre-feet of non-Indian agricultural priority water relinquished pursuant to the Arizona Water Settlement Agreement. See §306(a)(2) of the Southern Arizona Water Rights Settlement Amendments Act of 2004 (Title 3 of the Arizona Water Settlements Act, Pub. L. 108-451).