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RECLAMATION

Managing Water in the West

Upper Mojave River Groundwater Regional Recharge and Recovery

Including Oro Grande Groundwater Recharge
San Bernardino County, California

Environmental Assessment

U.S. Department of the Interior
Bureau of Reclamation
Southern California Area Office
Temecula, California

December 2009

ENVIRONMENTAL ASSESSMENT

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT (R^3)

INCLUDING ORO GRANDE GROUNDWATER RECHARGE

LEAD AGENCY:

THE UNITED STATES BUREAU OF RECLAMATION

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ACRONYMS AND ABBREVIATIONS

ACS ..... American Community Survey
AFY ..... acre-feet per year
AVRWC ..... Apple Valley Ranchos Water Company
bgs ..... below ground surface
CAA ..... Federal Clean Air Act
CCAA ..... California Clean Air Act
CDFG ..... California Department of Fish and Game
CEQ ..... Council on Environmental Quality
CEQA ..... California Environmental Quality Act
CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
CFR ..... Code of Federal Regulations
cfs ..... cubic feet per second
CNDDB ..... California Natural Diversity Database
CNEL ..... Community Noise Equivalent Level
CO ..... Carbon Monoxide
CO_2 ..... Carbon Dioxide
Corps ..... U.S. Army Corps of Engineers
CSA 64 ..... County of San Bernardino, Service Area 64
CWA ..... Clean Water Act
dB ..... Decibel

dBA ..... A-weighted Decibel
DNL ..... Day-Night Noise Level
EA ..... Environmental Assessment
EIR ..... Environmental Impact Report
EIS ..... Environmental Impact Statement
EPA ..... Environmental Protection Agency
°F ..... degrees Fahrenheit
FEMA ..... Federal Emergency Management Agency
FONSI ..... Finding of No Significant Impact
GSWC ..... Golden State Water Company
L_{max} ..... Maximum Sound Level
L_{min} ..... Minimum Sound Level
MBTA ..... Migratory Bird Treaty Act
MDAQMD ..... Mojave Desert Air Quality Management District
MWA ..... Mojave Water Agency
N_2O ..... Nitrous Oxide
NA ..... Not Applicable
NAAQS ..... National Ambient Air Quality Standards
NEPA ..... National Environmental Policy Act
NHPA ..... National Historic Preservation Act
NO_2 ..... Nitrogen Dioxide
NO_X ..... Nitrogen Oxides
NPDES ..... National Pollutant Discharge Elimination System
NRHP ..... National Register of Historic Places
O_3 ..... Ozone
OSHA ..... Federal Office of Safety and Health Administration
Pb ..... Lead
PM_{10} ..... Particulate Matter (10 microns in diameter or less)
$PM_{2.5}$ ..... Fine Particulate Matter (2.5 microns in diameter or less)
R^3 ..... Regional Recharge and Recovery Project
RCRA ..... Resource Conservation and Recovery Act
ROD ..... Record of Decision
RWMP ..... Regional Water Management Plan
SARA ..... Superfund Amendments and Reauthorization Act
SDWA ..... Federal Safe Drinking Water Act
SIP ..... State Implementation Plan
SO_2 ..... Sulfur Dioxide
SO_X ..... Sulfur Oxides
SWP ..... State Water Project
TDS ..... Total Dissolved Solids
USFWS ..... United States Fish and Wildlife Service

CHAPTER 1.0
INTRODUCTION

1.1 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) is for the Regional Recharge and Recovery Project (R^3), including the Oro Grande Wash Recharge Project. The R^3 is a project designed to improve the Mojave Water Agency's (MWA) capacity limitations regarding the recharge, pumping, and storage of California State Water Project (SWP) water. In January 2006, MWA certified an Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA), finding the proposed project would not result in significant adverse environmental effects. This EA was prepared to determine if an Environmental Impact Statement (EIS) is required under the National Environmental Policy Act (NEPA) or if a Finding of No Significant Impact (FONSI) is the appropriate determination. The EIR is incorporated by reference for NEPA compliance.

1.2 PROJECT SUMMARY

1.2.1 Project Location

The proposed R^3 project site is located within the MWA service area, in the western Mojave Desert of Southern California along the Mojave River at the northern base of the San Bernardino Mountains. This area is within the southernmost portion of the Mojave River drainage catchment and is also within the southern portion of the Alto Subarea of the Mojave River Groundwater Basin; refer to Exhibit 1-1, *Regional Location Map* and Exhibit 1-2, *Site Vicinity Map*.

1.2.2 Project Description

The R^3 project would construct recharge basins, site approximately 22 extraction wells, construct conveyance pipelines, and construct a disinfection facility. The project would also include electric power lines to supply power to the disinfection facility.

The proposed project is intended to provide MWA with new facilities and opportunities to reduce the rate of overdraft and achieve a balance of water supply and consumptive use. The R^3 project proposes to supplement regional groundwater supplies by providing the facilities required to bank and recover an additional 40,000 acre-feet per year (AFY) of SWP water in the Alto subarea; refer to Exhibit 1-3, *Proposed R^3 System*. The following is a brief description of the proposed project elements.

Oro Grande Recharge

Grant Agreement No. R09AP35R20 provides Challenge Grant ARRA funds to develop a turnout system with meter, valve, and screening structures adjacent to the California Aqueduct near State Highway 395, near the City of Adelanto and to install

approximately 16,000 feet of 30-inch diameter pipeline along existing roads to the new groundwater recharge basins in the Oro Grande Wash.

Oro Grande Wash Recharge Basins would provide approximately 80 acres of groundwater recharge basins. Recharge basins would be constructed in a series of stepped ponds. The ponds would be constructed by scraping the sandy soil from the bottom of the wash and along the lower slopes, pushing it up into a mound across the bottom of the wash. Recharge would be focused in the bottom of the wash and no stepped recharge basins would be constructed up the slopes of the wash.

The project will connect to an existing turnout and siphon in the East Branch California Aqueduct near the City of Adelanto. State Project Water would be introduced into the turnout through an existing siphon located along the California Aqueduct. An underground 30 inch pipeline 16,000 feet in length will be installed to new groundwater recharge basins located adjacent to the Oro Grande Wash. The pipeline will be located almost entirely within existing road rights-of-way. The Project includes several recharge ponds, a control facility, and outlet structures on a ten acre site.

Recharge ponds will be constructed in the bottom of the Oro Grande Wash downstream of the California Aqueduct. Ponds will be constructed in a series of stepped ponds by scraping the sandy soil from the bottom of the wash and along the lower slopes, pushing it up into a mound across the bottom of the wash. Mounds would be about 5 feet in height, but would vary depending on the slope of the channel. At the downstream end, mounds may be slightly higher than 5 feet. The interconnected mounds will have small sand-bag-lined notches in them to allow water to safely pass over them and flow into the next pond. Recharged water would be extracted using existing wells in the recharged area.

Upper Mojave River Groundwater Regional Recharge and Recovery

Cooperative Agreement No. R09AC35R15 provides Title XVI ARRA funding to implement the first phase of the R^3 Project, with an initial capacity of 15,000 AFY. The first phase consists of the following components:

- South of Rock Springs Pipeline: approximately 8,045 feet of pipeline to transport water to the recharge facilities
- Recovery Facilities: 6 fully equipped extraction wells with approximately 7,100 feet of pipeline
- East Conveyance Pipeline: approximately 2,600 feet of pipeline
- West Conveyance Pipeline: approximately 33,200 feet of pipeline
- Pipeline Turnouts: 4 turnouts

- Pump Station and Reservoir: 1,800 horsepower pumps and 2.65 gallon storage reservoir
- Electrical and Control Systems
- Disinfection Facilities: a chlorine treatment building

The ultimate capacity of the R^3 Project will be 40,000 acre-feet per year (AFY). The ultimate R^3 Project includes recharge basins, 15 miles of pipelines, pumps and reservoirs, 22 wells, and 6 turnouts. The facilities will be capable of storing the water when it is available from the State Water Project, which is usually only 9 months of the year. The recovery system will be capable of pumping sufficient water from the aquifer to meet demands year round. Water from the State Water Project is of high quality; it will be used to blend with water from other local aquifers that may be naturally impaired. The improved quality of the blended water will allow its use for potable purposes.

The R^3 Project includes seven primary components: (1) recharge facilities; (2) ground water wells; (3) conveyance pipelines (east and west); (4) pipeline turnouts; (5) booster pump stations and storage reservoirs; (6) electrical and supervisory control and data acquisition (SCADA); and (7) central disinfection system.

Recharge Facilities

Recharge basins located within and adjacent to the Mojave River will be constructed to percolate an average of 40,000 acre-feet of SWP water annually, over a 9-month period. The first phase of the Project, it is anticipated that an average of 15,000 acre-feet will be percolated annually over a 9-month period.

A new pipeline will connect to the Rock Springs Road turnout and extend southward approximately 7,500 feet to the proposed recharge site. The pipeline will be sized to accommodate the entire annual project flow of 40,000 acre-feet over a 9-month period, equivalent to a design flow rate of 74 cubic feet per second (cfs).

Ground Water Wells

Up to twenty-two (22) ground water wells will be constructed downstream of the recharge basins for the purpose of extracting stored water from the basin. Six (6) extraction wells are anticipated to be constructed for the first phase of the project. The locations and capacities of these wells were determined from a previously completed geo-hydrologic study. Well capacities are expected to range from approximately 1,600 gallons per minute (gpm) to over 2,000 gpm.

Conveyance Pipelines

The conveyance pipeline will deliver groundwater from the well field area to retail water providers' systems. The conveyance pipeline ranges in size from 24- to 42-inches. The conveyance pipeline has been sized for the ultimate flow. Additional turnouts with lateral piping will be added after Phase 1 to complete the ultimate project.

Pipeline Turnouts

The R^3 project will deliver water to the purveyors via a system of seven turnouts. The cities of Victorville, Hesperia, and Adelanto and County of San Bernardino, Service Area 64 (CSA 64) will be served through turnouts and lateral pipelines located on the west side of the Mojave River. A separate turnout will be located on the east side of the river to serve both Apple Valley Ranchos Water Company (AVRWC) and Golden State Water Company (GSWC), with water "wheeled" or exchanged through AVRWC to reach GSWC. Water wheeling through AVRWC's conveyance and storage systems would reduce the inherent cost and losses associated with additional water conveyance for GSWC.

At each connection point to the water retailers' systems, a turnout facility consisting of a flow control valve, meter, isolation valves, and appurtenances will be provided. Each turnout facility will be housed within a building. Some turnout facilities also include a disinfection system to boost chlorine residuals to match the retail water provider's other water supply sources

Booster Pump Station and Storage Reservoir

Because water from the Project is served over a large geographic area, and because of the large volume of water being served, it is necessary to provide both storage and booster pumping to regulate flow and provide adequate pressure at the points of delivery. A new MWA Reservoir Facility site would be located in the Hesperia Industrial Zoned area, north of Lemon Street, south of Mesa Street, and east of Santa Fe Avenue. Other potential sites considered for the Reservoir Facility are also in the general area of the Hesperia Industrial/Commercial Zones. Most potential sites in this general area are disturbed, and absent of any known sensitive environmental resources.

Ultimately, two reservoirs will be needed to regulate flows in the lower portion of the system (designated as Zone 1). One of these reservoirs will be constructed as part of the first phase of the Project. A pump station will boost water from Zone 1 into Zone 2. The pump station site and building will be built to full capacity, with spare pump cans and empty motor control centers to be added after the first phase.

Electrical and SCADA

A centralized SCADA system will be constructed at MWA operations headquarters to remotely monitor and control the Project system. In addition, electrical controls and devices will be required at each facility to locally monitor and control individual facilities. Power supply will also be required for each well and pump station facility.

Central Disinfection System

A central disinfection facility will be provided to comply with the State of California Department of Public Health requirements for drinking water. There are two possible locations for the central disinfection facility. One possible location is near the proposed reservoir facility, another possible location is closer to the well fields, near the intersection of Choiceana Avenue and Lemon Street. The central disinfection facility would replace the individual wellhead treatment facilities described in the 2006 Project EIR. The central facility would improve the Agency's ability to monitor raw water disinfection, obtain a more uniform water quality, and reduce hazards by storing and using water disinfection tablet chlorination in a single facility. The centralized tablet chlorination facility would have driveway access and a surrounding wall or fence. Chlorine tablets would be housed in a small structure and the disinfection facility would be enclosed within an approximate 60-foot by 55-foot structure that would be designed to be architecturally complementary to the surrounding community.

1.3 PURPOSE AND NEED

The recharge, storage and delivery components of the R^3 project will allow MWA to become less dependent on supplies from the SWP during drought periods or when the Sacramento Delta is under stress. By implementing the R^3 project, MWA is transforming SWP water into a more reliable, sustainable water source that local water retailers can rely upon as a consistent blending source for their impaired groundwater supplies. The R^3 project will also allow MWA to:

- Store SWP water in the Upper Mojave River groundwater basin and extract and deliver this stored water, when needed, to water retail providers for their use, including blending with other groundwater sources that are naturally impaired;
- Provide construction jobs and promote the economic recovery;
- Build a sustainable water delivery system that provides long-term benefits to the local area.

MWA also operates under the Mojave Basin Area Judgment (Judgment), which sets limits (Free Production Allowances) on the amount of groundwater production that can occur in each subarea without incurring an obligation to purchase imported water. These limits are based on long-term (1931-1990) averages of water supply and the highest year of production between 1986 an 1990. The Judgment requires reductions in Free Production Allowances of 5% per year

in each subarea until each subarea is in balance with the available water supply. Production in excess of the Free Production Allowance must be replaced with either (a) supplemental water from MWA or (b) use of unused Free Production Allowance from another party to the Judgment.

The Mojave River and the smaller drainages to the Morongo Basin are dry during most months of most years, and surface flow is an unreliable source of water except in infrequent intense storm periods. As a result, water users in the MWA service area rely almost entirely on groundwater, which since 1978 has been periodically supplemented by deliveries of water from the SWP. The large regional aquifer which underlies and is adjacent to the Mojave River aquifer receives water via runoff that concentrates and infiltrates along local washes along the interfaces at the mountain front, but this constitutes only about 20% of total infiltration to the basin, or about 13,000 acre-feet per year on average. This supply moves slowly through the basin and USGS notes that water in the regional aquifer under the Mojave River aquifer first entered the basin about 20,000 years ago. There is some documented recharge of the Regional Aquifer from the River Aquifer, and this has accelerated as Regional Aquifer overdraft has lowered water levels. Throughout the MWA service area, natural groundwater replenishment from sources other than the Mojave River is slow and only about 20% of average annual replenishment. The regional aquifer receives replenishment from the Mojave River.

1.4 AUTHORIZATION

The Bureau of Reclamation is authorized to provide funds to the Mojave Water Agency to implement the R^3 Project including the Oro Grande Wash Recharge Project in San Bernardino County, California. The permits required for the R^3 project are described in Table 1-1. Permits/approvals will be obtained prior to construction of the appropriate project elements.

1.5 PUBLIC INVOLVEMENT, CONSULTATION, AND COORDINATION

The project includes the development of expanded water infrastructure systems, and requires permits or approvals from those federal, state, and local agencies listed in Table 1-1. The Bureau of Reclamation is the lead federal agency for the proposed project. No additional scoping is necessary.

Table 1-1
Permits Required for the R^3 Project

Agency	Permit/Approval	Basis for Requirement
Federal Agencies		
US Bureau of Reclamation	Funding; Federal Consultation; State Historic Preservation Office – Section 106 Consultation	Federal Funding
US Fish and Wildlife Services	Environmental/Gnatcatcher Survey Permit; Endangered Species Act (ESA) Compliance	Construction Activities
US Army Corps of Engineers	Research, Section 404 Project Approval	Mojave River Oro Grande Wash
State Agencies		
Office of Historic Preservation (OHP), California Department of Parks and Recreation	State Historic Preservation Office – Section 106 Consultation	NEPA Compliance
California State Water Resources Control Board (SWRCB) Regional Water Quality Control (RWQCB)	NPDES General Permit Section 401 Certification	Construction Activity and Operations
California Department of Fish and Game	1602 Streambed Alteration Agreement (Notification Package) Section 2080 California Endangered Species Act (CESA) Compliance	Mojave River, Oro Grande Wash Construction Activities
California Dept. of Public Health (CDPH)	Amended Waterworks Permit	New water supply and water tanks
Transportation		
Caltrans District 8	Encroachment and Maintenance Permit(s)	SR-15 at Mesa Street and US-395 south of Mesa Street
BNSF RR (UP RR)	Right of Entry Agreement	Mesa Street
County of San Bernardino		
* Department of Public Health	Well Construction	Well Sites
Land Use Services Department	Buildings and Grading Permits	Recharge Facilities in unincorporated San Bernardino County
Public Works Department - Flood Control District	Encroachment Permit(s)	Recharge Facilities in unincorporated San Bernardino County Oro Grande Wash, Mojave River

Agency	Permit/Approval	Basis for Requirement
Local Agencies		
Mojave Desert Air Quality Management District	General Permit Air Conformity Determination	Construction equipment, emergency generators
* City of Hesperia	Encroachment Permit(s) Transportation Permit(s)	Mesa Street, Lemon Street, Choceana Avenue, Willow Street; Tamarisk Avenue, Santa Fe Avenue
* Town of Apple Valley	Electrical Permit	Darby Road
City of Victorville	Construction Excavation Permit(s)	Peters Canyon Road, Handy Creek Road, Jamboree Road

Note:

* = Required for R^3 Project only, not necessary for Oro Grande Wash Recharge

Map Document: (M:\Mdata\65100342\GIS\MWARegionalMap.mxd) - 8/19/2009

Source: ESRI Street Map

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

RBF CONSULTING

Not to Scale

8/19/09 JN 65-100342

Regional Location Map

Exhibit 1-1

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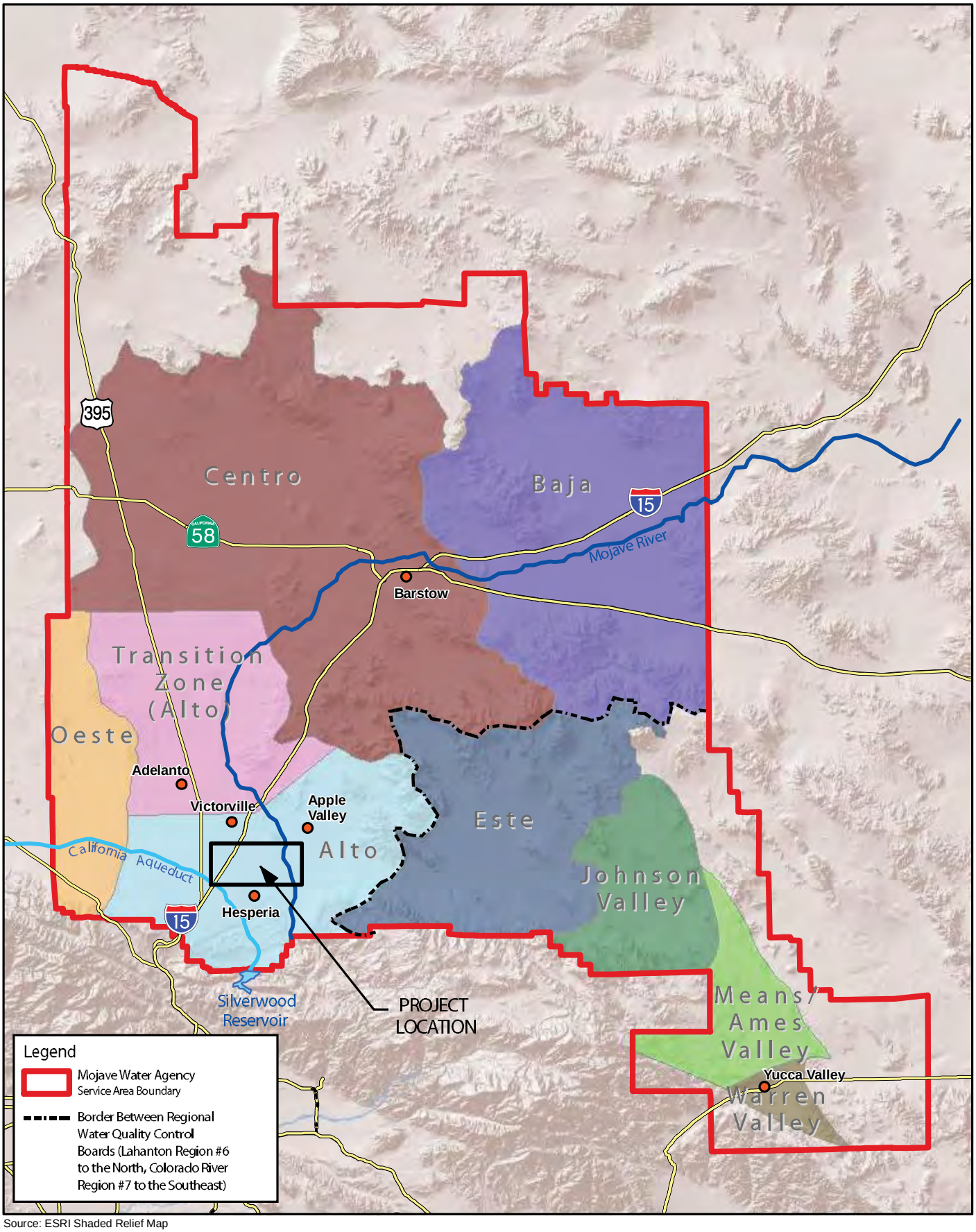

Source: ESRI Shaded Relief Map

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

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Not to Scale

8/19/09 JN 65-100342

Site Vicinity Map

Exhibit 1-2

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ADELANTO
Adelanto Zone 3
18"
24"
Turnout #7
VWD
Turnout #6
30"
CALIENTE RD
Zone 2 Reservoir
395
CITY OF VICTORVILLE
VWD
Plant 29
Turnout #5
Oro Grande Wash
30"
36"
VWD
Turnout #3
24"
Plant 19
Plant 14
42"
42"
42"
15
24"
Plant 21
PHELAN RD
HESPERIA
Turnout #4
Southern Pacific Railroad
CITY OF HESPERIA
California Aqueduct
UNINCORPORATED SAN BERNARDINO COUNTY
COUNTY SERVICE AREA 64
CSA 64
SANTA FE AVE
18"
Turnout #1
Zone 1 Reservoirs
Potential Disinfection Facility Location (Preferred)
Potential Disinfection Facility Location (Alternative)
42"
WILLOW
GLENDALE
Mojave River
APPLE VALLEY RANCHOS WATER COMPANY
Mockingbird
AVRWC
GSWC
GOLDEN STATE WATER CO
East Turnout
Rock Springs Turnout
48"
UNINCORPORATED SAN BERNARDINO COUNTY

Legend
- Preliminary Phase I Extraction Zone
- Recharge Zone
- MWA Reservoir
- MWA Pump Station
- Turnout
- Future Turnout (Ultimate Condition)
- Recharge Turnout
- Future MWA Reservoir (Ultimate Condition)
- Possible MWA-Acquired Tank from VWD
- Stakeholder Reservoir
- Oro Grande Wash Preferred Alternative Pipeline
- Oro Grande Wash Preferred Alternative Recharge Area
- AVRWC Transmission System
- Pipeline needed to serve Adelanto
- Possible MWA-Acquired Pipeline from VWD
- R3 Conveyance System
- Future Lateral Pipeline (Ultimate Conditions)
- South of Rock Springs Turnout Pipeline
- Future South of Rock Springs Turnout Pipeline
- Existing Morongo Basin Pipeline
- City Boundary

Map Document: (M:\Mdata\65100342\GIS\Updated_MXD\BLM_MWA_Proposed_Conveyance_System_Farmland_Flood.mxd) - 11/17/2009

RBF CONSULTING

0 5,000 10,000 15,000
Feet

11/11/09 JN 65-100342

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Proposed R³ System

Exhibit 1-3

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CHAPTER 2.0

DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

2.1 INTRODUCTION

In January 2006, the Mojave Water Agency prepared the Water Supply Reliability and Groundwater Replenishment Program EIR which identified various ultimate recharge/extraction alternatives, with a variety of recharge and extraction capacities. These alternatives could potentially increase net supply between 75,000 and 450,000 acre-feet. The three main alternative scenarios listed in Section 2.3 emerged from this analysis, and include both Phase I and Phase II of development.

2.2 ALTERNATIVES EVALUATED AND ELIMINATED

A preliminary alternatives screening process was conducted to eliminate alternatives that were considered infeasible. The initial screening process effectively eliminated from consideration a suite of sites with (a) high costs, (b) important water quality problems, (c) conveyance problems, (d) environmental impacts associated with the take of threatened and endangered species and riparian habitats, and (e) operational constraints unsuitable for a banking program. Based on the screening evaluation, it was also clear that the benefits and costs of alternatives would increase incrementally, with the lowest costs, yields, and impacts associated with smaller projects that utilized existing facilities, the capacity of the Mojave River Mainstem, and water exchanges to make returns of banked water. Based on the initial screening, MWA concluded that it was appropriate to develop a continuum of alternatives. The Notice of Preparation prepared for the EIR in 2006 initially described a potential alternative involving only use of existing facilities, but this alternative was eliminated from individual consideration based on findings of the 2004 PEIR that additional recharge in the Alto subarea was a high priority. This continuum of new facility components was broken into three distinct facility alternatives for the purpose of evaluating relative impacts of logical increments of facility development and to accommodate modeling of the water management aspects of the project. Following the intensive screening program that eliminated many alternative facilities and approaches to meeting MWA needs, this incremental approach to alternative formulation is intended to help the MWA Board of Directors identify an optimal mix of recharge and associated facilities.

2.3 PROJECT ALTERNATIVES

The fundamental objective for all water supply alternatives developed and analyzed by MWA is to try to balance future water demands with available supplies and to maximize the overall beneficial use of water throughout MWA's service area. MWA aims to accomplish this by recognizing the need to (1) maintain a sustainable water supply through extended drought periods, (2) stabilize the groundwater basin storage balance over long-term hydrologic cycles, (3) limit the potential for well dewatering, land subsidence, and migration of poor quality water, (4) supply water in quantity and of quality suitable to various beneficial uses, especially

in the absence of much needed recycled water supplies in the region, and (5) protect and restore riparian habitat areas as identified in Exhibit H of the Mojave Basin Area Judgment and described in the Habitat Water Supply Management Plan, which was prepared by the Department of Fish and Game for the benefit of these riparian habitat areas and species identified in the Judgment .

Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater. With groundwater storage stabilized, there will be groundwater available during surface water supply shortages and delivery interruptions. With a balanced basin, groundwater elevations will be relatively stable and be kept above the historic low. This will reduce the potential for land subsidence and associated aquifer compaction. By limiting migration of poor quality water, available supplies will be of sufficient quality to meet drinking water objectives, thereby increasing long-term water supply reliability.

2.3.1 Minimum Facilities Alternative

The Minimum Facilities Alternative, which was originally evaluated in the 2006 Project EIR, would add substantial additional recharge capacity for the Mojave River Floodplain Aquifer, both as a function of on-going use of low berms in the river channel to spread and slow flows and as a function of adding year-round release capacity via Unnamed Wash. The use of existing facilities and the added capability to recharge the river would mean MWA would have a total capacity to recharge over 90,000 AFY. This alternative would involve a cycle of recharge and annual extraction of water from the reach between Mojave Forks Dam and Bear Valley Road, with local water producers using water from this recharge/extraction process in lieu of other facilities. This alternative provided a basis for comparing the relative capital and operations costs associated with extraction of groundwater to meet area demand.

2.3.2 Small Projects Alternative

The Small Projects Alternative, also evaluated in the 2006 Project EIR, would add about 300 acres of permanent off-channel recharge capacity to MWA's system, resulting in an additional 150+ acre-feet per day of recharge capacity to the floodplain and regional aquifers, increasing MWA's net recharge capacity to about 120,000 AFY. The Small Projects Alternative includes the Minimum Facilities Alternative plus additional facilities.

2.3.3 The Large Projects Alternative

The Large Projects Alternative, also evaluated in the 2006 Project EIR, would add 580 acres of recharge capacity in the regional aquifer and substantial capacity to make returns to Metropolitan Water District (MWD) via pumping of stored groundwater to the California Aqueduct a viable option. The Large Projects Alternative adds about 230+ acre-feet of daily recharge capacity, increasing MWA's net recharge capacity to about 180,000 AFY. The Large Projects Alternative includes the Small Projects Alternative plus additional facilities.

2.3.4 No Project Alternative

The No Project Alternative would not include any banking or exchange programs. Under the No Project Alternative, MWA would continue to operate its existing facilities and plan and construct new recharge and conveyance facilities on an as-needed basis to accommodate increasing deliveries of SWP supplies for recharge to meet ongoing needs to deliver imported water to water producers in the MWA service area.

The No Project Alternative was defined in the context of MWA's ongoing obligations to provide imported water for producers in various subareas of MWA's service area. The No Project Alternative is not the existing baseline condition of the project. Whether or not the proposed project for banking and water exchange is approved and implemented, MWA will import an increasing amount of water to meet water supply needs. The recharge and conveyance of water to subarea producers will require facilities and will be developed over time. It is likely that MWA would develop these facilities in cooperation with local subarea producers, and, by 2025, would develop recharge and extraction facilities of similar capacity to those of the preferred alternative.

2.3.4 Preferred Project Alternative, Including Oro Grande Recharge Basins

The Preferred Project Alternative, the R^3 project, would include certain individual components of the Minimum Facilities Projects and the Small Projects Alternatives described above. The Preferred Project Alternative (described in Section 1.2.3, *Project Description*) would effectively be a hybrid of these alternatives. The R^3 project would include:

- The new facilities listed under the Minimum Facilities Alternative as described in the 2006 Project EIR, excluding the Recharge Via Unnamed Wash;
- A disinfection facility;
- 12.5 kV electric power lines; and
- The Off-Channel Mojave River Recharge and Pipeline, listed under the Small Projects Alternative.

The R^3 project was proposed under the *Upper Mojave River Groundwater Regional Recharge and Recovery Project*, Title XVI Feasibility Study Report (refer to Section 1.0, *Introduction*, for a more detailed discussion of the project background).

The R^3 project proposes to supplement regional groundwater supplies by providing the facilities required to bank and recover an additional 40,000 AFY over a nine-month period (equivalent to a design flow of 74 cfs); the SWP may not have adequate supply to deliver water during summer months. SWP water could be accepted through in-river recharge via releases from Silverwood Lake, tributary to the headwaters of the Mojave River, or off-river recharge via a connection to the Rock Springs turnout on the Morongo Basin Pipeline. The recovery facilities proposed under this Alternative include a new extraction wellfield, covering approximately 100 acres and including 22 wells.

Groundwater pumped from the wellfield would be conveyed to a central disinfection facility before it is delivered to the water purveyors, for use in their water supply systems. A system of

pipelines, reservoirs, turnouts and pump stations would be included in the project to accomplish this effort.

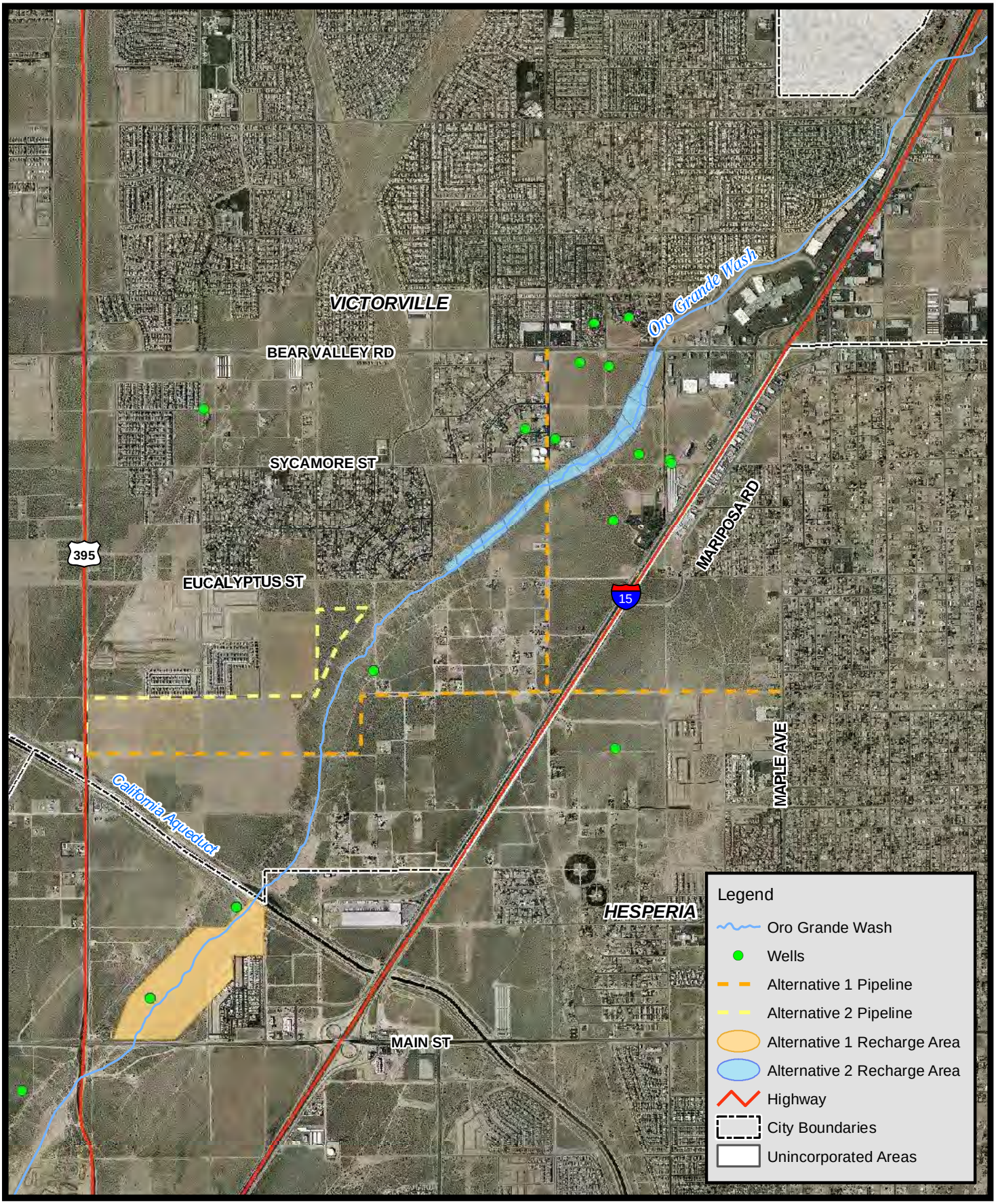
In addition, the Preferred Project Alternative includes two potential locations for the Oro Grande Recharge Basins. The Oro Grande Alternative 1 is an element of the Small Projects Alternative in the 2006 Project EIR. Figure 2-1, *Oro Grande Alternatives*, shows the pipeline alignments and recharge facility locations for both alternatives

Oro Grande Alternative 1

Oro Grande Alternative 1 would be constructed within the Oro Grande Wash, upstream of the California Aqueduct by as much as about a kilometer. This alternative provides for approximately 80 acres of groundwater recharge basins. A new turnout would be required to supply this site. The irregular contours and broad shoulders of the wash would result in a large area of construction activity. This would require substantial earth moving to establish berms along the slopes of the wash as well as along the bottom of the wash. This would also require substantial land acquisition outside of the wash as a result of severance issues. Alternative 1 would also provide for a pipeline and well field (along the pipeline alignment) so that water placed in the recharge area could be extracted and conveyed to customers. Recharge basins would be constructed below the surrounding land level, but the gentle slopes of the wash would allow for recharge basins to extend from the bottom of the wash up the sides of the wash, almost to the rim of the wash.

Oro Grande Alternative 2 (Preferred Alternative)

Oro Grande Alternative 2 would have approximately the same total footprint as Alternative 1 (80 acres). This alternative involves concentration of recharge facilities in the bottom portion of the Oro Grande Wash downstream of the California Aqueduct and Goss Road/Eucalyptus Avenue. Recharge basins would be constructed in a series of stepped ponds. The ponds would be constructed by scraping the sandy soil from the bottom of the wash and along the lower slopes, pushing it up into a mound across the bottom of the wash. This both provides for the material necessary for berm construction, but also removes the top 1-3 feet of soil, exposing the underlying sandy soils and improving the recharge rates. Soil removed may also be used to construct an access road along the edge of the berms. The effect of berm construction is to create a depression in the recharge area, with a levee raised around this excavated depression and a perimeter road created by pushing up excess soil from excavation above the berm area. Mounds would be about 5 feet in height, but would vary depending on the slope of the channel. At the downstream end, mounds may be higher than 5 feet at times. The interconnected mounds will have small sandbag-lined notches in them, or similar temporary construction, to allow water to safely pass over them and flow into the next basin.



RBF CONSULTING

0 1,500 3,000 Feet

11/17/09 JN 65-100342

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Oro Grande Alternatives

Exhibit 2-1

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Alternative 2 would focus all recharge downstream of the Goss Road/Eucalyptus Street in a portion of the channel that has similar habitats but has been extensively disturbed by off-road vehicle use and trash dumping. Recharge would be focused in the bottom of the wash and no stepped recharge basins would be constructed up the slopes of the wash. Three areas of this site include the following:

- The wash invert, consisting of largely un-vegetated soils with isolated plants, subject to infrequent erosive flooding, not including the low-flow channel, which will not be affected by the project;
- The sides of the wash, consisting of disturbed desert scrub habitats with occasional Joshua Trees; and
- Disturbed desert scrub along the rim of the wash where a pipeline will be installed.

The intake structure proposed for the project would consist of a 36-inch diameter pipeline running from an existing intake structure at the California Aqueduct. The pipeline would connect to a meter vault, approximately 25-feet by 35-feet, located within partially disturbed open space, just north of the California Aqueduct. The pipeline would then run northeast, approximately 100 feet from the meter vault to an approximately 90-feet by 60-feet moss screen structure and control building area. The moss screen structure and control building area would be graded and have a gravel surface. The area would be gated with a 6-foot high chain link fence and the site would be accessed from an existing dirt-traveled way running parallel to the California Aqueduct.

An 18-inch to 36-inch water conveyance pipeline connecting at the moss screen structure site would convey water for Oro Grande Wash recharge. This pipeline would be constructed and buried within a 20-foot easement located in open space, existing street rights-of-way, and potential easements that may need to be acquired by MWA along the route. An additional temporary 20-foot easement would be required for construction of the pipeline.

2.4 MEASURES INCORPORATED IN THE PROPOSED ACTION TO REDUCE ENVIRONMENTAL IMPACTS

Several measures have been incorporated into the proposed project that would reduce or avoid known potential impacts to environmental resources. These measures are identified throughout Section 4 of this document. MWA conducted extensive stakeholder consultation, which resulted in refinement of the project addressed in the 2006 Project EIR. These refinements are reflected in the 2009 Feasibility Study, including the development of an initial Phase I project to minimize groundwater elevation and improve water quality effects. The 2009 Feasibility Study further guides subsequent completion of the Phase II facilities for the R^3 project.

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CHAPTER 3.0
AFFECTED ENVIRONMENT

3.1 AFFECTED ENVIRONMENT

This section provides a discussion of the existing environmental setting for the area within the Mojave River Groundwater Basin that may be affected by the Project Alternatives based on previous documentation that has been prepared for this area as well as field studies. This information serves as a baseline to identify and evaluate any potential environmental impacts.

3.1.1 Air Quality

The project site is located within the Mojave Desert Air Quality Management District (MDAQMD). MDAQMD and California Air Resources Board operate a regional air quality monitoring network in the Mojave Desert Air Basin consisting of 14 monitoring stations that provides information on ambient concentrations of criteria air pollutants. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors.

As required by the Federal Clean Air Act (CAA), the EPA has established and continues to update the NAAQS for specific "criteria" air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead (Pb). The EPA has classified air basins as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved.

In 1988, the State Legislature passed the California CAA, which is patterned after the Federal CAA to the extent that areas are required to be designated as "attainment" or "nonattainment;" however, area designations that have been made under the California CAA correspond to the state standards, rather than the national standards. Areas in California have two sets of attainment / nonattainment designations: one set with respect to the national standards and another set with respect to the state standards.

The Federal CAA requires nonattainment areas to prepare air quality plans that include strategies for achieving attainment. Air quality plans developed to meet federal requirements are referred to as State Implementation Plans (SIPs). The state California CAA also requires plans for nonattainment areas with respect to the state standards. Pollutants regulated under NAAQS include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The Mojave Desert Air Basin is in a state of nonattainment relative to 8-hour ozone and respirable particulate matter (PM_{10}). MDAQMD plans and policies for the management of air quality in the

Mojave Desert Air Basin have been formulated to meet both Federal and California Air Resources Board requirements. Current plans are:

- MDAQMD Federal 8-Hour Ozone Attainment Plan
- Federal Particulate Matter (PM_{10}) Attainment Plan

These plans provide specific guidance and permitting requirements for stationary sources and facilities such as those proposed by the R^3 project.

3.1.2 Biological Resources

Vegetation

Vegetation communities identified during surveys include:

- Creosote Bush Scrub
- Joshua Tree Forest
- Desert Riparian
- Desert Wash
- Mixed Chaparral
- Chamise-Redshank Chaparral
- Pinyon-Juniper Woodland
- Ruderal weeds

No plant species federally listed as endangered, threatened, or species of concern are known to occur or have the potential to occur in the project area.

Wildlife

Riparian communities support some of the most diverse assemblages of wildlife and provide access to water, shade, and protection from predation. These areas also provide foraging habitat and are used for nesting and breeding by a number of species. The diverse riparian and upland community types that occur in and adjacent to the Mojave River provide habitat for a variety of resident and migratory wildlife species including nine federally listed species. Because the river is constricted by agriculture and urbanization, the creek bed and adjacent riparian and upland habitat function as a movement corridor for a number of wildlife species. Federally listed wildlife observed within the MWA service area or that potentially could occur within the MWA service area include birds, small mammals, amphibians, and reptiles (refer to Table 3-1, *Federally Listed Wildlife*).

Table 3-1
Federally Listed Wildlife

Common Name	Scientific Name	Status
Arroyo Toad	*Bufo Californicus*	Listed as Endangered under the federal Endangered Species Act
Desert Tortoise	*Gopherus agassizii*	Listed as Threatened under the federal Endangered Species Act
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Listed as Endangered under the federal Endangered Species Act
Yellow-Billed Cuckoo	*Coccyzus americanus*	Listed as Candidate Species under the federal Endangered Species Act

The following wildlife species are known to occur or have the potential to occur in the project area and have been federally listed as endangered, threatened, or as a species of concern.

Arroyo Toad (Endangered)
The arroyo toad requires shallow slow-moving riparian habitats that are disturbed naturally by flooding. The arroyo toad is found in the east and west forks of the Mojave River and the Mojave Forks Dam where the two forks converge. Mainstem Mojave River habitat is not suitable from about .75 miles downstream of the Mojave Forks Dam to the Narrows, because this area is not routinely flooded and high percolation rates cause the river to go dry during periods when the arroyo toad would require ponds for egg and tadpole rearing. None of the other potential sites for new facilities has suitable habitats for the arroyo toad. No species were identified during site surveys.

Desert Tortoise (Threatened)
The West Mojave Plan evaluates the current distribution of the desert tortoise and concludes that neither individuals, nor substantial signs of the species have been found in recent years south of State Highway 18. This does not mean that the species has been declared extirpated south of State Highway 18; it may be south of this major east-west arterial road. This reflects the habitat fragmentation effects of the roads and the ongoing urban and suburban development that is occurring along State Highway 18. No species were found during focused surveys.

Southwestern Willow Flycatcher (Endangered)
Southwestern willow flycatcher may occur in dense willow thickets or tamarisk in the vicinity of Mojave Forks Dam and in patches of riparian habitat upstream. It may occur in riparian habitats downstream of the Narrows. There is no suitable desert riparian habitat within the preferred alternative facility sites.

Yellow-Billed Cuckoo (Candidate Species)
Yellow-billed cuckoo is a species which may occur in the vicinity of Mojave Forks Dam and in patches of riparian habitat upstream. It may occur in riparian habitats downstream of the Narrows.

3.1.3 Water Resources and Hydrology

Surface water supplies in the MWA service area are unreliable and water users in the MWA service area rely on groundwater for agricultural, residential, and commercial/industrial use. Treatment facilities for the surface water supplies are not available; MWA delivers supplemental supplies as surface water to only two power plants, which utilize supply for cooling. Other supplies must be recharged and subsequently extracted.

Current water use practices have the effect of concentrating minerals in soils and groundwater. Groundwater extracted and used for domestic or agricultural irrigation is subject to evaporation and transpiration, which result in higher concentrations of the minerals in the water. Domestic and industrial water use result in evaporation and produce higher concentrations of salts as waste which are discharged to sewage treatment facilities, where treatment results in further evaporation.

These supplies, with higher concentrations of minerals, are then recharged into the groundwater. To the extent that supplies from the Regional Aquifer are extracted and then discharged as treated water to the Regional Aquifer, there is a progressive increase in mineral concentrations in this aquifer.

Surface runoff and river flow in the MWA service area are dominated by infrequent very wet conditions, both as a result of winter storms from the northwest and as a result of summer/fall monsoonal influences associated with subtropical moisture from the south creating short-term periods of locally-heavy rainfall. Locally-heavy summer precipitation has little regional effect.

3.1.4 Earth Resources

Topography
The MWA service area is located is a region known as the California High Desert, a portion of the Mojave Desert in southeastern California. The San Bernardino and San Gabriel Mountains, located southwest of the High Desert, physiographically separate the High Desert region from the coastal basin and inland valleys of the Los Angeles vicinity and reach elevations of over 10,000 feet above mean sea level (amsl). Elevations within the MWA service area range from 5,500 feet amsl in the San Bernardino Mountains, near the southern boundary of the service area to 1,500 feet amsl near Afton Canyon, towards the eastern portion of the service area.

Geology

The High Desert area can be generally characterized as a large alluvial plain, consisting of valleys and isolated basins. This alluvial plain primarily consists of water-bearing unconsolidated sediments, while hills and low mountains within the plain consist of consolidated igneous (volcanic), sedimentary, and metamorphic bedrock from which the sediments are derived. The alluvial plain includes a large number of northwest-trending faults, all of which are part of a fault region known as the Eastern California Shear Zone. These faults are relatively closely spaced, and undergo up to 13-14 millimeters per year of shear. Movement on these faults results in regional and local deformation of the geology and natural barriers to groundwater flow. Prominent fault zones include the Helendale fault zone, the Lenwood fault zone, the Johnson Valley fault zone, the North Frontal fault zone, the Camp Rock fault zone, and the Homestead Valley fault zone.

The Alto and Alto Transition Zone regions of the service area contain the southern portion of the Mojave River where it collects drainage at the base of the San Bernardino Mountains. A U.S. Army Corps of Engineers water control structure at the southern end of the Alto region joins the two forks of the Mojave River and marks the beginning of the river's northward flow through 14 miles of alluvial deposits. Within this 14- mile distance, the river bed drops 450 feet in elevation. Flow then reaches a granitic ridge named the Upper Narrows, through which the river has cut a 200-foot wide opening. In the vicinity of the Upper Narrows, a unique vertically stacked aquifer system exists, with aquifers separated by impervious clay layers. Until 1999, wells in the Upper Narrows vicinity were artesian, meaning that water reached the surface entirely by hydrostatic pressure from the surrounding environment. Artesian pressure has since been lost, but some leakage onto the near-surface from deeper aquifers is present in the Upper Narrows. The Mojave River continues to flow through 4 miles of the confined channel of the Upper Narrows, and exits at the Lower Narrows. The Lower Narrows of the Mojave River separate the Alto region and the Alto Transition Zone region.

3.1.5 Land Use

The project area is located within the western portion of San Bernardino County in the Desert Region. The Southwestern portions of this region (Victor Valley subregion) have experienced annual population growth of 6% to 9% and concentrated along the I-15 corridor. Lower growth rates have occurred in and around the City of Barstow; this has been attributed to a shortage of potable water. Since 1975, the pattern of growth has been a concentration of development and population within existing cities and towns, with some urban sprawl outside of city/town limits. As evidenced by recent reductions in water use for agriculture, agriculture is declining as development occurs. Since 1995, water use for agriculture in MWA's service area has declined from 54,400 acre-feet to 28,600 acre-feet in 2001, indicating reductions in agriculture acreage. The R^3 project will take place within the context of the County of San Bernardino General Plan, Victor Valley Subregional Planning Area, and Barstow Subregional Planning Area; the general plans for the Cities of Victorville, Barstow, Adelanto, and Hesperia and Town of Apple Valley; the U.S. Bureau of Land Management California Desert Conservation Area Plan and the West Mojave Plan; and the California Department of Conservation's program for the conservation of farmland.

3.1.6 Aesthetics

The R^3 project area is located within the MWA service area, in the Mojave Desert. The service area is located on the northeastern flank of the San Bernardino and San Gabriel Mountains, which separate the High Desert from the coastal basins and inland valleys of the greater Los Angeles area. These mountains, which reach elevations of over 10,000 feet amsl, were uplifted along the San Andreas Fault. The High Desert Area is characterized overall as an alluvial plain providing long range views with few interruptions. The Mojave River, which originates in the San Bernardino Mountains, is a major landscape feature in this region.

The R^3 project area is located near the desert communities of Adelanto, Victorville, Apple Valley, Hesperia, Yucca Valley, and Barstow. The greatest scenic resource for the MWA service areas are the panoramic views of the Mojave Desert, the San Bernardino and San Gabriel Mountains, the Mojave River and the Joshua tree habitats. The overall general aesthetic and visual character of this area consists of an expansive desert horizon and sparsely inhabited landscape with views of the surrounding San Bernardino Mountain and San Gabriel Mountain ranges in the distance.

No scenic highways have been officially designated by Caltrans within the MWA service area. However, there are roadways in the service area that are eligible to be designated as State Scenic Highways.

3.1.7 Recreation

A large portion of the MWA service area is currently in public ownership, with multiple uses on Bureau of Land Management lands and recreational uses within the Joshua Tree National Park. The Bureau of Land Management currently has four designated areas of intensive use (including off-road vehicle use), six major wilderness areas, as well as large areas of general recreation access. There are also many major wilderness areas along the Mojave River, including Mojave Forks Regional Park, Mojave Narrows Regional Park, Hesperia Lake Park, and several smaller private recreational lakes. A number of golf courses are located within the vicinity of the proposed improvements, near more urbanized areas. In addition, regional and local parks within Hesperia, Victorville, and Apple Valley include swimming pools, tennis courts, and areas for field sports and activities.

3.1.8 Noise

Primary noise sources within the vicinity of the project area include traffic noise from adjacent streets and from surrounding residential, commercial, and industrial uses. Traffic noise levels in the project area vary based on traffic volumes, vehicle speed, and type of vehicle.

Some land uses are considered more sensitive to elevated noise levels (both during construction and operation of the project) because of the purpose and intent of use. Sensitive receptors

typically include schools, hospitals, rest homes, long-term medical and mental care facilities, and parks, and recreation areas. These sensitive uses occur along the proposed conveyance pipelines and within the vicinity of certain reservoir tanks and turnouts, particularly along Willow Street, Glendale Avenue, Choiceana Avenue, Mesa Avenue, Pinon Avenue, Tamarisk Avenue, Goodwin Road, Mesa View Drive, Locust Avenue, Lilac Street, Apple Valley Road, and Grande Vista Street, where single-family residential homes would abut construction and operational activities.

3.1.9 Socioeconomics and Growth Inducing Impacts

Socioeconomics encompasses a number of topical areas including employment and income, population, and housing. Within each of these areas, subtopics are addressed. These include an examination of conditions at different geographical scales that have relevance to the potential impacts associated with implementation of the preferred alternative.

The assessment area encompasses five cities, including Adelanto, Hesperia, Victorville, and Barstow, as well as the Town of Apple Valley. While improvements are only being proposed within Hesperia, Victorville, and Apple Valley, the project would provide increased water supply to Barstow and Adelanto as well. The potential exists for each of these cities to experience socio-economic effects as a result of the preferred alternative.

Adelanto

Population
According to the California Department of Finance, the January 2009 population estimation for the City of Adelanto was 28,265 residents. The City of Adelanto has a median age of 26.9.

Employment
According to the Bureau of Labor Statistics, the March 2009 unemployment rate for the City of Adelanto was 19.4 percent. These statistics indicate that the unemployment rate for the City is greater than the County of San Bernardino's unemployment rate of 12.7 percent.

Housing and Income
According to the 2007 American Community Survey (ACS) of the U.S. Census, it is estimated that the City of Adelanto included approximately 23,666 housing units, and a total of 5,547 housing units were noted in the 2000 Census. This represents an increase of 18,119 units, or 74 percent increase since the 2000 Census. According to the 2007 ACS, approximately 12 percent of the housing units were vacant and the average household size is 3.6 persons per household.

Adelanto is considered a middle-class community with a 2007 median family income of $42,210.

Ethnicity
According to the 2007 ACS, the majority of the population of Adelanto consists of Whites at 51% and "some other race" at 25%.

Hesperia

Population
According to the California Department of Finance, the January 2009 population estimation for the City of Hesperia was 88,184 residents. The City of Hesperia has a median age of 32.0.

Employment
According to the Bureau of Labor Statistics, the March 2009 unemployment rate for the City of Hesperia was 16.3 percent. These statistics indicate that the unemployment rate for the City is greater than the County of San Bernardino's unemployment rate of 12.7 percent.

Housing and Income
According to the 2007 ACS of the U.S. Census, it is estimated that the City of Hesperia included approximately 24,806 housing units, and a total of 21,348 housing units were noted in the 2000 Census. This represents an increase of 3,458 units, or 14 percent increase since the 2000 Census. According to the 2007 ACS, approximately 8 percent of the housing units were vacant and the average household size is 3.12 persons per household.

Hesperia is considered a middle-class community with a 2007 median family income of $48,197.

Ethnicity
According to the 2007 ACS, the majority of the population of Hesperia consists of Whites at 70% and "some other race" at 18%.

Victorville

Population
According to the California Department of Finance, the January 2009 population estimation for the City of Victorville was 109,441 residents. The City of Victorville has a median age of 30.7.

Employment
According to the Bureau of Labor Statistics, the March 2009 unemployment rate for the City of Victorville was 15.3 percent. These statistics indicate that the unemployment rate for the City is greater than the County of San Bernardino's unemployment rate of 12.7 percent.

Housing and Income
According to the 2007 ACS of the U.S. Census, it is estimated that the City of Victorville included approximately 27,376 housing units, and a total of 22,498 housing units were noted in the 2000 Census. This represents an increase of 4,878 units, or 18 percent increase since the 2000 Census. According to the 2007 ACS, approximately 12 percent of the housing units were vacant and the average household size is 3.03 persons per household.

Hesperia is considered a middle-class community with a 2007 median family income of $48,162.

Ethnicity
According to the 2007 ACS, the majority of the population of Victorville consists of Whites at 41.3% and Black or African Americans at 17%.

Apple Valley

Population
According to the California Department of Finance, the January 2009 population estimation for the Town of Apple Valley was 69,861 residents. Apple Valley has a median age of 29.0.

Employment
According to the Bureau of Labor Statistics, the March 2009 unemployment rate for the Town of Apple Valley was 13.9 percent. These statistics indicate that the unemployment rate for the Town is greater than the County of San Bernardino's unemployment rate of 12.7 percent.

Housing and Income
According to the 2007 ACS of the U.S. Census, it is estimated that the Town of Apple Valley included approximately 23,784 housing units, and a total of 20,163 housing units were noted in the 2000 Census. This represents an increase of 3,621 units, or 16 percent increase since the 2000 Census. According to the 2007 ACS, approximately 8 percent of the housing units were vacant and the average household size is 2.90 persons per household. In addition, 77 percent of homes were single-family residences, with the remaining 23 percent being multi-family homes.

The Town of Apple Valley is considered a middle-class community with a 2007 median family income o $48,446.

Ethnicity
According to the 2007 ACS, the majority of the population of the Town of Apple Valley consists of Whites at 71.8% and "some other race" at 22%.

Barstow

Population
According to the California Department of Finance, the January 2009 population estimation for the City of Barstow was 24,213 residents. Barstow has a median age of 32.1.

Employment
According to the Bureau of Labor Statistics, the March 2009 unemployment rate for the City of Barstow was 14.2 percent. These statistics indicate that the unemployment rate for the City is greater than the County of San Bernardino's unemployment rate of 12.7 percent.

Housing and Income

According to the 2007 ACS of the U.S. Census, it is estimated that the City of Barstow included approximately 24,194 housing units, and a total of 9,153 housing units were noted in the 2000 Census. This represents an increase of 15,041 units, or 63 percent increase since the 2000 Census. According to the 2007 ACS, approximately 15 percent of the housing units were vacant and the average household size is 2.97 persons per household. In addition, 54 percent of homes were single-family residences, with the remaining 46 percent being multi-family homes.

The City of Barstow is considered a middle-class community with a 2007 median family income of $39,564.

Ethnicity

According to the 2007 ACS, the majority of the population of Barstow consists of Whites at 52.1% and "some other race" at 25%.

3.1.10 Transportation

The high desert region of Southern California has recently experienced rapid growth. Like many rapidly developing urban and suburban areas, the project regularly experiences traffic congestion. Interstate 15, which is the major highway extending through the high desert region, regularly experiences average daily traffic volumes between 38,000 and 115,000 vehicles. Subtracting truck traffic and assuming an average of two passengers per car, the volume of traffic represents approximately 20 to 70 percent of the population of MWA's service area. Much of the traffic on Interstate 15 is commuter traffic to major cities and through traffic involving non-residents. Within city limits, major arterial roads experience morning and evening rush hours with substantial delays at controlled intersections and through commercial areas. Accordingly, there are a number of highway projects that are currently underway or planned for Hesperia, Victorville, Adelanto, and Apple Valley.

3.1.11 Hazardous Material and Waste Handling and Disposal

Existing and past land use activities are used as potential indicators of hazardous material storage and use. For example, many industrial sites, historic and current, are known or suspected to have soil or groundwater contamination by hazardous substances. Properties devoted to oil production, including oil fields and processing facilities, are commonly known or suspected to have environmental contamination from petroleum hydrocarbons, heavy metals, and chlorinated solvents. Other hazardous materials sources can include leaking underground storage tanks in commercial and industrial areas, surface runoff from contaminated sites, and pesticides and herbicides in the soil of past agricultural lands. In addition to contaminants found in soils, groundwater is subject to contamination associated with underground storage tanks and other sources.

According to the 2006 Project EIR, there are nine Superfund contamination sites within the MWA service area. All of these sites are located within urban areas, and are associated with military activity, mining, and cement manufacturing. There are also leaking fuel tanks, hazardous waste generators, and landfills within the project area that may affect groundwater. Several wastewater treatment plants are also located along the Mojave River.

3.1.12 Cultural Resources

Cultural resources include prehistoric archaeological sites, historic archaeological sites, and historic structures, and consist of artifacts, food waste, structures, and facilities made by people of the past.

Prehistoric archaeological sites are places that contain the material remains of activities carried out by the native population of the area (Native Americans) prior to the arrival of Europeans. Historic archaeological sites are places that contain the material remains of activities carried out by people during the period when written records were produced after the arrival of Europeans. Historic archaeological materials usually consist of refuse deposited near structure foundations. Archaeological investigation of historic period sites is usually supplemented by historic research using written records. Historic structures include houses, commercial structures, industrial facilities, and other structures and facilities more than 50 years old.

Vegetation within the project area is comprised of Mojave Desert scrub from the saltbrush scrub, creosote bush scrub, Joshua tree and juniper woodland, and wash wetland and mesquite communities. Numerous plant species in these communities were utilized as foods and medicines, or provided materials for making bows, arrows, baskets, cordage, digging sticks, houses, or fuel for Native American groups. The project area also provides habitat for a variety of animals, including birds, insects, reptiles, rodents, pronghorn and bighorn sheep, coyote, and fox, which may have been hunted by Native American groups as well.

Prehistoric Setting
The prehistoric setting for the general project area has been divided into seven cultural periods, including: Fluted Point Period, Lake Mojave Period, Pinto Period, Gypsum Period, Saratoga Springs Period, Late Period, and Contact/Ethnographic Period.

Historical Setting
For the most part, the Mojave Desert has a somewhat abbreviated history as it was a frontier to be crossed rather than settled. The earliest known non-native people to enter the general project region were the Spanish explorers.

3.1.13 Public Services and Utilities

The project site is located within an area that includes urban uses. Police, fire, school, and recreation services are provided within the vicinity of the project site. In addition, the project area also includes water, wastewater, storm drain, electricity, and natural gas services to local residents.

Police Protection

Three police departments patrol the project area, including the San Bernardino County Sheriff's Department, Victorville Police Department, and Barstow Police Department.

Fire Protection

Five fire departments provide fire protection services to the project area, including San Bernardino County Fire Department, Barstow Fire Protection District, Apple Valley Fire Protection District, Hesperia Fire Department, and Victorville Fire Department.

School Services

Five school districts provide K through 12 grade school services to the project area, including Hesperia School District, Barstow Unified School District, Adelanto School District, Apple Valley Unified School District, and Victor Valley Union High School District.

Recreation Services

Recreation services for the project area are provided by the cities of Barstow, Victorville, Adelanto, Hesperia, and the Town of Apple Valley. In addition, San Bernardino County also provides recreation services to the project area.

Solid Waste Services

Solid waste services for the project area are provided by County of San Bernardino Solid Waste Management Division, AVCO Disposal, Burrtec Company and City of Victorville Solid Waste Division.

Electricity Services

Electricity services for the project area are provided by Southern California Edison.

Natural Gas Services

Natural gas services for the project area are provided by Southwest Gas Company.

Water Services

Water supply is provided to the project area by Mojave Water Agency via several water purveyors, including Apple Valley Ranchos Water District, Adelanto Public Utilities Authority, Hesperia Water District, Golden State Water Company, and Victorville Water District.

Sewer Services

Sewer services are provided to the project area by the cities of Barstow, Victorville, Hesperia, Adelanto, and the Town of Apple Valley, as well as the County of San Bernardino.

Storm Drainage Services

Storm drainage services are provided to the project area by the cities of Barstow, Victorville, Hesperia, Adelanto, and the Town of Apple Valley, as well as the County of San Bernardino.

3.1.14 Environmental Justice

For this assessment, the area of potential effect was determined in accordance with CEQ's guidance for identifying the *affected community*, which requires consideration of the nature of likely project impacts and identification of a corresponding unit of geographic analysis. The affected community is considered to encompass portions of the cities of Hesperia and Victorville, the Town of Apple Valley as well as the cities of Adelanto and Barstow; the area of potential project effect for purposes of environmental justice corresponds to the areas of effect associated with the specific environmental issues analyzed in this Environmental Assessment. Areas of potential effect differ somewhat for each environmental issue. The cities of Hesperia and Victorville, and the Town of Apple Valley, form a part of the reference community. The *reference community* is used to determine whether a disproportionately high and adverse human health or environmental impact would be borne by low-income and/or minority populations in the affected community when compared to the general population in and around the project.

Environmental justice guidance from CEQ (1997) defines *minority persons* as "individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black (not of Hispanic origin); or Hispanic" (CEQ 1997: 25). Hispanic or Latino refers to an ethnicity whereas American Indian, Alaskan Native, Asian, Pacific Islander, and Black/African- American (as well as White or European-American) refer to racial categories; for census purposes, individuals classify themselves into racial categories as well as ethnic categories, where ethnic categories include Hispanic/Latino and non-Hispanic/Latino. The 2000 Census allowed individuals to choose more than one race. For this analysis, consistent with guidance from CEQ (1997) as well as the EPA (1998, 1999b), *minority* refers to people who are Hispanic/Latino of any race, as well as those who are non-Hispanic/Latino of a race other than White or European-American.

The same CEQ environmental justice guidance (CEQ 1997) suggests *low-income populations* be identified using the national poverty thresholds from the U.S. Census Bureau; guidance from the EPA (1998, 1999b) also suggests using other regional low-income definitions as appropriate. Because southern California has a higher cost of living when compared to the nation as a whole, a higher threshold is appropriate for the identification of low-income populations. For the purposes of this analysis, the low-income threshold was based on Housing and Urban Development's low-income limits for the year 2007 and incorporated the average household income and average household size as determined by the 2007 census.

To establish context for this environmental justice analysis, race and ethnicity (i.e., minority) and income characteristics of the population residing in the vicinity of the Preferred Alternative were reviewed. Table 3-2 presents population, minority, and low-income status from the 2007 ACS of the U.S. Census. The table also presents similar data for other cities in the general vicinity of the Preferred Alternative.

Table 3-2
Minority and Low-Income Populations

Area	Total Population	Percent Minority Population	Percent Low-Income Population
California	33,871,648	53.3	25.4
Adelanto	25,718	49	26.4
Apple Valley	68,831	28.2	17.2
Barstow	24,395	47.9	24.6
Hesperia	86,738	29.8	16.5
Victorville	102,760	59.7	18.5
Source: 2007 American Community Survey (ACS) of the U.S. Census			

CHAPTER 4.0
ENVIRONMENTAL CONSEQUENCES

4.1 ENVIRONMENTAL CONSEQUENCES

Based on the 2006 Project EIR, MWA made the following findings under CEQA:

The impacts of the R^3 Preferred Project Alternative essentially reflect those described under the Minimum Facilities Alternative of the 2006 Project EIR with the addition of the Oro Grande Wash Recharge Basins and excluding any impacts associated with the Recharge Via Unnamed Wash, since this element is not included in the R^3 project. Impacts include those associated with additional proposed facilities described under Section 1.2.2, *Project Description* (e.g., disinfection facility and power lines).

The Preferred Alternative could impact air quality, biological resources, water resources and hydrology, earth resources, land use, aesthetics, recreation, noise, transportation, hazardous materials, energy, cultural resources, and public services and utilities. Mitigation measures (Appendix D) were imposed to reduce potential impacts to below significance. No environmental effects would remain significant and unavoidable after implementation of project design features, standard conditions, and mitigation measures.

4.1.1 Air Quality

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins
(Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

An Air Quality Conformity Analysis has been prepared and is included in Appendix A.

Construction-related Impacts
Temporary construction emissions would result from on-site activities, such as surface clearing, grading, excavation, and drilling. Pollutant emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather. The Preferred Project Alternative would not equal or exceed MDAQMD thresholds or federal *de minimis* levels, (see Table 4-1, *Preferred Project Construction Emissions Based on 2006 EIR*).

Table 4-1
Preferred Project Construction Emissions Based on 2006 EIR

Pollutant	Status	Threshold of Significance (Tons/Year)	Construction Emissions * (Tons/Year)
CO	Maintenance	100	61.4
O_3	Nonattainment (moderate)	100	-
NO_X	Maintenance	100	41.4
PM_{10}	Nonattainment (moderate)	100	50.1
SO_X	Maintenance	100	.7

Note: * Estimate is based on a 365 day work schedule

Operational Impacts

Air quality impacts may be generated by operation and maintenance activities involving the recharge basins and associated facilities. These activities will include intermittent periods of berm grading in the Mojave River and the removal of fine-grained sediments which may accumulate on the top of recharge basins forming a thin crust. Daily management activities, including routine inspection and operation of facilities will involve the use of vehicles; however these vehicles will not generate emission in excess of the MDAQMD thresholds.

Oro Grande Alternative 1

Construction-related Impacts

The Alternative 1 recharge basins are proposed to be constructed in a stepped manner from the bottom of the wash up to slopes of the wash crest. The 5-foot high berms would have a base width of 32 feet and a crest width of 12 feet, with side slopes of 2:1 for stability. This configuration means that 110 cubic feet (4 cubic yards) of soil would be needed for each linear foot of berm constructed.

According to the 2006 Project EIR for the MWA R^3 project, construction has the potential to result in significant air quality impacts. However, emissions control mitigation, such as an incremental construction schedule, was proposed to reduce emissions from construction, thus reducing potential air quality impacts. Alternative 1 would not equal or exceed MDAQMD thresholds or federal *de minimis* levels.

Operational Impacts

Air quality impacts may be generated by operation and maintenance activities involving the recharge basins and associated facilities. These activities will include intermittent periods of berm grading and the removal of fine-grained sediments which may accumulate on the top of recharge basins forming a thin crust. Daily management activities, including routine inspection and operation of facilities will involve the use of

vehicles; however these vehicles will not generate emission in excess of the MDAQMD thresholds.

Oro Grande Alternative 2 (Preferred Alternative)

Construction-related Impacts

The alignment of Alternative 2 in a linear fashion would allow for a similar recharge area without berm construction on the slopes. As a result of this alignment, there are two substantial changes in the construction of the berms. First, berms can be structured in an "L-shaped" configuration, which eliminates an upslope berm, reducing the total length of berms required. Second, the relatively flat slope of the wash bottom will minimize the need for large, stable berms. The berms for Alternative 2 would have a base width of 10-15 feet and a 5-foot crest width. Assuming the berms are uniform, this configuration means that 62.5 cubic feet (2.3 cubic yards) would be needed for each linear foot of berm constructed. The linear "L-shaped" configuration of the recharge, however, allows for berms to taper down to a height of several feet at the upstream end of each berm, and the linked recharge areas would generally not require berms on three sides. On average, then, smaller berms may result in approximately 2 cubic yards of earth per linear foot of construction.

In addition, construction will be less intense because work on the floor of the wash would be more rapid per unit of recharge area than construction on the steep slopes of the wash. The construction of larger berms on slopes of Alternative 1 would result in multiple passes, while a scraper may rapidly construct the smaller berms for the Alternative 2 sites.

Operational Impacts

Alternative 2 would require operation and maintenance activities involving the recharge basins and associated facilities. These activities will include intermittent periods of berm grading and the removal of fine-grained sediments which may accumulate on the top of recharge basins. Daily management activities, including routine inspection and operation of facilities, will involve the use of vehicles; however these vehicles will not generate emissions in excess of the MDAQMD thresholds.

Small Projects Alternative

Similar to the Preferred Alternative, the Small Projects Alternative would not equal or exceed MDAQMD thresholds or federal *de minimis* levels.

Large Projects Alternative

As with the Preferred Alternative, the Large Projects Alternative would not equal or exceed MDAQMD thresholds or federal *de minimis* levels.

No Project Alternative

Construction-related Impacts
Under the No Project Alternative, MWA would continue to operate its existing facilities and plan and construct new recharge and conveyance facilities on an as needed basis to accommodate increasing deliveries of SWP supplies for recharge to meet on going needs to deliver imported water to water producers in the MWA service area.

Under the No Project Alternative, facilities would be developed over time. It is likely that MWA would develop these facilities in cooperation with local subarea producers and would develop recharge and extraction facilities of similar capacity to those of the R^3 project. Delaying construction of some facilities will reduce net annual emission and allow for greater scheduling flexibility. Individual facilities may be constructed over a longer period of time, reducing daily vehicle emissions and fugitive dust from construction.

Operational Impacts
It is not anticipated that the operation of possible future facilities discussed in the No Project Alternative would significantly impact air quality.

4.1.2 Biological Resources

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins
(Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

The Preferred Project Alternative includes the operation of existing recharge basins, at these sites, there will be an increase in the frequency and duration of recharge basin use, resulting in extended periods of surface water availability.

Table 4-2, *Summary of Preferred Project Alternative Impacts on Federally Listed Endangered and Threatened Species*, lists the three federally listed endangered and threatened species which are known to occur or could potentially occur within the project area. Table 4-2 also identifies the potential for adverse impacts on these species as a result of the implementation of the Minimum Facilities Alternative.

Table 4-2
Summary of Preferred Project Alternative Impacts on Federally Listed Endangered and Threatened Species

Facility	Construction/Operations Related Impacts			Operation Related Impacts		
	Endangered		Threatened			
	Arroyo Toad	Southwestern Willow Flycatcher	Desert Tortoise	Impact to Wildlife Movement	Wildlife Attraction to Water and Indirect Impacts	Enhanced Predation of Desert Tortoise by Ravens
Mojave River Recharge	None[1]/ None[2]	None/ None	None/ None	Low	Low	Low
Mojave River Well Fields and Pipelines	None/ None	None/ None	Low/ Low	Low	None	Low
Off-Channel Mojave River Recharge	None/ None	None/ None	Low/ Low	Moderate	Low	Low
Oro Grande Wash Recharge	None/ None	None/ None	Low/ Low	Low	Low	Low

[1] Construction-related impacts are listed first
[2] Operational impacts are listed second

Mojave River Recharge

Recharge to the Mainstem Mojave River would involve releases from Silverwood Lake and Rock Springs Turnout Pipeline. Use of the Mainstem Mojave River channel for recharge will have no affect on habitats and low potential for direct effects on listed Federal Species. It is probable that wildlife utilize the river bed for north-south movement, but this would not be affected significantly by this alternative because the berm to be constructed would not block movement. East-west movement would not be blocked for any extended period of time.

There are no recent records of desert tortoise in the area. Recharge to the Mainstem Mojave River could attract ravens which would utilize this area for water. This should not have a significant impact on raven predation of desert tortoise because surface water is available from various recreational lakes and ponds.

Mojave River Well Field and Pipelines

The well field and pipelines will be constructed in an urban and disturbed area. No significant wildlife habitats will be permanently affected. Pipelines will be underground in public rights-of-way. Buried facilities will not affect wildlife movement. The wells and pipelines will be self-contained and will not provide water for ravens.

The northern portion of the extraction zone contains land designated by Fish and Wildlife as critical habitat for the southwestern willow flycatcher (refer to Exhibit 4-1 *Habitat Map*). However, surveys found that no suitable desert riparian habitat exists within the project area.

Off-Channel Mojave River Recharge Basin

The site for the off-channel Mojave River recharge basin consists of disturbed grasslands and desert scrub. Construction of a recharge basin at this location would place berms in the path of wildlife moving along the river and base of the hills. However, the most important wildlife corridor is along the river, upstream of the proposed recharge site, and along the hills to the east.

The portion of the project that affects the east bank of the Mojave River contains marginally suitable habitat for the Southwestern Arroyo toad. However, no Southwestern Arroyo toads were found during surveys.

This site is a considerable distance from known desert tortoise habitat. Use of this site as a recharge basin would not attract additional numbers of ravens, which are a predator of desert tortoise, because there are alternative water supplies located closer to the desert tortoise habitat. The potential for significant increases in raven predation of desert tortoise as a result of operation is low.

Impacts to Sensitive Wildlife and Habitat

In March 2009, a reconnaissance-level biological survey was conducted to determine the occurrence potential for several sensitive species within or adjacent to the Mojave Water Agency's (MWA's) R^3 pipeline project. These species are listed and analyzed below:

Southwestern Arroyo Toad

The project biologist conducted focused, presence/absence surveys for the federally listed endangered southwestern arroyo toad in accordance with the May 19, 1999 survey protocol issued by the U.S. Fish and Wildlife Service (USFWS). A total of six (6) surveys were conducted on April 18 and 27, May 5, 22 and 28 and June 14, 2009. Each survey included a daytime and nighttime survey component. No arroyo toad egg masses, larvae, juveniles or adults were found during the surveys and no adult arroyo toads were heard calling during the nighttime aspects of the surveys.

The portion of the project that affects the east bank of the Mojave River contains marginally suitable habitat for the Southwestern Arroyo toad. Refer to Exhibit 4-1, *Habitat Map*, for a map showing suitable habitat for the arroyo toad.

Although this species is not identified on the four quads searched in the California Natural Diversity Database (CNDDB), there are documented occurrences of this species in the near vicinity. Focused/protocol surveys were conducted. Based on the negative findings of the protocol surveys conducted for Southwestern Arroyo toad, the project biologist concludes that

southwestern arroyo toad are absent from the vicinity of the outlet. The project would have "no effect" on the arroyo toad to the Endangered Species Act.

Desert Tortoise

The desert tortoise, a federally listed threatened species, occurs in several desert plant communities, including creosote scrub, saltbush scrub and Joshua tree woodland. This species is known to construct burrows with firm soil, usually (but not always) at the base of shrubs (e.g. creosote bush) or in the banks of washes. As depicted in Exhibit 4-2, *Known Desert Tortoise Locations*, there are four current documented detections of desert tortoises in the vicinity of the alignment, with the closest location being approximately 5.35 miles northeast of the subject project site.

Refer to Exhibit 4-1, *Habitat Map*, for a map showing suitable habitat for the desert tortoise. The desert tortoise habitat is split into three categories: (1) Category 1 – dense tortoise habitat; (2) Category 2 – medium tortoise habitat; and (3) Category 3 – sparse tortoise habitat.

Based on the absence of desert tortoise signs on site and in adjacent areas, and available information reviewed, it was concluded tortoises are absent from the subject property. The project would have "no effect" on the desert tortoise pursuant to the Endangered Species Act.

Plant Communities

The plant communities within the project area can be characterized as disturbed/degraded creosote bush scrub, Joshua tree forest, disturbed ruderal weeds, and dry desert wash. Joshua tree, chaparral yucca, silver cholla, and beavertail cactus are plant species found in the project area that may be subject to pertinent development codes. During the survey, however, it did not appear that any of these species would be directly impacted.

Sensitive Habitat

Regulatory permits will be required for impacts to desert wash habitat. The project will affect stream channels as defined by the Section 1600 of the State of California Fish and Game Code under jurisdiction of the CDFG, and "Waters of the United States" as defined by Section 404 of the Clean Water Act under the jurisdiction of the U.S. Army Corps of Engineers (Corps). The proposed project will "not adversely affect" federally listed critical habitat pursuant to the Endangered Species Act.

Oro Grande Alternative 1

Alternative 1 is primarily located in the wash south of the California Aqueduct, in an area of moderately disturbed habitat, a mix of creosote bush scrub, alkali desert scrub, and non-native grasses and weedy species, with patches of Joshua Trees. Wildlife movement into and out of the Alternative 1 site is constrained by Highway 395 on the west, the California Aqueduct on the north, I-15 on the east, and a regional arterial road on the south.

This site's distance from known desert tortoise habitat and its isolation by major highways makes it highly unlikely that desert tortoise would be affected by recharge operations. The availability of surface water during the operation of the recharge basin may attract ravens but it is not likely to result in increased predation on known desert tortoise populations which are ten miles away.

Oro Grande Alternative 2 (Preferred Alternative)

The proposed project is located in San Bernardino County, at the base of the Cajon Pass, bounded by Highway 395 on the west, the California Aqueduct on the south, and Interstate 15 (I-15) on the east. Alternative 2 is located within a matrix of disturbed upland habitats and there is connectivity to the mountains to the south.

This site's distance from known desert tortoise habitat and its isolation by major highways makes it highly unlikely that desert tortoise would be affected by recharge operations. The availability of surface water during the operation of the recharge basin may attract ravens but it is not likely to result in increased predation on known desert tortoise populations which are ten miles away.

Small Projects Alternative

The focus of the Small Projects Alternative is to increase recharge capacity in the Alto subarea. The Small Projects Alternative includes the Minimum Facilities Alternative plus four additional facilities. The Small Projects Alternative also includes two options for the location of the off-channel Mojave River recharge basin. Construction of recharge basins, wells, pipelines, bridges, levees, and drop structures would result in permanent loss of all native habitats within the footprint of these facilities.

Table 4-3, *Summary of Small Projects Alternative Impacts on Federally Listed Endangered and Threatened Species,* lists the three federally listed endangered and threatened species which are known to occur or could potentially occur within the project area. Table 4-3 also identifies the potential for adverse impacts on these species as a result of the implementation of the Small Projects Alternative.

ADELANTO
Adelanto Zone 3
18"
24"
30"
Turnout #7
Turnout #6
VWD
Zone 2 Reservoir
CALIENTE RD
395
CITY OF VICTORVILLE
VWD
Plant 29
Turnout #5
Oro Grande Wash
30"
36"
42"
15
24"
Plant 21
PHELAN RD
Turnout #4
HESPERIA
Southern Pacific Railroad
CITY OF HESPERIA
California Aqueduct
VWD
Turnout #3
24"
Plant 19
Plant 14
42"
42"
42"
Zone 1 Reservoirs
PS
Potential Disinfection Facility Location (Preferred)
Potential Disinfection Facility Location (Alternative)
SANTA FE AVE
CSA 64
18"
Turnout #1
COUNTY SERVICE AREA 64
Mojave River
42"
WILLOW
GLENDALE
APPLE VALLEY RANCHOS WATER COMPANY
Mockingbird
AVRWC
GSWC
GOLDEN STATE WATER CO
East Turnout
Rock Springs Turnout
48"
UNINCORPORATED SAN BERNARDINO COUNTY
UNINCORPORATED SAN BERNARDINO COUNTY

Legend

- Southwestern Willow Flycatcher
- Arroyo Toad
- Desert Tortoise Area - Category 2
- Desert Tortoise Area - Category 3
- Preliminary Phase I Extraction Zone
- Recharge Zone
- MWA Reservoir
- MWA Pump Station
- Turnout
- Future Turnout (Ultimate Condition)
- Recharge Turnout
- Future MWA Reservoir (Ultimate Condition)
- Possible MWA-Acquired Tank from VWD
- Stakeholder Reservoir
- Oro Grande Wash Preferred Alternative Pipeline
- Oro Grande Wash Preferred Alternative Recharge Area
- AVRWC Transmission System
- Pipeline needed to serve Adelanto
- Possible MWA-Acquired Pipeline from VWD
- R3 Conveyance System
- Future Lateral Pipeline (Ultimate Conditions)
- South of Rock Springs Turnout Pipeline
- Future South of Rock Springs Turnout Pipeline
- Existing Morongo Basin Pipeline
- City Boundary

Map Document: (M:\Mdata\65100342\GIS\Updated MXD\BLM MWA Proposed Conveyance System Farmland Flood.mxd) - 11/17/2009

RBF CONSULTING

0 5,000 10,000 15,000
Feet

11/11/09 JN 65-100342

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Habitat Map

Exhibit 4-1

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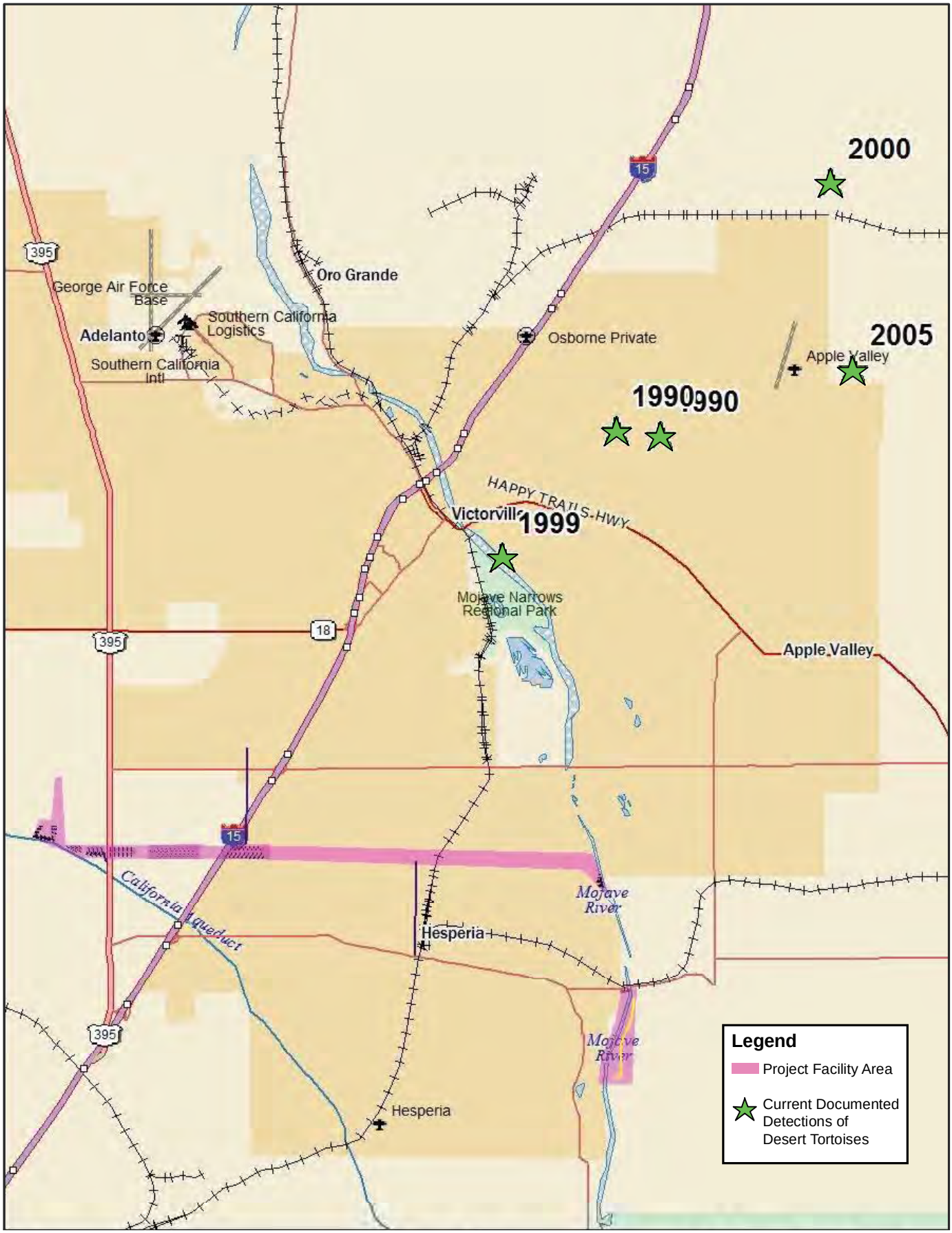

Source: California Natural Diversity Data Base and DeLorme XMap

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

RBF CONSULTING

0 1 2 4 Miles

8/19/09 JN 65-100342

Known Desert Tortoise Locations

Exhibit 4-2

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Table 4-3
Summary of Small Projects Alternative Impacts on Federally Listed Endangered and Threatened Species

Facility	Construction/Operations Related Impacts			Operation Related Impacts		
	Endangered		Threatened			
	Arroyo Toad	Southwestern Willow Flycatcher	Desert Tortoise	Impact to Wildlife Movement	Wildlife Attraction to Water and Indirect Impacts	Enhanced Predation of Desert Tortoise by Ravens
Mojave River Recharge	None[1]/ None[2]	None/ None	None/ None	Low	Low	Low
Mojave River Well Fields and Pipelines	None/ None	None/ None	Low/ Low	Low	None	Low
Off-Channel Mojave River Recharge: East	None[1]/ None[2]	None/ None	Low/ Low	Moderate	Low	Low
Off-Channel Mojave River Recharge: West	None/ None	None/ None	Low/ Low	Low	Low	Low
Oro Grande Wash Recharge	None/ None	None/ None	Low/ Low	Low	Low	Moderate
Cedar Avenue Detention Basin	None/ None	None/ None	Low/ Low	Low	Low	Low
Antelope Wash Recharge	None/ None *	None/ None *	None/ None *	None *	None *	Low

[1] Construction-related impacts are listed first
[2] Operational impacts are listed second
* Initial construction of the detention basin by the City of Hesperia would remove all habitats prior to the construction of the Antelope Wash Recharge.

Off-Channel Mojave River Recharge Basin: East

The east site for the off-channel Mojave River recharge basin consists of disturbed grasslands and desert scrub. Construction of a recharge basin at this location would place berms in the path of wildlife moving along the river and base of the hills. However, the most important wildlife corridor is along the river, upstream of the proposed recharge site, and along the hills to the east. Construction of the eastern site would not significantly affect wildlife movement and would preserve approximately 100 acres of open space.

This site is a considerable distance from known desert tortoise habitat. Use of this site as a recharge basin would not attract additional numbers of ravens, which are a predator of desert tortoise, because there are alternative water supplies located closer to the desert tortoise habitat. The potential for significant increases in raven predation of desert tortoise as a result of operation is low.

Off-Channel Mojave River Recharge Basin: West

The west site for the off-channel Mojave River recharge basin consists of disturbed non-native grasslands adjacent to a recreational lake and treated wastewater discharge ponds. Construction of a recharge basin at this location would place berms in the path of wildlife moving along the river and base of the hills. However, the most important wildlife corridor is along the river, upstream of the proposed recharge site, and along the hills to the west. Construction of the western site would not significantly affect wildlife movement and would preserve approximately 100 acres of open space.

This site is a considerable distance from known desert tortoise habitat. Use of this site as a recharge basin would not attract additional numbers of ravens, which are a predator of desert tortoise, because there are alternative water supplies located closer to the desert tortoise habitat. The potential for significant increases in raven predation of desert tortoise as a result of operation is low.

Oro Grande Wash Recharge Basins

The Oro Grande Wash recharge basins would be constructed at a site bounded by the California State Aqueduct, State Highway 395, Phelan Road, and Interstate 15. The majority of this site consists of desert scrub. Due to urbanization, wildlife movement within this site is constrained to the culverts under the California Aqueduct.

This site's distance from known desert tortoise habitat and its isolation by major highways makes it highly unlikely that desert tortoise would be affected by recharge operations. The availability of surface water during the operation of the recharge basin may attract ravens but it is not likely to result in increased predation on known desert tortoise populations which are ten miles away.

Cedar Avenue Detention Basin

The site for the Cedar Avenue detention basin is highly disturbed, showing evidence of previous grading and recreational vehicle use. This site is not a wildlife movement corridor; the California Aqueduct acts as a barrier to wildlife movement and the site has development around it.

This site is isolated from known tortoise habitat by State Highway 18, State Highway 395, Interstate 18, and the California Aqueduct. This isolation would make impacts to desert tortoise highly unlikely.

Antelope Wash Recharge (Ranchero Road)

The site for the Antelope Wash recharge basin is unsuitable for recharge until the dip crossing at Ranchero Road has been replaced by the City of Hesperia with a detention basin. This work, not part of the R^3 project, would be done in advance of the development of a recharge basin and would result in the complete removal of any wildlife habitat. Construction of the recharge basins within the proposed City of Hesperia detention basin would have no direct impact on wildlife or their habitat. Operation of the recharge basin may increase the availability of water and attract ravens but this site is far from any known desert tortoise populations.

Large Projects Alternative

The Large Projects Alternative includes the Small Projects Alternative plus three additional recharge basins. These additional recharge sites are further away from existing development than those in the other alternatives.

Table 4-4, *Summary of Large Projects Alternative Impacts on Federally Listed Endangered and Threatened Species,* lists the three federally listed endangered and threatened species which are known to occur or could potentially occur within the project area. Table 4-4 also identifies the potential for adverse impacts on these species as a result of the implementation of the Large Projects Alternative.

Table 4-4
Summary of Large Projects Alternative Impacts on Federally Listed Endangered and Threatened Species

Facility	Construction/Operations Related Impacts			Operation Related Impacts		
	Endangered		Threatened			
	Arroyo Toad	Southwestern Willow Flycatcher	Desert Tortoise	Impact to Wildlife Movement	Wildlife Attraction to Water and Indirect Impacts	Enhanced Predation of Desert Tortoise by Ravens
Mojave River Recharge	None[1]/ None[2]	None/ None	None/ None	Low	Low	Low
Mojave River Well Fields and Pipelines	None/ None	None/ None	Low/ Low	Low	None	Low
Off-Channel Mojave River Recharge: East	None[1]/ None[2]	None/ None	Low/ Low	Moderate	Low	Low
Off-Channel Mojave River Recharge: West	None/ None	None/ None	Low/ Low	Low	Low	Low
Oro Grande Wash Recharge	None/ None	None/ None	Low/ Low	Low	Low	Moderate
Cedar Avenue Detention Basin	None/ None	None/ None	Low/ Low	Low	Low	Low
Antelope Wash Recharge	None/ None *	None/ None *	None/ None *	None *	None *	Low
Oeste Recharge, Pipelines, and Wells	None[1]/ None[2]	None/ None	Moderate to High/ Moderate to High	Low	Moderate	High
Alto Recharge, Pipelines, and Wells	None/None	None/ None	None/ None	Low	Moderate	High
Antelope Wash Recharge and Pipelines	None/None	None/ None	None/ None	Moderate	Moderate	Low

[1] Construction-related impacts are listed first
[2] Operational impacts are listed second
* Initial construction of the detention basin by the City of Hesperia would remove all habitats prior to the construction of the Antelope Wash Recharge.

Oeste Recharge, Pipelines, and Wells

The potential recharge site for the Oeste subarea would be constructed 15 miles east of State Highway 395 and south of State Highway 18. This the most remote site proposed for construction. Surveys indicate that this site is a monotypic Creosote Bush Scrub and may support a typical desert scrub wildlife community. The Oeste sites are partially isolated from adjacent wildlife communities because it is located between Highway 18 and the California Aqueduct. However, there are several local washes that pass under Highway 18 and several local roads which pass over the Aqueduct, allowing wildlife movement to occur. The construction and operation of recharge basins may affect wildlife movement but this impact would not be significant. Wildlife has been known to use recharge basin levees for movement and the presence of water may enhance conditions for movement as well.

This site is within five miles of known desert tortoise habitat and there is a moderate to high potential for individual tortoise to be found, although signs of desert tortoise south of State Highway 18 are rare. Operation of the Oeste recharge basins may attract ravens which would forage within known desert tortoise habitat. This could result in increased predation on desert tortoise in the southern portion of their range. This would be considered a significant and adverse impact on desert tortoise, affecting populations within the area designated for conservation of the species.

Alto Recharge, Pipelines, and Wells

The potential recharge sites in the Alto area are bounded on the south by the California Aqueduct and existing development to the east. These recharge basins would be located in areas consisting of Mojavean creosote bush scrub. Several local washes pass under Highway 18 and several local roads which pass over the Aqueduct. It is likely that the sites are part of a large wildlife community and that there is unconstrained movement of wildlife within the area. If this is the case, the presence of recharge basins may affect wildlife movement, but this effect would probably not be significant. Wildlife has been known to use recharge basin levees for movement and the presence of water may enhance conditions for movement as well.

The Alto recharge basins would be within seven miles of known desert tortoise habitat located north of Highway 18. Operation of these recharge basins may attract ravens which would forage within known desert tortoise habitat. This could result in increased predation on desert tortoise in the southern portion of their range. This would be considered a significant and adverse impact on desert tortoise, affecting populations within the area designated for conservation of the species.

Antelope Wash Recharge and Pipelines

Recharge basins located at this site would be located in designated open space south and east of the Hesperia Airport, adjacent to a range of hills that separate the wash from the Mainstem Mojave River. This potential recharge site is dominated by Joshua tree, California juniper, and desert scrub. Recharge basin construction and operation could affect wildlife movement between the mountains and lower portions of the wash. The significance of this impact on wildlife movement would depend on the extent to which the recharge basins filled the lower portions of

the wash. Wildlife are known to use recharge basin levees for movement, and the current level of wildlife movement in the wash could be reduced, but connectivity would probably not be severed.

Operations may increase the availability of water and attract ravens, but the site is far from known desert tortoise populations and there is available water in many locations near the site. No impacts to desert tortoise are anticipated.

No Project Alternative

The No Project Alternative assumes continued implementation of the 2004 Water Management Plan. Eventually, MWA will be required to develop facilities that would allow it to meet its obligations to import and recharge up to 75,800 acre-feet of SWP supply in a year. The effect of the No Project Alternative would be to delay implementation of these facilities and possibly re-site some of them because of development that would constrain siting options for MWA.

Under the No Project Alternative, the facilities of the Preferred Project Alternative and Small Projects Alternative would likely be constructed and operated in the future. The potential delay in implementation would, result in a smaller potential take of threatened and endangered species because these species populations would have been reduced within this portion of their range due to ongoing urban development south of Highway 18. These facilities might have to be re-sited due to a delay in implementation. Re-siting of the facilities to the south would have potential impacts on riparian habitat, arroyo toad, and on wildlife movement.

4.1.3 Water Resources and Hydrology

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Implementation of the Preferred Project Alternative:

- Will increase groundwater levels, not decrease them
- Will not affect the course of an existing stream or river
- Will not create runoff that exceeds the capacity of drainage systems

<u>Facilities Within 100-Year Floodplain</u>

The R^3 Project includes components that will be placed within the FEMA Floodplain Zone A. The Rock Springs Pipeline will be placed within the 100-year floodplain in order to connect with the Rock Springs Turnout on the existing Morongo Basin Pipeline (located within the FEMA Floodplain). The Rock Springs Pipeline will be used to deliver SWP supplies to the recharge zone (refer to Exhibit 4-3, *Base Floodplain*). In addition, the R^3 conveyance pipeline will cross the flood zone along Lemon Street in order to connect with the disinfection facility.

ADELANTO
Adelanto Zone 3
18"
24"
30"
Turnout #7
Turnout #6
VWD
CALIENTE RD
395
CITY OF VICTORVILLE
VWD
Plant 29
Turnout #5
Oro Grande Wash
Zone 2 Reservoir
30"
36"
42"
15
PHELAN RD
24"
Plant 21
Turnout #4
HESPERIA
CITY OF HESPERIA
Southern Pacific Railroad
California Aqueduct
VWD
Turnout #3
24"
Plant 19
Plant 14
42"
42"
42"
Zone 1 Reservoirs
Potential Disinfection Facility Location (Preferred)
Potential Disinfection Facility Location (Alternative)
SANTA FE AVE
18"
CSA 64
Turnout #1
COUNTY SERVICE AREA 64
Mojave River
42"
42"
WILLOW
GLENDALE
APPLE VALLEY RANCHOS WATER COMPANY
Mockingbird
AVRWC
GSWC
GOLDEN STATE WATER CO
East Turnout
Rock Springs Turnout
48"
UNINCORPORATED SAN BERNARDINO COUNTY
UNINCORPORATED SAN BERNARDINO COUNTY

Legend
- Floodzone A
- Preliminary Phase I Extraction Zone
- Recharge Zone
- MWA Reservoir
- MWA Pump Station
- Turnout
- Future Turnout (Ultimate Condition)
- Recharge Turnout
- Future MWA Reservoir (Ultimate Condition)
- Possible MWA-Acquired Tank from VWD
- Stakeholder Reservoir
- Oro Grande Wash Preferred Alternative Pipeline
- Oro Grande Wash Preferred Alternative Recharge Area
- AVRWC Transmission System
- Pipeline needed to serve Adelanto
- Possible MWA-Acquired Pipeline from VWD
- R3 Conveyance System
- Future Lateral Pipeline (Ultimate Conditions)
- South of Rock Springs Turnout Pipeline
- Future South of Rock Springs Turnout Pipeline
- Existing Morongo Basin Pipeline
- City Boundary

Map Document: (M:\Mdata\65100342\GIS\Updated_MXD\BLM_MWA_Proposed_Conveyance_System_Farmland_Flood.mxd) - 11/17/2009

RBF CONSULTING

0 5,000 10,000 15,000
Feet

11/11/09 JN 65-100342

UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Base Floodplain

Exhibit 4-3

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Water Quality

The R^3 Project would result in an enhancement of indigenous groundwater quality for the nine constituents that have consistent water quality data within the MWA management subareas (refer to Exhibit 4-4, *Mojave River Aquifers)*. Recharged water would enhance indigenous groundwater quality in 76% of cases.

Table 4-5
SWP Supplies Compared to Indigenous Groundwater Quality

	Concentration of Water Quality Constituents (mg/l)							
Constituent	**SWP Supplies 1998-2004**	**Alto Floodplain**	**Alto**	**Transition Zone (Alto)**	**Baja**	**Centro**	**Este**	**Oeste**
Arsenic	.0022	.0052	.0118	.0062	.0104	.0063	*	.004
Boron	.153	**.081**	**.037**	.531	.931	.772	*	**.058**
Chlorides	58.8	**17.3**	**2.4**	80.8	132.7	132.2	*	**16.3**
Fluoride	.105	.580	.697	1.297	.707	.651	*	.627
Iron	.008	.020	.076	.732	.119	.214	*	.013
Nitrates	.72	**.35**	**.09**	**.24**	6.13	3.50	*	**.45**
pH	7.87	7.9	8.5	**7.8**	**7.7**	**7.6**	*	8.2
Sulfate	35.98	**17.4**	**24.7**	123	169.7	217	*	192.5
TDS	231.4	**156.0**	245.5	518	562.6	785	*	395.6

Notes:

* = no water quality data

Red = Indigenous groundwater is of a higher quality than SWP supply

Mixing of projected SWP supplies with indigenous groundwater would result in lower levels of arsenic, iron, and flouride. Water recharged with SWP supplies would have substantially lower levels of TDS than indigenous groundwater basins after blending except in the Alto Floodplain. After blending, no constituents would exceed National Drinking Water Standards. Although recharged water would vary in quality when compared to indigenous groundwater, the net effect of recharge would be to improve groundwater quality.

Oro Grande Alternative 1

The 2006 Project EIR shows that SWP supplies would not result in degradation of groundwater quality in the Mojave Basin and that SWP supplies are generally of much better quality than the indigenous groundwater in the Alta Regional Basin. The 2006 Project EIR also addresses the potential for recharge in washes to affect flooding:

"Recharge basins sited along the various washes would be subject to infrequent scouring flows which may erode berms and result in sediment transport downstream. This may occur during high flows in Oro Grande Wash and Antelope Wash. Recharge basins in

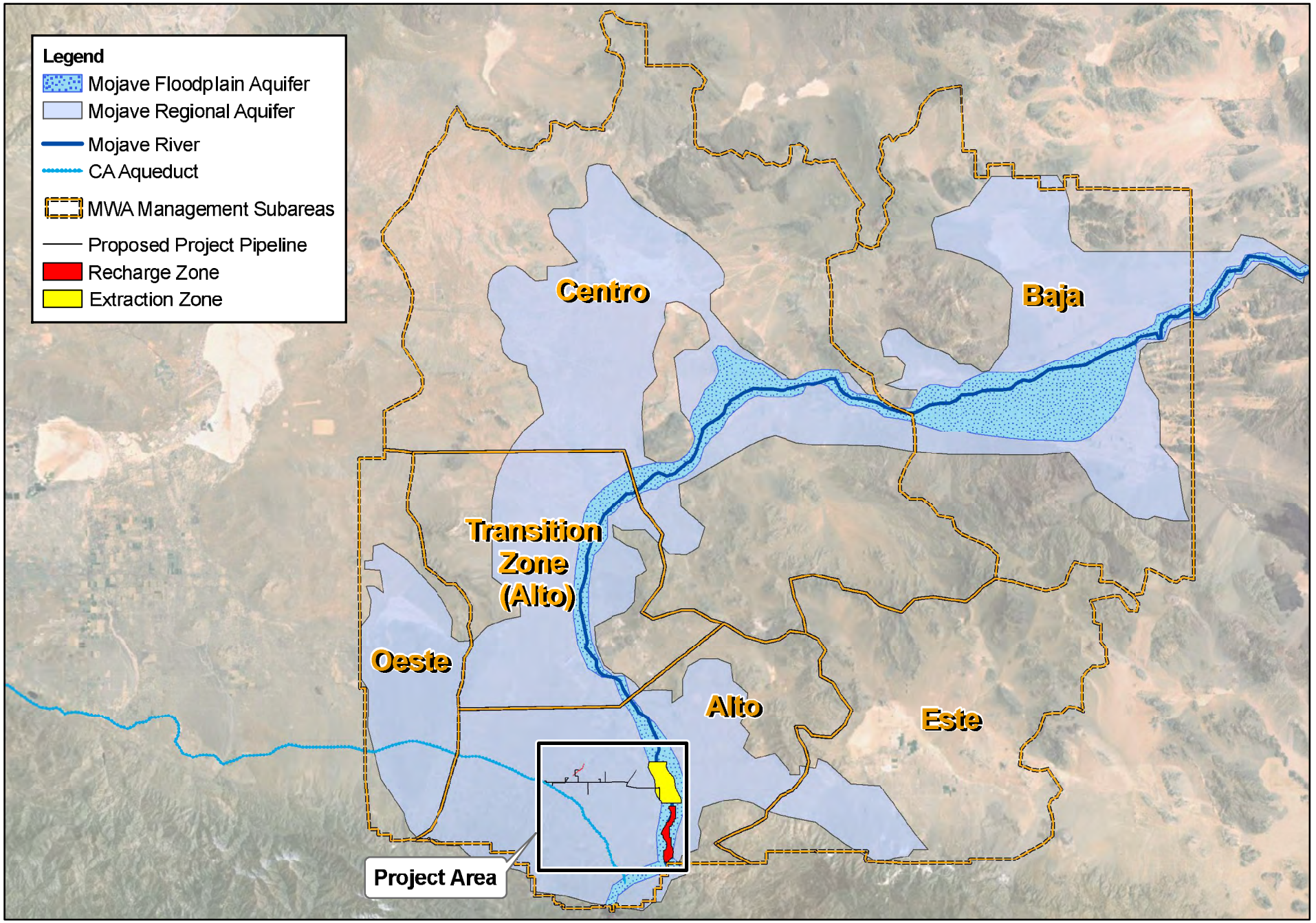
these washes will be constructed using existing soils in the basins and thus the net volume of sediment in these washes will remain constant; high flows that erode recharge basin berms will thus rapidly re-distribute these soils, and peak flows in the washes would not be affected by the berm. There is thus no mechanism by which in-basin berms would significantly affect flooding."

No significant impacts to water resources and hydrology are anticipated as a result of implementation of Alternative 1. Likewise, Alternative 1, being one of the multiple recharge basin sites proposed as part of the MWA R^3 project, would not have significant water resources and hydrology impacts.

Oro Grande Alternative 2 (Preferred Alternative)

Alternative 2 siting would place levees in a linear alignment along the invert of the wash, as opposed to the more broadly distributed recharge basins that would be constructed under Alternative 1 siting. During high flow periods, which occur infrequently, the levees and the excavated ponds behind them could somewhat impede flows. The Oro Grande Wash, which is not designated as a flood hazard area upstream of Highway 15, is a deeply incised channel in the affected reach and its capacity greatly exceeds the anticipated 100-year flood. A typical flooding scenario in the Oro Grande Wash would thus be that the flows would pass through the gap between levees until the levees were overtopped. If this occurs, flows would be diverted temporarily into the area behind the levees and subsequently wash out the next downstream levee. As a result of the intermittent levees running perpendicular to flow, flow velocity would decline and sediments from the eroded levees would settle out. The excavated areas behind each levee would fill with the sediment from upstream erosion. The effect of the levees would thus be to somewhat impede peak flows and result in re-distribution of the sediments in levees back to the floodplain. In addition, because some of the spoil from excavation of the berm areas would be pushed up above the berms to support a perimeter road, a portion of the existing sediment in the bottom of the wash would be raised outside of the floodplain unless water depths exceeded the elevation of the road.

Although the Alternative 2 siting linear distribution of recharge basins in the bottom of the wash would affect the behavior of flood flows, the general effect would be to somewhat roughen the surface of the wash, resulting in marginally lower flow velocities. Sediment used to push up berms would be re-distributed by flows, and no substantial change in flooding in the project reach would occur. The Alternative 2 siting would not substantially alter the conclusions of the 2006 Project EIR that, "There is thus no mechanism by which in-basin berms would significantly affect flooding."



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UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Mojave River Aquifers

Exhibit 4-4

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Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative would place pipelines within the 100-year flood zone to deliver SWP supplies to the recharge zone, would increase groundwater levels and would improve groundwater quality.

Large Projects Alternative

As with the Preferred Project Alternative, the Large Projects Alternative would place pipelines within the 100-year flood zone to deliver SWP supplies to the recharge zone, would increase groundwater levels and would improve groundwater quality.

No Project Alternative

The No Project Alternative assumes the continued implementation of the *2004 Regional Water Management Plan*. In the future, MWA would be required to develop facilities in order to meet its obligations to import and recharge up to 75,800 acre-feet of SWP supply in a year. Under the No Project Alternative, SWP deliveries to the Mainstem Mojave River would be initially lower until a Mojave River well field was eventually developed. Both the capacity for recharge and the capacity to extract recharged supplies would likely be lower than under the R^3 project. The No Project Alternative would not improve MWA groundwater and the groundwater of several subareas would continue to exceed the National Drinking Water Standards.

4.1.4 Earth Resources

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Construction-related Impacts
Construction of facilities related to the Preferred Project Alternative may have an impact on earth resources. During construction there is a potential for soil erosion to occur from precipitation and runoff from the construction site. To reduce this potential impact, best management practices have been incorporated into proposed project.

Operational Impacts
Operation of the facilities proposed in the Preferred Project Alternative is not expected to have a significant impact on earth resources. The Preferred Project Alternative has a low potential to increase risks associated with liquefaction in the floodplain adjacent to the river. New facilities will be constructed in a low seismic hazard area, levee failure is unlikely and water leaking from a failed levee would spread across the flat plain and percolate into the ground.

Oro Grande Alternative 1

Construction-related Impacts

According to the 2006 Project EIR, there is potential for soil erosion from both wind and runoff of precipitation associated with all elements of construction. However, with proposed mitigations including the implementation of Best Management Practices for water quality, the construction of proposed facilities, including the Alternative 1 site, would not have significant effects related to earth resources. In addition, the 2006 Project EIR concluded that recharge could potentially reduce wind-blown dust and soil erosion.

Operational Impacts

According to 2006 Project EIR, the general operational effects of recharge are likely to be small and limited to the vicinity of each individual recharge site, and there are limited mechanisms for the potential to cause significant effects.

Oro Grande Alternative 2 (Preferred Alternative)

Alternative 2's more northerly location in the wash would not change the underlying conclusions of the 2006 Project EIR that there would be less than significant impacts to earth resources. Alternative 2 would not result in significant soil erosion and facilities would be constructed in low seismic hazard areas.

Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative would not result in significant soil erosion and facilities would be constructed in low seismic hazard areas.

Large Projects Alternative

As with the Preferred Project Alternative, the Large Projects Alternative would not result in significant soil erosion and facilities would be constructed in low seismic hazard areas.

No Project Alternative

Under the No Project Alternative, facilities would be developed over time. It is likely that MWA would develop these facilities in cooperation with local subarea producers and would develop recharge and extraction facilities of similar capacity to those of the R^3 project. It is anticipated that projects would be sited to avoid geologic impacts. Temporary construction-related impacts would have the potential to occur, however, these impacts would be temporary in nature and would cease upon completion of construction. Development of the No Project Alternative would

involve the continued operation of existing facilities as well as future facilities built on an as needed basis.

4.1.5 Land Use

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Construction and operation of facilities proposed in the Minimum Facilities Alternative will not affect active agricultural lands, areas designated for regional conservation under the *West Mojave Management Plan* or conflict with land use planning. Areas identified under the Farmland Mapping and Monitoring Program as prime and/or unique farmland (see Exhibit 4-5 *Farmland Mapping*) will be avoided.

Oro Grande Alternative 1

The Oro Grande Wash Recharge and Pipelines would not conflict with land use designation, would not involve agricultural land conversion, nor would it conflict with the *West Mojave Management Plan*. As such, no land use impacts are anticipated with implementation of Alternative 1.

Oro Grande Alternative 2 (Preferred Alternative)

As with Alternative 1, no land use impacts are anticipated with implementation of Alternative 2.

Small Projects Alternative

Similar to the Preferred Project Alternative, construction and operation of facilities proposed in the Small Projects Alternative will not affect active agricultural lands, areas designated for regional conservation or conflict with land use planning.

Large Projects Alternative

As with the Preferred Project Alternative, construction and operation of facilities proposed in the Large Projects Alternative will not affect active agricultural lands, areas designated for regional conservation or conflict with land use planning.

No Project Alternative

The No Project Alternative assumes continued implementation of the *2004 Regional Water Management Plan*. Ultimately, MWA would develop facilities that would allow it to meet its obligations to import and recharge up to 75,800 acre-feet of SWP supply in a year. The No Project

Alternative would be to delay implementation of these facilities and possibly force MWA to resite them because of development that would constrain siting options. There is a greater potential for land use conflicts under the No Project Alternative.

4.1.6 Aesthetics

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Considering the disturbed nature of the local viewsheds, the Preferred Project alternative has been designed so that facilities and infrastructure would not impact aesthetics.

Oro Grande Alternative 1

Existing aesthetic conditions at the potential north project site are characterized by the following:

- To the east, the site has been graded for housing;
- The site itself has been graded for storm water detention;
- To the west, there is some mixed creosote scrub;
- To the north, there is an existing golf course across a major road.

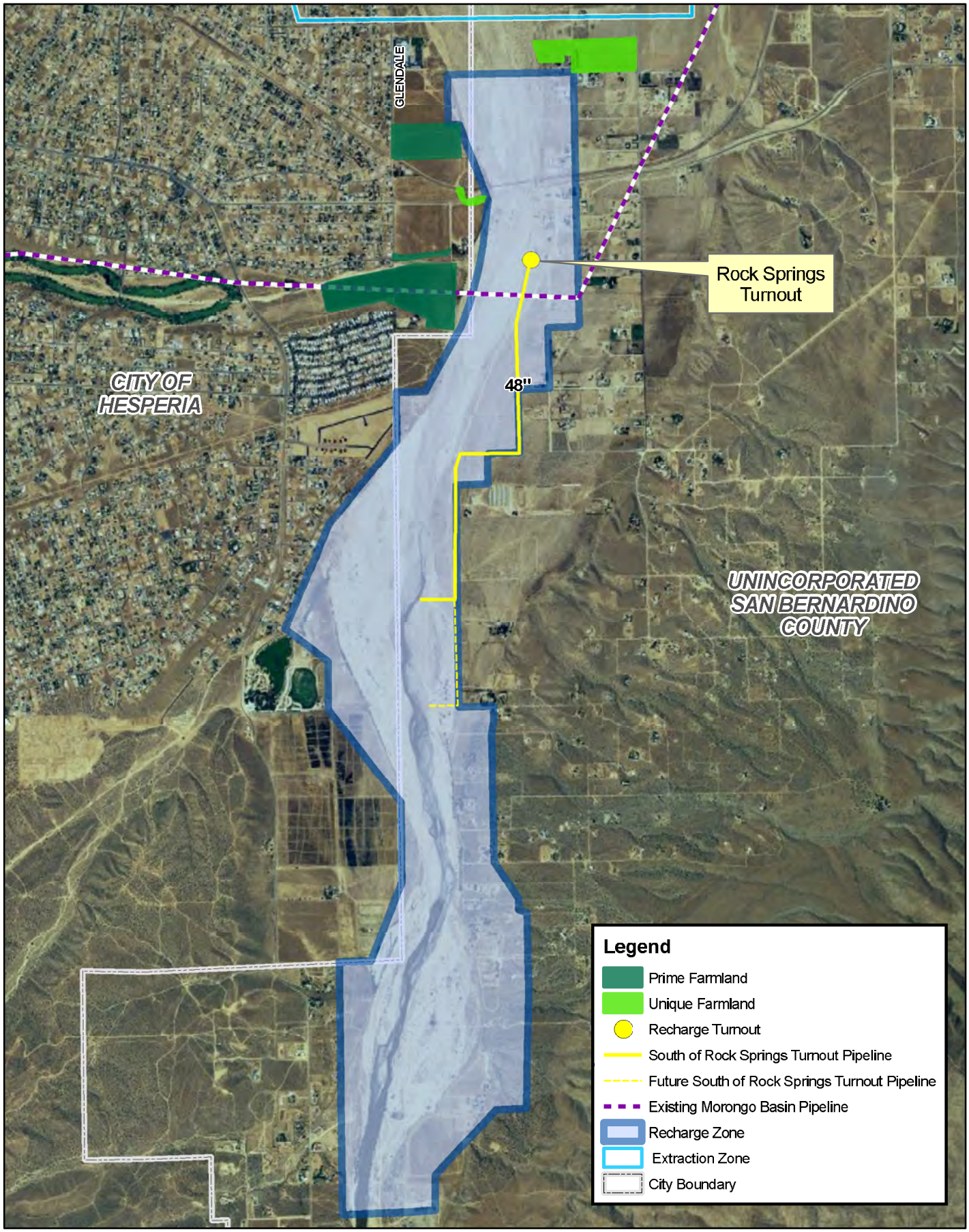
Site aesthetics have essentially already been lost due to grading for storm water detention. Alternative 1 has been designed so that facilities and infrastructure would not impact aesthetics.

Oro Grande Alternative 2 (Preferred Alternative)

The siting of Alternative 2 would have lower aesthetic impacts than Alternative 1 because it is in a more heavily disturbed area with less vegetative community integrity. In addition, the berms would be confined to the lower portion of the wash and would not be visible from 100-150 feet back from the wash edge. Thus, most housing and commercial development would not have a clear view of the berms. Alternative 2 has been designed so that facilities and infrastructure would not impact aesthetics.

Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative has been designed not to impact aesthetics.



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UPPER MOJAVE RIVER GROUNDWATER REGIONAL RECHARGE AND RECOVERY PROJECT
ENVIRONMENTAL ASSESSMENT

Farmland Mapping

Exhibit 4-5

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Large Projects Alternative

As with the Preferred Project Alternative, the Large Projects Alternative has been designed not to impact aesthetics.

No Project Alternative

The No Project Alternative assumes continued implementation of the *2004 Regional Water Management Plan*. However, MWA would ultimately be required to develop facilities that would allow it to meet its obligations to import and recharge up to 75,800 acre-feet of SWP supply in a year. The No Project Alternative would delay implementation of these facilities, possibly reducing the rate that aesthetic impacts would occur. Projects similar to the Preferred Project Alternative or the Small Projects Alternative will probably be developed, although over a longer period of time, resulting in comparable aesthetic impacts.

4.1.7 Recreation

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Under the Preferred Project Alternative, wells and delivery pipelines are proposed for the Mojave River Well Field. However, these facilities would be sited to minimize potential construction and operation effects on recreation on the east side of the river, which include trout fishing ponds and the Jess Ranch Country Club. Operation of the facilities proposed in the Preferred Project Alternative is not anticipated to impact recreation.

Oro Grande Alternative 1

Alternative 1 would not have any impacts to recreational facilities, as there are no recreational facilities located within the Oro Grande Wash Recharge project area.

Oro Grande Alternative 2 (Preferred Alternative)

As discussed above, there are no recreational facilities located within the proposed project area. Alternative 2 would not affect any recreational facilities.

Small Projects Alternative

Similar to the Proposed Project Alternative, facilities proposed as part of the Small Projects Alternative have been sited to avoid the conversion of recreational land for other purposes. Development of the recharge facilities would have no effect on recreation.

Large Projects Alternative

As with the Proposed Project Alternative, facilities proposed as part of the Large Projects Alternative have been sited to avoid the conversion of recreational land for other purposes. Development of the recharge facilities would have no effect on recreation.

No Project Alternative

Under the No Project Alternative, MWA would continue to operate its existing facilities and plan and construct new recharge and conveyance facilities on an as needed basis to accommodate increasing deliveries of SWP supplies for recharge to meet on going needs to deliver imported water to water producers in the MWA service area. It is likely that MWA would develop these facilities in cooperation with local subarea producers and would develop recharge and extraction facilities of similar capacity to those of the R^3 project. It is anticipated that projects would be sited to avoid impacts to recreation areas.

4.1.8 Noise

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

The Preferred Project Alternative would involve construction of temporary sand berms in the Mainstem Mojave River for a period of several weeks in each year. The construction of these berms would generate noise levels of 70 dBA when it is closest to adjacent development and would average a noise level of 64 dBA, which is the noise equivalent to heavy traffic.

Oro Grande Alternative 1

The Preferred Project Alternative would involve construction of recharge basins in Oro Grande Wash. Construction would occur below grade and within 200 feet from the development, generating noise levels of 66 dBA to 77 dBA.

Operation and maintenance of recharge facilities, such as those proposed in Alternative 1, will involve periodic use of heavy equipment to remove fine sediments from the recharge basin cells and maintain and repair levees. A majority of this work would be undertaken within the outer levees, which would block and deflect noise.

Oro Grande Alternative 2 (Preferred Alternative)

The siting of Alternative 2 would concentrate recharge along the lower portions of the wash and thus construction would be 600 to 2000 feet from the nearest residences on the east side of the wash and 600 to 1000 feet from the two developments on the west side of

the wash. Construction noise levels at these sites would be from about 57 dBA to about 67 dBA, or substantially lower than those projected for Alternative 1.

Similar to Alternative 1, there would be routine operational noise from maintenance and repair of the Alternative 2. A majority of this work would be undertaken within the outer levees, which would block and deflect noise.

Small Projects Alternative

The Off-Channel Mojave River Recharge basins proposed as part of the Small Projects Alternative would be developed in areas that have few residences and a small population. Noise levels at the closest residences would be approximately 60 to 71 dBA.

Construction at Oro Grande Wash would occur below grade and within 200 feet of residential development, as residences are located along the east bluffs of the wash south of the California Aqueduct. Construction in this area would generate noise levels of approximately 66 to 77 dBA.

Large Projects Alternative

The two large recharge basins for the Large Projects Alternative are located in sparsely developed areas. At the Alto Recharge Basin site, there is scattered development adjacent to the smaller element of this recharge basin, with several houses within 200 feet of the outer levee. Noise levels would be approximately 66 to 77 dBA for these receptors.

The recharge basin in the Antelope Wash would be located to the east and south of the Hesperia Airport, and would be approximately 2,000 feet from existing residences along the bluffs overlooking the wash. At this distance, noise from construction would be 45 to 55 dBA.

No Project Alternative

Under the No Project Alternative, facilities would be developed over time. It is likely that MWA would develop these facilities in cooperation with local subarea producers and would develop recharge and extraction facilities of similar capacity to those of the R^3 project. It is anticipated that projects would be sited to avoid impacts to adjacent sensitive receptors. However, temporary construction-related noise impacts have the potential to occur. These impacts would be temporary in nature and would cease upon completion of construction.

In the short-term, the No Project Alternative could reduce the number of people affected by construction noise. However, if there is substantial development around sites where facilities would eventually be sited, then delay in construction could increase the number of people exposed to construction and operational noise.

4.1.9 Socioeconomics and Growth Inducing Impacts

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Construction of the R^3 project would not place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing or public facilities in the region. The Preferred Project Alternative will supplement MWA regional groundwater supplies to reduce the rate of overdraft. 2006 Project EIR compared migration rates to water year data from California Department of Water Resources and found no relationship between water year type and the rate of migration (r^2=0.027). Economic trends, rather than fluctuations in water supply, appear to have a greater affect on population trends in California. Construction of the Preferred Project Alternative would not create socioeconomic impacts within the adjacent communities and would not induce growth.

Oro Grande Alternative 1

Construction of facilities proposed as part of Alternative 1 would be short-term and would not attract a long-term worker population to the project vicinity. Construction of Alternative 1 would not place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing, or public facilities in the region. Alternative 1 would not create socioeconomic impacts within the adjacent communities.

Oro Grande Alternative 2 (Preferred Alternative)

Similar to Alternative 1, construction of facilities proposed as part of Alternative 2 would be short-term, would not attract a long-term worker population to the project vicinity, and the majority of construction-related jobs are anticipated to be filled by currently employed workers. No socioeconomic impacts are anticipated with implementation of Alternative 2.

Small Projects Alternative

Similar to the Preferred Project Alternative, implementation of the Small Projects Alternative would neither induce population growth, nor result in a direct population increase through the need for new employees or construction workers. This alternative would not cause any socioeconomic impacts and would not induce growth.

Large Projects Alternative

As with the Preferred Project Alternative, implementation of the Large Projects Alternative would neither induce population growth, nor result in a direct population increase through the need for

new employees or construction workers. This alternative would not cause any socioeconomic impacts and would not induce growth.

No Project Alternative

Under the No Project Alternative, facilities would be developed over time. It is likely that MWA would develop these facilities in cooperation with local subarea producers and would develop recharge and extraction facilities of similar capacity to those of the R^3 project.

4.1.10 Transportation

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Construction-related Impacts
The Preferred Project Alternative would generate construction related traffic, including hauling of construction equipment to and from the site. Impacts to traffic associated with the implementation of the Preferred Project Alternative would include temporary minor delays in local neighborhood traffic.

Operational Impacts
Operation and inspection of facilities once constructed would involve routine water quality monitoring and inspection of wells. Traffic generated by the operation of the Preferred Project Alternative is not anticipated to be more than 10 daily trips.

Oro Grande Alternative 1

Construction-related Impacts

According to the 2006 Project EIR, the Oro Grande Wash Recharge Project would generate some construction-related traffic, including hauling of construction equipment to the site, along Main Street/Phelan Road, and the arterial roads leading to it. However, this impact is anticipated to be relatively minor.

Operational Impacts

According to the 2006 Project EIR, operations of the Oro Grande Wash Recharge Project would have very small effects on traffic. There would be infrequent movement of maintenance equipment between sites, but this is likely to result in addition of 1-2 vehicles per move and to occur infrequently.

Oro Grande Alternative 2 (Preferred Alternative)

Construction-related Impacts

Similar to Alternative 1, construction of Alternative 2 would generate some construction-related traffic, including hauling of construction equipment to the site, along Main Street/Phelan Road, and the arterial roads leading to it. Impacts would be minor.

Operational Impacts

Similar to Alternative 1, operation of Alternative 2 would have very small effects on traffic, including infrequent movement of maintenance equipment between sites.

Small Projects Alternative

Construction-related Impacts
The Small Projects Alternative would generate construction related traffic, including hauling of construction equipment to and from the site. Impacts to traffic associated with the implementation of the Preferred Project Alternative would include temporary minor delays in local neighborhood traffic.

Operational Impacts
The operation of facilities proposed under the Small Projects Alternative would involve the routine inspection, maintenance, and management of several recharge facilities. This would involve routine access to these project sites. Traffic generated by this level of routine work would amount to approximately 20 daily trips to the various facilities.

Large Projects Alternative

Construction-related Impacts
The Large Projects Alternative would generate construction related traffic, including hauling of construction equipment to and from the site. Impacts to traffic associated with the implementation of the Preferred Project Alternative would include temporary minor delays in local neighborhood traffic. The addition of construction traffic on Highway 18 could cause short delays on this busy arterial. No substantial changes in traffic relating to commuting construction crews and hauling of construction equipment to and from the site would occur as a result of the Large Projects Alternative.

Operational Impacts
The operation of the Large Projects Alternative would have a relatively small impact on traffic. Routine maintenance of the facilities would result in no more than 2 to 5 additional trips per day on any given road. There would be infrequent movement of maintenance equipment between sites, but this is likely to result in an additional 1 to 2 vehicles per move and occur infrequently.

No Project Alternative

Construction-related Impacts
The effect of the No Project Alternative on construction-related traffic is likely to vary, depending on the level of facility development pursued under the No Project Alternative and the timing of this development. Extending the length of time to develop various facilities would reduce traffic impacts, as individual development projects would be spread out over a longer period of time. At the same time, probable increases in development over time would result in greater traffic congestion. It is probable that traffic impacts associated with future development of some of the facilities proposed would be the same as those for the Preferred Project Alternative.

Operational Impacts
As stated above, it is probable that operational traffic impacts associated with future development of some of the facilities proposed would be the same as those for the Small Projects Alternative.

4.1.11 Hazardous Material and Waste Handling and Disposal

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

The Preferred Project Alternative does not involve transport of hazardous materials, storage of hazardous materials that may be accidentally be released, emissions of toxic materials, and will not cause conditions that could increase risks associated with wildfires.

Oro Grande Alternative 1

Alternative 1 does not involve transport of hazardous materials, storage of hazardous materials that may be accidentally be released, emissions of toxic materials, and will not cause conditions that could increase risks associated with wildfires.

Oro Grande Alternative 2

Alternative 2 does not involve transport of hazardous materials, storage of hazardous materials that may be accidentally be released, emissions of toxic materials, and will not cause conditions that could increase risks associated with wildfires.

Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative would not involve the transport, storage, routine use of hazardous materials, or increase the risks associated with wildfires.

Large Projects Alternative

Similar to the Preferred Project Alternative, the Large Projects Alternative would not involve the transport, storage, routine use of hazardous materials, or increase the risks associated with wildfires.

No Project Alternative

Development of the No Project Alternative would not involve the transport, storage, or routine use of hazardous materials.

4.1.12 Cultural Resources

Prior to archaeological surveys of the seven accessible project locations, a literature and records search was conducted by personnel from the San Bernardino County Archaeological Information Center, housed at the San Bernardino County Museum. Intensive archaeological surveys of the seven project locations per performed by Applied EarthWorks archaeologists. All landforms likely to contain or exhibit prehistoric or historically sensitive cultural resources were inspected carefully to ensure that all visible, potentially significant, or important cultural resources were discovered and documented. All potentially significant cultural resources identified were documented on State of California Department of Parks Recreation Primary Record Forms (DPR 523). Surveys were not conducted along potential pipeline alignments because pipelines would be constructed within existing public rights-of-way and these rights-of-way are either disturbed or paved. Surveys of well sites in urban areas were not conducted for the same reason. In addition, the Native American Heritage Commission reported that there are no known sacred sites in the immediate project area.

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

A records search and survey revealed no cultural resources that are currently listed on the National Register of Historic Places within the Preferred Project Alternative.

Oro Grande Alternative 1

A records search and survey revealed no cultural resources that are currently listed on the National Register of Historic Places within the Alternative 1 project area. As noted in the 2006 Project EIR, there is a small potential for buried cultural resources to be found during excavations.

Oro Grande Alternative 2 (Preferred Alternative)

The Alternative 2 sites were surveyed in July 2007 by Applied EarthWorks, Inc, and a review of existing literature identified a number of previously recorded sites in the vicinity of the sites. Based on the 2007 field survey, previously recorded historic sites within the potential construction areas had been disturbed by flood control management and/or by housing development. The previously recorded Southern California Edison historic power lines remain and should be avoided. No evidence of pre-historic (Native American) use of the site was found.

Small Projects Alternative

A records search and survey revealed no cultural resources that are currently listed on the National Register of Historic Places within the Small Projects Alternative.

Large Projects Alternative

A records search and survey revealed no cultural resources that are currently listed on the National Register of Historic Places within the Large Projects Alternative.

No Project Alternative

Under the No Project Alternative, facilities would be developed over time. A records search and survey revealed no cultural resources that are currently listed on the National Register of Historic Places within the No Project Alternative.

4.1.13 Public Services and Utilities

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

Construction of the Preferred Project Alternative would involve development in an urban setting. Alignments for pipelines were chosen in an effort to reduce the potential for interruptions of utilities along major arterial roads through urban areas. No changes in police, fire, or public emergency services would be created by the operation of facilities.

Oro Grande Alternative 1

Alternative 1 facilities would be constructed outside of public roads and would not impact the delivery of public services or utilities. In addition, the proposed project would not generate the need for additional public services.

Oro Grande Alternative 2 (Preferred Alternative)

Construction of Alternative 2 would have impacts similar to those of Alternative 1. Alternative 2 facilities would be constructed outside of public roads and would not impact the delivery of public services or utilities would occur. Alternative 2 would not generate the need for additional public services.

Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative would not affect the delivery of public services or utilities.

Large Projects Alternative

Similar to the Preferred Project Alternative, the Large Projects Alternative would not affect the delivery of public services or utilities.

No Project Alternative

The No Project Alternative would reduce the intensity of construction and allow for construction to occur over a longer period of time. Development in the future could accommodate a construction schedule involving one segment of pipeline at a time, reducing the potential for traffic related delays in public services and utilities. At the same time, development along potential well field and delivery pipeline alignments may intensify if there is a substantive delay in facility development. No changes in police, fire, or public emergency services would be created by the operation of facilities.

4.1.14 Environmental Justice

Preferred Project Alternative, Including Oro Grande Wash Recharge Basins (Minimum Facilities Alternative plus Additional Facilities Listed under Section 1.2.2)

The Preferred Project Alternative would result in an enhancement of indigenous groundwater quality for the nine constituents (arsenic, boron, chlorides, fluoride, iron, nitrates, pH, sulfates, and TDS) for which there is consistent data on water quality. Recharged water would enhance indigenous groundwater quality in the majority of cases. By delivering SWP influenced groundwater directly to local stakeholder turnouts, these stakeholders (including the Cities of Victorville, Adelanto, and Hesperia) would be able to utilize this water through blending to reduce arsenic levels for exiting or future local water supplies, as necessary. It should be noted that providing this blending opportunity for local water purveyors may be regarded as a beneficial effect.

In addition, decreased groundwater overdraft would decrease the risk of pumping older water that may contain higher levels of arsenic. In general, the Preferred Project Alternative would increase water supply reliability with the utilization of impaired ground water supplies. The Preferred Project Alternative would not expose a disproportionately high number of minority and/or low income population groups to adverse impacts.

Oro Grande Alternative 1

Alternative 1 will not expose a disproportionately high number of minority and/or low income population groups to adverse impacts. This alternative would also result in an enhancement of indigenous groundwater quality.

Oro Grande Alternative 2 (Preferred Alternative)

The impacts of Alternative 2 would similar to those of Alternative 1. Alternative 2 would not expose a disproportionately high number of minority and/or low income population groups to adverse impacts.

However, there are also potential beneficial impacts associated with the proposed project, such as the opportunity for local water purveyors to utilize State Water Project supplies through blending to reduce arsenic levels for exiting or future local water supplies, as well as the decreased risk of pumping older water that may contain higher levels of arsenic.

Small Projects Alternative

Similar to the Preferred Project Alternative, the Small Projects Alternative would not expose a disproportionately high number of minority and/or low income population groups to adverse impacts. The Small Projects Alternative would also enhance indigenous groundwater quality and improve water supply reliability.

Large Projects Alternative

Similar to the Preferred Project Alternative, the Large Projects Alternative would not expose a disproportionately high number of minority and/or low income population groups to adverse impacts. The Large Projects Alternative would also enhance indigenous groundwater quality and improve water supply reliability.

No Project Alternative

Under the No Project Alternative, MWA would continue to operate its existing facilities and plan and construct new recharge and conveyance facilities on an as needed basis to accommodate increasing deliveries of SWP supplies for recharge to meet on going needs to deliver imported water to water producers in the MWA service area. It is anticipated that projects would be sited to

avoid impacts to a disproportionately high number of minority and/or low income population groups.

CHAPTER 5.0
CUMULATIVE IMPACTS

5.1 INTRODUCTION

A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time in the proposed activity area. Those actions can be undertaken by various agencies (Federal, state, or local) or private entities. In accordance with NEPA regulations, a discussion of cumulative impacts resulting from actions and projects that are proposed, under implementation, or reasonably anticipated to be implemented in the near future is required.

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed activity and other projects expected to occur in a similar location, time period, and/or involving similar actions. Projects in proximity to the proposed action activities would be expected to have more potential for a relationship that could result in potential cumulative impacts than those more geographically separated.

For purposes of this analysis, the *County of San Bernardino General Plan* and the general plans of local jurisdictions in which the proposed action would have potential effects. The potential for water resources projects to contribute to cumulative impacts was evaluated in the context of these general plans, which take into account past, present, and projected development in the MWA service area within the reasonably foreseeable future. The analysis of cumulative effects of the proposed action is based on the analysis in the *2004 Regional Water Management Plan PEIR*. The various general plans outline general trends in development and the impacts related to development. These general trends are discussed in the *2004 Regional Water Management Plan* and are the context in which project-level effects are evaluated below. In addition, Table 5-1, *Recently Approved Related Project*, summarizes recently approved development projects or plans within the vicinity of the Preferred Project Alternative.

Table 5-1
Recently Approved Related Project

State Clearinghouse Number	Lead Agency	Project Title	Project Description	Date CEQA/ NEPA document was certified/ adopted
2008051024	Hesperia Water District	Hesperia Water District Water and Wastewater Master Plans	Hesperia Water District is proposing to construct and operate one new 5 million-gallon (MG) above-ground reservoir (19-3) on a project site currently containing two 5MG above-ground reservoirs (19-1 & 19-2). Once installed, the reservoir will be connected to the District's potable water distribution system.	8/26/2009

State Clearinghouse Number	Lead Agency	Project Title	Project Description	Date CEQA/ NEPA document was certified/ adopted
2006074002	Federal Railroad Administration	Desert Xpress High-Speed Passenger Train	The project entails construction and operation of a privately financed, fully-grade separated, dedicated double-track passenger only railroad along an approximately 200 mile corridor between Victorville, California and Las Vegas, Nevada	3/24/2009
2008051024	Hesperia Water District	Hesperia Water District Water and Wastewater Master Plans	Addendum to the Mitigated Negative Declaration adopted for the 2007 Wastewater Master Plan by the Hesperia Water District. These Master Plans were adopted in June 2008, and identify the water and wastewater system improvements that are forecast to be required to meet the water service demands of the District through the year 2032. Their implementation are divided into "near-term" (by 2012), "mid-term" (2012-2017) and long-term (post 2017) improvement schedules. One mid-term project (installation of two new reservoirs at Plant 19A) has been determined to be needed immediately (near-term). The purpose of the Addendum is to evaluate the environmental effects of bringing this project forward and construct in 2009, instead of waiting until 2012-2017.	3/19/2009
2006061064	Hesperia, City of	Main Street Marketplace	The project proposes the construction of up to 425,038sf. of commercial retail uses on a site totaling approx. 43.84 acres. Project development will include two "major" retail anchors, six ancillary commercial/retail outpads, and a parcel containing a proposed storm water detention facility.	3/9/2009
2008089011	Hesperia Water District	Plant 24 Well & Appurtenances, Plant 28 Well & Appurtenances, Plant 29 Well & Appurtenances	Well 29 is one of fifteen wells proposed by the Hesperia Water District in the District's 1983 Water Master Plan. The Hesperia Water District project includes the permitting and operation of Well 29.	8/6/2008
2008061121	Hesperia, City of	GPA-2007-04, ZC-2007-08 & SPR-2007-27	Consideration of a General Plan Amendment from Office professional (OF) to Commercial (C), a zone change from Administrative and Professional office (AP) to General Commercial (C-2), and a site plan review to construct a 2.6-acre recreational vehicle sales and service facility with a 4,800 square foot sales and service building.	6/23/2008
2008089011	Hesperia Water District	Plant 24 Well & Appurtenances, Plant 28 Well & Appurtenances, Plant 29 Well & Appurtenances	Plant 24 - Domestic Well, Plant 28 - Domestic Well and Plant 29 - Domestic Well.	6/20/2008

State Clearinghouse Number	Lead Agency	Project Title	Project Description	Date CEQA/ NEPA document was certified/ adopted
2008061013	Hesperia, City of	SPR-2008-06 and DA-2008-01	A Site Plan Review SPR-2008-06 and Development Agreement DA-2008-01 to construct a 320-unit affordable multiple residential development and a 19% density bonus on 17.4 gross acres, zoned R3. The development will have two and three bedroom units, ranging from 1,091 to 1,330 square feet in floor area. Recreational amenities such as swimming pool, tot aqua park, barbeque and picnic areas, community center, paseos, tot lots, and open space areas are included with the development. The development will extend an 8-inch sewer line north along Santa Fe Avenue and connect to existing sewer main in Sultana Street. The development will also extend an 8-inch water main north along Santa Fe Avenue and connect to existing water main in Sultana Street, and tie into an existing water main in Muscatel Street.	6/2/2008

5.2 ANALYSIS OF CUMULATIVE IMPACTS

5.2.1 Air Quality

As noted in the *2004 Regional Water Management Plan PEIR*, construction of the proposed project facilities could result in significant impacts to air quality related to emissions from construction equipment and fugitive dust. These impacts would occur within the context of additional growth, construction, and economic expansion within the MWA service area. Project level impacts would occur temporarily during construction. There is a potential for the operation of the proposed recharge facilities to have long-term minor beneficial effects in terms of fugitive dust emissions in the MWA service area, as recharge facilities have the potential to trap blowing dust. The proposed project would not have significant cumulative impacts related to air quality.

5.2.2 Biological Resources

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that substantially diminish or result in the loss of an important biological resource, or those that would conflict with local, state, and/or federal resource conservation plans, goals, or regulations. Impacts can be locally adverse but not significant, because—although they would result in an adverse alteration of existing conditions—they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis.

In the case of biological resources within the project site, the R^3 project would result in temporary impacts due to construction activities. It would not remove critical habitat, but would have an impacts are marginally suitable habitat for the southwestern arroyo toad and desert tortoise. In addition, suitable habitat is present for the burrowing owl. The loss of

individuals is not anticipated as part of the project. Short-term impacts to marginal habitat resulting from construction and operational impacts would be mitigated to less than significant with implementation of proposed mitigation (refer to Appendix D, *Biological Resources*, Mitigation Measures BIO-1 to 6). Facilities proposed as part of the project would be sited in predominantly urban areas and would reduce potential impacts to biological resources.

The cumulative impacts associated with the proposed project and surrounding areas, where similar types of development are occurring or proposed, would be considered less than significant due to the minimal amount of permanent loss of valuable biological habitat or sensitive species that depend on these resources within the project site and surrounding areas. Similar development project in the vicinity would be subject to regulatory requirements (i.e., Clean Water Act, Endangered Species Act, and California Porter-Cologne Water Quality Control Act, etc.) and, thus, impacts would be reduced on a case-by-case basis.

The lack of an adopted comprehensive habitat mitigation plan, however, compounds the potential for habitat and species losses within the region. If this plan were to be adopted by federal, state, and local agencies, it is anticipated that cumulative impacts to biological resources within the region would be better defined and mechanisms to reduce habitat loss would be in place, further reducing these impacts. Cumulative impacts associated with biological resources are considered less than significant with implementation of the proposed project.

5.2.3 Water Resources and Hydrology

Based on EIRs prepared within the project area, development planned within MWA's service area would cause significant cumulative impacts to groundwater quality. Groundwater pumping, use, and recharge following treatment tends to concentrate minerals in the recharged wastewater and result in long-term buildup of these minerals. The recharge of treated wastewater would increase in response to growth.

The proposed project would bring higher quality SWP into the service area for banking, thus remediating the potential for buildup of groundwater minerals. Banked water would be used in MWA's service area during dry years. The proposed project would enhance groundwater.

Planned development within the MWA service area would increase surface flows. Storm drains tend to increase the speed with which local runoff is conveyed. Development within the MWA service area thus has the cumulative effect of increasing peak flood flows, particularly floods generated by short term local runoff. Proposed recharge facilities have the potential to affect local runoff by collecting precipitation and preventing its runoff. No significant cumulative impacts on runoff and local flooding would occur. In addition, the proposed project would reverse declining groundwater levels by banking water through the exchange program. The project would also not contribute to significant cumulative decline in groundwater levels. The project would also not contribute to long term higher flood runoff and higher peak flows in the Mainstem Mojave River because river conditions are not affected by recharge operations. The

proposed project would not contribute to significant cumulative water resources and hydrology impacts.

5.2.4 Earth Resources

Potential seismic damage related to the proposed project is primarily related to raising groundwater levels in areas of development, thus creating a higher risk of soil liquefaction during a seismic event. This potential is only associated with recharge of the Mojave River Floodplain Aquifer, where high rates of recharge could raise groundwater levels. The potential for cumulative impacts related to seismic induced liquefaction depends on whether there is substantial development in the floodplain of the Mainstem Mojave River. Given that flooding affects a broad area of this floodplain, substantial new development within this area is unlikely. If a Mojave River Off-Channel Recharge Basin is constructed, this would reduce the potential for development in the floodplain, and thus reduce the potential for cumulative impacts related to seismically induced liquefaction.

The potential for loss of access to mineral resources is related to the total area of land developed in areas where there are substantial mineral resources. The project would not affect access to oil and gas, as drilling for these resources could be undertaken adjacent to the project sites. In addition, quarrying would not be affected as the proposed project sites are not located on land with significant rock resources. Recharge basins would not affect access to sand and gravel. The proposed project would not contribute to development in areas with potential for seismically induced liquefaction or to the severity of these effects. No significant cumulative impacts would occur. The proposed project would also not contribute to the depletion of mineral resources in the project vicinity.

5.2.5 Land Use

The project would not contribute to a cumulative land use changes, because the project would not convert land permanently to development. Recharge facilities would be designed to be compatible with proposed development to the extent feasible, but would not result in directly or indirectly affecting development trends.

5.2.6 Aesthetics

The cumulative impacts analysis for aesthetics considered the larger context of future development within the vicinity of the project as envisioned by the City of Adelanto, Hesperia, Victorville, and Apple Valley and the County of San Bernardino General Plans and relied upon the projections of the General Plans and General Plan EIRs. Cumulative impacts to visual resources would be impacts that result from incremental changes that degrade the overall visual quality of the natural viewscape or that degrade visual resources.

The General Plan EIRs analyzed the long-term development of the affected Cities and found that no significant impacts relative to light and glare and overall visual quality would occur with implementation of the General Plan. Development of the project site and any additional undeveloped land within the Cities' planning areas, would be required to meet design standards of the applicable City. Because it was determined that this project would not contribute to the degradation of the visual character of the natural viewscape, less than significant cumulative impacts are expected.

5.2.7 Recreation

The proposed project does not significantly affect growth trends, population density, or urban sprawl. The proposed project would not affect the demand for recreation or the demand for new recreation facilities.

5.2.8 Noise

Construction-related noise for the proposed project and each related project listed above would be localized. In addition, each of the related projects would have to comply with the local noise ordinance, as well as mitigation measures that may be prescribed pursuant to CEQA/NEPA provisions that require significant impacts to be reduced to the extent feasible.

Development is generally associated with a cumulative trend toward increased ambient noise levels due to traffic, congestion, and other aspects of a generally mechanized lifestyle. The proposed project would have temporary construction related noise impacts. However, these impacts would be temporary in nature and would cease upon completion of construction. Long- term operation of the proposed facilities is anticipated to generate lower noise levels than the commercial and residential land uses projected in the various general plans for MWA's service area. The proposed facilities would not contribute to cumulative noise effects of growth and development.

5.2.9 Socioeconomics

The proposed project would not create socioeconomic impacts to any adjacent communities in the region (refer to Chapter 4). The proposed project would not contribute to an incremental socioeconomic effect that would be considered to be cumulatively considerable.

5.2.10 Transportation

The proposed project's impacts to traffic would be temporary and would cease upon completion of construction. Long-term maintenance traffic generated by the proposed project would be minor, and would account for a very small fraction of total daily traffic. Each of the individual projects listed above would be required to mitigate for increased traffic levels. The proposed project would not account for a substantial percentage of the future traffic volume

assumed under the City of Adelanto, Hesperia, Victorville, Apple Valley and County of San Bernardino General Plans or General Plan EIRs. The proposed project would not contribute to cumulative traffic.

5.2.11 Hazardous Materials and Waste Handling and Disposal

As development occurs, there is the potential for increases in hazards and exposure to hazardous materials. The proposed project's potential for these impacts to occur would be limited to the construction phase of development. However, it is not anticipated that the project would have cumulative operational impacts. The project would not make a significant contribution to cumulative impacts related to hazards and hazardous materials.

5.2.12 Energy

Although construction of the proposed project would involve the use of up to 920,000 gallons of diesel fuel, energy savings associated with pumping supplies from the Mojave River Well Field and from basins where recharge has raised groundwater levels suggest that the project's net effect on regional energy use is neutral and potentially beneficial. No cumulative effects to energy use would occur over the term of the proposed project.

5.2.13 Cultural Resources

Potential impacts to cultural resources are largely limited to the project area and would not affect adjacent properties. Where such resources exist, implementation of cumulative development in the region would represent an incremental adverse impact on cultural resources. However, each project would be required to implement appropriate mitigation measures. Cumulative impacts on cultural resources resulting from project implementation are considered to be less than significant.

The monitoring, excavation, and treatment of cultural resources, as well as the appropriate reburial of human remains found during excavations, would reduce project-level impacts to a less than substantial level. No significant cumulative cultural resources impacts would occur with the implementation of the proposed project.

5.2.14 Public Services and Utilities

The proposed project does not significantly affect growth trends, population density, or urban sprawl. The proposed project would not affect the demand for public services or utilities.

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CHAPTER 6.0

COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

6.1 INTRODUCTION

The following section provides a brief summary of the laws, regulations, Executive Orders, and other guidelines that are relevant to the proposed project and alternatives.

National Environmental Policy Act of 1969

This Environmental Assessment has been prepared in accordance with the requirements of NEPA of 1969 (42 USC 43221, as amended) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), dated 1 July 1988. NEPA requires that agencies of the Federal Government shall implement an environmental impact analysis program in order to evaluate "major federal actions significantly affecting the quality of the human environment." A "major federal action" may include projects financed, assisted, conducted, regulated, or approved by a federal agency. Federal agencies consider potential environmental consequences of proposed actions in their decision-making process. Under the Regulations for Implementing the Procedural Provisions of the NEPA, Federal agencies are required to prepare an EA or Environmental Impact Statement, which is dependent upon the impacts, resulted from the implementation of the project. NEPA regulations are followed in the preparation of this EA. The preferred alternative and additional alternatives are described and the affected environment, impacts of each alternative to the resources, cumulative impacts, environmental commitments, and compliance with applicable laws, regulations, and policies are stated herein.

Air Quality

Based on the current proposed Project schedule, the Project's construction emissions would occur between 2009 and 2011, and emissions during each of these years would be less than 50 tons per year for ozone precursors. The preferred project's estimated emissions have been determined to be below the General Conformity applicability thresholds for San Bernardino County; by statute the preferred project is presumed to conform with the State Implementation Plan (SIP) and a conformity analysis is not required. An Air Quality Conformity Analysis has been prepared and is included in Appendix A.

Clean Air Act

The Clean Air Act (CAA) is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." The CAA of 1970 directs the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and fuel reformulation (Title II), hazardous air pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII). The USEPA also implements the NAAQS and determines attainment of federal air quality standards on a short- and long-term basis. An air

quality analysis was performed for the implementation of the preferred alternative and additional alternatives. With the implementation of mitigation measures AQ-1 through AQ-7 (Appendix D), and the compliance with all MDAQMD rules and regulations, the proposed project activities would not conflict with the CAA.

California Ambient Air Quality Standards

California Air Resources Board (CARB) has issued a number of California Ambient Air Quality Standards (CAAQS). These standards include pollutants not covered under the NAAQS and also require more stringent standards than provided under the NAAQS. Pollutants regulated under these standards include ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. CARB, like USEPA, also has on-road and off-road engine emission reduction programs that indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts. Under CEQA, mitigation measures were imposed (Appendix D) to reduce impacts to below significance. With the implementation of mitigation measures AQ-1 through AQ-7 (see Appendix D, *Air Quality*) and the compliance with all MDAQMD rules and regulations, the proposed project activities would not conflict with the CAAQS.

Biological Resources

Endangered Species Act of 1973, 1988 Amendments (16 USC § 1531 et seq)

The ESA protects federally-listed threatened and endangered plant and wildlife species by prohibiting actions that would jeopardize the continued existence of such species, or by minimizing actions that would result in the destruction or adverse modification of any critical habitat of such species. The R^3 Project activities have been designed to avoid or minimize effects to endangered or threatened plant and wildlife species that may occur in the area (see Section 3.1.2 and 4.1.2, Biological Resources and Appendix D, *Biological Resources*). Based on MWA's analysis, the preferred alternative will have "no effect" on sensitive wildlife or habitat pursuant to the Endangered Species Act.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, capture, kill, or possess or attempt such an action towards any bird listed in wildlife protection treaties between the United States and several countries including Great Britain, Mexico, Japan, and countries that are part of the former Soviet Union. A "migratory bird" includes the living bird, any part of the bird, its nests or eggs. Disturbance of the nest of a migratory bird requires a permit issued by the USFWS pursuant to CFR Title 50. Almost all birds, except for some nonnative pests, are covered by the Act. The administering agency is the USFWS. Bird species having the potential

to occur within or adjacent to the preferred project area include yellow-billed cuckoo, burrowing owl, and southwestern willow flycatcher. However, environmental commitments incorporated into the proposed project activities would avoid impacts to these species (see Appendix D, *Biological Resources*). This would include construction monitoring, pre-construction surveys, and the avoidance of nest locations. When possible, vegetation would be cleared outside of the breeding season for rare birds (September 1 to March 1). The proposed project activities would not conflict with this Act.

Water Resources and Hydrology

Clean Water Act of 1977 (33 USC § 1251 et seq.)

The Clean Water Act (CWA) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The definition of waters of the United States includes wetland areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). **Section 401** of the CWA requires Federal agencies to obtain state water quality certification from the state in which the proposed action would take place if impacts to these resources would occur. As the preferred project activities would implement the environmental commitments listed in Section 4.1.3, the proposed activities would not violate state and Federal water quality standards and would be consistent with the CWA. **Section 402** establishes conditions and permitting for point-source discharges of pollutants under the National Pollution Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the State Water Resources Board in Sacramento. Pursuant to NPDES requirements, a General Construction Storm Water Permit is required for construction activities. **Section 404** of the CWA regulates the discharge of dredged or fill materials into the waters of the United States, including rivers, streams, and wetlands, except as permitted under separate regulations by the USACE and the USEPA. The USACE administers the Section 404 permit program. The preferred project is in compliance with Section 404(b)(1) guidelines. A Section 404(b)(1) Evaluation has been prepared and is included as Appendix C.

Earth Resources

Federal Clean Water Act

The CWA includes provisions for reducing soil erosion relevant to water quality. The CWA made it unlawful for any person to discharge any pollutant from a point source (including construction site), into navigable waters, unless a permit was obtained under its provisions. This pertains to construction sites where soil erosion and storm runoff as well as other pollutant discharges could affect downstream water quality. To reduce this potential impact, best management practices have been incorporated into proposed project. Implementing these protocols will reduce the potential for erosion to less than significant levels. Under CEQA, mitigation measures were imposed (Appendix D) to reduce impacts to below significance. With

the implementation of mitigation measures GEO-1 through GEO-4 (refer to Appendix D, *Earth Resources*), the proposed project activities would not conflict with the CWA.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) process, established by the CWA, is intended to meet the goal of preventing or reducing pollutant runoff. Projects involving construction activities (e.g., clearing, grading, or excavation) involving land disturbance greater than one acre must file a Notice of Intent with the applicable Regional Water Quality Control Board (RWQCB) to indicate their intent to comply with the State General Permit for Storm Water Discharges Associated with Construction Activity. This Permit establishes conditions to minimize sediment and pollutant loading and requires preparation and implementation of a Storm Water Pollution Prevention Plan prior to construction. At this stage of development, the preferred project is in compliance with SWPPP and NPDES. Prior to construction, the Project Manager or Project Engineer will be responsible for the fulfillment of all SWPPP and NPDES requirements.

Clean Air Act

The CAA includes provisions for reducing soil erosion relevant to air and water quality. On construction sites, exposed soil surfaces are vulnerable to wind erosion and small soil particulates are carried into the atmosphere. Suspended particulate matter (PM_{10} and $PM_{2.5}$) is one of the six criteria air pollutants of the CAA. Under CEQA, mitigation measures were imposed (Appendix D) to reduce impacts to below significance. With the implementation of mitigation measures GEO-1 through GEO-4 (see Appendix D, *Earth Resources*), the proposed project activities would not conflict with the CAA.

Noise

Noise Control Act of 1972 (42 USC § 4901-4918)

The Noise Control Act directs all Federal agencies to carry out, "to the fullest extent within their authority," programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare. The USEPA identifies a 24-hour exposure level of 70 dB as the level of environmental noise which will prevent any measurable hearing loss over a lifetime (USEPA, 1974). Levels of 55 dBA (Ldn) outdoors and 45 dBA (Ldn) indoors were identified as preventing activity interference and annoyance. These levels are not standards, criteria, regulations, or goals, and should be viewed as levels, below which there is no reason to suspect that the general population will be at risk from any of the identified effects of noise. The preferred project activities would be consistent with this Act. Although construction activities will result in a noise impact at nearby residential locations, this impact will be short-term and will cease upon completion of construction. In areas where residences are located within 400 feet of construction, MWA will install temporary noise barriers to provide noise shielding to the extent feasible. All construction activities, in populated areas, will occur between 7 a.m. and 7 p.m. Construction of the preferred project will

not violate local noise ordinances. Noise impacts due to the preferred project alternative are considered to be a less than significant impact.

The Federal Office of Safety and Health Administration (OSHA) regulate exposure to occupational noise by limiting the interval of time a worker can be exposed to certain noise levels. For example, a worker should not be exposed to average sound levels of 90 dBA for over 8 hours. When noise exposure exceeds this, employers should reduce exposure conditions with engineering or administrative methods. If exposure time cannot be reduced, protective equipment is required to reduce noise to permissible levels. The preferred project is in compliance with OSHA standards.

Hazardous Material and Waste Handling and Disposal

Resource Conservation and Recovery Act of 1976 (42 USC § 6901)
Resource Conservation and Recovery Act (RCRA) was enacted to ensure the safe and environmentally responsible management of hazardous and nonhazardous solid waste, and to promote resource recovery techniques to minimize waste volumes. To ensure responsible management of hazardous and nonhazardous waste, the environmental commitment listed in Section 4.1.11 would be integrated into the preferred project activities. The preferred project activities would be consistent with this Act.

Hazardous Waste and Solid Waste Amendments Act of 1984 (42 USC § 6901).
The Hazardous Waste and Solid Waste Amendments Act of 1984 are amendments to the RCRA and the Solid Waste Disposal Act that authorize regulations or require that regulations be promulgated on waste minimization, land disposal of hazardous wastes, and underground storage tanks. In order to minimize waste impacts, the proposed project activities would implement the environmental commitments listed in Section 4.1.11. There would be no conflict with this Act.

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 USC § 9601)
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a statutory framework for the cleanup of waste sites containing hazardous substances and, as amended by the Superfund Amendments in 1986 and Reauthorization Act, provides an emergency response program in the event of a release (or threat of a release) of a hazardous substance to the environment. CERCLA's goal is to provide for response and remediation of environmental problems that are not adequately covered by permit programs of other environmental laws, such as the CAA, the CWA, the RCRA, and the Atomic Energy Act. In order to minimize hazardous waste impacts, the proposed project activities would implement the environmental commitments listed in Appendix D, *Hazardous Materials and Waste Handling and Disposal*. There would be no conflict with this Act.

Emergency Planning and Community Right-to-Know Act of 1986 (42 USC § 11001)
This act was included as Title III of the Superfund Amendments and Reauthorization Act. Under Subtitle A of this Act, Federal facilities provide information regarding inventories of specific chemicals used or stored, and releases that occur from these sites, to the State Emergency Response Commission and to the Local Emergency Planning Committee to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances. In addition, under Subtitle B of the Act, material safety data sheet reports, emergency and hazardous chemical inventory reports, and toxic chemical release inventory reports must be provided to appropriate state, local, national, and federal authorities. In order to minimize hazardous waste impacts, the preferred project would implement the environmental commitments listed in Appendix D, *Hazardous Materials and Waste Handling and Disposal*. There would be no conflict with this Act.

Cultural Resources

National Historic Preservation Act of 1966 (16 USC § 470)
Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on cultural resources eligible for the National Register of Historic Places (National Register). The action must demonstrate compliance with the NHPA, Public Law 89-665; 16 U.S.C. 470-470m, as amended, 16 U.S.C. 460b, 470l-470n, and 36 CFR 800, as amended (August 5, 2004). Based on surveys and the records search, there are no cultural resources currently listed or eligible for inclusion in the National Register of Historic Places. Under CEQA, mitigation measures were imposed (Appendix D) to reduce impacts to below significance. In order to minimize impacts to cultural resources, the preferred alternative would implement the mitigation measures CUL-1 through CUL-3 (refer to Appendix D, *Cultural Resources*).

Environmental Justice

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
Executive Order 12898 contains a general directive that states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The Council on Environmental Quality (CEQ) has oversight of the federal government's compliance with this Executive Order and NEPA. The preferred project and additional alternatives have been analyzed to determine if the project will have disproportionately high and adverse impacts on minority and low-income populations. Although property acquisition may be required, impacts would not be significant. The preferred project is in compliance with Executive Order 12898.

The preferred project and additional alternatives will also have a beneficial effect on water quality. The preferred project will recharge groundwater supplies and result in an enhancement of indigenous groundwater quality. By delivering SWP influenced groundwater directly to stakeholder turnouts, local water purveyors will be able to utilize this water through blending to reduce the arsenic levels of existing and future local water supplies.

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CHAPTER 8.0
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