RECLAMATION

Managing Water in the West

ENVIRONMENTAL ASSESSMENT

Superstition Mountains Recharge Project

Central Arizona Water Conservation District

Pinal County, Arizona

U.S. Department of the Interior
Bureau of Reclamation
Lower Colorado Region
Phoenix Area Office

October 2009

Mission Statements

The mission of the Department of the interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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ABBREVIATIONS AND ACRONYMS

ACS	Archaeological Consulting Services. Ltd.
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AF	acre-feet
AF/yr	acre-feet per year
AMA	Active Management Area
AOI	Area of Impact
ASLD	Arizona State Land Department
ASM	Arizona State Museum
AZPDES	Arizona Pollutant Discharge Elimination System
CAGRD	Central Arizona Groundwater Replenishment District
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ESRV	East Salt River Valley
F	Fahrenheit
FWS	U.S. Fish and Wildlife Service
GPS	global positioning system
MCL	maximum contaminant level
mg/m3	milligrams per cubic meter
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
pH	A measure of the acidity or basicity of a solution.
PM	particulate matter
PM_{10}	particulate matter with a diameter of 10 microns
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns
ppm	parts per million
Reclamation	Bureau of Reclamation
SHPO	State Historic Preservation Officer
SMRP	Superstition Mountains Recharge Project
TDS	total dissolved solids
µg/m3	micrograms per cubic meter
USF	Underground Storage Facility
USGS	United States Geologic Survey
WRCC	Western Regional Climate Center

UNIT CONVERSION GUIDE

For the reader's convenience, the following table has been included to serve as a guide in converting measurements found in this document between U.S. measurements and metric.

CONVERSION OF U.S. TO METRIC MEASUREMENTS	
U.S. Measurement	**Metric Measurement**
DISTANCE	
1 inch	2.54 centimeters
1 foot	0.31 meter
+-1 mile	1.61 kilometers
AREA	
1 square foot	0.09 square meter
1 acre	0.41 hectare
CONVERSION OF METRIC TO U.S. MEASUREMENTS	
Metric Measurement	**U.S. Measurement**
DISTANCE	
1 centimeter	0.39 inch
1 meter	3.28 feet
1 kilometer	0.62 mile
AREA	
1 square meter	10.76 square feet
1 hectare	2.47 acres

I. PURPOSE AND NEED

A. Background

The Central Arizona Water Conservation District (CAWCD) is an Arizona tax-levying public improvement district formed pursuant to Arizona law. The CAWCD was established to repay the Federal government for reimbursable costs associated with construction of the Central Arizona Project (CAP), and to operate, maintain and manage the CAP. CAWCD operates and maintains the CAP pursuant to two agreements with the United States, a 1987 Operation and Maintenance Transfer Contract and a 2000 Operating Agreement. Use and possession of Reclamation land associated with the CAP have been transferred to CAWCD under the 1987 Operation and Maintenance Transfer Contract.

Pursuant to Arizona Revised Statute 48-3713.B.5, regarding Multi-County Water Conservation Districts, Powers of District, the State of Arizona also has authorized CAWCD to construct and operate underground storage (recharge) projects. CAWCD has developed and is currently operating three recharge projects in Pima County: Avra Valley, Pima Mine Road and Lower Santa Cruz recharge projects. Three additional recharge projects are operated by CAWCD in Maricopa County--the Agua Fria, Hieroglyphic Mountains and Tonopah recharge projects. CAWCD is actively pursuing development of additional recharge projects to meet demands for recharge capacity by entities such as the Arizona Water Banking Authority, Central Arizona Groundwater Replenishment District (CAGRD), and various municipal and industrial CAP water service subcontractors.

B. Purpose and Need

1. Underground Storage Facility - CAWCD is proposing to construct and operate the Superstition Mountains Recharge Project (SMRP) on Bureau of Reclamation (Reclamation) and Arizona State trust land in Pinal County, Arizona. Because construction and operation of a recharge project is not an operation and maintenance activity of the CAP covered under the 1987 Operation and Maintenance Transfer Contract, Reclamation intends to separately approve CAWCD's use of Reclamation land for this proposed project.

The SMRP is designed to provide capacity for long-term storage of CAP water, for the benefit of the CAGRD and Arizona Water Bank Authority. The East Salt River Valley (ESRV) sub-basin is an area of historic groundwater decline that has experienced land subsidence and the formation of earth fissures (CAWCD 2007). Numerous regional planning efforts indicate that groundwater pumping will increase in the eastern portion of the Phoenix Active Management Area (AMA).[1] CAGRD's latest Plan of Operation, approved by the Arizona Department of Water Resources (ADWR) in October 2005, indicates the estimated replenishment obligations for the eastern portion of the Phoenix AMA by the year 2015 will be 48,600 acre-feet per year (AF/yr) and will grow to 83,600 AF/yr by 2025. The proposed project would offset over-pumping of groundwater that is anticipated to occur in the ESRV sub-basin by CAGRD members into the future. The project would assist the ESRV groundwater users in reaching ADWR's mandated safe yield (when a long term balance is achieved between the annual amount of groundwater pumped and the amount of natural and artificial recharge).

Other cities in southeastern Maricopa County may desire to recharge and store water at this facility. Under the current permit, only CAP water may be stored at this Underground Storage Facility (USF).

2. Environmental Assessment - Reclamation proposes to approve CAWCD's request to use Reclamation land to construct and operate the proposed SMRP for the life of the project (a minimum of 20 years; renewal for an additional 20 years is likely). To comply with the National Environmental Policy Act of 1969, as amended (NEPA), Reclamation is preparing this environmental assessment (EA) to describe and address potential environmental consequences resulting from Reclamation's approval, and CAWCD's construction and operation, of the SMRP. Reclamation issued a memorandum on October 4, 2007, notifying the public of a 30-day scoping

[1] The Phoenix AMA is one of five groundwater basins that have been designated as planning areas within Arizona by the State's Groundwater Management Code. These groundwater basins are characterized by severe groundwater overdraft. ADWR has identified a water management goal for each AMA to address water use concerns. The Phoenix AMA's management goal is to achieve "safe-yield" by 2025. Under safe-yield, the amount of groundwater pumped out of the basin does not exceed the amount that is recharged into the basin. The Groundwater Code allows entities to artificially recharge water with rights to recover the credits at a later date.

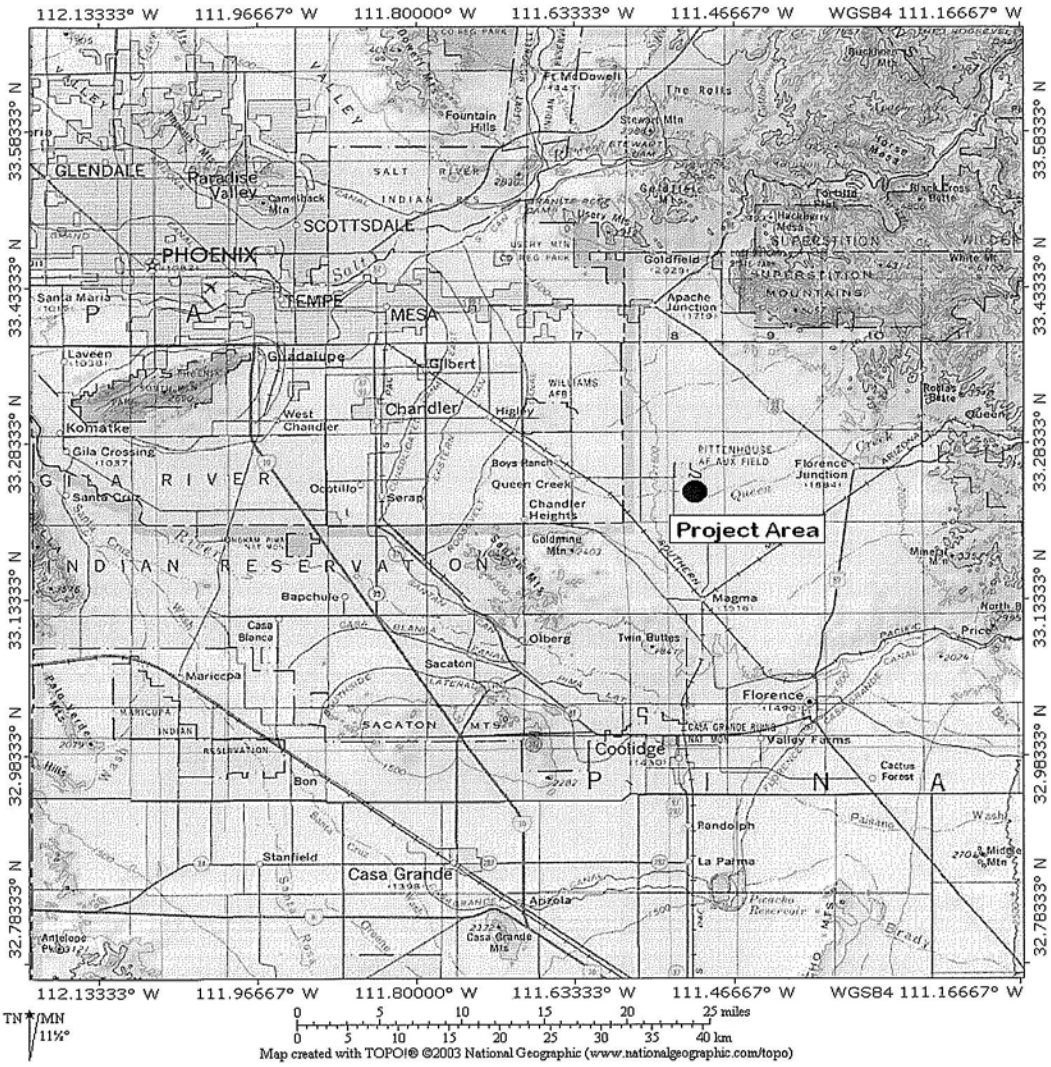
period for this EA. One scoping comment letter was received and relevant issues identified in that letter have been addressed in this EA as appropriate.

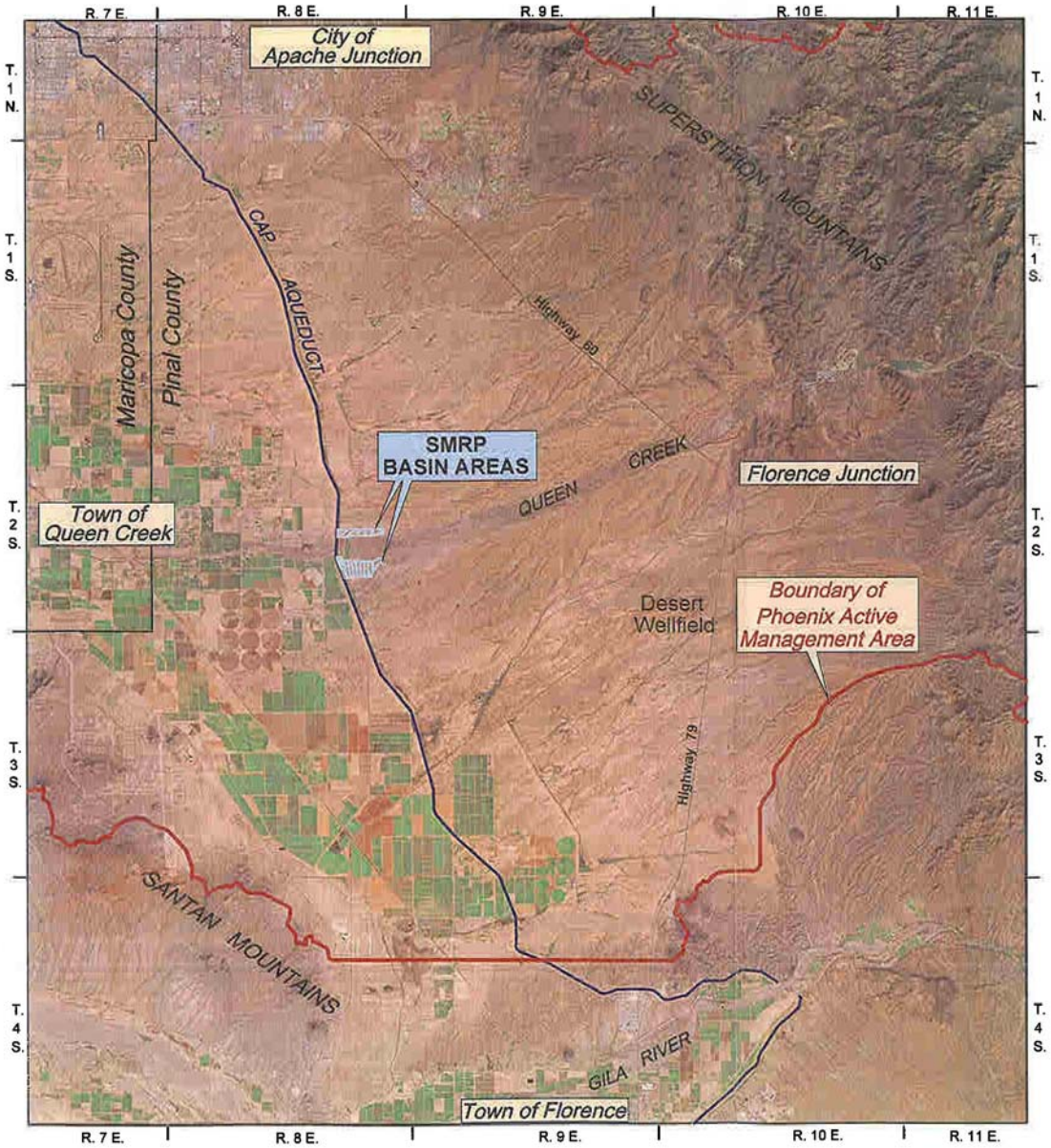
Reclamation's primary areas of interest include the following: (1) ensuring the integrity and operation of the CAP canal structures will not be adversely affected by the construction and operation of the proposed action; (2) describing the potential impacts from the project on the human environment to determine whether an environmental impact statement must be prepared or a Finding of No Significant Impact is appropriate; and (3) providing the affected public an opportunity to comment upon the NEPA document and ensuring any public comments are considered by decision-makers prior to Reclamation making a decision on this proposed project.

C. Project Description/Location

The proposed project is located in parts of sections 23, 24, 25, and 26 of Township 2 South, Range 8 East of the Gila and Salt River Baseline and Meridian in the northern portion of Pinal County, Arizona (Figures 1 and 2). The project area is immediately east of the CAP's Fannin-McFarland Aqueduct and its associated flood control structure, the Sonoqui Dike, between the Ocotillo Road alignment on the north and Combs Road alignment on the south. The communities closest to the SMRP are the town of Queen Creek which is about 8 miles west, Apache Junction which is north about 13 miles, and Florence, located about 15 miles southeast of the proposed project. The entire project area encompasses approximately 386 acres, consisting of two parcels. One parcel, about 143 acres in size, is located north of Queen Creek. The other parcel, about 243 acres, is located south of Queen Creek. Under the fully built-out project, recharge basins would be constructed within each parcel, affecting 157 acres. The remaining 229 acres would be used for associated facilities. CAWCD anticipates that at full build-out, 56,500 AF/yr of CAP water would be recharged at this site for 20 years, with a total of 1,130,000 AF of CAP water being stored by the end of the permit period. CAWCD currently anticipates it would apply to renew the storage permit for another 20 years after that time. A more detailed description of the proposed features of the proposed project is provided in Chapter II.

Figure 1. Regional Location Map-Superstition Mountains Recharge Project





Satellite image from Landsat 7 Visible Spectrum Image System, Florence Junction, Arizona, and surroundings, October 3, 1999.

CENTRAL ARIZONA PROJECT
SUPERSTITION MOUNTAINS RECHARGE PROJECT
PINAL COUNTY, ARIZONA

SITE LOCATION MAP

ERROL L. MONTGOMERY & ASSOCIATES, INC. 2005
CONSULTANTS IN HYDROGEOLOGY
TUCSON, ARIZONA

Figure 2

II. PROPOSED ACTION AND NO ACTION ALTERNATIVE

A. Proposed Action

Under the proposed action, CAWCD would construct and operate approximately 157 acres of recharge basins—53 acres in the North Basin Facility, and 104 acres in the South Basin Facility (Figure 2). An additional 229 acres would be used for associated features. At each basin facility these would include, but are not limited to, the following: maintenance roads, a CAP aqueduct turnout and pumps, conveyance pipelines, a water distribution system with water monitoring and control system; and excess excavation spoil areas. For safety purposes, the basins would be surrounded by chain link security fencing. A groundwater monitor well, and vadose zone piezometers (one set of nested piezometers at each basin) would be located downstream of each basin facility, directly west of the CAP canal. There also would be one additional piezometer at the South Basin Facility.

Construction activities at each basin facility would include excavating and hauling earthen material, trenching for piping, compacting spoil areas, drilling and installing monitor wells, constructing a bridge over the CAP canal, and constructing a pump station where the bridge crosses over the CAP canal. Recharge basins would be constructed with a typical excavated depth of six feet. Soil excavated from the basins would be used to construct berms around the perimeter of the basins; 15-foot wide operation and maintenance roads would be located on the top of the berms. Soil in excess of what is needed for the berms would be stored on-site in designated spoil areas within the project area. Operational activities would include occasional ripping and scraping of the basin floors, spraying for weeds, and sampling the monitor wells for water quality and groundwater level changes.

Portions of the proposed project would be located on State land that is currently not available for long term lease or sale; therefore, at this time CAWCD intends to only construct two 20-acre basins on Reclamation land in the South Basin at this time, as well as its associated turnout, pump station, CAP bridge crossing, water conveyance system, monitor well, and piezometers (Phase I). This would affect 107 acres of Reclamation land. No construction would occur on State trust land in the South Basin, nor within the North Basin in the foreseeable future

since the great majority of this basin is located on State land. CAWCD's long term goal is to pursue acquisition of the adjoining State lands which would be needed at both the North and South basin facilities to develop and operate the remainder of the project. Table 2-1 identifies the total amount of Reclamation and State trust lands that would ultimately be affected if/when the entire project is completed; however, in the foreseeable future, CAWCD intends to only construct Phase I. While the EA describes the impacts from the proposed project at full build-out, less than 30 percent of the land needed for the entire project would be impacted in the foreseeable future, to implement Phase I.

Table 2-1. Ownership and Number of Acres for Project

	South Basins	North Basins	Total Acres
Reclamation	**107 (Phase I)**	25	132
State Land	140	114	254
Total acres	247	139	386

ADWR issued a Constructed Underground Storage Facility Permit (Permit No. 71-207702.0000) to CAWCD on January 15, 2008. It is currently being modified to reflect the smaller South Basin Phase I project that CAWCD intends to construct and operate unless/until CAWCD acquires the State lands needed for the fully built-out project. In addition, CAWCD obtained a permit from Pinal County Flood Control District to build within the floodplain. This permit indicates the 100-year flood delineation will not be altered as a result of the project. No jurisdictional waters of the United States would be affected by the project; therefore, a section 404 permit from the U.S. Army Corps of Engineers (Corps) is not required (McGuire 2007). Other State, county and/or local permits, required for air and water pollution control during construction, would be obtained by the contractor hired to construct the project.

CAWCD also has acquired a Water Storage permit from ADWR to store recharged water underground. Under Phase I, CAWCD would recharge up to 25,000 AF/yr. Once/if the fully built-out project is operational, up to 56,500 AF/yr would be recharged. Both the USF and Water Storage permits are issued by ADWR for a 20-year period, with an option to renew for subsequent 20-year terms.

Water that would be recharged at this facility is not expected to be recovered and used within the foreseeable future. Plans for recovery and use have not been developed and may not be finalized for another 10 years. Recovery of stored water is overseen by ADWR; Reclamation has no jurisdiction over or approval role with regard to its recovery or use. Therefore, recovery of stored water and use of recharge credits are not covered by this EA.

B. No Action

Under the No Action Alternative, Reclamation would not approve use of its land for construction and operation of the SMRP. CAWCD would continue to recharge available CAP water at its existing USFs. Although it is preferable to recharge within associated groundwater withdrawal area of hydrologic impact, State rules allow CAGRD to fulfill its replenishment obligations anywhere within the AMA in which they accrue. Under the No Action Alternative, it is assumed CAGRD would continue using existing recharge facilities within the Phoenix AMA to fulfill replenishment obligations that accrue within the ESRV sub-basin. There is sufficient capacity within these existing recharge facilities to fulfill CAGRD's replenishment obligations for the entire Phoenix AMA, including those of the ESRV sub-basin.

C. Alternatives Initially Considered but Eliminated from Further Study

CAWCD initially investigated potentially suitable recharge sites within a study area covering approximately 410 square miles. The study area was roughly bounded by the Roosevelt Water Conservation District Canal on the west, the Salt River Project South Canal on the north, the Phoenix AMA boundary on the south, and 5 miles beyond the CAP canal on the east. Based upon a thorough review of existing data and previous geologic investigations, CAWCD conducted geologic investigations in six sub-regions—three located west of the CAP canal approximately 6 miles north of the project area, and three located in the general vicinity of the proposed project area (GeoTrans 2003). The geologic investigations consisted of on-site soil and infiltration testing to determine whether or not the underlying geologic conditions were suitable for operating a CAP water recharge project. The northern three sub-regions were all determined to be unsuitable due to the presence of silt to silty sand in the upper nine feet of material, which would not allow the CAP water to percolate into the aquifer at a rapid enough

rate. Of the three southern sub-regions, the westernmost sub-region was determined to be technically infeasible due to its location near the CAP canal and Sonoqui Dike, the relatively small size of the parcel; and because it was located within the Queen Creek floodplain.

Locating the recharge basins outside the ESRV sub-basin also was eliminated from further investigation, as that would not meet the purpose of the project, which is to provide groundwater replenishment to the ESRV sub-basin and support CAGRD's needs. Recharging excess CAP water at SMRP is designed to offset groundwater withdrawals in the area and help the ESRV groundwater users reach the ADWR-mandated safe yield goal. Locating the project outside the ESRV sub-basin would not benefit the ESRV sub-basin or its groundwater users.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES[2]

Resource areas that could be affected by the proposed project which are of primary concern include the following: Air quality, geology, water quantity and quality, biology, cultural resources, and land ownership and use. This section describes the existing conditions of these resources within the project area and the potential environmental consequences resulting from the construction and operation of the proposed recharge project. The consequences of the No Action Alternative also are described for each of the resources identified above, as a basis for comparing the potential impacts of the proposed project. Other resources such as recreation and socioeconomic resources are not expected to be affected and are not discussed in this EA.

Potential impacts of the proposed project will occur in the context of other development actions that have occurred and will occur in the impact area. Cumulative impacts, or effects, are the impacts on the environment which result from the incremental impacts of the proposed project when added to the impacts of other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time. The ADWR application for constructing a USF permit requires a delineation of the project's projected maximum area of impact and groundwater level rise (AOI). The AOI is defined as the area within which a 1-foot or more rise in the groundwater table is projected to occur over the 20-year life of the facility permit. In this EA, the AOI generally establishes the outer boundary within which potential cumulative impacts from the proposed project are evaluated, referred to in the EA as the "impact area" (Figure 3).

[2]Unless otherwise noted, information provided was obtained from CAWCD's "Application for Underground Storage Facility Permit and Water Storage Permit for Superstition Mountains Recharge Project Pinal County, Arizona, dated May 27, 2005 (Montgomery 2005a) and subsequent CAWCD submittals to ADWR (Montgomery 2005b, 2006a, 2006b); other studies related to this project; and/or through Reclamation staff field work and evaluation.

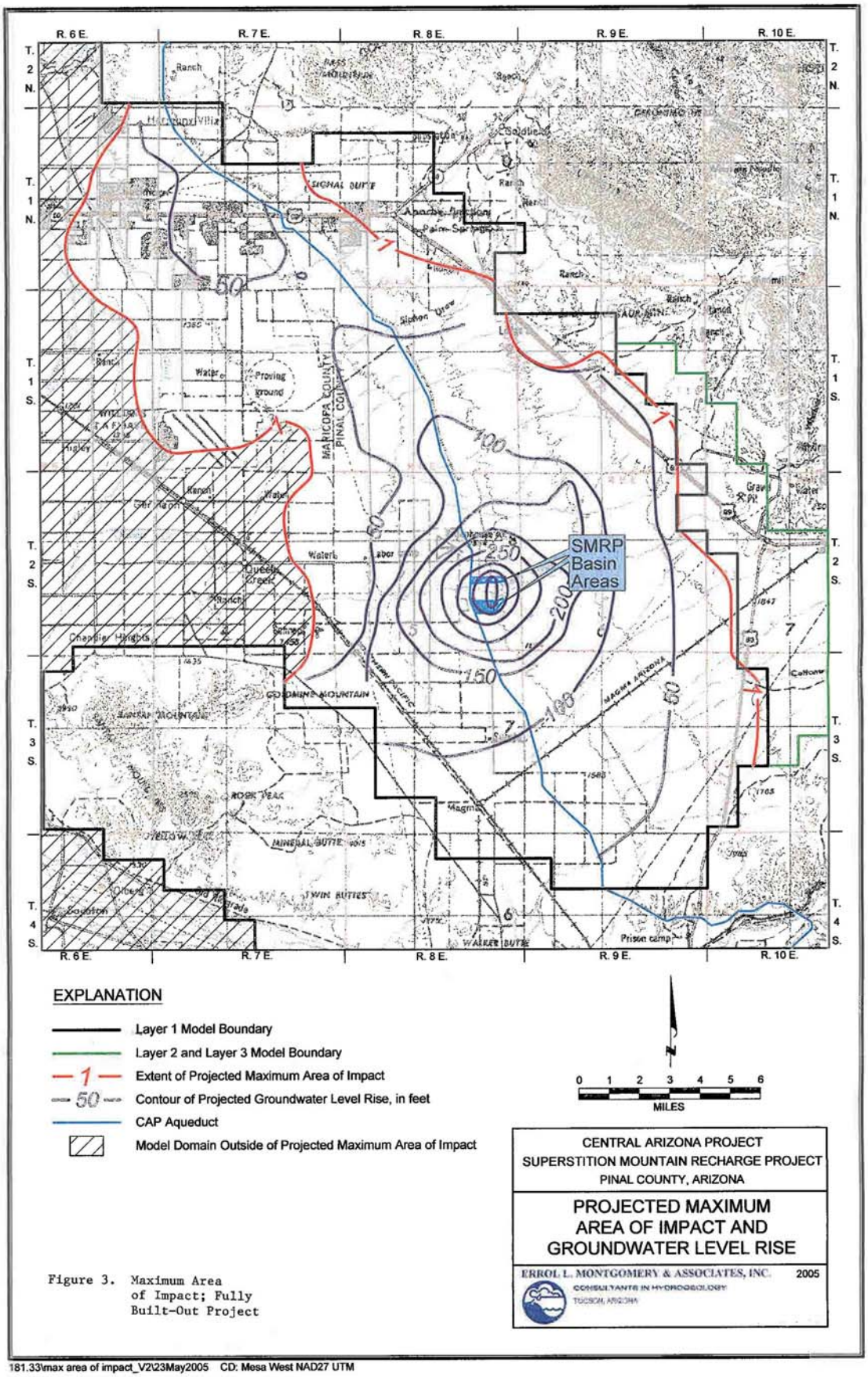


Figure 3. Maximum Area of Impact; Fully Built-Out Project

181.33\max area of impact_V2\23May2005 CD: Mesa West NAD27 UTM

The primary past and present actions in the impact area involve farming as well as the urbanization of former agricultural lands. "Reasonably foreseeable future actions" are defined as actions that are not speculative—they have been approved, are included in short- to medium-term planning and budget documents prepared by government agencies or other entities, or are likely to occur given trends (Environmental Protection Agency [EPA] 1999). The most likely future actions within the impact area include development of remaining agricultural land within the immediate vicinity of the project as market conditions improve, and eventual sale and/or lease of State trust lands within the impact area. There are, however, no approved plans or permit applications regarding conversion of agricultural land within the impact area, nor is any of the State trust land within the impact area currently up for auction. Therefore, continuation of the status quo will be considered to be the most reasonably foreseeable future actions, for purposes of evaluating cumulative effects.

A. Climate and Air Quality

1. Affected Environment

The climate of the general project area is typical of arid southwestern deserts in the United States. It is characterized by hot, long summers; short, mild winters; sparse rainfall; low relative humidity; and high evaporation rates. The average annual rainfall in the project area is just below nine inches, as measured by the Western Regional Climate Center (WRCC) at Chandler Heights, Arizona. The months experiencing the largest amounts of precipitation are December, January and February, when a maximum of 4.75 inches have fallen; however, during the period of record (1948 through 2007), there have also been years when no precipitation has fallen in those months (WRCC 2007a). Average monthly temperatures in the vicinity of the project area range between about 52 degrees Fahrenheit (°F) in December and January, and 90°F in July (WRCC 2007b). Average maximum temperatures in the low 100s (°F) occur during June, July, and August (WRCC 2007c).

The U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. These include carbon monoxide, nitrogen oxide, sulfur dioxide, lead, ozone, particulate matter (PM) less than 10 microns in

diameter (PM_{10}), and PM less than 2.5 microns in diameter ($PM_{2.5}$). States are required to adopt standards that are at least as stringent as the NAAQS. In Arizona, ambient air quality standards are identical to the Federal NAAQS (Table 3-1).

The project area is located within an area designated as attaining the NAAQS for all criteria pollutants; however, the proposed project is located within an area that is under consideration for PM_{10} non-attainment designation. The closest non-attainment area is about 10 miles north of the project site, in the vicinity of Apache Junction, Arizona, which is in non-attainment for both the PM_{10} and 8-hour ozone NAAQS.

2. Environmental Consequences

a. Proposed Action - Construction-related activities would generate PM as a result of land-disturbing activities, including but not limited to clearing; excavating recharge basins and pipeline trenches; and constructing berms and roads. These impacts, however, would be temporary, occurring over a 12-month period of time. Operation of trucks and construction equipment also would generate minor amounts of air emissions, including hydrocarbons, carbon monoxide, nitrogen oxide, and sulfur dioxide, in addition to PM (Appendix A). Mobile sources are not subject to emission limitations; however the Contractor would be required to comply with all Federal, State and local air quality regulations, obtain all applicable dust abatement permits and minimize dust generation, and follow best management practices to maintain all motorized equipment in good working order to minimize emissions (Walch 2009). These temporary air pollutant emissions would contribute insignificantly to the county-wide emissions for the 12-month construction period; this contribution of project-related emissions is not anticipated to result in exceedances of the air quality standards (Crandall 2009).

Table 3-1. National Ambient Air Quality Standards.

	Primary Standards		Secondary Standards	
Pollutant	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour[1]	None	
	35 ppm (40 mg/m^3)	1-hour[1]		
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour[2]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual[3] (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour[4]	Same as Primary	
Ozone	0.075 ppm (2008 STD)	8-hour[5]	Same as Primary	
	0.08 ppm (1997 STD)	8-hour[6]	Same as Primary	
	0.12 ppm	1-hour[7] (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m^3)	3-hour[1]
	0.14 ppm	24-hour[1]		

1 Not to be exceeded more than once per year.
2 Not to be exceeded more than once per year on average over 3 years.
3 To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
4 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
5 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
6 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. The 1997 standard—and the implementation rules for that standard—would remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
7 The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas; there are none within Arizona.
STD – Standard.
Source: EPA 2009

Once in operation, pumps used to lift water from the CAP canal and convey it to the recharge basins would be operated 24 hours per day, 7 days per week. They would be powered from nearby existing overhead electrical lines that would be extended to the SMRP to provide electrical service. No generators would be used that would result in additional air pollutant emissions. It is anticipated the recharge basins themselves would need to be scarified on a periodic basis (annually or more). This would consist of removing any hard packed surfaces from the recharge basins, to promote increased water infiltration rates. Removal of this material, haul truck traffic, and the subsequent disposal of the material removed from the basins onto spoil areas, would result in the generation of negligible volumes of PM. The soil beneath the surface would still be moist which would minimize generation of dust during scarification and subsequent disposal activities. Additional fugitive PM could be created by wind erosion of the spoil areas until they are stabilized through implementation of best management practices to minimize PM emissions; these emissions would be negligible. These emissions would occur over a 4-day period, and would contribute insignificantly to the air emissions within the project area.

Continued farming operations and construction of housing in the future would generate construction-related vehicle and fugitive dust in the impact area. Construction of the proposed project would temporarily add minor emissions of air pollutants in the immediate vicinity of the proposed project; however, construction of the proposed project would have the potential to contribute only slightly to cumulative air quality impacts. Timing of construction of the proposed project in relation to these other anticipated projects is not known; if they do not occur at the same time, there would not be an additive, or cumulative, impact.

The proposed project's gaseous exhaust emissions (including greenhouse gases) would add cumulatively to pollutants emitted from other natural and human-caused sources into the atmosphere. The relatively minute quantities of pollutants released during construction and operation of the SMRP would have a negligible cumulative effect on local air quality or global processes that lead to climate change.

b. No Action Alternative - Without the project, there would be no short-term increases in PM emissions resulting from construction of the basins, or from brief periodic PM emissions on a long-term basis from periodic scarification of the basins at this location. Dust would be generated from continued periodic use of the unpaved roads and agricultural activities in the general vicinity. PM emissions would be generated if/when development of State land occurs in the future; local air pollution control ordinances would apply to these activities. In addition, with the creation of additional urbanized areas, ozone and carbon monoxide from increased traffic would result. If any new stationary source of air emissions is constructed and operated in an attainment area, that source would need to comply with the Clean Air Act's Prevention of Significant Deterioration requirements. If the area is designated as a non-attainment area for PM, general conformity requirements would apply for any Federal project.

B. Geologic Resources

1. Affected Environment

The project area is located within the Basin and Range Physiographic Province, which is typically characterized by a series of mountain ranges with intervening basins. The mountain ranges are composed predominantly of crystalline rocks of Precambrian to middle Tertiary age, and extrusive rocks of middle Tertiary to Quarternary age. The crystalline rocks are composed of metamorphic and granitic rocks; the extrusive rocks include middle to late Tertiary volcanic rocks of rhyolitic to basaltic composition and basalt flows of middle Tertiary to Quarternary age (Corkhill et al. 1993, p. 13).

The project area falls within the ESRV sub-basin, which is one of seven groundwater sub-basins that make up the Phoenix AMA. This sub-basin is approximately 1,710 square miles in size, and is roughly bounded on the north and east by New River and the McDowell, Usery, Goldfield, and Superstition mountains; on the south by the Santan and Sacaton mountains; and on the west by the South and Phoenix mountains, Papago Buttes, and the Union and Deems hills (ADWR 1994). The basin-fill deposits that developed between the mountain ranges within the ESRV sub-basin have formed three hydrogeologic units: an upper sand and gravel unit, a middle silt and clay unit, and a lower conglomerate unit (ADWR 1994, p.

203). They also are referred to as the upper alluvial unit, middle alluvial unit, and lower alluvial unit, respectively (Corkhill et al. 1993; Montgomery 2005a). ADWR indicates the upper unit ranges in thickness from less than 100 feet near the basin margins, to over 350 feet in some parts of the basin (ADWR 1994, p. 203). The thickness of the upper unit is relatively uniform, between 200 and 300 feet in the ESRV sub-basin, but becomes thinner near the Salt and Gila rivers, between 100 and 200 feet, and near mountain fronts (Corkhill et al. 1993, p. 24). The middle unit ranges in thickness from less than 100 feet near the basin margins to over 1,800 feet southeast of Gilbert, Arizona, and also may contain some interbedded sand and gravel within the silt and clay. Near the basin margins where the sands and gravels are coarser, this middle unit may not be distinguishable from the upper and lower units. The lower unit consists mainly of conglomerate near the basin margins, with finer sediments toward the center of the basin. It ranges in thickness from less than 100 feet near the basin margins to over 9,000 feet southeast of Gilbert (ADWR 1994, p. 203).

Where significant groundwater withdrawals result in declining water levels, aquifer compaction and subsidence can occur, causing the land surface to sink in some areas (Corkhill et al. 1993, p. 25). Where land subsidence is not uniform because of differential compaction of the underlying aquifer, fissuring may result. Fissures are associated with areas of large groundwater-level declines within alluvial basins. They oftentimes conform to zones of steep gravity gradients that may reflect buried fault scarps along the periphery of the subsiding basin, suggesting they are tensional breaks (Interior 1979, p. 41). Overdraft of groundwater has resulted in land subsidence and the development of earth fissures in the town of Queen Creek, east Mesa, Apache Junction, and Paradise Valley areas within the ESRV sub-basin (ADWR 1994, p. 204). In the southeastern portion of the ESRV, a 230-square mile area north of the Santan Mountains had subsided more than three feet by 1977, while over five feet of land subsidence occurred east of Mesa, Arizona, between 1948 and 1981 (Corkhill et al. 1993, p. 25-26). In July 2007, an earth fissure reopened near Chandler Heights, Arizona, after a major thunderstorm resulted in two inches of rainfall within one hour. The fissure is about 0.5 mile long and runs in a north-south direction. After the thunderstorm, it had a maximum width of 15 feet and was estimated to be about 40 feet deep. In addition to disrupting traffic, several

properties were damaged and a corral was undermined which resulted in the entrapment and death of one horse (Arizona Geological Survey 2007).

2. Environmental Consequences

a. Proposed Action – It is anticipated that recharge at the proposed project could assist in achieving safe-yield in the ESRV sub-basin. This, in turn, could assist in reducing the potential for fissuring and subsidence in the future.

As nearby agricultural lands are urbanized, grandfathered irrigation water rights would be converted for use associated with the lands' new uses. ASLD has a CAP water entitlement for State trust lands within the three-county CAP service area; some of this entitlement could convey with State trust lands that are sold. It is unlikely ASLD would have enough remaining CAP entitlement to provide a sufficient water supply for all the State trust lands within the impact area that are available for development. The degree to which fissuring and deposition continue to occur would depend upon the degree to which the proposed project is able to recharge sufficient amounts of water used by these new developments, locations of future groundwater withdrawals, and the specific geologic conditions underlying the impact area.

b. No Action Alternative – Long-range planning documents indicate residential and commercial development will ultimately replace agriculture within the general vicinity (The Planning Center 2008). The residential developments are expected to join CAGRD as member service areas, to obtain the required certifications of assured water supply from ADWR in order to proceed with development. Without the proposed project, CAGRD would fulfill the replenishment obligations of these developments at existing recharge facilities in other sub-basins within the Phoenix AMA. In the absence of replenishing the ESRV sub-basin which is the area of hydrologic effect, it is anticipated the area would experience continued and potentially accelerated overdraft of the groundwater. The overdraft, in turn, could result in additional subsidence and fissuring, depending upon the rate and location of the groundwater pumping.

C. Water Resources

1. Existing Conditions

a. Groundwater - Historically, groundwater entered the ESRV sub-basin as underflow from several sources: from the Lake Pleasant sub-basin south of New River, Arizona, in the Phoenix AMA; and from the Maricopa-Stanfield sub-basin between the Santan and Sacaton mountains, and the Eloy sub-basin east of the Santan Mountains, within the Pinal AMA. Groundwater flowed into the ESRV sub-basin toward and along the Salt and Gila rivers, continuing into the West Salt River Valley sub-basin between the Papago Buttes and South Mountains (ADWR 1994, p. 203).

Groundwater development in the ESRV sub-basin began in the late 1800s, when shallow irrigation wells were located along the Salt and Gila rivers. Agriculture expanded and groundwater pumping increased to supplement surface water supplies. Pumping increased to meet municipal and industrial uses as well. Pumping in the entire Salt River Valley increased from 15,000 AF in 1915, to 1,000,000 AF/yr by 1942. Groundwater pumping hit its peak in the 1950s, with approximately 2,300,000 AF/yr being withdrawn from 1952 to 1958. After that, groundwater pumping decreased and by 1982, pumping was about 1,100,000 AF/yr. In the ESRV sub-basin, there were approximately 304,900 AF of groundwater pumped in 1990 (ADWR 1994, p. 204). Groundwater is currently pumped for irrigation, domestic, and industrial uses.

The extent of groundwater pumping and subsequent overdrafting of the groundwater aquifer have resulted in the formation of three large cones of depression within the ESRV sub-basin—near Scottsdale, Mesa, and Queen Creek, Arizona. Most of the groundwater currently flows toward these cones of depression. Groundwater pumping in the Maricopa-Stanfield sub-basin to the south also has diverted some of the underflow entering the sub-basin (ADWR 1994, p. 203).

Within the ESRV sub-basin, the upper alluvial unit used to be the primary source of groundwater; however, it is now dewatered in many locations due to groundwater

withdrawal. The middle alluvial unit presently serves as the major water-bearing unit, although substantial amounts of groundwater pumped from the peripheral areas of the sub-basin are derived from the lower alluvial unit (Corkhill et al. 1993, p. 21-24).

U.S. Geologic Survey's Groundwater Site Inventory database information indicates water levels in the general project area have risen between 7 and 11 feet per year over the past 10 to 15 years. This is due to decreased groundwater pumping and the number of USFs operating within the ESRV. CAWCD's USF permit application indicates 18 USFs have been permitted to operate within the ESRV, having a total permitted storage amount of roughly between 283,000 and 303,000 AF/yr; however, several facilities are presently not in operation, and/or are not recharging at their maximum permitted capacities. Based upon groundwater level measurements observed in December 2002 and January 2003, depth to groundwater at wells in the general vicinity of the proposed project ranges between 400 and 450 feet below land surface. Radiating out, depth to groundwater ranges from a maximum of 600 feet below land surface northeast of the project area, to 300 feet below land surface going west from the project area. Estimated depth to groundwater approximately one mile west of the proposed recharge facility is about 370 feet; a little over 2.5 miles northwest of the proposed recharge facility, depth to groundwater is estimated to be about 336 feet (Odom 2009).

The existing groundwater in the project area is classified as a calcium-carbonate type, having qualities typical of "hard" water, or water high in mineral content. Table 3-2 provides a summary of the water quality of local groundwater. Historic use of the area for agricultural purposes has contributed over time to the hardness of the groundwater (T. Gorey, pers. comm. 2008). Hard water typically causes scaling, which can result in pipes clogging, build-up of minerals on the insides of tea and coffee pots, and decreased life of water-related appliances such as water heaters, toilets, and washing machines.

Table 3-2. Water Quality of Local Groundwater

Parameter	Standard	Units	SMRP Exploration Borehole 8/1/2003	Queen Creek Water Co. ID 004 3/1/2007	Queen Creek Water Co. ID 005 3/1/2007	H2O, Inc. Well 55-625006 8/20/2008
Copper	1.30 (AL)	mg/l	<0.01	NR	NR	NR
Arsenic	10[1] (MCL)	µg/l	<0.005	0.0043	0.0037	0.003
Barium	2 (MCL)	mg/l	<0.02	0.0100	0.0327	0.03
Fluoride	4.0 (MCL)	mg/l	0.5	<0.50	<0.50	0.4
Nitrate (as Nitrogen)	10 (MCL)	mg/l	1.9	<0.50	4.3	3.09
Gross Alpha	15 (MCL)	pCi/l	NR	NR	NR	2.1±0.9
Radium 226	5 (MCL)	pCi/l	NR	NR	NR	<0.4
pH	6.5 to 8.5 (SMCL)	STU	11.2	NR	NR	NR
Chloride	250 (SMCL)	mg/l	99	NR	NR	NR
Iron	0.3 (SMCL)	mg/l	0.187	NR	NR	NR
Magnesium	No STD	mg/l	3.73	NR	NR	NR
Manganese	0.05 (SMCL)	mg/l	<0.01	NR	NR	NR
Sodium	No STD	mg/l	46.5	NR	NR	NR
Sulfate	250 (SMCL)	mg/l	100	NR	NR	15
TDS	500 (SMCL)	mg/l	440	NR	NR	NR
Zinc	5 (SMCL)	mg/l	<0.02	NR	NR	NR

[1] Prior to January 23, 2006, MCL for arsenic was 50 µg/l.
AL – Action Level.
MCL – Maximum Contaminant Level (EPA Primary Standard).
NR – Not Reported.
SMCL – Secondary MCL (taste and aesthetics).
STD – Standard.
STU – Standard Testing Units.
TDS – Total Dissolved Solids.
µg/l – micrograms per liter equivalent to parts per billion.
mg/l – milligrams per liter equivalent to parts per million.
pCi/l – picocuries per liter.
Sources: Montgomery 2005a; QCWC 2007; Schnepf 2009

b. Surface Water – The major sources of surface water in the Phoenix AMA include the Gila River and its four principal tributaries—the Salt, Verde, Agua Fria, and Hassayampa rivers. In addition, several other ephemeral surface water tributaries occur within the Phoenix AMA. Historically, the Gila and Salt rivers flowed through the ESRV sub-basin, although they now are both ephemeral within the sub-basin. The Gila River is diverted upstream

at Ashurst-Hayden Diversion Dam, located east of Florence, Arizona, by the San Carlos Irrigation Project for irrigation purposes. Within the ESRV sub-basin, the Gila River flows mainly in response to flooding or reservoir releases.

Just upstream of Granite Reef Dam, the Salt River enters the ESRV sub-basin downstream of its confluence with the Verde River. The Salt River is diverted at Granite Reef Dam by the Salt River Project for irrigation, municipal, and industrial uses. As with the Gila River, flows are mainly in response to flooding or upstream reservoir releases.

The ephemeral tributaries that occur within the ESRV sub-basin include Skunk and Cave Creeks, which travel southwest across the very northern tip of the ESRV sub-basin, and Queen Creek which originates east of the ESRV sub-basin in the Superstition Mountains. Queen Creek is regulated by the Whitlow Ranch Dam, an earthfill dam that was constructed by the Corps in 1960. It was built to provide flood protection to farmlands, portions of Williams Air Force Base, and the nearby communities of Chandler, Gilbert, Queen Creek, and Florence Junction. Local interests, that have acquired water rights behind the Dam, operate a slide gate and an outlet/diversion structure to satisfy their water rights. Outflows usually percolate into the alluvial plain downstream of the dam, rarely traveling more than a few miles. Only flows from very large and infrequent storms travel further downstream (Corps 1998). A United States Geologic Survey (USGS) gage on Queen Creek just below Whitlow Ranch Dam obtained about 4 to 5 years' worth of measurements, from October 2000 to September 2006. These data indicate the mean daily discharge for the period of record ranged between a low of 1.0 cubic feet per second (cfs) to as much as 166 cfs; both of these occurred in February (USGS 2007). Approximately 13 miles downstream of Whitlow Dam, Reclamation constructed Sonoqui Dike to provide flood protection for the CAP canal. Floodwater is regulated through the Sonoqui Dike by a manually operated slide gate. The floodwater passes through pipes over the CAP canal into Queen Creek. Downstream of the CAP canal, Queen Creek is channelized for about 12 miles, where it then discharges into Maricopa County Flood Control District's Maricopa Floodway.

CAP water that would be recharged at the proposed project would be composed of varying ratios of Colorado River and Agua Fria water, depending upon the time of year the water is recharged.[3] CAP water quality is monitored regularly by the CAWCD. Samples are taken at two locations along the CAP canal between Lake Pleasant and the SMRP project area. These locations are: (1) at 99th Avenue; and (2) at McKellips Road. Overall, CAWCD's monitoring data indicate CAP water typically meets all Federal and State primary drinking water standards for non-organic constituents, with the exception of turbidity (cloudiness). High turbidity is not unexpected, since CAP water is surface water. Concentrations of total dissolved solids (TDS) and sulfate in the CAP water are close to or slightly exceed secondary drinking water standards. Table 3-3 provides a summary of the chemical analyses for CAP water.

2. Environmental Consequences

a. Proposed Action. Under the fully built-out project, recharging up to a total of 1,130,000 AF over 20 years would result in groundwater levels rising in elevation, radiating out from the recharge basins. The model used to estimate this rise assumed ambient groundwater levels would continue to rise at the same rate experienced between 1983 and 2003. This assumption provides a conservative estimate because population growth projections indicate there will be greater water demands into the future which would result in increased groundwater pumping and thus, declining groundwater levels. The projected maximum AOI, within which a one-foot or more rise in groundwater would occur, extends from the proposed basins to a little over 5 miles west, just under 19 miles northwest, up to about 8 miles east, and about 8 miles south (Figure 3). Existing wells within the impact area, which are generally located within a 7- to 10-mile radius of the project area, would experience groundwater levels rising in the range of 150 to 50 feet over the 20-year permit period.

[3] Colorado River water is diverted at Lake Havasu and transported through the CAP canal to Pima County, AZ. During winter, some of it is diverted into Lake Pleasant, located in northwestern Maricopa County, AZ, where it mixes with Agua Fria water. When needed, it is released back into the CAP canal for delivery to downstream users.

Table 3-3. Water Quality of CAP Water

CONSTITUENT (mg/L unless otherwise noted)	CAP Water Quality 2008[1]			USEPA MCL*	
	Mean	Maximum	Minimum	Health	Secondary
Calcium, Total	76	82	71	none	none
Magnesium, Total	30	31	28	none	none
Sodium, Total	97	100	92	none	none
Potassium, Total	5.1	5.4	4.9	none	none
Chloride	87	97	47	none	250
Sulfate	259	270	250	none	250
Nitrate (as Nitrogen)	0.33	0.48	0.17	10	none
Alkalinity (as $CaCO_3$)	124	146	91	none	none
Total Dissolved Solids	666	716	642	none	500
Turbidity (NTU)	1.8	4.2	0.6	5	none
Dissolved oxygen	10.1	11.9	8.1	none	none
Temperature (°F)	64.5	75.2	50.1	none	none
pH (Standard Units)	8.3	8.5	7.9	none	6.8 – 8.5
Arsenic [2]	0.0027	0.0032	0.0022	0.010	none
Barium, Total	0.146	0.160	0.130	2	none
Cadmium, Total [2]	ND	ND	ND	0.005	none
Copper, Total	ND	ND	ND	1.3 (AL)	1.0
Iron, Total	0.078	0.100	0.023	none	0.3
Manganese, Total	0.011	0.043	0.002	none	0.05
Mercury [3]	ND	ND	ND	0.002	none

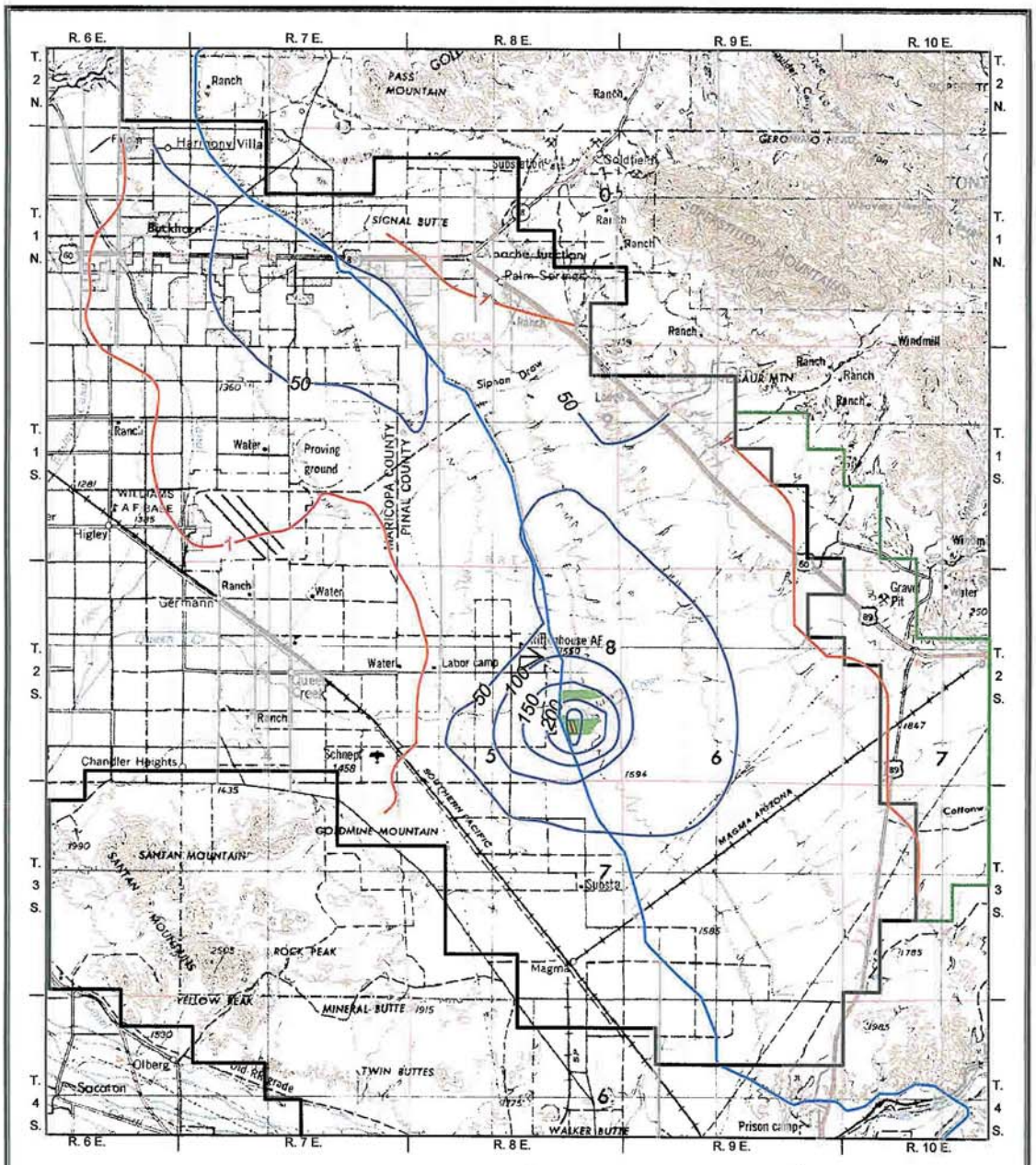
[1] Sampled at McKellips Road monthly unless noted otherwise (CAWCD 2009).
[2] Sampled at 99th Avenue quarterly; [3] Sampled at 99th Avenue triannually
AL – Alert Level
MCL – Maximum Contaminant Level
ND – Not Detected
NTU – Nephelometric Turbidity Units
Source: CAWCD 2009, pp. 11-12.

Directly under the recharge basins the groundwater is expected to rise about 430 to 436 feet by the end of the 20-year permit life. The current depth to groundwater in the vicinity of the project area ranges roughly from 450 to 300 feet below ground surface. Using the most conservative scenario, in which groundwater would continue to rise, at the end of the 20-year project period the depth to groundwater would be between 145 and 120 feet below ground surface within a mile surrounding the recharge basins. Beyond that point, the greatest projected groundwater level rise would occur within an approximate 2-mile radius surrounding the SMRP, where the groundwater level is anticipated to rise between 350 to 200 feet

With the Phase I project, the area within which a groundwater level rise of 100 feet or more is much smaller than with the fully built-out project. Directly beneath the

recharge basins, the maximum groundwater rise is expected to be about 375 feet at the end of a 20-year period. Beyond that, the groundwater is expected to rise about 200 feet within a radius of one mile out from the recharge basins after a 20-year period (Figure 4). The maximum AOI is fairly consistent with that of the fully built-out project (Montgomery 2009).

Recharge operations could temporarily impact wells near the recharge facilities. As groundwater levels rise, wells within the impact area could draw in more fines, resulting in turbid or muddy pumped water. This would depend upon the well's distance from the recharge facility, the well's screen length and depth, the size of the pump in the well, and whether or not the well was constructed with a gravel pack around the well screen. Depending upon the purpose(s) for which the water is being used and the length of time it takes for the water to clear up, there could be some minor damage to property and/or inconvenience to those using the well water, especially for domestic purposes. These temporary impacts would be more likely to occur with small capacity wells rather than large production (irrigation) wells. According to ADWR well records, there are 13 irrigation wells and two domestic wells within one mile of the project. For the nearby domestic wells, recharged water may travel down the outside of existing well casings, causing the casing to collapse. A change in water quality also is likely as CAP water replaces groundwater, resulting in increased TDS and a higher sulfate content, which may alter the taste of the water.



EXPLANATION

- Layer 1 Model Boundary
- Layer 2 and Layer 3 Model Boundary
- 50 — Contour of Projected Groundwater Level Rise, in feet
- 1 — Contour of Projected One-foot Groundwater Level Rise, in feet
- CAP Aqueduct

0 1 2 3 4 5 6
MILES

CENTRAL ARIZONA PROJECT
SUPERSTITION MOUNTAIN RECHARGE PROJECT
PINAL COUNTY, ARIZONA

PROJECTED
GROUNDWATER LEVEL RISE
FOR 20-YEAR PERIOD

ERROL L. MONTGOMERY & ASSOCIATES, INC. 2009
CONSULTANTS IN HYDROGEOLOGY
TUCSON, ARIZONA

Figure 4. Maximum Area of Impact; Phase I Project

196.03\ProjectedRise_Rev\27March2009 NAD27 UTM

As more and more CAP water mixes with the natural groundwater, local water quality would take on the characteristics of CAP water. This is already occurring due to the use of CAP water by agricultural districts functioning as groundwater storage facilities, such as New Magma Irrigation and Drainage District, Queen Creek Irrigation District, and Chandler Heights Citrus Irrigation District. In general, CAP water has higher concentrations of many of the common constituents analyzed; however with the exception of TDS, these concentrations are still within the primary (health) and secondary (taste/odor) maximum contaminant levels established by EPA. TDS levels of CAP water typically exceed EPA's secondary standard, whereas the existing groundwater is just below the secondary standard. Transition from the existing groundwater's TDS to that of CAP would result in water that is slightly "harder" which could cause a change in taste, and result in continued and/or slightly increased hard water characteristics mentioned above, e.g., scaling, build-up of minerals on the insides of tea and coffee pots, and decreased life of water-related appliances such as water heaters, toilets, and washing machines.

Nitrate levels in local groundwater are higher than those of CAP water, which typically range from non-detectable levels to <0.50 mg/l (see Tables 3-2 and 3-3). Recharging water in the area could result in lower nitrate levels in the groundwater; however, it could also dissolve nitrates in the vadose zone, if they are present. Although this could cause temporary nitrate level increases in wells located near the project, it is not anticipated, due to the likelihood that historic flows in Queen Creek have already flushed out naturally occurring nitrate in the vadose zone.

As part of its constructed USF permitting process, ADWR requires permit applicants to show that no unreasonable harm will occur to other land and water users within the AOI from the proposed recharge project. CAWCD's USF permit requires CAWCD to establish and implement a Monitoring Plan that will indicate if/when groundwater levels rise to within 15 feet of the deepest portion of the existing sand and gravel pits (alert level), as measured on November 2, 2004. The permit also requires operational prohibition limits to be implemented at that time to protect the sand and gravel operations from damage. The USF permit application

modeling indicates the projected groundwater levels at the end of the 20-year period would be 80 feet or more below the sand and gravel pits as measured on November 2, 2004 (65 feet lower than the 15-foot buffer at the point where the groundwater levels would be the shallowest). Under Phase I, the distance between the projected groundwater table and bottom of the sand and gravel pits (as measured on November 2, 2004) ranges between 135 feet and 195 feet (Montgomery 2009).

Arizona Department of Environmental Quality's (ADEQ) records indicate there are six sites downstream of the project area where leaking underground storage tanks have been reported, remediated, and then closed or permanently removed (ADEQ 2009). The depth of buried underground tanks is about 20 feet below ground level (Hasbrouck et al. n.d.). All six sites are generally west (southwest to northwest) of the proposed recharge basins. The closest site to the recharge basins is located just over three miles due west of project area; it falls within an area that is anticipated to experience a 100-foot rise in groundwater elevation by the end of the 20-year project period under the fully built-out project, or a 50-foot rise under Phase I. The current groundwater levels in this part of the impact area are estimated to be about 370 feet below ground surface; therefore, should any residue of contamination be present at any of these sites, it is highly unlikely any groundwater rise resulting from the proposed project would result in entrainment of such contamination into the existing groundwater.

Two U.S. Environmental Protection Agency (EPA) Superfund[4] sites are located on the former Williams Air Force Base, approximately 11 miles northwest of the SMRP at the western edge of the project's impact area. Contamination from Williams Air Force Base's Liquid Fuels Storage Area and Landfill occurred as a result of jet fuel and aviation gasoline releases over the course of 50 years; the U.S. Air Force is currently in the process of cleaning up the sites. The remediation efforts are concentrated in a contaminated area approximately 165 to 245 feet below land surface. This contaminated area is isolated from the top of the primary aquifer by a local aquitard[5] which is approximately 290 feet below land surface. Recharge of up

[4] Superfund sites are the Nation's worst hazardous toxic waste sites, as determined by EPA.
5 An underground bed or layer of soil, rock, or clay that is too dense to allow easy passage of water.

to 1,130,000 AF of CAP water over 20 years is expected to result in the groundwater level rising about 5 to 5.5 feet within this portion of the impact area. No impact to the contaminated areas beneath Williams Air Force Base is expected to occur with the implementation of the proposed project, due to the depth to groundwater and presence of the aquitard in this location.

Even under the fully built-out project, under which the maximum volume of CAP water is recharged over the 20-year permit life, continued long-term groundwater pumping could result in localized impacts such as continued overdraft and extensions of cones of depression. This may occur even if safe-yield is achieved AMA-wide because, under State rules, replenishment is not required to take place within the area of hydrologic impact. Therefore, there could be localized overdraft impacts where groundwater pumping occurs, if CAGRD's replenishment does not occur within the area of hydrologic impact (EVWF 2007).

The following measures would be undertaken as part of the project, to reduce potential adverse impacts to water resources.

1. An Arizona Pollutant Discharge Elimination System (AZPDES) Storm Water Pollution Prevention permit for construction would be obtained by the Contractor, who would prepare and implement a Storm Water Pollution Prevention Permit plan to reduce the introduction of pollutants into waters of the U.S.

2. As part of ADWR's USF permit requirements, monitoring for water quantity and quality concerns at specified locations will be conducted as follows.

(a) Monitoring to measure depth to groundwater at specified locations every two weeks for the first two years of the facility's operation, and monthly thereafter;

(b) Monitoring daily to measure the total volume of water delivered to the recharge facility;

(c) Sampling and testing groundwater for specified water quality constituents every three months for the first year of the facility's operation and, if no problems are encountered, biannually thereafter.

3. Existing wells that are determined by CAWCD to be adversely affected by the recharge operations will be mitigated by CAWCD on a case-by-case basis; if the well problem(s) cannot be mitigated, CAWCD will pay to have the well re-drilled.

4. Should existing wells experience levels of nitrate greater than the MCL that are attributed to CAWCD's recharge activities, CAWCD will provide potable water until nitrate levels return to levels that are below the MCLs.

5. When the permit reaches the end of its 20-year term, CAWCD would evaluate the need to extend its operation. The permit process includes a re-evaluation of the impacts from 20 years of additional recharge.

b. No Action Alternative – For permit application purposes, it was assumed groundwater would continue to rise 7 to 11 feet per year to represent a worst case scenario; however, it is more likely that, over the long-term, groundwater levels would decline due to increased development in southeast Maricopa and northwest Pinal counties. New developments would join CAGRD and continue pumping groundwater from the ESRV sub-basin. CAGRD would, however, fulfill these developments' replenishment obligations by recharging in other existing recharge facilities elsewhere in the Phoenix AMA. As the ESRV sub-basin groundwater table continues to decline, deeper wells would need to be installed. Within the ESRV sub-basin, the quality of the groundwater declines as the depth to groundwater increases; thus users would experience water with higher concentrations of dissolved salts, arsenic, and increased temperature (T. Gorey, pers. comm. 2008). There would need to be greater coordination among water users within the ESRV sub-basin to implement aquifer management programs to address delivery and water quality issues associated with groundwater overdraft.

D. Land Ownership and Use

1. Affected Environment

The total project area consists of about 386 acres of undeveloped desert extending east from the CAP canal just north and south of Queen Creek. Approximately 134 acres of the project area were purchased for the CAP and are owned by Reclamation. The remaining 252 acres consist of Arizona State trust lands. State trust lands, which are managed by ASLD, surround the project area to the north, east, and south. There also is a narrow border of State trust land immediately west of the CAP canal; further west of that, land is in private ownership.

The Sonoqui Dike was constructed by Reclamation to protect the CAP canal from flood flows during large storm events. The State land within and surrounding the project area consists of undeveloped desert that has been leased for grazing, with the exception of State land just west of the CAP canal in sections 25 and 35, T. 2S., R. 8E., which has been leased for agriculture (ASLD 2007). Further west of the project area, land use mostly consists of a mix of residential (both rural and urban) and agricultural properties. For a couple miles west of the proposed project, the majority of the urban residential development occurs north, and most of the agriculture occurs south, of the channelized Queen Creek. Five commercial sand and gravel operations are located along the channelized Queen Creek within a 2-mile stretch downstream (west) of the CAP canal, two of which include cement manufacturing facilities. The town of Queen Creek is located about 7 to 8 miles west of the project area.

The Rittenhouse Air Force Auxiliary Field is located approximately 1-1/2 miles northwest of the SMRP project area. This field was build during World War II as a satellite airfield for Williams Army Airfield, and was used to train twin- and four-engine bombers and single-engine fighters (Freeman 2007). The airfield is no longer used for Air Force operations, but is used in helicopter training by the Arizona National Guard. No fuel is stored onsite.

Most of the land directly west and southwest of the proposed project is currently under cultivation. The agricultural land closest to the SMRP is approximately ¼ mile west of the South Basin Facility.

2. Environmental Consequences

a. Proposed Action – Construction would occur over an 18-month time frame. There would initially be construction-related traffic associated with delivery of supplies and equipment; major roadways would be used. At the end of construction, there would be additional construction-related traffic associated with removal of equipment and unused supplies. During these times, there would be dust and noise generated, as well as potential traffic disruptions from delivery of large pieces of equipment and supplies. During the majority of the construction period, however, project-related traffic would consist of construction workers traveling to and from the jobsite. The construction contractor would be required to obtain any local air quality permits and/or implement dust abatement best management practices to reduce the amount of dust generated from land disturbing activities. Construction would generally be restricted to daylight hours to the degree practicable. The construction yard, which would be located within the project area, would be lighted during the night for security purposes. The Contractor would be required to shield lighting to avoid causing a nuisance to surrounding areas.

To avoid penetrating Sonoqui Dike, which could result in erosion of this flood protection structure, pipeline installation to convey water from the CAP canal to the recharge basins would consist of laying the pipe on top of the dike.

Operation of the facilities would result in noise being generated from electrical pumps, six at each basin, which would be used to fill the basins. Up to six pumps would be operated during Phase I. The pumps would be supplied by electricity brought in from existing nearby electrical transmission lines that are located on the west side of the CAP canal. No diesel back-up generators would be used. The pumps would operate 24 hours a day, seven days a week for extended periods of time. The nearest occupied house is about 0.4 mile west of the proposed project. Currently, no noise abatement structures are considered to be needed.

On a periodic basis (annually or more), the basins would be scarified to improve infiltration rates. Scarification consists of breaking up the surface of the recharge basins and removing a small amount of the top layer of material. The material removed would be

placed in spoil areas located within the project area outside natural washes. It will take about four consecutive days to complete these periodic maintenance activities. This work would result in some minor dust being generated from scarification, transportation of the material to the spoil areas, and placement of material onto the spoil areas. County-established best management practices would need to be followed to minimize dust generated from these ground-disturbing activities, such as maintaining proper soil moisture along the haul roads to reduce the amount of dust generated by truck traffic. Spoil areas would be stabilized by re-seeding, as required. It is anticipated these spoil areas would not be visible from the west, due to the position of Sonoqui Dike and line-of-sight trajectory from the nearest road.

The basins would be operated to maintain vector control and minimize odor problems. Vector control would be achieved by timing the wet/dry cycles to keep mosquitoes and white flies from breeding, and to minimize algae growth, which contributes to odor problems. Also, the basins would be kept free of vegetation, removing breeding habitat for mosquitoes. The vegetation would be controlled through spraying with approved herbicides or by manual removal.

Rittenhouse Air Field, used for helicopter training, is surrounded by agricultural fields which typically attract birds. Although vegetation around the basins will be controlled, the recharge basins could provide resting habitat for shore birds. According to Lt. Col. Jerry Madison, Arizona Army National Guard, due to the distance from the proposed project and because birds do not pose a threat to rotary wing aircraft, there would be no adverse impact to the training activities at Rittenhouse Air Field as a result of the proposed project (Montgomery 2006a).

As discussed in Chapter III.C, Water Resources, CAWCD has modeled where recharge of CAP water would result in groundwater levels rising over the span of 20 years, from one foot at the outer boundaries of the AOI to over 400 feet immediately beneath the recharge basins themselves. The remediation efforts at WAFB for the two Superfund sites are focused approximately 165 to 245 feet below land surface where the contamination is essentially

separated from the underlying aquifer by the presence of an aquitard. Any groundwater rise beneath these two sites would not come into contact with contaminated soils.

Commercial sand and gravel operations within Queen Creek downstream of the proposed project could potentially be affected by the proposed project. The deepest elevation in each of the gravel pits for all five operations was determined by a CAWCD survey crew using global positioning system technology (Trimble 4800 Series GPS unit); data were collected on November 2, 2004. The bottom elevations of the gravel pits were between approximately elevation 1,520 feet and 1,415 feet above mean sea level (msl) going downstream. The groundwater levels resulting from 20 years of operation of the fully built-out proposed project within this same reach of Queen Creek are projected to range between approximately elevation 1,440 feet and 1,300 feet above msl. That would provide a buffer between 80 and 115 feet between the bottom of the gravel pits and the groundwater level in any given pit. CAWCD's USF permit requires ongoing groundwater monitoring be conducted to ensure groundwater levels stay at least 65 feet below the deepest pit, as measured on November 2, 2004. Under Phase I, groundwater levels are anticipated to range between 1,249 feet and 1,340 feet above msl. This would provide a buffer between 135 and 195 feet beneath the depth of the gravel pits on November 2, 2004. The current depths of the existing gravel pits may be lower than what was reported in the Hydrologic Reports filed with ADWR, however, because mining has continued in some of the pits since the depths of the pits were calculated on November 2, 2004. Depending upon how much longer these mines remain active, mining operations could potentially encounter groundwater earlier than would otherwise occur without the proposed project.

As recharge occurs, over time the groundwater quality directly beneath and radiating out from the recharge facilities would approximate that of CAP water. As local groundwater is displaced with CAP water, there would be an increase in the concentrations of sulfate and TDS. It is anticipated any increased levels of sulfate that would occur over time would not adversely affect the quality of aggregate or cement produced at the sand and gravel plants located west of the project area (Reclamation 1992, p. 55).

Pinal County's "Open Space and Trails Master Plan" indicates a trail is planned to roughly follow Queen Creek within the project area (Logan Simpson Design Inc. 2007). Plans to install barbed wire fence to protect Reclamation's lands at Sonoqui Dike (and ultimately both the north and south recharge basin facilities) will not interfere with these plans, as the Creek itself will not be fenced. Breakaway fencing is planned to be placed within the Creek. CAWCD will coordinate with sponsors of this trail if/when plans for the trail are known, to determine if gates are needed to accommodate trail users.

b. No Action Alternative. In the absence of the construction and operation of the proposed project, there would be no immediate change to the existing land ownership and use in the project area. Residents in the area would not experience short term annoyances from construction activities, the views in the area would not change, nor would there be the potential for additional background noise from operation of pumps along the CAP canal. In the longer term, it is anticipated the agricultural lands would be developed, and State trust lands would be sold and developed.

E. Biological Resources

1. Affected Environment

The proposed SMRP is located within the Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). The topography of the project area is relatively flat, ranging in elevation between 1,570 feet above msl and 1,600 feet above msl (Gladding 2004). Queen Creek, which is ephemeral in this area, drains in a westerly direction through the project area.

The project area consists primarily of native desert vegetation, although there are areas throughout that have been disturbed by cattle grazing and off-road vehicle use. Two vegetative communities are found within the project area. Upland vegetation, found in areas where the desert has not been disturbed, consists mostly of creosote bush (*Larrea tridentata*). Xeroriparian vegetation, found along the ephemeral washes that cross the project area, include creosotebush, triangle-leaf bursage (*Ambrosia deltoidea*), velvet mesquite (*Prosopis velutina*),

desert ironwood (*Olneya testota*), blue paloverde (*Parkinsonia florida*), wolfberry (*Lycium* sp.), and burrobrush (*Hymenoclea salsola*). A list of all the plant species observed during field surveys conducted by SWCA, Inc. in May and August 2004 are provided in Appendix B (Gladding 2004).

No systematic wildlife surveys have been conducted within the project area, but it is likely that some of the species identified in Brown (1994) for the Sonoran Desertscrub biome are present. The area has been classified as low quality habitat for the desert tortoise (Logan Simpson Design 2007).

Areas of high foliage volume are often recognized as sites of high breeding bird densities and MacArthur and MacArthur (1961) demonstrated a close correlation between foliage height diversity and bird species diversity (Mills et al. 1991). Although pure stands of creosote bush are prevalent in the Southwest, relatively fewer birds select them as breeding habitat. Open creosote bush flats supported fewer breeding species of birds than microphyll woodland or dense creosote bush vegetation near the Algodones Dunes in Imperial County, California (Franzreb 1978). Of the 10 habitats studied in Arizona, creosote bush had the second lowest number of terrestrial species (n=37) and cottonwood-willow riparian had the highest (n=89) (Short 1982). Although the xeroriparian vegetation along the washes can increase species diversity, overall wildlife quality of the proposed recharge area can be considered low.

The Fish and Wildlife Service (FWS) identifies 13 federally listed endangered or threatened species that potentially exist within Pinal County (Table 3-4). All 13 federally listed species have been determined not to be affected because their known geographic ranges are distant from the project area and/or the project area does not contain conditions similar to those known to be necessary to support these species.

Table 3-4. U. S. Fish and Wildlife Service Endangered Species List for Pinal County, AZ

Common Name	Scientific Name	Listing Status
Arizona hedgehog cactus	*Echinocereus triglochidiatus arizonicus*	Endangered
California brown pelican	*Pelecanus occidentalis californicus*	Endangered
Desert pupfish	*Cyprinodon macularius*	Endangered
Gila chub	*Gila intermedia*	Endangered
Gila topminnow	*Poeciliopsis occidentalis occidentalis*	Endangered
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered
Loach minnow	*Tiaroga cobitis*	Threatened
Mexican spotted owl	*Strix occidentalis lucida*	Threatened
Nichol Turk's head cactus	*Echinocactus horizonthalonius,* var. *nicholii*	Endangered
Razorback sucker	*Xyrauchen texanus*	Endangered
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered
Spikedace	*Meda fulgida*	Threatened
Yuma clapper rail	*Rallus longirotris yumanensis*	Endangered
(FWS 2007)		

2. Environmental Consequences

a. Proposed Action – Construction and operation of the fully built-out SMRP would ultimately result in permanent disturbance of up to 386 acres of Sonoran desertscrub vegetation. Within the foreseeable future, there would be loss of individual wildlife (e.g., small mammals and reptiles) and breeding habitat for desert nesting birds as a result of grading and excavation activities during construction, and a loss of permanent habitat as a result of conversion of about 107 acres of upland desert into recharge basins, berms, and permanent spoil areas associated with Phase I. The construction would also result in fragmentation of the existing habitat which could also negatively affect wildlife. Because birds are comparatively easy to study, much research has been directed toward examining the impacts of habitat fragmentation on this taxon. In general, less overall habitat results in lower species richness. Smaller patches would lose some species; habitat fragmentation can impact bird density and fecundity; edge effects can negatively affect nesting success (Hilty et al. 2006).

This type and quality of habitat is relatively abundant on a regional scale. Impact to this habitat is not considered to be significant regionally due to the sparseness and lack of diversity of the existing habitat within the project area, degradation by cattle and off highway

vehicle use, and phased implementation of the project. In conjunction with this project, CAWCD will be installing wildlife compatible barbed-wire fence along the boundary of Reclamation's property, east of the SMRP. This will protect 677 acres of similar habitat from continued cattle grazing and off highway vehicle use. There would be no effect to federally protected species from the construction and operation of this project.

The configuration and operation and maintenance of the recharge basins would likely preclude nesting by waterfowl and shorebirds. Waterfowl and some shorebirds are anticipated to use the area opportunistically for resting and possibly for forage, however. The basins would be about two feet deep with sloped sides, which would allow mammals and reptiles that can access the basins, as well as shorebirds and waterfowl, to safely drink from the basins.

The impact from the loss of up to 386 acres of Sonoran desertscrub vegetation from implementation of the SMRP would be in addition to the conversion of agricultural land to urban development. The 677 acres of similar Sonoran desertscrub habitat that will remain protected after construction of the SMRP will continue to provide habitat for mammals, birds, and reptiles adapted to creosote bush-dominated Sonoran desertscrub. In addition, Queen Creek may provide a movement corridor for wildlife in the project area to and from the Tonto National Forest

Several mitigation measures would be implemented to offset the habitat loss, as follows:

- All existing cacti and trees determined by a professional arborist to be salvageable, that otherwise would be destroyed by clearing activities, would be salvaged and transplanted within the project area. Wherever practicable, mesquite, palo verde and ironwood would be transplanted along washes to enhance existing xeroriparian habitats.

- CAWCD would fence Reclamation's right-of-way upstream of Sonoqui Dike, tying this fencing to existing fencing upstream and downstream along the CAP right-of-way. This

would protect approximately 677 acres from cattle grazing and off-highway vehicle use that are currently occurring on Reclamation land along Queen Creek.

- All areas disturbed by construction activities that are not needed for permanent facilities would be reseeded with a native seed mix, consisting of the following:

Species of Seed	Lbs. pure live seed/acre
Plantago (*Plantago insularis*)	5.00
Desert mallow (*Sphaeralcea ambigua*)	1.50
Creosote bush (*Larrea tridentata*)	3.00
Brittle bush (*Encelia farinosa*)	1.00
Bursage (*Ambrosia deltoidea*)	4.00
Desert marigold (*Baileya multiradiata*)	1.50
Fluff grass (*Erioneuron pulchellus*)[6]	1.00
Desert lupine (*Lupinus sparsiflorus*)	2.00
Wolfberry (*Lycium andersonii or L. exsertum*)	1.00
Total weight per acre	20.00

b. No Action Alternative - In the absence of the project, up to an estimated 132 acres of Reclamation-owned creosote-bush dominated Sonoran desert would not be destroyed. The biodiversity of the area is relatively low. The xeroriparian habitat along the edges of Queen Creek would become more valuable as other areas of xeroriparin habitat are lost due to development; however, these small patches of habitat also would become more isolated. In the reasonably foreseeable future, up to 254 acres of State trust land would also remain relatively undisturbed; however, at some point in the future it is anticipated the State land would be sold, and some type of development would occur, resulting in the eventual loss of the existing habitat. As with the proposed action, due to the sparseness and lack of diversity of this habitat, this would be considered to be a minor impact. The small amount of habitat along the CAP canal would become further fragmented and isolated.

[6] Formerly *Tridens pulchellus*; if unavailable, replace with Purple three-awn (*Aristida purpurea*) in the same proportion.

F. Cultural Resources

The following is summarized from the documents "Archaeological Evaluations of the Proposed Superstition Mountains Recharge Facility Site near Queen Creek, Pinal County, Arizona" (D.R. Mitchell, C. North, & C. Schmidt 2004) and "Results of Cultural Resources Monitoring of Geotechnical Testing at AZ U:15:57 and U:15:58 (Arizona State Museum [ASM]) for the Central Arizona Project Superstition Mountains Recharge Project, Queen Creek, Pinal County, Arizona" (Schilling 2005). All sites are designated (ASM) unless otherwise noted.

1. Affected Environment

a. Background - The SMRP is located within what is generally referred to as the Phoenix Basin, which has supported several prehistoric cultural groups over the centuries. Relatively little is known about the earliest inhabitants, who were Paleo-Indian and Archaic groups. More is known about the Hohokam, the name given to farmers/craftspeople who inhabited much of the region from about A.D. 1 until the mid to late 1400s. Evidence of their earliest occupation (around A.D. 1 to 500) indicates the Hohokam subsisted on both wild resources and cultivated products (corn being the dominant crop, but also beans and squash). Cotton also was grown. The Hohokam built canals to support agricultural practices along the Salt and Gila rivers beginning around A.D. 400.

By A.D. 650 to 750, Hohokam irrigation practices became well-established and they were expanded to terraces above the floodplains. Although temporary housing at agricultural sites appears to have consisted of domed field houses made from bent poles covered with brush, habitation sites that were occupied for extended periods of time consisted of moderately sized pit structures with square or rectangular floor plans and formal, plastered hearths. Subsistence practices during this period continued to include a dependence upon both wild resources and agricultural produce.

A.D. 750 to 950 is considered to have been a period when the Hohokam expanded both in terms of population distribution and cultural development. Hohokam artifacts from this period have been found much further north, east, south, and west beyond the Phoenix

Basin than from previous periods. In addition, it appears their contact with neighboring groups increased, as evidenced by other types of ceramics found in Hohokam sites dating to this time. During this period, the Hohokam are considered by scholars as achieving their highest level in the production of arts and crafts. Evidence of ballcourts in southern Arizona, probably first built in the early A.D. 800s, is thought to mark the appearance of a regional system with religious, economic, and political links that crossed geographical boundaries (Abbott 2001; Wilcox & Shenk 1977).

From A.D. 950 to 1150, changes occurred in Hohokam culture. Construction of ballcourts diminished, replaced by construction of platform mounds. Houses were more closely packed into courtyard groups or village segments. By the end of this period, many village sites and areas appear to have been abandoned, with populations beginning to concentrate in larger villages along the Salt and Gila rivers. Subsistence was based upon agriculture, with some emphasis on the collection of wild plant species, especially cholla. Cotton production was important for both seeds as a food source and the fiber it provided for weaving.

During the latter part of what is called the Classic period (A.D. 1150-1450), public architecture of Hohokam society reached its highest achievement with construction of "big houses." The only remaining example is the Casa Grande Ruins on the outskirts of Coolidge, Arizona, located approximately 17 miles south of the SMRP site. These structures served multiple functions and are considered by some as having been symbols of elite status within the Hohokam society (Wilcox & Shenk 1977). During the latter half of this period, the Hohokam built adobe compounds and structures rather than the semi-subterranean structures and pole-reinforced wall structures that were previously built. The number of rooms within compounds increased, as did their proximity to each other. Population size and density at many of the large sites in the Salt River Valley reached their maximum extent during this period. There is debate as to the degree of social and political organization that was actually achieved by the Hohokam; however, evidence of the higher population densities that developed indicates some increased level of social complexity occurred during this period. Use of canals for irrigation continued to be important; corn, beans, and squash were mainstays of the Hohokam

diet. Agave has been found at many Hohokam sites from this period, indicating its use played a significant role in the society.

Investigations indicate that by the mid-1400s, Hohokam occupation of the Phoenix Basin had ended, although some scholars believe a Hohokam presence may have persisted until the early 1500s. There is much debate over the demise of the Hohokam. Factors attributed to their collapse include high population densities, decline in agricultural production and depletion of food resources, failure of irrigation systems, disease, flooding, and drought.

Until the arrival of Spanish, Mexican, and Anglo settlers in appreciable numbers in the 18th century, the Phoenix Basin was only sparsely populated. Early non-native settlers engaged in mining, ranching and homesteading. The settlers used the prehistoric irrigation canals, and constructed new irrigation canals as well.

b. Previous Research/Current Investigations – Prior to conducting geotechnical testing during basin location studies for the project, Archaeological Consulting Services, Ltd. (ACS) was contracted in 2003 to conduct a cultural resources reconnaissance study. This study provided an inventory and assessment of any cultural resources that might be affected within areas where geotechnical testing was proposed, including what are now the north and south basins of the proposed project. ACS determined the proposed project area had previously been surveyed, falling within an area proposed for designation as the "Queen Creek Archaeological District," by researchers from ASM in the 1970s. This proposed designation was based upon the cluster of habitation, agricultural, and limited activity sites recorded in this area as a result of surveys and excavations conducted for the CAP. The Arizona State Historic Preservation Officer (SHPO) did not officially designate the area as a district. Two National Register-eligible Hohokam sites, AZ U:15:57 and U:15:58 were identified as occurring within the project area; limited data recovery was conducted at AZ U:15:57 in conjunction with the CAP investigations (Deaver 1983).

Fieldwork conducted by ACS in 2003 revealed the ground surface of the project area had been extensively modified by erosion since the time the area was surveyed and mapped for the CAP project. In November 2005, ACS monitored geotechnical testing conducted by a contractor to CAWCD to obtain additional site-specific geologic data about the proposed project area. The archaeological monitoring did not reveal subsurface cultural deposits in any of the geotechnical bore holes or testing trenches.

The 1916 General Land Office map indicates historic features previously existed within the southern parcel. The western half of section 26 and east half of section 27 used to contain the "Bowen Ranch," which included a barn, windmill, house and corral. There were also several unnamed roads visible on the map.

2. Environmental Consequences

a. Proposed Action - Based upon previous work conducted as part of the CAP investigations, the more recent literature search, and lack of cultural resources found during the geotechnical excavations undertaken for the proposed project, ACS recommended, and Reclamation has concurred, there would be "No Historic Properties Affected" on Reclamation land. No further archaeological work is necessary prior to the proposed project proceeding on the portion of the project located on Reclamation land. The Arizona SHPO concurred with this finding on September 10, 2007. ASLD would be required by State law to consult with the SHPO regarding any effects to cultural resources prior to approving sale or lease of its land for this proposed project, as well as sale or lease of any State trust land in the future.

b. No Action Alternative - Under the No Action Alternative, no land disturbing activities would occur in the project area as a result of the proposed project; therefore, any previously undiscovered cultural resources that might be located beneath the surface would remain intact and undetected. However, previous studies have indicated it is highly unlikely that any are present in the area. ASLD requires that cultural resource surveys be conducted prior to purchase of any State lands. Prior to any proposed State land purchase and development, file review and surveys similar to those conducted for this proposed project (and described above)

would need to be conducted and a report on their findings would need to be submitted to the SHPO. It would be the responsibility of the ASLD archaeologist to consult with the SHPO.

IV. ENVIRONMENTAL MITIGATION MEASURES

Following are specific mitigation measures that will be implemented by CAWCD as an integral part of this project.

1. Monitoring and reporting requirements from CAWCD's Constructed USF Permit addressing water quality and quantity will be implemented. Results from these monitoring and sampling efforts will be reported on a frequency identified in the permit; additional steps are identified to be taken if established limits are exceeded. These include, but are not limited to:

(a) Measuring depth to groundwater every two weeks for the first two years of the facility's operation, and monthly thereafter;

(b) Measuring the total volume of water delivered to the recharge facility daily;

(c) Sampling and testing groundwater for specified water quality constituents every three months for the first year of the facility's operation, and biannually thereafter;

2. Dust abatement measures will be implemented during construction and operation of the recharge basins, to minimize air pollution and dust nuisance.

3. If previously undiscovered cultural resources are identified during excavation activities, all work will cease until the discovery can be evaluated by a Reclamation archaeologist.

4. Construction activities will be restricted to daylight hours to the degree practicable.

5. Any lighting installed at contractor use area(s) will be shielded to avoid causing a nuisance to surrounding residents.

6. Selected vegetation, which will be removed due to construction of the recharge basins, will be transplanted and used as landscaping to buffer the visual impact of the basins.

7. Basins will be operated to maintain vector control and to minimize odor problems, by timing the wet/dry cycles. Vegetation growing around and/or in the basins will be controlled through spraying with approved herbicides or by manual removal.

8. Areas disturbed by construction activities that are not needed for permanent facilities will be reseeded with a native seed mix.

9. All construction equipment will be power washed prior to entering the project area to reduce the potential for bringing non-native invasive weed seeds into the project area.

10. Existing wells that are determined by CAWCD to be adversely affected by the recharge operations will be mitigated by CAWCD on a case-by-case basis; if the well cannot be mitigated, CAWCD will pay to have the well re-drilled.

11. Should existing wells experience levels of nitrate exceeding the MCL, that are determined to be attributed to CAWCD's recharge activities, CAWCD will provide potable water until nitrate levels return to levels that are below the MCLs.

V. CONSULTATION AND COORDINATION

In preparing its permit to ADWR for a constructed USF facility, CAWCD coordinated with the ADWR, ADEQ, the Corps, and Pinal County Flood Control District. ADWR's USF permit was issued on January 15, 2008. ADEQ approved the groundwater quality sampling plan prior to ADWR issuing the permit.

VI. ENVIRONMENTAL LAWS AND DIRECTIVES CONSIDERED

A. National Environmental Policy Act. This EA has been prepared in accordance with the requirements of NEPA, Interior's Departmental Manual, and Departmental regulations implementing NEPA found at 43 CFR Part 46 (Vol. 73, 61314-61323). Notification of public scoping for this EA was provided in a memorandum dated October 4, 2007. This EA is being issued with a draft Finding of No Significant Impact (FONSI) determination, both of which are being made available for a minimum 30-day public review and comment period prior to Reclamation making a final determination whether the FONSI is appropriate, or an environmental impact statement should be prepared.

B. Clean Water Act, as amended. CAWCD and its contractor will acquire and abide by conditions of any and all applicable Arizona regulations implementing the Clean Water Act, including but not limited to an AZPDES stormwater permit for construction activities disturbing an acre or more of land. CAWCD has determined an AZPDES permit for point sources of pollution will not be required, as there will be no discharge of pollutants into waters of the US. The Corps has confirmed no section 404 permit will be required (for discharges of dredged or fill material into jurisdictional waters of the U.S.).

C. Clean Air Act, as amended. Construction-related activities will result in temporary air quality degradation. State or local grading/excavation permits will need to be acquired for such activities. Compliance with these permits will ensure NAAQS limits are not exceeded and no significant air quality impacts will occur. Long-term operation of the recharge basins is not expected to degrade air quality; however, periodic scarification of recharge basins will result in temporary PM emissions on a very limited basis (four consecutive days or less). Best management practices for controlling dust will be employed for both construction-related and maintenance activities. Any applicable grading and/or dust control permits will be acquired as appropriate.

D. Endangered Species Act of 1973, as amended. No species that are federally listed as threatened or endangered, or proposed for listing are found within the project area. There also is no designated critical habitat that would be impacted by the proposed project.

E. Fish and Wildlife Coordination Act. The proposed action does not constitute a Federal water resource project that impounds, diverts or otherwise modifies a stream or other natural body of water; therefore this Act is not applicable.

F. National Historic Preservation Act of 1966, as amended. Based upon previous studies conducted as part of the CAP investigations and the results of archaeological monitoring conducting during geotechnical testing for the proposed project, adverse impacts to cultural resources are not expected to result from this proposed project. The Arizona SHPO has concurred with this determination.

G. Wild and Scenic Rivers Act of 1968. There are no rivers designated or proposed for designation as wild and scenic within or near the project area.

H. Wilderness Act of 1964, as amended. There are no areas designated or proposed for designation as wilderness areas within or near the project area.

I. Executive Order 11990, Protection of Wetlands. There are no wetlands found within the project area.

J. Executive Order 11998, Floodplain Management. Portions of the recharge basins will be located within the 100-year floodplain; CAWCD has obtained a floodplain use permit from the Pinal County Flood Control District which indicates the 100-year floodplain would not be altered as a result of this project.

K. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The area being used for this project is owned by Reclamation and the State of Arizona. No minority or low-income populations will be adversely impacted by this project.

VII. LIST OF PREPARERS

The following individuals prepared this EA:

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