Eagle Mountain Pumped Storage Project
Draft Environmental Impact Report
Volume I

State Clearinghouse No. 2009011010
FERC Project No. 13123

State Water Resources Control Board
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July 2010

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TECHNICAL MEMORANDUM (bound separately)

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Acronyms and Abbreviations

AB	assembly bill
ACEC	Areas of Critical Environmental Concern
AF, ac-ft	acre-feet
AFY	acre-feet per year
AGFD	Arizona Game and Fish Department
APCD	Air Pollution Control District
APE	Area of Potential Effect
AQMD	Air Quality Management District
ASM	ASM Affiliates, Inc.
ATV	all-terrain vehicle
Basin Plan	Water Quality Control Plan for the Colorado River Basin Region
BLM	(United States) Bureau of Land Management
BOR	(United States) Bureau of Reclamation
BMP	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CAL/EPA	California Environmental Protection Agency
CAL/EPA, DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
California EDD	California Employment Development Department
California DOF	California Department of Finance
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Central Affairs Association
CARB	California Air Resources Board
CBC	California Building Code

CBOC	California Burrowing Owl Consortium
CCR	California Code of Regulations
CDCA	California Desert Conservation Area
CDFG	California Department of Fish and Game
CDNPA	California Desert Native Plants Act
CDPA	California Desert Protection Act of 1994
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEII	Critical Energy Infrastructure Information
Census	(United States) Bureau of the Census
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	cubic feet per second
CH_4	methane
CHU	critical habitat unit
CNEL	Community Noise Exposure Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
Commission	Federal Energy Regulatory Commission (FERC)
Corps	United States Army Corps of Engineers
County	County of Riverside
CPUC	California Public Utilities Commission
CRA	Colorado River Aqueduct
CRF	Code of Federal Regulations
CSA	County Service Areas
CSLC	California State Lands Commission
CSRI	Cultural Systems Research, Inc.

CWA	Clean Water Act of 1977
CVAG	Coachella Valley Association of Governments
DEIR	Draft Environmental Impact Report
DI	Demineralization
DLA	Draft License Application
DOE	(United States) Department of Energy
DOF	(United States) Department of Finance
DOI	(United States) Department of the Interior
DPV1	Devers-Palo Verde 1 Transmission Line
DPV2	Devers-Palo Verde 2 Transmission Line
DSOD	California Division of Safety of Dams
DTC	Desert Training Center
DTC/CAMA	CA/AZ Manuever Area
DTSC	(California) Department of Toxic Substances Control
DWMA	Desert Wildlife Management Areas
DWR	California Department of Water Resources
ECE	Eagle Crest Energy Company
EDA	County of Riverside Economic Development Agency
EIC	Eastern Information Center California
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
El.	Elevation
EMEC	Eagle Mountain Energy Company, now known as Eagle Crest Energy Company
EPA	(United States) Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission

FESA	Federal Endangered Species Act
FLPMA	Federal Land and Policy Management Act
FOIA	Freedom of Information Act
ft	feet
GEI	GEI Consultants, Inc.
GHG	greenhouse gases
GIS	Geographical Information System
GLO	Government Land Office
gpd	gallons per day
gpm	gallons per minute
GWh	gigawatt hour
GWP	global warming potential
H_2O	water vapor
HPMP	Historic Properties Management Plan
I/O	Inlet/Outlet
IBLA	Interior Board of Land Appeals
ICOLD	International Commission on Large Dams
ILP	Integrated Licensing Process
ISO	Independent System Operator
JTNP	Joshua Tree National Park
Kaiser	Kaiser Eagle Mountain, LLC., and Kaiser Ventures, LLC.
KOPs	key observation points
kV	kilovolt
LORS	local laws, ordinances, regulations, and standards
m	meter
MBTA	Migratory Birds Treaty Act
MCE	maximum credible earthquake
MCL	maximum contaminant level

MDAB	Mojave Desert Air Basin
MGD	million gallons per day
Mg/L	milligrams per liter
MM	mitigation measure
MMRP	Mitigation Monitoring and Reporting Program
MOA	Memorandum of Agreement
msl	mean sea level
MUC	multiple use class
MW	megawatt
M_W	moment magnitude
MWD	Metropolitan Water District of Southern California
MWh	megawatt hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	(California) Native American Heritage Commission
NECO	Northern and Eastern Colorado Desert Coordinated Management (Plan)
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NHPA	National Historic Preservation Act
NGA	next generation attenuation
NO_2	nitrogen dioxide
NOI	Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historical Places
O_3	ozone
O&M	Operations and Maintenance

OES	Office of Emergency Services
OHV	off-highway vehicle
OPR	Office of Planning and Research
ORV	off-road vehicle
PAD	Pre-Application Document
Pb	lead
PDFs	project design features
PGA	peak ground acceleration
PG&E	Pacific Gas and Electric
$PM_{10/2.5}$	particulate matter with aerodynamic diameter of 10 or 2.5 microns and less
PMF	probable maximum flood
PPM	parts per million
Project	Eagle Mountain Pumped Storage Project
PSD	prevention of significant deterioration
psi	pounds per square inch
RCC	roller-compacted concrete
RMP	Risk Management Plan
RO	reverse osmosis
ROD	Record of Decision
ROW	right-of-way
ROWD	Report of Waste Discharge
rpm	revolutions per minute
RPS	Renewable Portfolio Standards
RTS	Reservoir Triggered Seismicity
RWQCB	State of California, Regional Water Quality Control Boards
SARA	Superfund Amendment and Reauthorization Act of 1986
SB	Senate Bill

SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCH	State Clearinghouse
SCS	(United States) Soil Conservation Services
SGIP	Self Generation Incentive Program
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMARA	California Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SR	State Route 177
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	(California) State Water Resources Control Board
TBM	tunnel boring machine
TCPs	traditional cultural properties
TDS	total dissolved solids
THPO	Tribal Historic Preservation Officers
TLP	Traditional Licensing Process
TM	technical memorandum
TMP	Transportation Management Plan
UBC	Uniform Building Code
USCOLD	United States Committee on Large Dams
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	unexploded ordinance
UXO Plan	UXO Identification, Training and Reporting Plan
VC	California Vehicle Code
VRM	BLM's Visual Resource Management
Valley	Chuckwalla Valley

WEAP	Worker Environmental Awareness Program
WBWG	Western Bat Working Group
WDRs	Waste Discharge Requirements
White	Caucasian
WHMA	Wildlife Habitat Management Area
WUS	Waters of the United States
ybp	years before present
ZOI	Zone-of-Influence

1.0 Introduction

1.1 Legal Authority and Purpose

The California Environmental Quality Act (CEQA) of 1970 (as amended) requires that an Environmental Impact Report (EIR) be prepared for any project to be undertaken or approved by a State or local agency that has the potential to have a direct or indirect physical change in the environment. The purpose of this Draft EIR (DEIR) is to present information relevant to the regulatory settings for Federal, State and local environmental policies, describe the existing physical conditions, evaluate potential environmental impacts, and recommend a mitigation program designed to reduce or avoid identified significant adverse environmental effects that could result from implementation of the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project).

Approval of the proposed Project requires discretionary approval by the State Water Resources Control Board (SWRCB); and therefore constitutes a "project" under CEQA (CEQA Guidelines §15378). The SWRCB has primary State responsibility for carrying out and approving the Clean Water Act Section 401 Water Quality Certification for the proposed Project, and is therefore the designated Lead Agency under CEQA[1]. The proposed Project site is located north of the unincorporated town of Desert Center, within Riverside County, California. The proponent of the Project is Eagle Crest Energy Company (ECE).

This DEIR was prepared by the SWRCB acting in its capacity as Lead Agency pursuant to CEQA and the CEQA Guidelines. It was prepared in compliance with CEQA (Public Resources Code §§21000-21178), and the 2010 CEQA Guidelines (California Code of Regulations (CCR), Title 14, Chapter 3, §15000-15387.) As described in the CEQA Guidelines §15121(a), an EIR is a public information document that assesses potential environmental impacts of a proposed project, and identifies mitigation measures and alternatives to the project that could reduce or avoid potential adverse environmental impacts.

CEQA requires that State and local government agencies consider the environmental consequences of projects over which they have discretionary authority. It is not the purpose of an EIR to recommend either approval or denial of a project. Rather, an EIR is a document whose primary purpose is to disclose the potential environmental impacts associated with an action or "project."

This section discusses the legal authority and purpose of the EIR, explains the intended uses of the EIR including the regulatory requirements for the Lead Agency, provides an overview of the

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[1] The proposed Project must also obtain a license from the Federal Energy Regulatory Commission (FERC); as such, the FERC is the Federal Lead Agency. The FERC is conducting a coordinated but independent environmental review of the project to satisfy its requirements under the National Environmental Policy Act (NEPA).

CEQA process, and organizational layout of the EIR. Also included in this section is the summary of the scoping process and public outreach, issues of concern (as determined by the SWRCB during Project scoping and preliminary environmental analysis), a list of issues to be resolved and analyzed within this EIR, terminology used to describe the level of significance of impact, components of the mitigation program, as well as, providing a contact person for the public review of this EIR.

1.2 Intended Uses of the EIR

This DEIR is part of the environmental review process for the proposed Eagle Mountain Pumped Storage Hydroelectric Project. The intent of this DEIR is to enable the SWRCB and other responsible agencies and interested parties to understand the potential environmental effects of the proposed Project. The DEIR is expected to be used for the following purposes:

- To inform the public, decision-makers, elected officials and other stakeholders regarding the proposed Project
- To disclose to the public, decision-makers, elected officials and other stakeholders the potential environmental effects associated with short-term construction and long-term operation of the proposed Project, and to solicit input on the potential environmental effects
- To identify ways to avoid or minimize potential environmental effects of the proposed Project and evaluate alternatives to the proposed action(s)
- To provide the SWRCB with a technically and legally adequate environmental document to be used as one basis for their decision-making process for the proposed Water Quality Certification and Waste Discharge Requirements
- To provide responsible and trustee regulatory agencies with information necessary to evaluate Project permitting requirements

A detailed description of the proposed action, required entitlements, and agencies expected to utilize this EIR in their subsequent permitting for the Project is presented next in Section 2.0 Project Description.

1.2.1 Statutory and Regulatory Requirements

The proposed Project is subject to the Federal Power Act and Clean Water Act, as well as various other regulatory Federal, State and local requirements. For a complete listing of applicable regulatory settings please refer to the resource sections contained within Section 3.0 Environmental Analysis of this EIR. A summary of the Federal Power Act and Clean Water Act are provided below.

1.2.1.1 Federal Power Act

An operating license for the Eagle Mountain Pumped Storage Hydroelectric Project is subject to numerous requirements under the Federal Power Act 16 U.S.C. §§ 791-828c (2000). As the Federal Lead Agency for the Project, the Federal Energy Regulatory Commission (FERC) is preparing an Environmental Impact Statement (EIS) for evaluation and assessment of the proposed Project to satisfy requirements of the National Environmental Policy Act (NEPA). The Project Proponent has submitted to the FERC a Pre-Application Document (January 2008), the Final License Application (June 2009), and Responses to Comments (April 2010). The EIS is currently underway. The NEPA and CEQA documents, while not considered a joint document, have been drafted in consultation with Federal and State coordination.

1.2.1.2 Clean Water Act

On September 26, 2008, the Project Proponent applied to the SWRCB for water quality certification under section 401 of the Clean Water Act. For purposes of the CEQA, the SWRCB is the California State Lead Agency for the preparation of the EIR, as required for a California public agency reviewing potential environmental impacts associated with the proposed licensing of the Project. On October 15, 2008, the SWRCB determined that the Water Quality Certification application met the requirements for a complete application and was acceptable for processing. A public notice for Clean Water Act Section 401 Water Quality Certification was published December 17, 2008. The application is pending environmental review based on the findings of the EIR. As a decision-making body, and as the Lead Agency under CEQA, the SWRCB will make a decision to disapprove or approve the Project, certify the EIR, and carry out the Project.

1.3 Environmental Review Process

1.3.1 Notice of Preparation

In accordance with Section 15082 of the CEQA Guidelines, the SWRCB prepared a Notice of Preparation (NOP) and sent it to the Governor's Office of Planning and Research, State Clearinghouse and Planning Unit (SCH), responsible and trustee agencies, and interested persons and organizations on January 6, 2009. The public review and comment period on the NOP was extended to coincide with the Federal scoping process and ended on February 16, 2009. A copy of the SCH stamped NOP and NOP distribution list are included in Appendix E of this report.

The purpose of the NOP is to provide the responsible agencies with sufficient information describing the proposed Project and the potential environmental effects to enable the responsible agencies to make a meaningful response. The scoping process helps the Lead Agency identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR. The scoping process also helps to eliminate from further study issues found not to be significant. Section 15082(c)(1) of the CEQA Guidelines requires the Lead Agency to conduct at least one scoping meeting for projects of statewide, regional, or area wide significance.

Consistent with §21083.9 of the CEQA Statute (Public Resources Code Section 21000, et. seq.), the SWRCB held a public scoping meetings to solicit public and agency comments on the scope and content of the EIR on January 15, 2009 and January 16, 2009 at the University of California, Riverside (Palm Desert Extension) in the City of Palm Desert, California. In addition, a Project-area tour was conducted on January 16, 2009. The scoping meetings and Project-area tour were noticed in *The Desert Sun* news publication on December 12, 2008. As required by the FERC's public record process, a court reporter recorded the scoping meeting, including all comments and statements (these transcripts are provided in Appendix E). [As part of the NEPA process, a scoping document (SD-1) was distributed (prior to the scoping meetings) to interested agencies and others on December 17, 2008. It was noticed in the *Federal Register* on December 24, 2008]. In addition to verbal comments provided at the scoping meetings, the following entities provided written comments:

- Kaiser Ventures, LLC (dated February 13, 2009)
- County Sanitation Districts of Los Angeles County (dated February 17, 2009)
- Metropolitan Water District of Southern California (dated February 10, 2009)
- National Parks Conservation Association (dated February 10, 2009)
- Citizens for the Chuckwalla Valley (dated February 17, 2009)
- Riverside County Fire Department (dated March 5, 2009)
- Department of Interior, Bureau of Reclamation (dated March 17, 2009)

A copy of comment letters submitted during scoping can be found in Appendix E.

On June 5, 2009, the SWRCB and FERC issued a second scoping document 2 (SD-2), providing clarification regarding issues identified for analysis, and incorporating comments submitted in response to SD-1. A Draft License Application (DLA) was released for public comment and filed with the FERC in June 2008. The following agencies/entities/persons commented on the DLA:

- Kaiser Ventures, LLC (dated September 12, 2008)
- Agua Caliente Band of Cahuilla Indians (dated August 26, 2008)
- County Sanitation Districts of Los Angeles County (dated September 12, 2008)
- Joshua Tree National Park (dated September 12, 2008)
- Margit F. Chiriaco Ruche (dated June 28, 2008)
- Metropolitan Water District of Southern California (dated September 15, 2008)
- Tahquitz Group of the Sierra Club (dated September 12, 2008)
- Native American Land Conservancy (dated August 29, 2008)

In determining the scope and content of the EIR, the SWRCB took into consideration comments received during the NOP public review period. The issues raised by agencies and the public during Project scoping are demonstrated in Table 1-1 below, and are the basis of the scope and content for this DEIR. Also included in this EIR is the discussion and environmental analysis of Agricultural Resources, Population & Housing, Noise, and Environmental Justice.

Table 1-1. Issues Raised during Project Scoping

Geology and Soils	Effects of Project construction, filling, and operation on geology and soil resources in the Project boundary, including assessment of potential geologic hazards such as soil liquefaction, Project-induced seismicity, and slope instability.
	Effects of Project construction, filling, and operation on soil erosion and sedimentation in the Project area.
	Effect of Project construction, filling, and operation on the potential for subsidence and hydrocompaction in the Project area and associated Chuckwalla Valley groundwater basin, including potential effects in adjacent river basins (e.g., the Pinto Basin) and on the Aqueduct.
Water Resources (Groundwater & Surface Water)	Effects of construction activities on water quality in the Project area.
	Effects of reservoir and tunnel on seepage and on groundwater levels in the Project area.
	Effects of seepage from the reservoirs and brine pond(s) on groundwater quality in the Project area.
	Effects of groundwater pumping on groundwater levels, including assessment of groundwater level changes in relation to: other groundwater users; local springs; the Aqueduct; and Reclamation's accounting surface elevation for monitoring use of Colorado River water.
	Effects of groundwater pumping on groundwater quantity and quality in the Project area.
	Effects on long-term water quantity and quality in the reservoirs and brine ponds, including the potential for colonization by avian organisms.
Terrestrial Resources	Effects of the reservoirs as a rare water source in the desert environment on the attraction of waterfowl and bats, attraction of predators (e.g., coyotes, badger, and ravens), and establishment and composition of riparian communities.
	Effects of Project construction (i.e., disturbance and habitat fragmentation) and operation (i.e., lighting, physical and noise disturbance, and migration barriers) on desert bighorn sheep migration patterns, foraging habitat, and breeding and lambing behavior; including an assessment of consequences to desert bighorn sheep populations in the area.
	Potential effects of the Project's reservoirs on deer, big horn sheep, and desert tortoise drowning in the reservoirs, and effectiveness of fencing.
	Effects of the brine ponds on birds, and measures to minimize adverse effects.
	Effects of Project construction and operation, including, but not limited to, construction of the access roads, water pipeline, transmission line, powerhouse, brine ponds and reservoirs, staging areas, transmission line pulling areas, and waste spoil and disposal sites on vegetation.
	Effects of changes in local springs on wildlife, including desert bighorn sheep.
	Effects of Project construction and operation on the spread of invasive species including the consequences of the spread of noxious weeds on vegetation species composition and wildlife habitat values.
	Effects of Project construction and operation on special status species, including BLM sensitive species and state threatened and endangered species.
	Effects of Project facilities and operations on raven populations.

Threatened and Endangered Species	Effect of Project construction and operation on federally threatened and endangered species: (1) desert tortoise and its critical habitat, (2) Coachella Valley milkvetch.
	Potential conflicts between the proposed Project and the terms of Kaiser's incidental take statement for the Eagle Mountain Landfill Project.
Aesthetic Resources	Effects of proposed Project facilities on visitors who view the landscape (i.e., Riverside County has designated the section of Interstate 10 from Desert Center to Blythe as a scenic corridor).
	Effects of Project construction and operation on visitors to the area, including visitors to wilderness and non-wilderness areas within the Joshua Tree National Park, and effects on the park's wilderness values.
Cultural Resources	Effects of construction and operation of the proposed Project on historic, archeological, and traditional resources that may be eligible for inclusion in the National Register of Historic Places.
	Effects of Project's construction and operation on the Project's defined area of potential effects.
Land Use / Public Services / Utilities	Effects of Project construction and operation on Aqueduct other land uses, including future mineral development, and solar farms.
	Effects of Project construction and operation on the proposed Eagle Mountain Landfill and Recycling Center, including assessment of potential areas of incompatibility between the proposed Project and the landfill.
	Effects of Project-related desalinization ponds (from the reverse osmosis system) and associated removal of an estimated 2,500 tons of salt from the upper reservoir on land use.
	Effects of the proposed Project on the Riverside County Fire Department's ability to provide an acceptable level of service.
Recreation	Effects of Project construction and operation on recreational use within the Project area, including lands administered by the BLM for dispersed recreational use and, at the Joshua Tree National Park.
	Effects of Project construction and operation on special designated areas, including BLM's Chuckwalla Valley Dune Thicket Area of Critical Environmental Concern, and Chuckwalla Critical Habitat Unit (an area designated by the U.S. Fish and Wildlife Service as desert tortoise habitat), and federally designated wilderness areas within the Joshua Tree National Park.
Transportation	Effects of increased traffic and potential congestion on local roads due to the combination of existing mining-related and landfill traffic and Project construction and operation.
Air Quality	Effects of construction and operation of the Project on air quality in the region
Greenhouse Gas Emissions	Effects of the Project on carbon production emissions.

1.3.2 Draft Environmental Impact Report

This document constitutes the DEIR. The DEIR contains a description of the Project, regulatory settings, description of the physical environmental setting, analysis of Project implementation, identification of Project impacts, and mitigation measures for impacts found to be potentially significant, as well as an analysis of Project alternatives, growth inducing effects, cumulative impacts, and other considerations. Upon completion of the DEIR, the SWRCB will file a Notice of Completion (NOC) with the SCH to begin the 45-day public review period (Public Resources Code §21161 and CEQA Guidelines §15085).

1.3.3 Public Notice / Public Review

Concurrent with the filing of the NOC, the SWRCB will release a Notice of Availability (NOA) to provide public notice that the DEIR is available for public review and will invite comment from the general public, agencies, organizations, and other interested parties. Public comment on the DEIR will be accepted in written form. (CEQA Guidelines §§15086-15087).

1.3.4 Response to Comments / Final Environmental Impact Report

Following the public review period, a Final EIR (FEIR) will be prepared. The FEIR will include written Response to Comments on the comments received during the public review period for the DEIR. The FEIR may also contain additional information clarifying the Project or addressing comments received on the DEIR, where necessary. The SWRCB will review and consider the FEIR prior to their decision to approve or conditionally approve the proposed Project. The FEIR, including the Responses to Comments, will be available at least 10 days prior to the meeting. (CEQA Guidelines §§15088 and 15089).

1.3.5 Certification of the Environmental Impact Report

Should the SWRCB find that the FEIR is "adequate and complete," the SWRCB may certify the FEIR. The rule of adequacy generally holds that the EIR can be certified if: 1) it shows a good faith effort at full disclosure of environmental information, and 2) provides sufficient analysis to allow decisions to be made regarding the Project in contemplation of environmental considerations. (CEQA Guidelines §15090).

1.3.6 Project Consideration

After review and consideration of the FEIR, the SWRCB can consider taking action on the proposed Project (CEQA Guidelines § 15092). A decision on the Project application will be accompanied by written Findings in accordance with CEQA Guidelines §15091, and, if applicable, §15093. (Public Resources Code §§21081 and 21081.5) A Notice of Determination (NOD) is then filed within 5 working days after deciding to carryout or approve a project (CEQA Guidelines §15094).

1.3.7 Mitigation Monitoring and Reporting Program

Public Resources Code §21081.6(a) requires lead agencies to adopt a reporting or monitoring program to describe measures that have been adopted or made a condition of Project approval in order to mitigate or avoid significant effects on the environment. The mitigation program adopted by the SWRCB as conditions for approval of the Project will be included in a Mitigation Monitoring and Reporting Program (MMRP) designed to reduce or avoid potentially significant effects on the environment. (CEQA Guidelines §15097). The MMRP ensures the mitigation program is carried out during Project implementation.

1.4 Organization and Scope of the EIR

The Eagle Mountain Pumped Storage Hydroelectric Project DEIR is organized as follows:

Executive Summary. This section presents a summary of the proposed Project and Alternatives considered in this EIR, identifies areas of controversy, significant unavoidable impacts, and provides a summary of potential environmental impacts and the mitigation program directly related to such impact. Also within the section is comprehensive table that lists the threshold of significance, environmental impact, trigger point, related mitigation program, and residual impact.

Section 1.0 – Introduction. This section describes the purpose and scope of the EIR which is based on the CEQA EIR process. Public scoping efforts are discussed, including environmental issues to be analyzed in the EIR. The public review and intent of the EIR document are addressed, followed by an organizational list of EIR sections.

Section 2.0 – Project Description. This section defines the Project Description, including the location and identification of potential environmental issues. Within this section are the Project Objectives, existing environment and background, and identification of potential environmental impacts. Lastly, this section concludes with a list of agencies expected to use the EIR document for review of approvals and permits required for implementation of the proposed Project.

Section 3.0 – Environmental Analysis. This section describes the regional and local environmental setting for the proposed Project. The section also describes the regulatory setting (if applicable), thresholds of significance, and includes a discussion of potentially significant adverse environmental impacts associated with the proposed Project for each environmental issue area. Where applicable, this section outlines a mitigation program based on project design features and/or mitigation measures to reduce or avoid potentially significant impacts and identifies the residual level of significance of the impact once the mitigation program is implemented. This section addresses each of these resource topics in detail:

> **Geology and Soils –** Construction activities of the dams and reservoirs, along the water conveyance corridor or transmission line corridor, and Project operations may have the potential to impact the geological resources on-site.
>
> **Surface Water –** Construction activities along the water conveyance corridor or transmission line corridor, and Project operations planned at the facility may impact groundwater levels, groundwater quality, or springs and wells.

Groundwater – Construction and operation will affect this resource. This section discusses groundwater quality and supply data for the Chuckwalla Valley Groundwater Basin, aqueducts, springs/wells, water bearing formation, and hydraulic characteristics.

Agricultural Resources – This discussion focuses on the Project's compatibility with existing agricultural and forestry resources land uses.

Biological Resources – Construction and operational activities planned at the facility, along the water conveyance corridor or transmission line corridor may impact plant communities and wildlife. The Project will be required to adhere to federal, state and regional biological plans.

Threatened & Endangered Species – Project implementation may impact state listed threatened and/or endangered species having the potential to occur on-site, or having suitable habitat on-site or in the Project vicinity.

Aesthetic Resources – The physical character of the site will be modified. The overall aesthetic appearance of the facilities as viewed from off-site requires evaluation to ensure consistency with national and regional standards.

Cultural Resources – Construction and operational activities proposed at the pumped storage hydroelectric facility or along the water conveyance corridor or transmission line corridor may have the ability to impact archeological, paleontological, or historical resources within the Area of Potential Effect.

Land Use, Public Services, Planning & Utilities – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor will change the existing land use on-site, and have the potential to affect public services times and utility capacities The existing land use is an out of use iron ore mine that has been inactive as an iron mine since 1983. At present, gravel mining and military training is conducted on the site. Development on this site will be evaluated for compatibility with surrounding land uses and correspondence with the national and regional long term goals.

Recreation – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor may have the ability to impact surrounding recreational areas, including the Joshua Tree National Park and Wilderness Area.

Population & Housing – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor may increase population and/or housing demands within the region.

Transportation & Traffic – Construction activities and operational phases have the potential to increase traffic and decrease level of service.

Air Quality – Construction, operational activities, and truck and automotive traffic anticipated and planned at the facility will generate emissions and dust that may have an effect on local and/or regional air quality.

Noise – Construction and operational activities of the pumped storage hydroelectric facility could generate increased noise levels adversely affecting surrounding sensitive receptors.

Greenhouse Gas Emissions – Construction may affect these levels, however, operational activities would displace energy demand for fossil-fueled power plants and if effectively used would reduce GHG emissions necessary for meeting the energy demands in California and assist meeting future targets for a larger portfolio of renewable power generation sources.

Hazards & Hazardous Materials – Construction and operational activities may impact potential public health and environmental issues related to hazards and the use of hazardous materials associated with construction and operations proposed for the Eagle Mountain Pumped Storage Hydroelectric Project area. This section also describes potential wildland fire hazards.

Environmental Justice – Although not required under CEQA, the EIR provides this discussion relevant to with applicable regulations and policies. This section addresses the question of whether and how the impacts of the proposed Project and alternatives may disproportionately affect minority populations and low-income populations or Native American communities.

Section 4.0 – Alternatives Analysis. The purpose of the alternatives analysis is to identify ways to mitigate or avoid the significant effects a project may have on the environment; as such, this section begins by providing an overview of the alternative selection process. This section describes the alternatives to the proposed Project and compares their relative impacts to those of the proposed Project while considering the Project objectives and specific evaluation criteria. This section also provides a description of alternatives considered but rejected from further analysis, as well as, the determination of the environmentally superior alternative.

Section 5.0 – CEQA Mandated Discussions. This section discusses potentially significant irreversible effects and irretrievable commitments of resources, the potential for growth inducing impacts, and cumulative impacts. The purpose of this section is to evaluate the potential for growth-inducing effects of the proposed Project. Additionally, this section considers the effects of the proposed Project that would result in a commitment of resources and uses of the environment that could not be recovered if the proposed Project were constructed, as well as describing the potential for unavoidable adverse impacts from the proposed Project. Cumulative impacts are those impacts that are individually less than significant but, when considered together with related impacts of other projects in the affected area, could result in a combined effect that is significant.

Section 6.0 – Mitigation Summary. This section presents a comprehensive matrix of the mitigation program recommended within the DEIR which catalogs the potential environmental impact, level of significance, related mitigation program, and residual impact after implementation of the mitigation program (Table 6.1). In addition, a Mitigation Monitoring and Report Program table (Table 6-2) is provided as a verification tool to provide the Lead Agency, Applicant/Owner/Operator, among others, the mitigation program task, staff monitor, timing of compliance, and date of compliance.

Section 7.0 – References. This section provides a list of the sources of information cited in the DEIR.

Section 8.0 – Organizations and Persons Consulted. This section identifies the individuals, agencies, and organizations consulted in preparing the DEIR.

Section 9.0 – List of DEIR Preparers. This section provides the names of the SWRCB staff and consulting scientists and planners who contributed to preparation of the DEIR.

Appendices (supporting data and technical information referenced in the DEIR)

Section 10.0 – Appendix A – Sensitive Species in Project Area

Section 11.0 – Appendix B – Fish and Wildlife Observed in Project Area

Section 12.0 – Appendix C – Technical Memoranda

- 12.1 Stage 1 Design Level Site Investigation Plan
- 12.2 Erosion and Sediment Control Plan
- 12.3 Preliminary Groundwater Supply Wells, Pipeline, and Operating Costs: Eagle Mountain Pumped Storage Project
- 12.4 Groundwater Supply Pumping Technical Memorandum
- 12.5 Eagle Mountain Pumped Storage Project: Seepage Analysis for Upper and Lower Reservoirs
- 12.6 Seepage Recovery Wells, Groundwater Modeling Report
- 12.7 Schedule, Manpower, and Equipment Utilization During Construction of the Eagle Mountain Pumped Storage Project
- 12.8 Eagle Mountain Pumped Storage Project- Landfill Compatibility
- 12.9 Project Drainage Plan and Reservoir Spillway Designs
- 12.10 Appendix to Air Quality Analysis, Construction-Related Data
- 12.11 Class I Cultural Resources Investigation for the Proposed Eagle Mountain Pumped Storage Project.
- 12.12 Class III Cultural Resources Report

12.13 Draft Historic Properties Management Plan
12.14 Biological Mitigation and Monitoring Reports, and Biological Assessment of Desert Tortoise.
12.15 Golden Eagle Aerial Surveys for Eagle Mountain Pumped Storage Project in the Mojave Desert Region, California.
12.16 Results of Class I record search and Class III field inventory of Eagle Mountain Pumped Storage Project alternative transmission line corridors and substations.

Section 13.0 – Appendix D – Scoping Materials

1. State Clearinghouse Notice of Preparation (NOP)
2. Distribution List
3. FERC Notice of Scoping
4. Scoping Document 1
5. Scoping Document 2
6. Transcript of Scoping Meeting
7. Comments Received During Comment Period

Section 14.0 - Figures

1.5 Threshold of Impact / Impact Terminology

The threshold of impact utilized throughout this EIR to assess potential environmental impact as a result of Project implementation was developed in consultation with the SWRCB (Lead Agency), CEQA Guidelines, local/regional plans and ordinances, accepted standards of practice, and/or consultation with recognized environmental experts. Within Section 3.0 Environmental Analysis, each resource section provides specific criteria for determining environmental impact assessment.

The following terminology is used throughout the DEIR to describe the level of significance of potential environmental impacts:

- A finding of **no impact** is appropriate if the analysis concludes that the Project would not affect the particular resource in any way.
- An impact is considered **less than significant** if the analysis concludes that it would not cause substantial adverse change to the environment and requires no mitigation.
- An impact is considered **potentially significant and subject to the mitigation program** if the analysis concludes that it could have a substantial adverse effect on the environment and requires implementation of a mitigation program.
- An impact is considered **significant and unavoidable** if the analysis concludes that it would cause substantial adverse change to the environment and no feasible mitigation program was developed taking into account economic, environmental, legal, social, and technological factors.

1.6 Mitigation Program

Implementation of the recommended mitigation program would reduce potentially significant impacts to a less than significant level; except for the resource areas of Groundwater, Aesthetics, and Air Quality for unavoidable and significant environmental impacts; of which will require a statement of overriding consideration (CEQA Guideline §15093). Where stated, the potential environmental effects of the proposed Project are categorized to reduce the impacts to levels less than significant. The mitigation program includes both project design features (PDFs) and mitigation measures (MMs).

Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Because project design features are incorporated into the Project, either in the Project design or by law as part of Project implementation, they do not constitute mitigation measures, which are required to reduce or avoid a potentially significant impact. For clarity, project design features are described within the mitigation program and are described within the analysis of each CEQA resource topic. Mitigation measures are provided to reduce all impacts from the proposed Project to below a level of significance, where applicable.

1.7 Public Review of the EIR

This DEIR is being circulated to Federal, State, regional and local agencies, and interested organizations and individuals that may wish to review and comment on the proposed Project. Publication of this DEIR marks the beginning of a 45-day public review period during which written comments may be submitted to the SWRCB at the following address:

Mr. Paul Murphey
Re: Eagle Mountain Pumped Storage Project
State Water Resources Control Board
1001 I Street, 14th Floor
Sacramento, California 95814
Telephone: (916) 341-5435

Comments may also be submitted electronically. Address comments to pmurphey@waterboards.ca.gov. Please reference “Eagle Mountain Pumped Storage Project” in the subject line of the email.

Copies of the DEIR are available to the public at the on the SWRCB’s website, at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/water_quality_cert/ceqa_projects.shtml#eagle

Copies are also available for viewing at the California EPA Building 1001 I Street, 2nd Floor, in the Water Rights File Room, Sacramento, California and at the Indio Library, 200 Civic Center Mall, Indio, CA 92201; Lake Tamarisk Library, P.O. Box 260, 43-880 Tamarisk Drive, Desert Center, CA 92239; and at the Palo Verde Valley District Library, 125 W. Chanslorway, Blythe, CA 92225.

2 Project Description

This section of the Draft Environmental Impact Report (EIR) presents the Project Description which includes the goals and objectives of the proposed Eagle Mountain Pumped Storage Project (Project), the precise location and boundaries of the Project site, and a general description of the technical, economic, and environmental characteristics. The Project Description provides information regarding the Project components, facilities, operation, and project design features. In addition, this section discusses the Project goals and objectives, identifies the potential environmental impacts associated with construction and operational activities of the proposed Project, identifies the public agencies that are expected to use this EIR in their decision-making process, provides a list of the approvals and permits required to implement the proposed Project, and list of related environmental review and consultation requirements required by Federal, State, and local laws, regulations, or policies.

As outlined in the California Environmental Quality Act (CEQA) Guidelines §15124, the description of the Project shall contain the above mentioned information, but does not require extensive detail beyond that needed for evaluation and review of the environmental report.

2.1 Existing Environment and Background

The Eagle Crest Energy Company (ECE or Project Applicant) has submitted to the State Water Resources Control Board (SWRCB) an application for a Section 401 Water Quality Certification, under the Clean Water Act. The Project Applicant intends to develop the proposed Project near the town of Eagle Mountain (just north of the unincorporated town of Desert Center), located within eastern Riverside County, California (Figure 2-1).

The proposed Project is a large scale energy storage project that will provide electrical generation peaking capacity and transmission system regulating benefits deemed essential for integration of a high level of renewable wind and solar generation sources, and to maintain transmission reliability for southwestern electric utilities.

The basic mode of operation for the Project will be typical of most pumped storage projects: storing low-cost energy for use to provide peaking generation during periods of high power demand. This pattern would use the available, unused capacity of wind generation at night and solar power on weekends, for energy to pump water from the lower reservoir to the upper reservoir. During the day, the Project would operate as a hydroelectric generation project, releasing water from the upper reservoir through the reversible turbines to the lower reservoir to generate power.

The Project, with a cycle efficiency of 79 percent would use approximately 1.25 kilowatt hour (kWh) of low cost energy to produce 1.0 kWh of much higher value energy in a different time period. The annual plant capacity factor (ratio of average annual output to installed capacity) will be in the range of 20 to 37.8 percent.

2.2 Statement of Goals & Objectives

The proposed Project would provide hydroelectric generation to meet part of California's power requirements, resource diversity, and capacity needs. The Project would have an installed capacity of 1,300 megawatts (MW) and generate a maximum of 4,308 gigawatt hour (GWh) per year, assuming a capacity factor of 37.8 percent.

Goal and Objective #1 – Support California's Energy Policy

California's energy policy calls for maintaining a reliable, efficient, and affordable energy system that minimizes the environmental impacts of energy production and use (CEC, 2009). The California Energy Commission (CEC) recognizes that although the economic downturn has reduced energy demand in the short-term, demand is expected to grow over time as the economy recovers. It is essential that the State's energy sectors be flexible enough to respond to future fluctuations in the economy and that the State continue to develop and adopt the "green" technologies that are critical for long-term reliability and economic growth (CEC, 2009).

The proposed Project will be a significant addition to California's energy reliability and efficiency by providing flexibility in generation and providing energy storage for integration of renewable energy projects.

Goal and Objective #2 – Provide Generation to Meet Part of California's Peak Power Requirements

Power from the proposed Project would help meet a need for power in the southern California region in both the short- and long-term. The proposed Project will be capable of providing 1,300 MW of generating capacity, with an energy storage volume capable of providing maximum generating discharge for 18.5 hours. Water stored in the upper reservoir will provide approximately 22,000 megawatt hours of on-peak generation.

According to the CEC's 2009 Integrated Energy Policy Report (IEPR), CEC-100-2009-003-CMF, the CEC staff forecast of future electricity demand shows that consumption will grow by 1.2 percent per year from 2010 to 2018, with peak demand growing an average of 1.3 percent annually over the same period. The current forecast is markedly lower than the forecast in the 2007 Integrated Energy Policy Report, primarily because of lower expected economic growth in both the near- and long-term as well as increased expectations of savings from energy efficiency. Because of economic uncertainties surrounding the current recession and the timing of potential recovery, the IEPR Committee directed staff to look in its forecast at alternative scenarios of economic and demographic growth and their impacts on electricity demand. Staff analyzed both optimistic and pessimistic scenarios and found only small differences in projected electricity demand. Annual growth rates from 2010 to 2020 for electricity consumption and peak demand would increase from 1.2 percent and 1.3 percent, respectively, to 1.3 percent and 1.4 percent in the optimistic case and fall to 1.1 percent each under the pessimistic scenario.

Figure 2-4 shows the 2009 CEC projection for energy consumption in California. California is projected to use 309,581 GWh of electricity by 2018. Figure 2-5 shows the 2009 CEC projection for peak demand. Peak demand is projected to reach 69,240 MW by 2018.

Goal and Objective #3 – Provide Energy Storage for Integration of Renewable Energy Generation

According to the CEC, the California Independent System Operator (CAISO), and the major electric utilities in the State, large scale energy storage is essential for successful integration of wind and solar renewable power generation and maintaining reliable transmission grid operations (CEC Workshop on Energy Storage Technologies, April 2, 2009).

Not all renewable generators provide the operating characteristics that the electrical transmission system needs to maintain local area reliability, and integrating certain renewable technologies can make it more difficult to operate the system reliably (CEC, 2009).

While geothermal and biomass resources can provide baseload power, resources like wind, hydro, and solar are intermittent and not always available to meet system needs during peak hours. Intermittent resources can also drop off or pick up suddenly, requiring quick action by system operators to compensate for the sudden changes. Significant energy storage will be required to integrate future levels of renewables, thus allowing better matching of renewable generation with electricity needs. These technologies can also reduce the number of natural gas-fired power plants that would otherwise be needed to provide the characteristics the system needs to operate reliably (CEC, 2009).

The CEC's recognition of the need for storage as an essential element in attaining the State's Renewable Portfolio Standard (RPS) goals of 2020 is very important, as is the recognition that storage is not generation, transmission, or distribution, but rather a special and distinct function required for reliable grid operations and power flow management. This recognition is consistent with the unanimous consensus among the transmission system operator and the major utilities that adding significant storage capacity is the only means to successfully integrate wind and solar power to meet the State's 33 percent renewable power generation goals and maintain reliable grid operations. As a related consequence, large scale energy storage will also be essential to meeting the State's goals for reductions in greenhouse gases (GHG) by displacing existing natural gas peak power generation.[1]

The need for pumped storage as a companion to renewable energy development is well recognized by national energy policy makers. For example, the United States Department of Energy (DOE) Secretary Steven Chu's remarks on the Nation's Energy Future – presented at the DOE National Electricity Delivery Forum, February 18, 2009[2] – specifically cited the benefits of pumped storage for integrating renewable energy sources and maintaining reliable transmission operations. Likewise, comments of FERC Chairman Jon Wellinghoff before the Senate Energy and Natural Resources Committee Hearing in December 10, 2009[3] noted these same benefits and the importance for storage as one part of the nation's future energy strategy.

Pumped storage hydroelectric generation is recognized as one of only two feasible "bulk storage" technologies (Compressed Air Energy Storage – CAES – being the other), and the only one to have been proven on large scales. Other emerging technologies (mainly batteries and flywheels) are much smaller in scale and have significant R&D timelines, but are expected to play a role in small scale applications and management of electricity distribution systems.

A recent study for the DOE Energy Storage Systems Program (*Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide*, Sandia Report, February 2010; Jim Eyer and Garth Corey), highlights numerous renewable energy integration applications of energy storage including renewable energy time-shift, capacity firming, and wind generation grid integration.

The proposed Project's location in the southern California transmission grid is complimentary to support existing wind power generation in the San Gorgonio Pass, Tehachapi, and the Salton Sea area, and thousands of megawatts of proposed wind and solar power generation in the Mohave Desert, Chuckwalla Basin and Palo Verde Valley.[4].

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[1] Workshop participants and CEC staff indicated that California will need an estimated minimum of 4,000 MW of energy storage by 2020.

[2] *See* Secretary Steven Chu's address at the National Electricity Delivery Forum (February 18, 2009), *available at* http://www.c-span.org/Watch/watch.aspx?MediaId=HP-A-15640

[3] *See* Chairman Jon Wellinghoff's testimony before the Senate Committee on Energy and Natural Resources (Dec. 10, 2009), *available at* http://www.ferc.gov/EventCalendar/Files/20091210101921-12-10-09-wellinghoff-testimony.pdf.

[4] Several thousand megawatts of solar power are proposed for development in the nearby Chuckwalla Basin and Palo Verde Valley that may offer opportunities for complimentary transmission operations.

Goal and Objective #4 – Provide Ancillary Services for Management of the Transmission Grid

Specific transmission operations – known collectively as “ancillary services” – include spinning reserves, voltage regulation, load following, Black Start, and possibly protection against over-generation. Pumped storage is capable of providing all of these ancillary services.

Spinning reserve is defined by the CAISO as the on-line reserve capacity that is synchronized to the grid system and ready to meet electric demand within 10 minutes of a dispatch instruction by the ISO. Spinning reserve is needed to maintain system frequency stability during emergency operating conditions and unforeseen load swings[5].

In electrical engineering, voltage regulation is the ability of a system to provide near constant voltage over a wide range of load conditions. Voltage regulators are an important part of power systems and power supplies.

Load following is a utility's practice of adding additional generation to available energy supplies to meet moment-to-moment demand in the distribution system served by the utility, and/or keeping generating facilities informed of load requirements to insure that generators are producing neither too little nor too much energy to supply the utility's customers.

Black Start is the procedure to recover from a total or partial shutdown of the transmission system which has caused an extensive loss of supplies. This entails isolated power stations being started individually and gradually being reconnected to each other in order to form an interconnected system again. In general, all power stations need an electrical supply to start up: under normal operation this supply would come from the transmission or distribution system; under emergency conditions Black Start stations receive this electrical supply from small auxiliary generating plant located on-site. Not all power stations have, or are required to have, this Black Start capability, but pumped storage hydropower projects have value because they do have Black Start capability, and as such they can assist in the restoration of power to the grid in the event of a major outage.

Over generation is a condition that occurs when power demand is less than or equal to generation. The CEC is conducting an analysis to identify solutions to integrate increasing levels of energy efficiency, smart grid infrastructure, and renewable energy while avoiding infrequent conditions of overgeneration. Pumped storage hydropower provides a solution for overgeneration by using excess generation to pump water to the upper reservoir, thus storing the energy for peak demand periods or when intermittent renewable generation is not available.

[5] http://www.caiso.com/docs/2003/09/08/2003090815135425649.pdf - accessed May 3, 2010.

In general, ancillary services provided by pumped storage hydroelectric generation ensures reliability and supports the transmission of energy from generation sites to customer loads.

Goal and Objective #5 – Provide for Flexible Transmission Grid Operations

One additional energy system function that the Project will provide critical support for is development of the "Smart Grid," which entails operational improvements in the electrical grid to substantially improve transmission efficiency, reliability, and affordability, while fully incorporating renewable and traditional energy sources and potentially reducing carbon emissions; (U.S. Department of Energy, *The Smart Grid: An Introduction; How a smarter grid Works as an enabling engine for our economy, our environment, and our future. 2004.)*

Utility scale energy storage (as proposed with the Eagle Mountain Pumped Storage Project) provides the means for flexible grid operations to improve overall system efficiency.[6]

Energy storage benefits identified in Eyer and Corey (2010) that are critical to reliable grid operations include reserve capacity, area regulation, voltage support, load following, transmission congestion relief, electric service reliability, avoided transmission energy losses, reduced fossil fuel generation use, and reduced air emissions from generation, among others.

Operational flexibility provided by pumped storage hydro systems comes from the ability to integrate renewable resources that generate during off-peak demand periods, and that naturally fluctuate in generation output as variable wind speed and cloud cover affect wind and solar energy production (by generating for voltage regulation, ramping and load following). These functions improve system reliability as well, by maintaining a constantly charged electrical grid, providing emissions-free generation to meet peak demands, and providing "Black Start" capabilities in the event of a system failure (regional outages and massive blackout) in which energy is needed to recharge the grid and provide power needed to restart other traditional generation sources.

Goal and Objective #6 – Reduce Greenhouse Gas Emissions

Operating a smarter grid also reduces waste (reducing GHG emissions), allows full integration of renewable energy generation sources that do not produce GHG emissions, and provides GHG-free peak power generation that displaces traditional single cycle natural gas GHG-producing peak power generation. Energy storage, and particularly at the utility scale proposed with this Project, is an essential enabling technology for these future smart grid operations and related attainment of State, national, and international environmental goals for addressing GHG emissions.

[6] The DOE estimates that a 5% improvement in efficiency nationwide would be equivalent to eliminating greenhouse gas emissions from 53 million cars. (DOE, The Smart Grid, 2004.)

Goal and Objective #7 – Re-use Existing Industrial Site

The environmental impacts of energy generation can be minimized by siting facilities on previously disturbed sites. The Eagle Mountain Mine site has four large mining pits, and associated tailing impoundments and waste rock sites. The mine site has been denuded of vegetation and has little, if any, value to wildlife or native species. No recreational activities are allowed at the site. Iron mining was discontinued in 1983. Using this site for energy generation will limit the potential environmental impacts.

Goal and Objective #8 – Locate Energy Generation Adjacent to the Transmission Grid

By locating energy generation facilities in close proximity to the transmission grid, the environmental impacts of the construction and operation of transmission interconnection is minimized. In addition, shorter transmission interconnection results in reduced Project costs, benefiting the rate payer.

Goal and Objective #9 – Generate Hydropower Without Causing Impacts to Surface Waters and Aquatic Ecosystems

By locating the proposed Project in existing mining pits, all impacts to streams, fisheries resources, wetlands, and other aquatic ecosystems are completely avoided. No natural waters will be affected.

2.3 Proposed Project

The Project will use off-peak energy to pump water from the lower reservoir to the upper reservoir during periods of low electrical demand and generate energy by passing the water from the upper to the lower reservoir through the generating units during periods of high electrical demand. In general, the low demand periods are expected to be during weekday nights and throughout the weekend, and the high demand periods are expected to be in the daytime during weekdays. The Project will provide an economical supply of peaking capacity, as well as load following, system regulation through spinning reserve, and immediately available standby generating capacity.

The Project will provide 1,300 MW of generating capacity, using reversible pump-turbine units, with four units of 325 MW each. The Project reservoirs will be formed by filling existing mining pits with water (Figure 2-2). The mining pits are empty and have not been actively mined for decades. There is an elevation difference between the reservoirs that will provide an average net head of 1,410 feet. The proposed energy storage volume will permit operation of the Project at full capacity for 10 hours each weekday, with 12 hours of pumping each weekday night to fully recharge the upper reservoir on a weekly basis, with additional pumping on weekends. The amount of active storage in the upper reservoir will be 17,700 acre-feet, providing 18.5 hours of energy storage at the maximum continuous generating discharge. Water stored in the Upper Reservoir can provide approximately 22,000 MWh of on-peak generation. Tunnels will connect the two reservoirs to convey the water, and the generating equipment will be located in an underground powerhouse.

A 500 kilovolt (kV) double circuit transmission line will convey power to and from the Project through an interconnection collector substation located west of the unincorporated town of Desert Center, California (Figure 2-3). System improvements and accessible power markets will be investigated during upcoming system analysis performed by the CAISO in coordination with Southern California Edison.

The Project will be located entirely off-stream in that neither the upper nor lower reservoirs intercept a surface water course. The reservoirs will receive only incidental runoff from surrounding slopes in a very limited watershed area within the historically mined lands. Water to initially fill the reservoirs and annual make-up water will be pumped from groundwater within the adjacent Chuckwalla Valley. The Applicant has acquired land and attendant water rights to three properties in the Chuckwalla Valley where three new wells will be installed and connected to a central collection pipeline corridor.

The Mine Reclamation Corporation (MRC), a division of Kaiser Ventures LLC (Kaiser), intends to develop portions of the mine site for a major landfill (the Eagle Mountain Landfill or landfill). As such, the pumped storage Project has been formulated with the assumption that the landfill will exist as proposed by the landfill developers. As detailed in this Draft EIR, the landfill and pumped storage Project are deemed compatible in that neither would materially interfere with the construction or operation of the other (*see* Section 3.9 Land Use and Section 12.5 Eagle Mountain Pumped Storage Project – Landfill Compatibility). Kaiser currently owns a portion of the lands within the Project site. Whether by lease, acquisition of fee title or otherwise, ECE will obtain the property rights required for Project purposes consistent with the requirements of the Federal Power Act.

More details about the characteristics and description of the major features of the Project are available in Table 2-1 below.

Table 2-1. Significant Data for Eagle Mountain Pumped Storage Project

Project Feature	Feature Data
Hydroelectric Plant	
Total Rated Capacity	1,300 MW
Number of Units	4 (Reversible)
Unit Rated Capacity	325 MW
Maximum Plant Discharge	11,600 cfs
Pump/Turbine and Motor/Generator Unit Data	
Rated Head	1410 ft

Project Feature	Feature Data
Rated Turbine Output	319 MW
Maximum Turbine Flow	2,900 cfs
Operating Speed	333.3 rpm
Generator Rating	347 MVA
Low Pressure Upper Tunnel	
Diameter	29 ft
Length	4,000 ft
Shaft	
Diameter	29 ft
Length	1,390 ft
High Pressure Lower Tunnel	
Diameter	29 ft
Length	1560 ft
Tailrace Tunnel	
Diameter	33 ft
Length	6,835 ft
Powerhouse Cavern	
Height	130 ft
Length	360 ft
Width	72 ft
Upper Reservoir	
Dam Type	Roller-compacted
Volumes	
Total Reservoir Capacity	20,000 ac-ft
Inactive Storage	2,300 ac-ft
Active Storage	17,700 ac-ft
Operating Levels	
Minimum Operating Level	El. 2343
Maximum Operating Level	El. 2485
Water Surface Areas	
Water Surface Area at El. 2,343 feet	48 acres
Water Surface Area at El. 2,485 feet	191 acres
Dimensions of Dams	
Structural Heights (West and South Saddle Dams)	60 ft and 120 ft
Top Widths	20 ft (both dams)
Crest Lengths	1100 to 1300 ft
Crest Elevation	El. 2490
Spillway, ogee crest elevation	El. 2486
Spillway Width	100 ft
Spillway Channel Length	4,230 ft
Spillway Channel Elevations	El. 2380 - 2200
Lower Reservoir	

Project Feature	Feature Data
Dam Type	None
Volumes	
Total Reservoir Capacity	21,900 ac-ft
Inactive Storage	4,200 ac-ft
Active Storage	17,700 ac-ft
Operating Levels	
Minimum Operating Level	El. 925
Maximum Operating Level	El. 1092
Water Surface Areas	
Water Surface Area at El. 925 feet	63 acres
Water Surface Area at El. 1,092 feet	163 acres
Spillway Ogee Crest elevation	El. 1094
Spillway width	15 ft
Water Treatment Facilities	
Treament Type	Reverse osmosis
Volume treated	2055 gpm
Target water quality (Total dissolved solids)	~660 ppm
Brine ponds	56 acres
Brine quantity (annual)	270 ac-ft
Frequency of salt removal from ponds for disposal	Every 10 years
Water Supply Wells	3
Pumps	2,000 gpm 1,000 HP
Monitoring Wells	15
Seepage Recovery Wells	13
Extensiometers	2
Roads (new, all within Project site)	
To West Saddle Dam, from existing access road	0.32 mi.
Elevator access road	0.36 mi
On north side of lower reservoir, to lower reservoir inlet	0.96 mi
To South Saddle Dam, from existing access road (existing road to be improved)	0.78 mi

2.4 Detailed Description of Project Facilities & Components

A map showing the proposed Project layout and proposed Project boundary are found in Figures 2-6 and 2-7.

2.4.1 Upper Dams and Reservoir

The Central Pit of the Eagle Mountain Mine will be utilized for the Upper Reservoir. The bottom of the pit is at elevation 2,230, and the existing low point of the rim is at elevation 2,380. The active storage portion of the reservoir is planned between elevation 2,343 feet and elevation 2,485. The volume between these elevations is 17,700 acre-feet, and the respective surface areas are 48 and 191 acres. The existing low points of the pit rim are at elevation 2,380 and elevation 2,440. To obtain the required volume of storage it will be necessary to construct two dams along the perimeter of the pit. These dams are identified as the South Saddle Dam and West Saddle Dam (Figure 2-8).

The dams are planned to be constructed of roller-compacted concrete (RCC) with an upstream membrane liner and foundation grouting to control seepage. The crest elevation of the dams will be elevation 2,490 and the crest width will be 20 feet. The South Saddle Dam will have a height of 120 feet and a crest length of 1,300 feet. The West Saddle Dam will have a height of 60 feet and a crest length of 1,100 feet. Dam construction will require preparation of the foundation to remove any waste materials from mining, overburden, and weathered rock to expose firm, un-weathered bedrock prior to placement of dental and leveling concrete and the RCC lifts. For Project planning and based on available information, ECE assumed an average of 10 feet of excavation would be required for the foundation. Normal freeboard was assumed to be 5 feet between the normal high-water level and the dam crest. As described in Section 12.9, a spillway will protect the upper reservoir in the very unlikely event of overtopping during an over-pumping event and to handle surface runoff from the very small surrounding watershed area into the reservoir.

Drilling and testing of the foundation and dam and testing of RCC aggregate sources will be initial design tasks performed when access rights to the site are obtained. A study plan has been prepared describing the geotechnical evaluations that will be undertaken when site access becomes available. That study plan is found in Section 12.1.

The downstream face of the dam was assumed to be 0.8 (H) to 1 (V), with no chimney section. This section is conservative based on experience and judgment with dam design in southern California. Many concrete gravity dams have steeper downstream faces and chimney sections in areas with greater seismic loads. Similar to the recently completed Olivenhain Dam in San Diego County, the upstream face of the dam would be formed with grout-enriched RCC and later covered with a membrane liner to control seepage. Seepage control is in the economic and environmental interest of the Project and will also protect the down-slope groundwater aquifer. The preliminary design concept includes a drainage gallery to accept flows from foundation drains provided to control uplift. The foundation would most likely require grouting for seepage control, and ECE assumed a double row grout curtain with depths equal to the height of the dam along the entire dam axis. Final design of the RCC will follow criteria established for RCC gravity dam design and comply with all requirements of the Federal Energy Regulatory Commission (FERC) and the California Division of Safety of Dams (DSOD).

Control of seepage from the upper reservoir will be important to minimize water losses and to limit the amount of reservoir water that could potentially reach the aquifer below the nearby Colorado River Aqueduct (CRA). Existing geologic data suggest that there is sufficient permeability of the fractured rock that underlies the Central Pit to produce seepage from the upper reservoir. The final design will include seepage control measures in the upper reservoir utilizing localized grouting and shotcrete placement and potentially other methods. During final design, geologic mapping will be performed and seepage control methods will be defined with greater certainty. Further discussion of seepage potentials and seepage control measures are provided in Sections12.5 and 12.6. Section 12.6 details a seepage mitigation program consisting of monitoring and pump-back recovery wells.

An excavated approach channel to the inlet/outlet (I/O) structure at the east end of the reservoir will have a bottom width of 100 feet and side slopes of 0.5 horizontal to 1.0 vertical. The approach channel will have an invert at elevation 2,287 and slope down to the tunnel invert at elevation 2,282. The I/O structure will have a trashrack with a gross area that is about 84 feet wide by 60 feet high. Three piers within the flared portion of the I/O structure will assist in spreading flow uniformly over the trashrack area in the pumping mode. The upper reservoir I/O structure will be equipped with a fixed-wheel gate for emergency closure and tunnel inspection. The I/O structure in the upper reservoir will be a reinforced concrete gravity structure founded on competent bedrock.

The slopes above the maximum normal reservoir pool (elevation 2485) will be evaluated relative to their stability under normal and earthquake loading conditions. Based on these analyses, slope stabilization measures may be required to prevent a slide of material into the reservoir that could result in loss of storage and/or overtopping of the dams. These measures could include: flattening of slopes; rock-bolting of unstable zones, if found; and placement of shotcrete or rock fencing.

The entire upper reservoir area will be fenced and gated to prevent the entry of unauthorized personnel and the public both during and after construction. (Fencing for wildlife exclusion purposes is also proposed. This is described in more detail in Section 3.5 Biological Resources.)

Access to the dams and reservoir will be by improved roads planned as part of the landfill operation (but that may be built initially for this Project) and by new 30-foot-wide gravel roads constructed from the landfill road to the features.

2.4.2 Lower Reservoir

The East Pit of the Eagle Mountain Mine will form the lower reservoir for the Project. The bottom of the pit is at elevation 740, and the existing low point of the rim is at elevation 1,100. The active portion of the reservoir is planned between elevation 925 and elevation 1,092. The volume between these elevations is 17,700 acre-feet, and the respective surface areas are 63 and 163 acres. The entire active reservoir volume can be contained within the pit; therefore, construction of dams will not be necessary to create the lower reservoir (Figure 2-8).

Seepage potential from the lower reservoir is expected to be more significant than from the upper reservoir because the east end of the mine pit is in alluvial material. Studies conducted by Kaiser and MRC (1991) [in EMEC, 1994] indicated that the horizontal permeability of these alluvial deposits is relatively high (EMEC, 1994). Multiple seepage control measures may be required. Detailed geologic mapping will be performed once site access is obtained in order to identify areas where provision of a seepage blanket will be effective. This blanket will be comprised of fine tailings from the mining operation placed on the bottom and flat areas of the reservoir. Depending upon the impermeability of this material, it may also be necessary to top it with a layer of the finer tailings from the nearby fine tailings ponds or to mix the tailings with imported clay materials (bentonite) to further reduce permeability. In addition to this general blanketing at the eastern end of the pit, some localized blanketing may be required at other locations in the lower reservoir. Also, grouting and shotcrete placement may be required following identification of high permeability zones. Other seepage control options that may be explored during design include interior slope modifications and placement of RCC or soil cement over the areas with greatest seepage potentials.

To support final engineering design, geologic mapping will be performed and seepage control methods will be defined with greater certainty for the lower reservoir. In addition, as discussed in Section 12.6, a seepage mitigation program consisting of monitoring and pump-back recovery wells will also be employed to ensure that seepage does not impact down-gradient groundwater or the CRA.

The I/O structure at the lower reservoir will be located near the west end of the reservoir and will be constructed in the sloping bank of the pit. The I/O structure approach channel will have an invert at elevation 862 and slope down to the tunnel invert at elevation 857. The structure will have a trashrack with a gross area that is about 84 feet wide by 60 feet high. A fixed-wheel gate will provide for emergency closure and for tailrace tunnel inspection. The I/O structure in the lower reservoir will be very similar to the one planned for the upper reservoir and will be a reinforced concrete gravity structure founded on competent bedrock.

The entire lower reservoir area will be fenced and gated to prevent the entry of unauthorized personnel and the public during construction and operation. Fencing for wildlife exclusion purposes is also proposed.

The slopes above the maximum normal reservoir pool (elevation 1092) will be evaluated relative to their stability under normal and earthquake loading conditions. Based on these analyses, slope stabilization measures may be required to prevent a slide of material into the reservoir that could result in loss of storage and/or overtopping of the dams. These measures could include: flattening of slopes; rock-bolting of unstable zones, if found; and placement of shotcrete or rock fencing.

Access to the reservoir will be by improved roads planned as part of the landfill operation (that may be initially developed for this Project) and by new 30-foot-wide gravel roads constructed from the landfill road to the features. Access will be afforded to the crests of each Upper Reservoir by gravel roads.

2.4.3 Spillways

The release system from the Lower Reservoir is proposed to be an overflow spillway and a channel from the southeast rim of the Lower Reservoir across mine property and the CRA. This channel would terminate beyond the CRA and flows would spread laterally at shallow depths over the alluvial fan. For Project planning, the Lower Reservoir spillway is assumed to be 15 feet wide, with an ogee crest at EL. 1,094. The ogee crest will have an approach depth of 5.6 feet, and varying height sloped side walls. With the reservoir at elevation1098, the spillway will discharge approximately 460 cubic feet per second (cfs). The Lower Reservoir Spillway Channel will be about 6,665 feet long and descend from approximately elevation 1,088 to approximately elevation 985. The Lower Reservoir Spillway Channel was modeled using the USACE HEC-RAS computer program to estimate the required size and velocities within the channel. The Lower Reservoir Spillway Channel will transition from the 15-foot wide ogee crest with vertical side walls to a 10-foot wide, minimum 5-foot-high, 2H:1V side slope channel in approximately 250-feet. The first 250 feet will be a concrete-lined channel, and the remaining portion of the channel will be lined with riprap. If the probable maximum flood (PMF) volume (11,520 acre-feet) is stored in addition to the water used for energy storage, it will be necessary to change the normal pumped-storage operating procedures to cause this excess water to be spilled. With the Lower Reservoir spillway described, the excess PMF volume could be released over a period of 305 hours (13 days).

A spillway will be provided for the Upper Reservoir at the South Saddle Dam. This spillway will handle any excess water that cannot be stored during the inflow design flood, which will be the PMF, and will also provide for protection of the dam if over-pumping should occur. Because the reservoirs are both off-channel and the reservoir volume used for generation is fixed, the potential for an over-pumping event causing over-topping of the Upper Reservoir dam is extremely small. Also, the RCC dams of the Upper Reservoir could be overtopped without causing dam failure. An overflow spillway with a crest length of 100 feet will be provided to pass approximately 3,120 cfs with a water surface at elevation 2,489. This capacity will handle routing of the PMF and also provides capacity somewhat greater than the pumping capacity of one turbine unit. The storage capacity between elevation 2,485 and the dam crest would provide two hours of storage for the full pumping discharge.

The spillway will be integral with the South Saddle Dam and consist of a formed ogee crest with an approach depth of 10-feet, and 4-foot high vertical side walls that transition to the stepped RCC downstream face of the dam where considerable energy dissipation will occur. At the toe of the dam a USBR Type III Stilling Basin will be constructed to dissipate the remaining excess energy of the flood flows. The stilling basin will be 100-feet wide, approximately 30-feet long, and have 12.5-feet high basin side walls. The basin floor will be set approximately at elevation 2,380, and transition to the spillway channel. The Upper Reservoir Spillway Channel will be about 4,230-feet long and descend from approximately elevation 2,380 to approximately elevation 2,200, where flows will be discharge into Eagle Creek. The Upper Reservoir Spillway Channel was modeled using the USACE HEC-RAS computer program to estimate the required size and velocities within the channel. The Upper Reservoir Spillway Channel will transition from the 100-foot wide vertical side wall stilling basin at the dam toe to a 20-foot wide, 10-foot-high, 2H:1V side slope channel over a distance of approximately 500-feet. The first 500-feet will be concrete-lined channel, and the remaining portion of the channel will be provided with armoring to protect against high velocities or energy dissipation structures to reduce velocities and protect against scour and erosion. The Upper Spillway Channel will cross an existing road in two locations and then the spillway channel flows will be discharged into Eagle Creek. Water from the spillway channel will reach the Lower Reservoir via Eagle Creek channel, which will be routed to the Lower Reservoir.

2.4.4 Conduits

A system of water conductor tunnels will convey water from the Upper Reservoir to the underground powerhouse and from the powerhouse to the lower reservoir in the generating mode (Figure 2-8). Flow will be reversed in the pumping mode of operation. From the upper reservoir I/O structure, an upper (“low head”) pressure tunnel will extend 3,963 feet to a 1,348-foot-deep vertical shaft connecting the upper tunnel to the lower (“high head”) tunnel; the lower pressure tunnel will extend 1,563 feet to a 35-foot-long penstock manifold; and four penstocks will extend approximately 500 feet to the turbine inlet valves at the powerhouse. From the powerhouse, the four individual tailrace tunnels will extend approximately 350 feet through a tailrace manifold, and the main tailrace tunnel will extend 6,635 feet from the manifold to the Lower Reservoir I/O structure.

The upper pressure tunnel and the main tailrace tunnel will be excavated by tunnel boring machine (TBM). The finished tunnel diameter for the upper pressure tunnel will be 29 feet. For planning, ECE assumed that the upper tunnel will be concrete lined; however, depending on rock quality, the upper tunnel may be not be lined throughout its entire length. A concrete-lined manifold will connect the lower pressure tunnel to the penstocks. The four penstocks will be completed to a finished diameter of 15 feet and will be steel lined. The four tailrace tunnels upstream of the concrete-lined tailrace manifold will be completed to a finished diameter of 16 feet. These tunnels will be concrete lined. The main tailrace tunnel from the manifold to the

Lower Reservoir will be completed by TBM or drill and blast methods. This tunnel will be shotcrete lined to a finished diameter of 33 feet.

The penstock lining steel is designed to be ASTM A537, Class 1, with a yield strength of 50,000 pounds per square inch (psi) and a design stress with normal pressure rise of 37,500 psi. The resulting thickness will be 1.625 inches. External pressure on the lining will be controlled with drains extending from a grout curtain at the end of the steel lining farthest from the powerhouse to the powerhouse cavern, with provisions for reaming out deposits in the future. Steel linings will be backfilled with concrete and low pressure grouted.

The penstock and tailrace manifolds will be concrete lined, as will portions of the individual penstocks and tailrace tunnels that are not steel lined. Just downstream of the tailrace manifold there will be a rock trap to collect rock spalls and prevent them from reaching the pump-turbines from downstream direction. Access to the rock traps for cleaning will be through a bulkhead door. The door is in a plugged section of a construction access tunnel.

Surge control facilities will be provided upstream and downstream from the powerhouse. The upstream surge chamber will be an enlargement of the vertical pressure shaft to a diameter of 90 feet. The surge chamber portion of the shaft will extend from elevation 2,270 to the ground surface at elevation 2,515 feet. The surge chamber will have a restricted orifice entrance to balance the transient pressure rise. The tailrace surge chamber will consist of two horizontal tunnels, each 550 feet long, connected with a shaft, which continues to a connection with the main tailrace tunnel immediately above a rock trap. The tunnels will be 26 feet wide by 26 feet high and horseshoe shape, and the shaft will be 12 feet in diameter. Both the tunnels and the shaft will be concrete lined. Air admission and release to and from the tailrace surge chamber will be through an air shaft extending to the ground surface outside of the landfill boundary. The tailrace surge chamber will also have a restricted orifice below the lower tunnel.

The surge tank shaft will open to the atmosphere and will day-light into a rock cut. The slope will be excavated and benched to be stable. Rockbolts and shotcrete will be used to assure long-term slope stability. If required, a rock-retaining fence or rock-retaining concrete wall will be placed around the perimeter of the shaft.

Waste rock from tunnel boring will be used to meet construction needs; such as for road base for access roads, miscellaneous backfills for access roads and around structures, flood berms, and potentially for RCC in the dams. Any excess material will be placed in the reservoirs or spoiled in areas from which fine tailings have been removed. The volume of waste rock is estimated 1,772,000 CY, which is equivalent to 1,100 AF unless materials are compacted where they are disposed. If materials are compacted, the volume is 1,541,000 CY (955 AF). The upper reservoir has 2,300 AF of dead storage, the lower reservoir has 4,200 AF of dead storage which can be used for disposal of excess waste rock.

2.4.5 Powerhouse

The powerhouse cavern will be located underground approximately 6,300 feet from the upper reservoir and 7,200 feet from the lower reservoir. The pump/turbine centerline will be at elevation 770 feet. The cavern will be sized to accommodate four 325 MW units. The cavern will be approximately 72 feet wide, 150 feet high, and 360 feet long. A separate transformer gallery a short distance downstream from the powerhouse will be approximately 46 feet wide, 40 feet high, and 400 feet long.

The powerhouse substructure and superstructure will be constructed of cast-in-place reinforced concrete. The pump/turbine spiral cases will be permanently embedded in second-stage concrete. Floors will be supported with concrete walls and columns. Walls will also serve to partition areas. Substructure and superstructure configurations will be dictated by final mechanical and electrical equipment arrangements. The transformer chamber, located downstream from the powerhouse chamber, will be located above the tailrace manifold and connected to the powerhouse by the main access tunnel.

Suspended corrugated metal panels supported from steel trusses will extend the length of the machine hall. The false ceiling will protect against possible water seepage and rockfalls. A drain system will be provided around the powerhouse walls to carry collected seepage to the powerhouse drainage sump pit.

An unloading and erection bay will be located at one end of the unit bays, accessed by the main access tunnel. Space for the control room, workshop and office and personnel-related space will be located in the two upper levels at the end of the cavern adjacent to the erection bay.

The major equipment will be handled by two 300-ton bridge cranes that will run on rails the length of the unit and erection bays. Floor hatches will be provided for moving other equipment between floors. The turbine inlet valves will be handled with the main crane. The transformers will be moved into place on transfer rails. The draft tube gates will be installed and maintained using a dedicated under-hung bridge crane.

Personnel movement within the underground chambers will be by elevators and stairs, the locations and dimensions of which will be decided during final Project planning and design.

2.4.6 Access Tunnel

Access to the underground powerhouse will be through the main access tunnel. This will be a vehicular tunnel that is 28 feet wide and 28 feet high. The tunnel portal will be south-east of the powerhouse. The invert elevation at the portal will be approximately 1,100 feet, and it will enter the powerhouse at elevation 808 feet. The length will be approximately 6,625 feet and the slope 4.4 percent. The tunnel will be shotcrete lined and will have a concrete roadway on the invert.

Rockbolts or other rock support will be used as required where areas of weak or broken rock are encountered. The top portion of the tunnel will carry a powerhouse and tunnel ventilation duct.

2.4.7 Other Structures

A switchyard (Project Connection Point) will be located about 4,500 feet south of the powerhouse, outside the boundaries of the proposed future landfill. It will be located on a level site at an approximate elevation 1,430 feet. It will be 500 by 1,100 feet, with a gravel surface. This area will be surrounded by a security fence. A security and maintenance lighting system will be provided. It will also be designed to protect against bird electrocution if appropriate.

This switchyard will be connected to the underground powerhouse via cables from the transformer gallery to the access tunnel portal and overhead as overhead lines from the portal to the switchyard. The high-voltage cables will run inside the length of the access tunnel to a shaft located near the lower reservoir inlet structure. Here the transmission lines will come up through the shaft to the ground surface. At the ground surface they will follow the upper edge of the lower reservoir as overhead transmission lines to the southwest, connecting to the switchyard. The overhead lines will terminate in the switchyard and be connected through protective breakers and associated switches to a double circuit 500 kV transmission line. The switchyard will contain all necessary disconnect switches, protective equipment and metering equipment.

A fenced area near the access road to the access tunnel portal will contain a storage warehouse building and an administration building. Bottled water for drinking will be provided to Project staff. Sewage disposal will be provided in a properly permitted septic system, incineration, or off-site disposal. Composting toilets may be used in the underground powerhouse, and potentially at the administration building as well.

While the primary powerhouse access will be through the main access tunnel described above, safety requires a second means of personnel egress from the underground facilities. This normally would be an elevator shaft from the ground surface directly above the powerhouse. However, to accommodate the landfill development, this access shaft will be provided approximately 800 feet north and west of the powerhouse with connection of this shaft to the powerhouse by a short, curved tunnel section. The elevator shaft would be approximately 1100 feet deep and 9 feet in diameter extending to the erection bay floor at elevation 808. The tunnel section would be approximately 800 feet long and be a 14-foot horseshoe section similar in design to the main access tunnel except smaller in size.

Access to Eagle Mountain Pumped Storage Project facilities will be in part by the roads that were developed for the mining operations and which are planned to be improved for servicing the landfill. The primary access road will be the existing Kaiser Road, which is a public County road. No new road crossings of the CRA will be required.

In addition to these roads, new access roads will be constructed to provide access to the upper reservoir dams, both I/O structures, the upper surge chamber and the access tunnel portal, and storage/administration area. The road to the access tunnel portal and the storage/administration will be paved with asphaltic concrete; the other roads will be gravel surfaced.

2.4.8 Water Supply and Conveyance Pipelines

Water to initially fill the reservoirs and annual make-up water will be pumped from groundwater within the Chuckwalla Valley. Three wells will be utilized to provide initial reservoir fill. Water to replace losses due to seepage and evaporation will be obtained from the same source. The new wells will be connected to a central collection pipeline corridor.

The locations of the three groundwater wells are approximately 11 miles southeast of the Project area (Figure 2-3). ECE has developed estimates of pipe material, pipe sizes, pumping head, pumping costs, and construction costs for potential alternative water supply systems. The preferred groundwater supply well system consists of the following main components:

- Three 2,000 gallons per minute (gpm), 1,000 horsepower (HP) vertical turbine pumps
- 1.3 miles of 12 inch-diameter well field collection pipe
- 3.3 miles of 18 inch- diameter well field collection pipe
- 10.7 miles of 24 inch-diameter conveyance pipe

One well will have adequate capacity to replenish water lost to evaporation and seepage. A second well will be maintained as a backup water supply for the makeup water needs.

The Project Applicant has identified a total of eleven (11) specific Project feature elements designed to reduce or eliminate potential environmental impacts. These project design features (PDFs) are incorporated into the Project, either in the Project design or by regulatory law as part of Project implementation. These features are identified with a numeric identifier. One project design feature that has been incorporated into the Project to reduce environmental impacts from water pipeline construction is:

PDF LU-3. Permanent impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.

2.4.9 Reverse Osmosis System

In order to maintain water quality (primarily salinity) within the reservoirs, a water treatment system will be required to remove certain constituents from the reservoir water supply. This facility would treat the make-up water supply to the reservoir system, which will come from groundwater wells in the Chuckwalla Basin.

The design of the treatment facility comprises several pretreatment steps to ensure that the stored surface water is suitable for treatment by the reverse osmosis (RO) process, which will provide for the bulk of the salt concentration. Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. The treatment goal will be to maintain water quality levels in the reservoirs comparable to the existing groundwater quality.

Water quality data from wells in the Chuckwalla Aquifer were used to make assumptions about the source water quality. While the total replacement water need is estimated to be 2,360 acre-feet per year for evaporation and seepage, only the evaporation component (1,760 acre-feet per year) enters into the estimation of water treatment requirements. The RO treatment system would remove water from the upper reservoir at a rate of 2055 GPM and remove sufficient total dissolved solids (TDS) to maintain the in-reservoir TDS at the same average concentration of the source water.

The specific treatment process steps are: (1) energy recovery turbine, (2) dissolved air floatation, (3) automatic strainers, (4) microfiltration, (5) reverse osmosis, and (6) brine concentration.

A dissolved air flotation (DAF) unit is provided as the first step in the desalting process. DAF is a clarification process, provided to treat water from the reservoir for turbidity and suspended solids control. The DAF is particularly efficient in removing algae, which could be a potential problem in the reservoir system. The DAF works by passing a portion of the feed stream through an air saturator where it becomes saturated with air at high pressure. This stream is then mixed with the balance of the feed water in the flotation portion of the tank. The release of pressure generates bubbles which rise to the surface carrying with them suspended solids including algae. The DAF process can be improved by the addition of coagulants, commonly iron salts or polymers.

The two automatic backwash screens provide protection for the microfiltration (MF) system, which removes fine particles. The filtered water is pumped through the RO membrane system.

The microfiltration system will consist of two 50 percent capacity treatment trains in parallel. The MF systems consist of hollow fiber membranes contained in housings with multiple housings connected in parallel to provide the required membrane area. Filtered water leaves the MF units and is stored in a filtered water tank located just outside of the process building.

The operation of the MF systems involves the following major process steps.

1. Normal filtration where the feed water passes from outside to inside the membrane fibers. Filtered water is collected from each module in the unit and flows into the filtered water tank.
2. Backwash or reverse filtration occurs on a predetermined cycle typically every 15 to 30 minutes. During backwash, normal filtration for one unit or part of the unit is interrupted and filtered water is passed from the filtrate side of the membrane to the outside dislodging suspended solids which have collected during the filtration cycle. In addition, during the backwash cycle air is introduced to the outside of the fiber bundle to scour the fibers improving backwash efficiency. After backwash which typically takes 2 to 3 minutes the unit returns to normal filtration.
3. Maintenance Wash. On a daily basis the membranes are exposed to a hypochlorite solution to minimize biological growth and otherwise reduce membrane fouling. A waste stream of hypochlorite solutions is therefore produced daily. It is anticipated that this stream can be returned to the reservoirs.
4. Chemical Cleaning. On an infrequent basis (typically 45 to 60 days) the membranes are cleaned with more aggressive chemical cleaners including caustic solutions, detergents and dilute acids. These cleaning solutions will be neutralized and disposed of in a properly permitted on-site septic system or hauled to an approved disposal site.

The individual membrane modules are connected together in manifold fashion forming individual MF trains. The membranes will be configured vertically in this instance. Two parallel membrane trains will be located inside the treatment building. The auxiliary equipment including feed pumps, backwash pumps and membrane cleaning equipment will also be installed inside the membrane building. Filtered water from the filtered water tank is pumped through a set of cartridge filters to the RO feed pumps where it is further pressurized to provide feed to the RO vessels.

The RO concentrate, containing the bulk of the salts removed from the reservoir system, would be processed to dry salt in an evaporation pond or ponds. From the overall material balance, the total brine to be evaporated is approximately 170 gpm or 270 acre feet per year. This converts to a pond of about 56 acres. The proposed design for the evaporation pond divides the total required pond area into six varying level salinity ponds and five solidifying ponds. Each pond will be about 8.3 acres in size, and each solidifying pond will be about 1.4 acres in size. The RO concentrate would flow into one pond then be directed to another pond while the solution remaining in the first pond evaporates. Typical pond design includes 8 foot berms with double liners to protect against seepage. Monitoring wells would be installed to identify a potential liner failure. ECE will be required to prepare a Report of Waste Discharge (ROWD), to comply with requirements of Title 27 of the California Code of Regulations[7], for permitting of the brine

[7] *See* Cal. Code Regs. tit. 27, § 21710 (2009).

ponds. The ROWD will include details of the proposed liner and monitoring facilities and is required to be submitted during final engineering for the Project.

Over a period of years, the salt level in the ponds will rise and salts would need to be mechanically removed from the ponds. Based on the pond size and the salt balance the estimated rate of salt build up is 0.25 to 0.5 inches per year. Salt removal would be expected to occur on the order of once every 10 years, at which time the pond liners will be inspected and replaced as needed.

To summarize, water quality in the Project reservoirs will be protected with a reserve osmosis water treatment plant. The reverse osmosis treatment plant will maintain water quality levels in the reservoirs comparable to the existing groundwater quality. Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. The treatment goal will be to maintain water quality levels in the reservoirs comparable to the existing groundwater quality. In addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well. Therefore, no eutrophication will occur as the water quality in the reservoirs will be maintained. The water treatment facility is also referred to as **PDF GW-1** in this document.

2.4.10 Transmission Lines

Power will be supplied to and delivered from the Project by one double circuit 500 kV transmission. The line will extend approximately 13.5 miles from the Project switchyard to a proposed new Interconnection Collector Substation for interconnection to the planned Devers - Palo Verde No. 2 transmission 500-kV line owned by SCE.

The new Interconnection Collector Substation will require an estimated total area of 25 acres. This facility will be located near Desert Center, California.

The typical right-of-way (ROW) for the transmission line will be about 200 feet. However the ROW width can be reduced in specific locations to mitigate potential impacts to resources (e.g., historic trails, adjacent land restrictions, existing roads and highways, and biological and cultural resources). The total ROW area is estimated to be approximately 327 acres. Additional proposed transmission line facilities and communication facilities are summarized in Table 2-2.

Cables from the powerhouse transformer chamber to the switchyard will run from each of the four 500/18 kV, 135 Mega Volt Ampere transformers through the access tunnel and then above ground on towers to the switchyard. The total length of each cable will be approximately 10,000 feet and each will be rated as indicated for the transformers. The cable runs in the tunnel will be approximately 6,000 feet long and above ground the length will be approximately 4,000 feet.

Table 2-2 Summary of Proposed Transmission Line Facilities and Communication Facilities

Transmission Line Facilities (500 kV, double circuit)
• Conductors: Two, three-phase AC circuit consisting of three 1.5- to 2-inch ACSR conductors per circuit.
• Minimum Conductor Distance from Ground: 35 feet at 60°F and 32 feet at the maximum operating temperature.
• Shield Wires: Two ½ to ¾-inch-diameter wire(s) for steel lattice.
• Transmission Line Tower Types:
  - Steel Lattice Tower along entire route.
  - Structure Heights (approximate): Steel Lattice - 175 to 235 feet.
• Average Distance between Towers: Steel Lattice – 1,056 feet.*
• Total Number of Towers (approximate): 54-68.*

Communications Facilities • Systems: Digital Radio System, microwave, VHF/UHF radio, fiber optics. • Functions: Communications for fault detection, line protection, SCADA, two-way voice communication.

Note: The exact quantity and placement of the structures depends on the final detailed design of the transmission line and route, which is influenced by the terrain, land use, and economics.

PDF BIO-4. Raptor Protection of Transmission Line. ECE will design and construct raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation. In addition, prior to the start of ground disturbing activities, ECE will file for FERC approval a transmission line design plan that considers adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.

2.4.11 Public Lands within the Project Boundary

The Project will occupy 2,364.0 acres of land (Table 2-3). Land ownership of the various features of the Project includes patented or privately owned lands (52 percent of the Project site) not directly under BLM stewardship. The rest are lands managed by the BLM under the “Limited” Class “L” MUC designation or Class “M” moderate use MUC-designation. Table 2-3 presents a tabulation of the land acreage within the Project boundary. The table identifies the acreage of Federal lands based on the current ownership status of the lands. A portion of the Federal lands are proposed to be exchanged for private lands, currently owned by Kaiser. If the land exchange between the BLM and Kaiser is effectuated, the amount of Federal land this Project will affect is decreased to 696.1 acres.

Table 2-3 Summary of Land Ownership within the Project Boundary

Land Owner	Water Supply Line Acreage	Transmission Line Acreage	Central Project Area Acreage	Total Acreage	Percent
Bureau of Land Management	84.80	537.41	73.84	696.1	29.4%
Bureau of Land Management (Subject to Land Exchange)	22.00	35.68	379.01	436.7	18.5%
State	0.00	0.00	0.00	0.0	0.0%
Private – MWD	24.69	38.56	4.62	67.9	2.9%
Private – other ownership	120.78	0.16	1042.46	1163.4	49.2%
Total Project Acreage	252.3	611.8	1499.9	2364.0	100.0%

2.4.12 Pre-construction Biological Surveys

Several biological project design features have been included in Project design to insure that Project construction has a minimal impact on special wildlife and plant species.

PDF BIO-1. **Pre-Construction Special Species and Habitat Survey.** Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, necessary protection measures will be modified and/or developed in consultation with the United States Fish and Wildlife Service and the California Department of Fish and Game (CDFG).

PDF BIO-2. **Pre-construction Plant Survey.** Preconstruction surveys will identify special-status plant populations and also species protected by the California Desert Native Plants Act (CDNPA). For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 , 2009 and 2010 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white, candy-striped flagging or other obvious barrier tape.

Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in approved areas. Transplantation is part of the revegetation plan developed for the Project. Salvaging seed may also be an option considered for certain species (e.g., smoke tree, ironwood).

PDF BIO-3. **Pre-construction Mammals Surveys.** Prior to construction, surveys will be conducted for all burrows that might host a badger or kit fox. (These surveys can be simultaneous with those for desert tortoise burrows.) Active burrows and all fox natal dens will be avoided, where possible. The perimeters of all avoidance areas will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white, candy-striped flagging or other obvious barrier tape.

Where avoidance is infeasible, occupancy of burrows will be determined through fiber optics and/or night vision equipment. All occupants will be encouraged to leave their burrows using one-way doors, burrow excavation in the late afternoon/early evening (to encourage escape at night), or other approved methods. All burrows from which badgers or foxes have been removed will be fully excavated and collapsed to ensure that animals cannot return prior to or during construction.

2.4.13 Site Investigations

PDF GEO-1. Detailed investigations to support final engineering will be conducted in two stages, as follows:

- **Stage 1 Subsurface Investigations:** Based on available information and the current Project configuration, conduct a limited field program designed to confirm that basic Project feature locations are appropriate and to provide basic design parameters for the final layout of the Project features. Phase 1 Subsurface investigations will be initiated within 60 days of licensing and receipt of site access, field work will be completed within four months of the start of field investigations, and results filed with the Commission six months after the start of field investigations.

- **Stage 2 Subsurface Investigations:** Using the results of the Stage 1 work, and based on any design refinements developed during pre-design engineering, conduct additional explorations that will support final design of the Project features and bids for construction of the Project.

The Stage 1 subsurface site investigation program for the proposed Project will commence as soon as site access is obtained. The Stage 1 program will provide the information needed to finalize Project features and to plan a second-stage program to support final design of the Project.

The detailed scope of the Stage 1 program is discussed in a technical memorandum found in Section 12.1.

PDF GEO-2. During site investigations, geologic mapping will be performed by Project engineers to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining. The apparent stability of the cut slopes and benches will be assessed at this time.

During construction, areas within the pits that exhibit unstable slopes because of adverse fracture sets exposed in the pit walls will be scaled of loose rock and unstable blocks. Material scaled from the side slopes will be removed and disposed of outside the pit, or pushed downslope and buried in the bottom of the pit. Rock slopes within the East and Central Pits that lie below an elevation of 5 feet above the maximum water level will be scaled of loose and unstable rock during construction. Existing cut slopes that lie above these elevations will not be modified unless there is evidence of potential failure areas that could impact Project facilities.

2.4.14 Construction Staging

PDF AES-1. Staging areas and areas needed for equipment operation, material storage and assembly shall be combined with construction lands to the extent feasible, and organized to minimize total footprint needed. Staging, storage, and temporary construction areas shall be reclaimed as soon as the use of each such area is completed.

PDF LU-1. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site.

PDF LU-2. Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along State Route 177.

2.4.15 Landfill Compatibility

PDF LU-4. The Project layout has been modified to eliminate conflicts with existing and proposed land uses, including the proposed Eagle Mountain Landfill. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the Metropolitan Water District of Southern California (MWD) regarding the proximity of the brine ponds to the CRA. As the Project progresses into the design phase, the Project layout will be designed to accommodate the landfill as configured.

2.4.16 Project Safety

As part of the licensing process, the Commission will review the adequacy of proposed Project facilities. Special articles would be included in any license issued, as appropriate. Commission staff would inspect the licensed Project both during and after construction. Inspection during construction would concentrate on adherence to Commission-approved plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, any license issued would require an inspection and evaluation every 5 years by an independent consultant and submittal of the consultant's safety report for Commission review.

The proposed Project will also comply with California DSOD regulatory requirements.

2.4.17 Employment / Hours of Operation

The majority of required manpower is needed during construction, particularly in the timeframe approximately 2 years into the construction period, with considerably less needed in the first and last years. The Project is expected to commence construction activities in 2013 to 2014. Peak monthly employment would occur in Year 2 with a high of 209 employees.

It is expected that most of the general labor required during construction would be available from the labor pool within Riverside County and the Project region. As much as 50 percent of the skilled trades and management and support personnel could also be provided by regional labor.

At Project buildout, during the operation phase, it is anticipated the pumped storage facility would operate 24/7 and utilize a permanent workforce of approximately 30 full-time employees over three shifts within a 24-hour period.

2.5 Identification of Potential Environmental Impacts

The SWRCB identified the following potential environmental resource issues during its review of the Project application and supporting materials, and through input received during the scoping process and Notice of Preparation comment letters, site visits, and additional background research conducted for the proposed Project. Implementation of the proposed Project may result in the following changes, which are further evaluated individually within Section 3 of this EIR:

Geology and Soils – Construction activities of the dams and reservoirs, along the water conveyance corridor or transmission line corridor, and Project operations may have the potential to impact the geological resources on-site.

Surface Water – Construction activities along the water conveyance corridor or transmission line corridor, and Project operations planned at the facility may impact groundwater levels, groundwater quality, or springs and wells.

Groundwater – Construction and operation will affect this resource. This section discusses groundwater quality and supply data for the Chuckwalla Valley Groundwater Basin, aqueducts, springs/wells, water bearing formation, and hydraulic characteristics.

Agricultural Resources – This discussion focuses on the Project's compatibility with existing agricultural and forestry resources land uses.

Biological Resources – Construction and operational activities planned at the facility, along the water conveyance corridor or transmission line corridor may impact plant communities and wildlife. The Project will be required to adhere to Federal, State and regional biological plans.

Threatened & Endangered Species – Project implementation may impact State listed threatened and/or endangered species having the potential to occur on-site, or having suitable habitat on-site or in the Project vicinity.

Aesthetic Resources – The physical character of the site will be modified. The overall aesthetic appearance of the facilities as viewed from off-site requires evaluation to ensure consistency with national and regional standards.

Cultural Resources – Construction and operational activities proposed at the pumped storage hydroelectric facility or along the water conveyance corridor or transmission line corridor may have the ability to impact archeological, paleontological, or historical resources within the Area of Potential Effect.

Land Use / Public Services – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor will change the existing land use on-site, and have the potential to affect public services times and utility capacities The existing land use is an out of use iron ore mine that has been inactive as an iron mine since 1983. At present, gravel mining and military training is conducted on the site. Development on this site will be evaluated for compatibility with surrounding land uses and correspondence with the national and regional long term goals.

Recreation – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor may have the ability to impact surrounding recreational areas, including the Joshua Tree National Park and Wilderness Area.

Population / Housing – Construction and operational activities proposed at the pumped storage hydroelectric facility, along the water conveyance corridor or transmission line corridor may increase population and/or housing demands within the region.

Transportation – Construction activities and operational phases have the potential to increase traffic and decrease level of service.

Air Quality – Construction, operational activities, and truck and automotive traffic anticipated and planned at the facility will generate emissions and dust that may have an effect on local and/or regional air quality.

Noise – Construction and operational activities of the pumped storage hydroelectric facility could generate increased noise levels adversely affecting surrounding sensitive receptors.

Greenhouse Gas (GHG) Emissions – Construction may affect GHG levels, however, operational activities would displace energy demand for single cycle natural gas power plants and if effectively used would reduce GHG emissions necessary for meeting the energy demands in California and assist meeting future targets for a larger portfolio of renewable power generation sources.

Hazards & Hazardous Materials – Construction and operational activities may impact potential public health and environmental issues related to hazards and the use of hazardous materials associated with construction and operations proposed for the Eagle Mountain Pumped Storage Hydroelectric Project area. This section also describes potential wildland fire hazards.

Environmental Justice – Although not required under CEQA, the EIR provides this discussion relevant to with applicable regulations and policies. This section addresses the question of whether and how the impacts of the proposed Project and alternatives may disproportionately affect minority populations and low-income populations or Native American communities.

2.6 List of Approvals and Permits Required

Table 2-4 lists the approvals and permits anticipated to be required for the proposed Project.

Table 2-4 Approvals / Permits Required for the Proposed Project

Agency	Approval / Permits
Federal Energy Regulatory Commission	License
State Water Resources Control Board	Water Quality Certification
U.S. Fish and Wildlife Service	Incidental Take Permit
California Department of Fish and Game	Streambed Alteration Agreement and Section 2081 (California Endangered Species Act) permit
Bureau of Land Management	Right-of-Way for areas within the Project boundary managed by the BLM. A California Desert Conservation Area Plan Amendment is potentially needed.
California Division of Safety of Dams	Approval of dam design, oversight of dam construction
South Coast Air Quality Management District	Permits to operate
California Department of Industrial Relations, Division of Occupational Safety and Health	Work area design approval

2.7 Agencies Expected To Use This EIR

The SWRCB is the Lead Agency for preparation of this EIR and is responsible for certifying its contents, and taking action to approve or deny approval of the proposed Water Quality Certification. Once certified, this EIR would be used by the SWRCB in connection with review of applications for the actions and approvals required for this proposed Project. The CDFG would be expected to utilize this EIR for the Section 2081 permit.

The FERC is responsible for conducting environmental review under the National Environmental Policy Act (NEPA), as part of Project licensing. The environmental review under NEPA is being conducted in a separate but coordinated process.

3 Environmental Analysis

The proposed Eagle Mountain Pumped Storage Project (Project) lies in the California portion of the western Sonoran Desert, commonly called the "Colorado Desert." This includes the area between the Colorado River Basin and the Coast Ranges south of the Little San Bernardino Mountains and the Mojave Desert. Rainfall amounts are low, approximately 2.8 to 5.4 inches per year (Turner and Brown, 1982). Winter temperatures average approximately 54 degrees Fahrenheit (°F) (Turner and Brown, 1982) and summer temperatures are extreme, commonly reaching 110+ °F for long periods. This period of extremely warm weather is also lengthy, extending from mid-spring through the fall.

The Project is located at the edge of the Eagle Mountains. Gently sloping to undulating bajadas and valleys are found in the area of the proposed linear features (water pipeline and transmission line). Elevations range from approximately 400 to 2,500 feet.

There are no perennial streams or natural wetlands in the Project vicinity. Drainages in this part of Riverside County are generally limited to high-energy runoff via desert washes that are usually dry. As water from these events quickly percolates into the surrounding soil or evaporates, the establishment of wetland vegetation is precluded.

There are several highly disturbed habitats in the Project area. The reservoirs are proposed to be constructed in inactive mining pits from the Eagle Mountain Mine. Eagle Mountain Mine was operated by Kaiser Steel Corporation from 1948-1982 for the mining and concentrating of iron ore through excavation of four open pits located on the property (Kaiser Steel Resources, 1990). In the Chuckwalla Valley, the Project intersects several abandoned jojoba and asparagus farms.

Common wildlife species in this region are adapted to arid conditions and/or are migratory. In the habitats intersecting the Project, taxa include ungulates, small and midsized mammals, birds, reptiles, and invertebrates.

Soils generally range from soft sand to coarse-sandy loams, with aeolian patches of loose sand and intermittent incipient dunes. Boulders and cobbles are common in the upper bajadas and toeslopes, with smaller particles downslope. Desert pavement is intermittently present in the immediate area of the Central Project Area.

Drainage patterns reflect the local topography. Along the broad bajadas traversed by the Project's linear facilities, drainage is primarily characterized both by scattered, well-defined washes and networks of numerous narrow runnels. The former are several yards wide, sandy to cobbly drainages that carry periodic runoff to a regional drainage. They are often incised, from a half to several yards deep, and vegetated along the banks by both shrubs and trees. By contrast, the numerous, shallow runnels are typically only a yard or less wide, 1-to-3 inches deep, and irregularly vegetated by locally common shrub species.

Two basic native plant communities (after Holland, 1986) are intersected by the Project. The reservoir area of the Project site is largely heavily disturbed by prior mining activities, but is bordered by Sonoran Creosote Bush Scrub (County of Riverside and BLM, 1996). An aerial view of the Project area in the Chuckwalla Valley near the proposed water pipeline corridor is shown in Figure 3.0-1. From the reservoir area east, the plant community is characterized by variations of Sonoran Creosote Bush Scrub. Throughout Chuckwalla Valley and in bajadas to the east, the Project also intersects broad plains of contiguous to intermittent, arboreal washes (Desert Dry Wash Woodland).

The Project site lies almost entirely within the Eagle Mountain Mine, an idle iron ore mine encompassing approximately 4,700 acres in eastern Riverside County. Primary mining operations were suspended in 1982, and although Kaiser Ventures, LLC. (Kaiser) maintains a management office at Eagle Mountain, ore crushing and concentrating facilities have been dismantled for salvage, and major mining equipment sold.

The Eagle Mountain Mine is located south and east of the Joshua Tree National Monument (JTNM). The Project boundary is located about 1.5 miles from the closest JTNM boundary. The JTNM encompasses approximately 558,000 acres of land of which 467,000 have been designated wilderness. The JTNM attracts over 1 million visitors annually, concentrated mostly in the center of the Park and not in the areas near the Eagle Mountain Mine site.

The town of Eagle Mountain is a 460-acre townsite, fenced with controlled access, and is now owned by Kaiser (Figure 3.0-2). The townsite is fenced with controlled access and is mostly vacant; (at the January 16, 2009 site visit conducted as a part of the FERC scoping process Kaiser representative indicated that as many as nine of the houses may still be occupied).

The townsite and the mine are accessed by Kaiser Road, a two-lane county-maintained roadway. Numerous dirt roads intersect Kaiser Road, leading to individual residences and agricultural fields. Agricultural activities near the Project site include irrigated cropland producing primarily jojoba and asparagus. These crops are irrigated by pumping groundwater within the Chuckwalla Valley. None of the area is mapped as Important Farmland by the State Department of Conservation.

Two other small communities of Lake Tamarisk and Desert Center are located approximately 9 and 10 miles southeast of the Central Project Area. Lake Tamarisk consists of approximately 70 single family dwellings, an executive golf course, a recreational vehicle park, 150 undeveloped lots, and two small lakes.

Desert Center is located at the junction of Interstate 10 and State Route 177. Desert Center consists of a few small single-family dwellings, a mini-market, café, and bar. The community included gas stations at one time, but are now closed. Public facilities include a county fire station, branch library, post office, and several churches.

Both communities, as well as the Eagle Mountain townsite are accessed by Kaiser Road, which connects to Interstate 10 at Desert Center.

Numerous transmission lines and service roads cross the area south of the Project site. The Colorado River Aqueduct extends through the Coxcomb Mountains northeast of the Project area, and continues in a southwesterly direction, passing the eastern portion of the mine site as an open channel before converting into a tunnel to the Metropolitan Water District of Southern California Eagle Mountain Pump Station south of the Eagle Mountain townsite.

3.1 Geology, Soils and Mineral Resources

This section of the Draft Environmental Impact Report discusses the current geologic and soil conditions at the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) site and identifies the potential geologic and soil-related impacts based on the construction and operational activities associated with the Project. Mitigation measures are provided in order to reduce significant impacts to less than significant, where applicable. Information for this section was obtained primarily from existing reports, public and agency contacts, and Project area reconnaissance.

3.1.1 Regulatory Settings

The following Federal, State, and local laws and policies apply to the protection of geology and soils. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the Bureau of Land Management (BLM) and therefore subject to the geological resource LORS of the agency.

3.1.1.1 Federal

The Uniform Building Code (UBC) was developed by the International Conference of Building Officials and is used by most states, including California, as well as local jurisdictions to set basic standards for acceptable design of structures and facilities. The UBC provides information on criteria for seismic design, construction, and load-bearing capacity associated with various buildings and other structures and features. Additionally, the UBC identifies design and construction requirements for addressing and mitigating potential geologic hazards. New construction generally must meet the requirements of the most recent version of the UBC.

3.1.1.2 State

The Surface Mining and Reclamation Act (SMARA) of 1975 is administered by the California Department of Conservation, Office of Mine Reclamation. Under SMARA guidelines adopted by the State Mining and Geology Board, the State Geologist is required to classify specified areas into Mineral Resource Zones. Classification is the process of identifying lands containing significant mineral deposits, based solely upon geologic factors and without regard to present land use or ownership.

The State Alquist-Priolo Earthquake Fault Zoning Act (A-P Act) of 1972 was passed to mitigate the hazards associated with surface faults in California. Administered by the California State Department of Conservation, California Geological Survey, the A-P Act prevents construction of buildings used for human occupancy on active faults. Before a project can be permitted, a geologic investigation is performed to demonstrate that proposed buildings will not be constructed across active faults.

The 1990 Seismic Hazards Mapping Act and related regulations establish a statewide minimum public safety standard for mitigation of earthquake hazards. The purpose of this Act is to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure as well as other hazards caused by earthquakes.

The 1990 Seismic Hazards Mapping Act provides the minimum level of mitigation needed to reduce the risk of a building collapse. Under this Act, the approving agency can withhold permits until geologic investigations are conducted and mitigation measures are incorporated into building plans. In addition, the Act addresses not only seismically induced hazards but also expansive soils, settlement, and slope stability. The program and actions mandated by this Act closely resemble those of the A-P Act by requiring:

- The State Geologist to delineate various "seismic hazard zones"
- Cities, counties, and/or other local permitting authority to regulate certain development "projects" within these zones by withholding the development permits for a site until the geologic and soil conditions are investigated and appropriate mitigation measures (if required) are incorporated into development plans
- The State Mining and Geology Board to develop regulations, policies, and criteria in guiding cities and counties in their implementation of the law
- Sellers (and their agents) of real estate property within a mapped hazard zone to disclose that property lies within such a zone at the time of sale

The California Building Code (CBC) of 2007 specifies the acceptable design and construction requirements associated with various facilities or structures, and includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The CBC specifies criteria for open excavation, seismic design, and load-bearing capacity directly related to construction in the State. The CBC augments the UBC and provides information for specific changes to various sections within it. The seismic building requirements under the CBC are more stringent than the Federal UBC.

The Seismic Hazards Mapping Act, PRC Section 2690–2699 identifies areas that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.

3.1.1.3 Local

Riverside County General Plan 2000, Safety Element adopts the UBC of 1997, which provides design criteria for buildings and excavations. The UBC is superseded by the CBC of

2007. It requires mitigation measures for geologic hazards, including seismic shaking, surface rupture (adopts the A-P Act), liquefaction, unstable soils and slopes, and flooding.

3.1.2 Existing Conditions

The Project site is located in the northeast portion of the Eagle Mountains near the lower western edge of the Mojave Desert Physiographic Province of California, slightly east of the southern limits of the adjacent Transverse Ranges Physiographic Province (CGS, 2002). The Eagle Mountains are bounded on the northeast by the Coxcomb Mountains, the southeast by Chuckwalla Valley, and the north by Pinto Basin (Figure 3.1-1). To the south are the Orocopia Mountains (west) and the Chuckwalla Mountains (east). A broad valley containing Smoketree Wash forms the edge of the Eagle Mountains to the west. The Cottonwood Mountains are to the southwest of the Project area.

The major rock units in the region include Jurassic- to Cretaceous-age plutonic intrusive rocks and Paleozoic and Precambrian metamorphic and meta-sedimentary rocks (Jennings, 1967). At the Eagle Mountain site, the meta-sedimentary rocks generally trend northwest and are surrounded and underlain by intrusive granitic rocks. The meta-sedimentary rock units have been folded into a northwest-trending anticline, which continues into the north-central Eagle Mountains. Iron ore deposits are typically found along the northeast limb of this anticline. The iron ore deposits are comprised of magnetite and hematite with minor amounts of pyrite, which were formed by the replacement of carbonate meta-sedimentary rocks.

Localized outcrops of Tertiary-age volcanic rocks are found in the region, principally at the northern end of the Chuckwalla Valley. Younger Pleistocene-age basalt is present in the north-central portion of the Eagle Mountains. Deposits of Quaternary-age alluvium fill the Pinto Basin and Chuckwalla Valley, locally reaching depths of greater than 2,000 feet (Eagle Mountain Energy Company [EMEC], 1994). Alluvial deposits include both cobbles/gravels and finer grained units that form alluvial fans at the mouths of major drainages from the adjacent highlands.

Regional structural trends are reflected in the alignments of faults in and near the Eagle Mountain site. East-west trending faults are present at distances of approximately 5 miles, both to the north and south of the site, while northwest-trending faults are present along the eastern edge of the Eagle Mountains. The latter group of faults includes the Bald Eagle Canyon Fault Zone and several smaller faults that traverse the planned tunnel alignments. None of these faults have experienced Holocene deformation as indicated by the unbroken alluvial deposits that overlie them (EMEC, 1994).

The site is cut by a series of northeast-trending dikes. The dikes have near-vertical dips and lie at approximately right angles to the northwest-trending faults. Where exposed, dikes that cross the northwest-trending faults are not offset by the faults (EMEC, 1994). Range-front faulting has been recognized to the east of the Eagle Mountain site, along the eastern side of the Chuckwalla Valley parallel to the base of the Coxcomb Mountains. Vertical displacements along this fault zone may be up to several thousand feet, with the western side being displaced downward relative to the eastern side (EMEC, 1994). Range-front faults do not appear to be present along the eastern side of the Eagle Mountains.

3.1.2.1 Project Area Geology

Bedrock geologic units present at the site can be generally classified as either igneous or meta-sedimentary. The igneous rocks are principally comprised of Mesozoic-age quartz monzonite. The meta-sedimentary units include quartzites, meta-arkoses, and marbles formed by metamorphosis and/or hydrothermal-alteration or sandstones, conglomerates, arkoses, and carbonate rocks deposited in the Paleozoic or Precambrian age. In general, the younger igneous rocks intruded into the older meta-sedimentary rocks, leaving the meta-sediments as remnant roof pendants atop the plutonic rock. Areal near-surface exposures of the rock units in the Project area are shown on Figure 3.1-2.

3.1.2.2 Formational Rock Stratigraphy

3.1.2.2.1 *Meta-Sedimentary Rock Units*

The meta-sedimentary units dip to the northeast in the site area, with dips ranging from 30 to 60 degrees (EMEC, 1994). The meta-sedimentary units can be subdivided into six distinct units, which include three quartzite units, two marbles, and a schistose meta-arkose. These units, beginning with the oldest and proceeding to the youngest, are described by GeoSyntec Consultants (GeoSyntec, 1992, cited in EMEC, 1994) as follows:

Lower Quartzite: This unit consists of a vitreous white to light-gray quartzite that is very coarse-grained and massive with bedding obscured or obliterated. This quartzite is compositionally supermature, commonly consisting of 98 to 99 percent quartz. The thickness of the unit is 1,000 feet (300 m) or more.

Schistose Meta-arkose: This unit consists of a gray, medium-grained, meta-arkose with schistose structure. Iron oxide staining throughout the unit has locally produced reddish- and purplish-brown colors. The unit has high percentages of quartz, feldspar, sericite, and clay, with minor amounts of chlorite, biotite, apatite, and opaque minerals. The thickness of the unit ranges from 20 to 200 feet (6 to 60 m).

Lower Marble: This unit consists of marble that is white, very coarse-grained with ferriferous layers of hematite-dolomite. The unit thickness ranges from 20 to 200 feet (6 to 60 m). The minerals magnetite and hematite are abundant in the iron ore zone, and gangue minerals associated with the ore are mainly pyrite, actinolite, and tremolite. Other associated minerals include diopside, serpentine, calcite, gypsum, and garnet.

<u>Middle Quartzite</u>: This unit consists of quartzite that is green and dark gray, fine- to medium-grained, vitreous, and banded. Conglomerate containing pebbles and cobbles of quartz and quartzite occurs in layers and lenses up to 10 feet (3 m) thick that are interbedded with cross-bedded quartzite near the base of this rock unit. Hematite imparts a characteristic rusty-brown stain to weathered rock in this unit. The thickness of the unit ranges from 150 to 400 feet (45 to 120 m). Banded varieties of quartzite are also present primarily due to the presence of diopside.

<u>Upper Marble</u>: This unit consists of dolomite marble that is white to light-gray on fresh surfaces and grayish orange to buff on weathered surfaces. The rock is a very coarse-grained, recrystallized dolomitic marble with grains up to 1 cm across, and is thin- to thick-bedded to massive. The thickness of the unit ranges from 50 to 400 feet (15 to 120 m). An iron ore zone has formed within the unit as a function of hydrothermal replacement of host rocks. The metallic mineralization in the ore zone is magnetite and hematite. Gangue minerals associated with the ore are pyrite, actinolite, and tremolite.

<u>Upper Quartzite</u>: This unit consists of quartzite that is mottled gray and bluish gray, vitreous, fine-to coarse-grained, medium-bedded to massive with low-angle sets of tangential planar cross-laminations. This unit is compositionally mature, consisting of 95 percent or more quartz. The rock contains thin interbeds of meta-arkose and conglomeratic lenses comprised of pebbles and cobbles of quartzite. The thickness of the unit is several hundred feet.

3.1.2.2.2 *Igneous Rock Units*

Igneous rocks at the Eagle Mountain site include several varieties of granitic rocks including porphyritic quartz monzonite, diorite, monzonite porphyry, granodiorite, and granite (EMEC, 1994). These rock types are collectively referred to as “granitic rocks.” In addition to the granitic rocks, two discrete sets of igneous dikes cut across the site. GeoSyntec (1992, cited in EMEC, 1994) described the igneous rocks units as follows:

<u>Granitic Rocks</u>: This generalized rock unit consist of subunits including, from youngest to oldest: (1) biotite monzonite that is coarse-grained and typically contains 25 to 35 percent quartz; (2) biotite monzonite that is coarse-grained and porphyritic with abundant quartz and alkali feldspar; (3) sphene-biotite-hornblende granodiorite that is medium-grained; (4) quartz-poor monzonite that is coarse-grained; and (5) hornblende-biotite, quartz-poor, monzonite that is coarse-grained and porphyritic. Some subunits exhibit gneissic banding.

<u>Dikes</u>: Two systems of dikes were mapped within the proposed Project site. One system consists of mafic dikes oriented in a general northwest-southeast direction. The other comprises light- to medium-gray andesite and andesite porphyry dikes that trend northeast-southwest. Andesite dikes in the Chuckwalla/Chocolate mountains, to the southeast of the proposed site, were dated at 25 to 29 million years old.

Age dating of the mafic dikes was completed as part of the fault investigations completed by Proctor (1993, cited in EMEC, 1994). Two samples were collected for radiometric dating. Results of these tests indicated ages of 124±3 MY and 234±6 MY (EMEC, 1994).

3.1.2.2.3 *Surficial Deposits*

Natural Alluvial Deposits. Surficial geology of the Eagle Mountain area is shown on Figure 3.1-2. Unconsolidated alluvial deposits are found in several locations within the site area. The alluvial deposits include sands, silts, gravels, and debris-flow deposits (EMEC, 1994). The most significant alluvial deposits are found on the eastern edge of the site area, where they form a laterally extensive alluvial fan that extends and thickens to the east into the Chuckwalla Valley. Some of these deposits are exposed in the east wall of the East Pit, in an area that would underlie the lower reservoir (EMEC, 1994). Elsewhere in the Project area, alluvial deposits are confined to laterally discontinuous, generally thin deposits along the bottoms of the canyons (EMEC, 1994).

Extensive investigations of the alluvial deposits were completed by the firm of GSi/Water (GeoSyntec, 1992, cited in EMEC, 1994). Investigations included analysis of aerial photography, surface mapping, trenching, geophysical surveys, and drilling. The following four alluvial units were identified:

Unit I: This unit is composed predominantly of flat elongate cobbles (85 percent), boulders (5 to10 percent), and fines (silt and clay-size particles), sand, and gravel (±5 percent). This unit forms an extensive dark red-brown to nearly black desert pavement that is nearly devoid of vegetation.

Unit II: This unit is similar to Unit I, but has more fines, sand, and gravel (15 percent) with some desert pavement. This unit is reddish-brown and supports low-lying desert shrubs.

Unit III: This unit contains greater percentages of sand and fines than Units I or II. The clasts are typically more angular in shape. This unit has little or no desert pavement and supports moderately dense desert vegetation.

Unit IV: This unit is similar to Unit III, but is located in stream-bed channels and supports thicker floral growth, including shrubs and palo verde.

These units are irregularly layered on top of one another within the alluvial wedge east of the mountain front. Individual units are typically elongated in an east-west direction and reflect the location of the primary depositional channel at the time of deposition. The total thickness of the alluvial fan is on the order of a few tens of feet near the mountain front. It thickens steadily to the east, reaching a maximum thickness of more than 2,000 feet in the eastern part of the Chuckwalla Valley (EMEC, 1994).

Alluvial deposits in the western portion of the site are confined to the canyon bottoms (EMEC, 1994). These deposits are typically composed of sandy gravel, but may vary locally from sand and gravelly sand to gravel. These deposits are discontinuous and range in thickness from 0 to 50 feet. The thickest deposits are found near the mouths of canyons. Older alluvial deposits in the upper portions of the canyons may be locally cemented (EMEC, 1994).

An ancient alluvial fan is exposed near the base of the north wall in the East Pit of the Eagle Mountain Mine (EMEC, 1994). At the base of this feature, and interbedded with some of the soils characteristic of the upper portions of the fan, are a series of debris flows. In the east wall of the East Pit, debris flow deposits rest directly on bedrock (EMEC, 1994).

Mining By-Product Deposits. Mining by-products generated by the former Kaiser Mining Company operations were deposited in numerous areas near the site (Figure 3.1-3). These by-products include several distinctly different materials, including both bedrock and alluvial overburden, and tailings produced as a result of the mining and separation of iron ore bearing rock from host rock. The tailings include both fine and coarse varieties. The mining waste materials are described below:

<u>Overburden</u>: Overburden materials removed during mining operations were stockpiled at several locations in the site area. The largest piles of overburden are located on the eastern edge of the site, to the northeast of the East Pit, along the northern rim of the East Pit, adjacent to the former haul road about midway between the Central and East Pits, and to the southeast of the Central Pit. The total volume of overburden materials on-site is estimated to be in excess of 100 million cubic yards (EMEC, 1994). Grain-size testing on these materials indicated a locally variable mix of sands, gravels, cobbles, and boulders, with up to 26 percent silt and clay.

<u>Fine Tailings</u>: The hydraulically placed fine tailings were placed in six separate settling ponds to the southeast of the Central Pit. Total volume of these materials is estimated to potentially be over 19 million cubic yards (EMEC, 1994). Laboratory testing (GeoSyntec, 1992 cited in EMEC, 1994) indicated the fine tailings vary in composition, ranging from silty sand and sandy silt to clayey silt to silty clay. In general, soils with higher sand content are located near the slurry discharge point while finer grained soils are present in the distal portions of each pond. Based on available test results, the fine tailings are suitable for use as a reservoir liner or for construction of a low-permeability central core in embankments proposed for the upper reservoir site (EMEC, 1994).

Coarse Tailings: Coarse tailings were placed at several locations around the site, although the largest deposit lies immediately south of the East Pit. The total volume of coarse tailings in this stockpile is estimated to be about 50 million cubic yards (EMEC, 1994). A testing program for the coarse tailings (GeoSyntec, 1992 cited in EMEC, 1994) indicated the majority were classed as clean gravels or sandy gravels containing significant percentages of cobbles and boulders and few fines. Based on the available test data, the coarse tailings were judged to be suitable for use in embankment construction (EMEC, 1994).

3.1.2.2.4 *Geologic Structures*

Three steeply dipping, pre-Holocene faults have been mapped at the site. These faults were investigated in detail by Proctor (1993) and Shlemon (1993) and summarized for landfill siting studies by GeoSyntec (1993). The most prominent faults at the site are the Bald Eagle Canyon Fault, which trends northwest-southeast along Bald Eagle Canyon, and an unnamed parallel fault about 4,600 feet (1,400 m) to the west. The faults do not cut overlying Quaternary sediments, or, in the case of the latter fault, a cross-cutting andesite dike (EMEC, 1994).

Several bedrock joint systems have been mapped at the site (EMEC, 1994). The most prominent joint set trends northwest-southeast, parallel to the trend of the Bald Eagle Canyon Fault. A second joint set is oriented approximately perpendicular to the first, and trends northeast-southwest. Less-developed joint systems with east-west and north-south trends were also noted in the fault studies, as was a set of shallowly dipping joints of varying strike (EMEC, 1994).

3.1.2.3 Mineral Resources

3.1.2.3.1 *Ore Deposits and Mining History*

The Central Project Area occupies an ore mineral-rich zone of the Eagle Mountains. Iron is the most important ore found within both the primary minerals of this zone, which are magnetite and pyrite, and within the secondary minerals, hematite and geothite (DuBois and Brummett, 1968, cited in EMEC, 1994).

The Central Project Area occupies a portion of the inactive Eagle Mountain Mine. This mine facility began operations in 1948 to extract iron ore from these deposits. During the life of the mining operation, 940 million net tons of rock were mined from the pits. With the closure of Kaiser Steel Company’s Fontana, California steel mill, the Eagle Mountain Mine lost its principal market, forcing the mine’s closure as well (Mine Reclamation Corporation, 1997). Ore crushing and concentrating facilities were subsequently dismantled and the mining equipment sold. By 1986, most of the mine’s infrastructure had been abandoned (Kaiser and MRC, 1991, cited in EMEC, 1994). Investigations in 1990 (Kaiser, 1990, cited in EMEC, 1994) indicated that recoverable precious metals are not present in the Central Project Area.

The proposed Project would utilize two of the four inactive pits at the Eagle Mountain Mine site: the East Pit and the Central Pit. The two western-most of the four pits, the North and South Black Eagle Pits, are outside the proposed Central Project Area and would not be affected by construction and operation of the pumped storage hydroelectric facility, access roads, or transmission line.

Iron Ore Resources. Approximately 170 million short tons of iron ore reserves, considered economically recoverable at the time the mine was closed, remain on the entire Eagle Mountain Mine site (Mine Reclamation Corporation, 1997). Eagle Mountain iron ore reserves are magnetite mixed with pyrite, or magnetite and hematite with small amounts of pyrite. The grades of ore remaining on the site are not a salable, direct shipping ore grade, but would have to be crushed and concentrated to produce salable products (Mine Reclamation Corporation, 1997). Following suspension of mining operations, equipment and structures were removed from the mine site; consequently no means exists on site to convert ore into a salable product (Mine Reclamation Corporation, 1997). Thus, a new concentration facility would need to be built if large-scale mining activity were to resume at Eagle Mountain (Kaiser and MRC, 1991, cited in EMEC, 1994).

The reserves located in the alluvial resource area in the East Pit are the best candidates for future iron ore mining at Eagle Mountain. Approximately 13 percent of the remaining open pit ore reserves are located in this area. These deposits contain low average iron content; the iron could be concentrated at a relatively inexpensive facility. However, iron ore mining at Eagle Mountain was completely dependent on the availability of rail transportation. The rail line has been inactive since 1986 (Mine Reclamation Corporation, 1997), and would require substantial reconstruction for reoperation.

The placer deposits are contained in a parcel in which the California State Lands Commission (CSLC) has a 100 percent reserved mineral interest (EMEC, 1994). The mineral extraction lease permit granted to Kaiser by the CSLC expired in 2002. Kaiser’s application to exchange the State’s reserved mineral interest at Eagle Mountain for a nearby mineral estate owned by Kaiser remains in abeyance (CSLC, 2007). Nonetheless, activation of placer mining would be complicated by the present lack of equipment or a mining infrastructure at Eagle Mountain (EMEC, 1994).

3.1.2.4 Soil Resources

Soils potentially impacted by the proposed Project include those that would be affected by construction of the major Project facilities within the proposed generating facility area, those that would be traversed by the proposed Interconnection Transmission Line, and those crossed by the water supply corridor.

3.1.2.4.1 *Proposed Generating Facility Area*

Detailed soils mapping within this area had not been conducted until 1994. The soils map (Figure 3.1-3) produced by EMEC (1994) was based on soils mapping by the U.S. Soil Conservation Service (SCS) in the Desert Center area (Kim, 1993, cited in EMEC, 1994). A SCS soil survey for the Coachella Valley area (Knecht, 1980, cited in EMEC, 1994), and studies by EMEC including August 1993 field observations, interpretation of 1:24,000 scale topographic maps, and aerial photo interpretation.

The soils within the Project area have developed in a mid-latitude, low desert environment at elevations ranging from 1000 to 2800 feet above mean sea level (MSL). Slopes range from nearly level to extremely steep and include both north- and south-facing exposures as well as numerous intermediate aspects. Most of the Central Project Area is unvegetated as a result of past mining activities. Undisturbed areas support Sonoran Creasote Bush Scrub (Figure 3.5-1).

The referenced reports indicate the proposed generating facility area has been divided into five soil mapping units (EMEC, 1994), which are described below:

Typic Torripsamments, sandy, mixed, hyperthermic, 2 to 5 percent slopes: These soils are very deep, excessively drained, sand and loamy sand horizons formed in alluvial fan deposits at the foot of the Eagle Mountains. The water erosion hazard of these soils is moderate because of minimal vegetative protection.

Typic Torripsamments, sandy, mixed, hyperthermic, 5 to 15 percent slopes: These soils are deep, excessively drained, sand and loamy sand horizons formed in alluvium within the valley bottoms of the Eagle Mountains. The water erosion hazard of these soils is moderate because of minimal vegetative protection.

Lithic Torripsamments, sandy skeletal, mixed - Rock Outcrop complex, 15 to 75 percent slopes: In addition to rock outcrops, this complex includes shallow, excessively drained, very gravelly sand and very gravelly loamy sand. These soils have formed on mountain slopes in colluvial deposits derived from crystalline bedrock. The water erosion hazard of these soils is severe because of steep slopes and minimal vegetative protection.

Mine Dumps/Tailings: Soils in these areas consist of mixed cobbles and soil deposited by human activity. These deposits have not been stable long enough to develop characteristic soil profiles.

Mine Pits: The pit excavations are characterized by disturbed rock outcrops or a thin mantle of mixed soil, and cobbles deposited by human activities.

3.1.2.4.2 *Water Supply Corridor*

Current published regional SCS soils surveys in eastern Riverside County are limited to the Coachella Valley Area (Knecht, 1980, cited in EMEC, 1994), located tens of miles southwest of the Eagle Mountain site, and the Palo Verde Area (Elam, 1974), similar distances east of the site near Blythe. Therefore, detailed soil mapping of the water supply corridor in the western Chuckwalla Valley has not been performed. The few areas that were examined along the route by EMEC (1994) were typically characterized by irrigated agriculture. In their report, EMEC (1994) also used site-specific mapping in the Desert Center Area by Kim (1993, cited in EMEC, 1994) to provide a general picture of soils along the water pipeline corridor.

The proposed pipeline route follows a portion of Kaiser Road from the Central Project Area then enters an existing transmission line corridor as it extends into the alluvial basin of Chuckwalla Valley to the southeast (Figure 3.1-4). Soils found within the water supply corridor are typical of those developed in a mid-latitude, low desert alluvial environment with elevations ranging from 500 to 1,600 feet MSL. Kim (1993, cited in EMEC, 1994) described these soils as Carsitas gravelly loamy sand. The Carsitas series consists of excessively drained, very deep soils formed in alluvium from granitic parent material. These soils have low runoff, moderately rapid to rapid permeability. Vegetation is typically Sonoran Creosote Bush Scrub, with some Desert Dry Wash Woodland, and (currently inactive) irrigated farmland.

The proposed water supply corridor extends through a desert basin environment crossed by numerous washes (EMEC, 1994). The soils of this area are gravelly loamy sands with particle size decreasing with distance from the mountains. Kim (1993, cited in EMEC, 1994) suggests that the sandy surface horizon typically extends 5 to 6 feet in depth.

3.1.2.4.3 *Transmission Line Corridor*

The proposed transmission line corridor extends generally southward from the Central Project Area (*see* Figure 3.1-4). Beyond the southwest corner of the Eagle Mountain township, the alignment turns generally to the southeast while partially following an existing service road. After passing through the existing transmission corridor to the Metropolitan Water District of Southern California Eagle Mountain Pump Station, the proposed transmission alignment turns to the southwest to follow the service road as it rises and cuts through a narrow east-west trending granitic ridge. South of the ridgeline, the proposed alignment again veers to the south.

Continuing south, the alignment cuts across the west end of a second east-west trending rock ridge. On the south side of the ridge, the proposed transmission alignment continues on a southerly track for approximately 1 mile before turning east-southeast. From here the alignment continues to the connection with the regional grid at the northwest corner of Desert Center.

Specific areas of the transmission line corridor have not been mapped for soils type although limited soils mapping was performed by Kim (1993, cited in EMEC, 1994) in the Desert Center Area, typically east of the south end of the corridor. This information coupled with interpretations of topographic maps indicate that the soils within this area are similar to those along the water supply corridor, having developed in a mid-latitude, low desert environment at elevations ranging from 800 to 1,600 feet MSL. Slopes in the area range from nearly level to steep and include both north- and south-facing exposures as well as numerous intermediate aspects. Vegetation is Sonoran Creasote Bush Scrub and Desert Dry Wash Woodland (Figure 3.5-1).

Soils within the transmission line corridor that have developed primarily on valley fill alluvium are expected to belong to the Carsitas-Myoma-Carrizo association (EMEC, 1994). However, at the north end of the alignment, and across the two narrow bedrock ridges in the middle portion of the alignment, bedrock materials may be shallow. Because of the steeper surface gradient and shallower depth to bedrock, soil conditions in these areas may change to the Badland-Carsitas-Chuckwalla association (EMEC, 1994). General characteristics of these two soil associations are described in the following paragraphs:

> **Carsitas-Myoma-Carrizo Association:** These soils are somewhat excessively drained and excessively drained sands, fine sands, gravelly sands, cobbly sands, and stony sands. They are found on nearly level to moderately steep slopes, and have formed on alluvial fans and valley fill. These are deep soils (5 to 6 feet depth) with a moderate water erosion hazard.

> **Badland-Carsitas-Chuckwalla Association:** These soils are excessively drained fine sands, sands, gravelly sands, and cobbly sands. They are found on nearly level to steep slopes, and have formed on hill and mountainsides. These are shallow soils which are subject to severe water erosion on steeper slopes.

3.1.2.5 Earthquakes and Faults

Landfill siting studies completed by Kaiser and MRC (1991, cited in EMEC, 1994) and GeoSyntec (1996) included seismic hazard assessments to evaluate the potential for surface ground displacement from movement of active and potentially active faults, and for strong shaking from active faults, potentially active faults, and from non-specific area sources of seismicity. Active faults (Bryant, et al., 2007) are defined as faults along which seismically induced (tectonic) displacement has occurred in the past 11,000 years (the Holocene epoch). Potentially active faults are defined as faults along which tectonic displacement has occurred between 11,000 and 1.6 million years before present (the Pleistocene epoch). Inactive faults are defined as faults along which tectonic displacement has not occurred in the past 1.6 million years (since the beginning of the Quaternary period).

3.1.2.5.1 *Regional Faults*

There are numerous active and potentially active faults and fault zones located within 100 miles (161 km) of the site (Figure 3.1-5). Based on the Fault Activity Map of California (Jennings, 1994), the nearest active faults to the Eagle Mountain site are the Hot Springs Fault and the paralleling San Andreas Fault (Coachella segment), located about 30 miles (48 km) and 33 miles (53 km) southwest of the site, respectively.

The Alquist-Priolo Earthquake Zoning Act (Bryant, et al., 2007) establishes zones around "sufficiently active and well-defined" faults in California wherein site-specific fault location studies are required to mitigate fault surface rupture hazards prior to construction intended for human occupancy. The closest "zoned" faults to the Eagle Mountain site are the Hidden Springs Fault, located 29 miles (47 km) to the southwest, the aforementioned Hot Springs Fault, and the mid-east portion of the Pinto Mountain Fault, located 32.5 miles (52 km) to the northwest.

Potentially active faults from the late Quaternary are also frequently considered in a seismic hazard assessment since they can represent active faults that have a greater (more than 11,000 years) recurrence interval. In addition to the aforementioned faults, potentially active late Quaternary faults considered capable of generating significant seismic events include the Blue Cut Fault, with the nearest segment mapped about 4 miles (6 km) north of the site; the Salton Creek Fault, about 23.5 miles (38 km) to the southwest; and eastern segments of the Pinto Mountain Fault, located 30.5 miles (49 km) northwest of the site. In addition to these fault-specific sources, previous investigations of seismic exposure at the Eagle Mountain site (EMEC, 1994; GeoSyntec, 1996) considered non-specific area sources including the Southeast Transverse Ranges, the San Bernardino Mountains, the Eastern Mojave, the Sonoran, and the Salton seismo-tectonic zones. Table 3.1-1 identifies the faults and non-specific source zones considered in the previous seismic assessment by GeoSyntec. The table includes the closest distance from each source to the site, the length of each fault or area of each non-specific source zone, and the maximum event magnitude.

Table 3.1-1. Significant Seismic Sources Within 100 km of the Eagle Mountain Site

Fault or Fault Zone	Closest Distance Miles (km)	Length miles (km) or Area [1] miles ^{2} (km ^{2})	Maximum Credible Earthquake[2] Magnitude (M max)	Recurrence Interval (years) $M \geq 4.5$	Recurrence Interval (years) $M \geq$ (Mmax -0.50)	Maximum Credible Earthquake Peak Horizontal Acceleration[3] (g)
Blue Cut Fault	4 (6)	L – 52 (83)	7.5	39.5	12,500	0.48
Pinto Mountain Fault	28 (45)	L – 50 (80)	7.2	7.2	2,290	0.10
Southeast Transverse Ranges Zone	3 (5)[4]	A – 2,602 (6,737)	6.75	2.3	166	0.49
San Bernardino Mountains Zone	56 (90)	A – 832 (2,156)	7.0	6.2	778	0.03
Eastern Mojave Zone	7 (11)	A – 8,500 (22,008)	7.5	1.9	573	0.41
Sonoran Zone	14 (22)	A – 44,608 (115,487)	6.5	44.7	1,412	0.15
Salton Zone	34 (55)	A – 12,464 (32,269)	7.0	1.2	73.6	0.07
San Andreas Fault[5]						
- Coachella Valley Segment	33 (53)	L – 27 (69)	8.0	69.5	695	0.14
- San Bernardino Segment	40 (65)	L – 48 (125)	8.0	0.8	795	0.11

Notes: [1]L – length and A – area.
[2]Maximum Credible Earthquake (MC) is the "maximum earthquake that appears capable of occurring under the presently known tectonic framework" as defined by the California Geologic Survey. The MCE represents a seismic event more severe than the Maximum Probable Earthquake. The MCE is presented in this table as a means of indicating the relative differences in fault source characteristics.
[3]Using mean attenuation relationship of Sadigh as reported by Joyner and Boore (1988).
[4]Site is within S.E. transverse Range. Minimum site to source distance assumed to be five kilometers.
[5]Minimum magnitude equal to 6.5 for Coachella Valley Segment. Magnitude 8.0 maximum event assumes simultaneous rupture of Coachella Valley, San Bernardino, and Eastern Mojave Segments.

Source: EMEC, 1994

3.1.2.5.2 *Regional Seismicity*

The California Geological Survey provides a database of all known historical earthquakes of magnitude greater than 4.0 within the Project region for the period from 1769 to 2000 (CGS, 2001). Figure 3.1-6 is a plot of this earthquake activity in the Project region. The data shown in Figure 3.1-6 are only complete for the past 75 years, since establishment in 1932 of the Southern California Seismic Network jointly administered by the United States Geological Survey (USGS) and California Institute of Technology. Prior to 1932, only events large enough and close enough to be felt in populated areas were recorded. Locations of these events are inferred, based upon either observations of surface rupture or reports of observed shaking intensity.

Figure 3.1-6 shows the site on the eastern edge of a region of high historical seismicity in southern California. Most seismicity in this area is associated with the San Andreas Fault Zone (southwest and west of the site), the San Jacinto Fault Zone (south and west of the site), or the Brawley Fault Zone (south of the site). Some seismicity is associated with the Pinto Mountain Fault to the north of the site. Upon review of recorded seismicity in the region, and using the attenuation relationship developed by Sadigh as reported by Joyner and Boore, 1988, (cited in EMEC, 1994); GeoSyntec (1992 cited in EMEC, 1994) estimated that the strongest ground motion at the site from historical events was about 0.15g (1g = acceleration due to gravity), using mean attenuation rates, and 0.27g using mean plus one standard deviation.

Based on the distances to recognized regional seismic sources and a "random earthquake" of Magnitude 6.75 located 3 miles (5 km) from the Eagle Mountain site, deterministic calculations of potential ground motion at the site were performed (EMEC, 1994; GeoSyntec, 1996). The calculations, which used the attenuation relationship developed by Sadigh (Joyner and Boore, 1988, cited in EMEC, 1994), estimated the highest horizontal peak ground acceleration (PGA) of 0.49g that results from a moment magnitude (M_W) 6.75 random event in the Southeast Transverse Ranges (*see* Table 3.1-1). A similar PGA of 0.48g was estimated from a magnitude 7.5 event on the Blue Cut Fault (EMEC, 1994; GeoSyntec, 1996). Regional probabilistic studies on seismicity (Peterson et al., 2008) estimate that the site has a 2 percent probability of exceeding PGAs of between 0.35 and 0.46g in the next 50 years.

Several new peer-reviewed deterministic attenuation relationships, introduced in 1997, are in common use at this time. In addition, next generation attenuation (NGA) deterministic models were introduced in 2006-2007. The NGA relationships were extensively reviewed by regulatory agencies and the scientific community and were adopted by the USGS for use in their national ground-motion mapping (Peterson et al., 2008). However, many site investigators use the results from the 1997 relationships as a comparison to those from the NGA relationships in their estimates of seismic exposure.

For this investigation, the Applicant reviewed the fault parameters used in the previous site studies (EMEC, 1994; GeoSyntec, 1996) as presented in Table 3.1-1. Some of the information in Table 3.1-1 was updated based on more recent fault data, regulatory guidelines and professional judgment. In particular, the maximum considered earthquake for the Blue Cut Fault, which produces the highest estimated ground motions at the site, was considered overly conservative since the fault has no known Holocene movement and enechelon movement with adjacent faults was assumed in the GeoSyntec (1996) evaluations. In addition, the random event in the Southeast Transverse Ranges was reduced from M_W 6.75 to M_W 6.25 in keeping with the State Division of Safety of Dams (DSOD) guidelines (Fraser and Howard, 2002).

The revised fault information, as presented on Table 3.1-2, and newer attenuation relationships were used to update seismic exposure at the site using both the 1997 and NGA equations. The results of these analyses (Table 3.1-2) indicate that the highest seismic shaking at the site would again result from a maximum event on the Blue Cut Fault. The maximum earthquake of M_W 6.9 on the Blue Cut Fault yields a mean PGA of 0.46g with the 1997 relationships, and a mean PGA of 0.36g using the NGA equations. If the higher magnitude used by GeoSyntec (M_W 7.5) for the Blue Cut Fault is employed, the mean PGAs increase to 0.56g and 0.40g for the 1997 and NGA relationships, respectively.

The random earthquake in the Southeast Transverse Ranges also contributes a high mean PGA (0.48g) at the site with the 1997 attenuation relationships and 0.38g with the NGA formulas, but only if the GeoSyntec value of M_W 6.75 is used. Estimated potential ground motions from the random earthquake are reduced to a mean PGA of 0.15g for both the 1997 and NGA relationships when the preferred M_W 6.25 is used.

Probabilistic potential ground motions presented in Table 3.1-3 for the Eagle Mountain site are based on the California Geological Survey database (2007) and the USGS database (2002). The results indicate that for return periods of 100 and 475 years, PGAs of 0.10g and 0.19g, respectively, are estimated for the site.

Table 3.1-2. Fault Parameters and Established Ground Motions Eagle Mountain Project

FAULT PARAMETERS AND ESTIMATED GROUND MOTIONS
EAGLE MOUNTAIN PROJECT

FAULT	M (low)	M (high)	M_w (used)	Type Length (km)	Slip (mm/yr)	Dist. (km)	GeoSyntec, 1996 PGA [1] (g) Mean	GEI Estimates 1997 PGA [2] (g) Mean	GEI Estimates NGA PGA [3] (g) Mean
				R.L. S/S					
Hot Springs	**--**	--	**6.6 [4]**	**19**	--	48.0	--	**0.07**	**0.06**
				uncertain					
Hidden Springs	**--**	--	**6.6 [4]**	**20**	--	47.0	--	**0.07**	**0.07**
				L.L. S/S					
Blue Cut	**6.8 [a]**	**6.9 [b]**	**6.90**	**30-83?**	**1.0-2.5**	**6.0**		**0.46**	**0.36**
(w/ rupture of parallel faults for GeoSyntec)			*7.50*	*83*		*6.0*	*0.48*	**0.56**	**0.40**
				uncertain					
Eastern Mojave Fault Zone [d]	**7.7 [a]**	**8.3 [f]**	**7.50**	**100-133**	**19-25**	**11.0**		**0.40**	**0.30**
San Andreas Mojave segment for ECE			*7.50*	--		*11.0*	*0.41*	**0.40**	**0.30**
				uncertain					
SE Transverse Ranges	**6.0**	**6.5**	**6.25 [g]**	--	--	random		**0.15**	**0.15**
(random event for GeoSyntec)			*6.75*	--		*5.0*	*0.49*	**0.48**	**0.38**
				R.L. S/S					
San Andreas - Coachella [5]	**6.8**	**8.0**	**7.60**	**600**	**20-30**	**53.0**		**0.11**	**0.10**
San Andreas - San Bernardino	**7.5**	**8 [e]**	**7.70**	**600**	**19-29**	**65.0**		**0.09**	**0.08**
(3 segment rupture for GeoSyntec [6])			*8.00*	*194 + ?*		*53.0*	*0.14*	**0.14**	**0.12**
				L.L. S/S					
Pinto Mountain [c]	**6.5**	**7.3 [a]**	**7.00**	**73-90**	**1.0-5.0**	**45-49?**		**0.09**	**0.08**
			7.20			*45.0*	*0.10*	**0.11**	**0.09**
				L.L. (??)					
Salton Zone	--	--	**6.75**	**18??**	--	**38.0**		**0.10**	**0.08**
(Salton Creek Fault for GEI)		*7.4*	*7.00*			*55.0*	*0.07*	**0.08**	**0.06**
				--					
Sonoran Zone [random M?]	--	--	**6.50**	--	--	**22.0**		**0.15**	**0.12**
			6.50			*22.0*	*0.15*	**0.15**	**0.12**
				R.L. S/S					
San Bernardino Mtns. Fault Zone [d]	--	--	**6.75**	**50??**	--	**90.0**		**0.04**	**0.03**
			7.00			*90.0*	*0.03*	**0.04**	**0.03**

ECE preferred estimates are in bold case ***GeoSyntec, 1996 estimates are italicized***

NOTES:

[1] PGA estimates for GeoSyntec (1996) used Sadigh 1988 equation
[2] Average of mean using Adamson and Silva (1997), Boore, et al (1997), and Sadigh, et al (1997) equations
[3] Average of mean using Campbell and Bozorgnia (2007), Chiou and Youngs (2006), and Idriss (2007) NGA equations
[4] Estimated from mapped length (Jennings, 1994) and Wells and Coppersmith (1994) length/magnitude relationship
[5] Includes Coachella and San Bernardino segments
[6] Previous magnitude .5 (GeoSyntec, 1996) assumed en-echelon rupture of the Blue Cut and all adjacent faults. This assumption may be overly conservative as the Blue Cut Fault is not documented as Holocene active.

REFERENCES:

[a] Wesnousky (1986)
[b] Anderson (1984)
[c] Petersen and Wesnousky (1994)
[d] WGCEP (1995)
[e] OSHPD (1995)
[f] Mualchin and Jones (1992)
[g] Fraser and Howard (2002)

Table 3.1-3. Probabilistic Seismic Hazard Analysis
(Based On Seismic Hazard Mapping Programs)

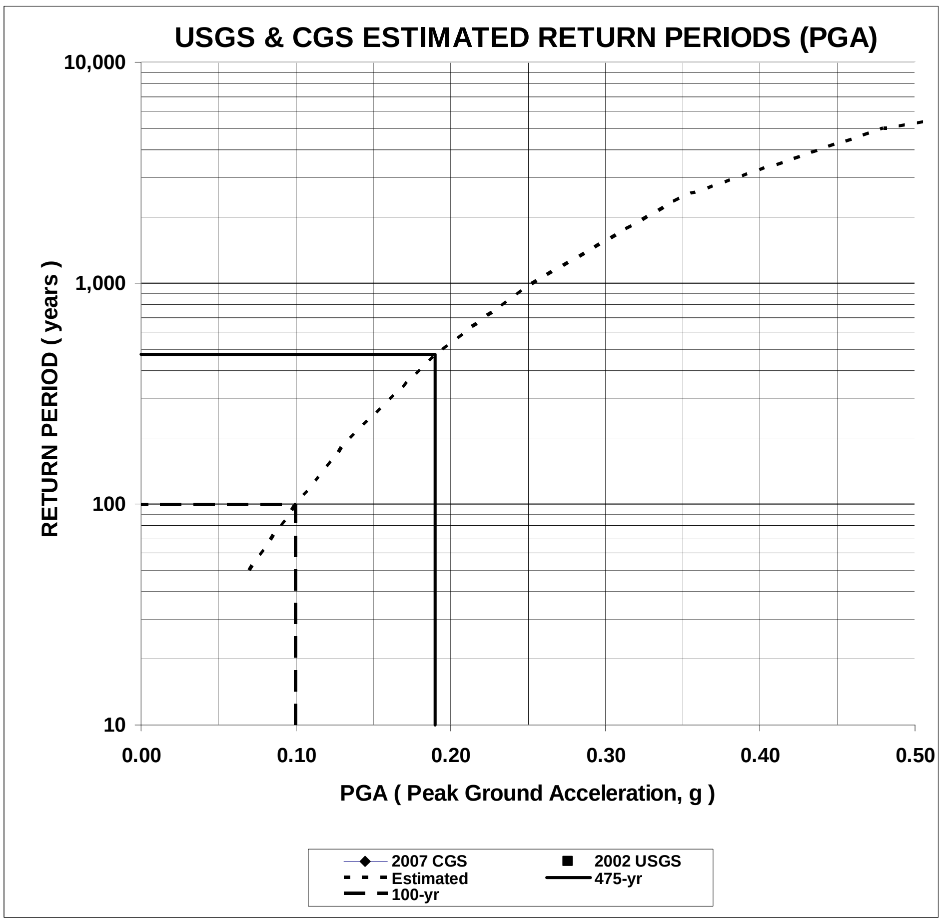
EAGLE MOUNTAIN SITE [SOFT ROCK CONDITIONS]

SITE COORDINATES	
LATITUDE:	33° 52' 12"
LONGITUDE:	115° 29' 38"

	DATABASE		
	2007	2002	ESTIMATED
T (years)	PGA (g)	PGA (g)	PGA (g)
50	--	--	0.07
100	--	--	0.10
200	--	--	0.14
475	**0.19**	**0.19**	0.19
975	--	--	0.25
2,475	--	**0.35**	0.35
5,000	--	--	0.48
10,000	--	--	0.75

2002: USGS database
2007: CGS - soft rock database
(both databases accessed 2008)

T = Return Period
PGA = Peak Ground Acceleration
g = acceleration due to gravity



USGS – U.S. Geological Survey
CGS – California Geological Survey

Note: Increase predictions by 30% for alluvium or soft soil site

3.1.2.5.3 *Local Faulting*

Field reconnaissance and review of remote sensing data (GeoSyntec, 1992, cited in EMEC, 1994) identified six major structural lineaments that trend across the site or are within 2,000 feet (600 m) of the proposed Eagle Mountain Landfill boundaries. Three of these were found to be bedrock faults (Fault A, Bald Eagle Canyon Fault and East Pit Fault), two were determined to be intrusive dikes, and the last (Lineament B) resulted from differential erosion along prominent joints in the bedrock. These features were further investigated by Proctor (1993) and Shlemon (1993) to evaluate the activity or potential activity of the faults. The investigations included review of available geologic reports of the area, aerial photographs, high altitude infra-red imagery, gravimetric surveys, field mapping, trench excavating and logging, evaluation of local micro-seismicity, and soil-stratigraphic age dating.

The fault investigations indicated that the lineaments trend northwest across the site in a direction consistent with a pattern of regional faulting believed to have existed since Miocene time (approximately 5 to 22 million years ago). Analyses performed during the studies included evaluation of stereoscope air photos taken of the site during mining operations, which indicated no identifiable displacement of alluvium estimated to be at least 40,000 years old. Furthermore, evaluation of aerial photos taken prior to the start of mining operations, and field reconnaissance within the East Pit and the general site area, indicated that no displacement has occurred along faults at the site in the past 40,000 to 100,000 years.

In some areas of the site, shallow tailings or alluvial fan deposits cover the fault traces. Therefore, trenches were excavated through the overburden across Fault A and the Bald Eagle Canyon Fault. Exposures in the exploratory trenches also indicated unbroken alluvium, providing additional evidence that there had been no displacement along these faults at the site during Holocene or late Pleistocene time (GeoSyntec, 1993).

Site mapping indicated that cross-cutting dikes of volcanic rock, dated as 124 million years or more in age (GeoSyntec, 1993), are not offset by Fault A and the Bald Eagle Canyon Fault. This suggests that the most recent movement of these faults dates back to at least Mesozoic time. The relationship of the cross-cutting dikes to the East Pit Fault is less certain, but the fault is readily exposed in the walls of the East Pit beneath up to 270 feet (82 m) of unbroken alluvium, estimated to be more than 100,000 years in age (Proctor, 1993).

Additional northwest-southeast fault segments were mapped; one in the western end of the East Pit and another at western end of the proposed landfill footprint (GeoSyntec, 1993). Soil stratigraphic age dating of these features was hindered by lack of natural soil cover. However, GeoSyntec (1993, 1996) concluded that, due to the enechelon structure of the northwest-southeast system of site area faults, formation of all the northwest-trending faults at the site occurred within a similar geologic age and tectonic stress regime. Thus, these additional fault segments were also concluded to be at least pre-Holocene in age. However, if the northwest-trending faults are collectively considered to be of similar age and origin, significant displacement has not occurred on these faults since the formation of the dikes more than 100 million years ago. As such, these faults are considered inactive. Further details of the investigations for on-site faults, including information from the Proctor (1993) and Shlemon (1993) studies, are contained in GeoSyntec (1993, 1996).

3.1.3 Potential Environmental Impacts

3.1.3.1 Methodology

Preparation of this section is based on review of geologic maps, data, aerial photographs, and reports for the Project area. Extensive geologic investigations have been performed for the Eagle Mountain Site. Mineralogical studies were conducted prior to and during operation of the iron ore mining activities at the site. In the early 1990s, comprehensive site investigations were performed during landfill permitting studies. The results of those investigations were summarized in the Eagle Mountain Pumped Storage Project Application for Federal Energy Regulatory Commission (FERC) License (EMEC, 1994), which was based largely on the *Report of Waste Discharge for the Eagle Mountain Landfill and Recycling Center* by GeoSyntec in 1992. Additional summary site investigations were performed by GeoSyntec in 1996.

3.1.3.2 Thresholds of Significance

The State Water Resources Control Board (SWRCB) concludes that the Project may have significant impacts on geology, soils, and mineral resource if the Project does any of the following:

(a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving: rupture of an earthquake fault, strong seismic ground shaking, seismic-related ground failure, liquefaction, or landslides

(b) Result in substantial soil erosion or the loss of topsoil

(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(d) Be located on expansive soils, as defined in Table 18-1-B of the UBC (1994), creating substantial risks to life or property

(e) Affect soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are unavailable for the disposal of waste water

(f) Cause inundation by seiche, tsunami, or mudflow

(g) Result in loss of available mineral resource that would be of value to the region and the residents of the State and/or

(h) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan

Related to geologic considerations, the acid production potential of the site is addressed in Section 3.2 Surface Water, and reservoir seepage is addressed in Section 3.3 Groundwater.

3.1.3.3 Environmental Impact Assessment

3.1.3.3.1 *Earthquakes and Faults*

Studies for the landfill investigated those faults that trend towards or through the proposed landfill footprint. These include several northwest trending fault segments including the Bald Eagle Canyon Fault, the East Pit Fault, and Fault A. The East Pit Fault crosses through the East Pit, which is the proposed site for the lower reservoir of the proposed Project. The Bald Canyon Fault and Fault A extend through the broad area separating the proposed upper (Central Pit) and lower reservoirs. Reports by GeoSyntec (1996) and their consultants indicated that surface displacement has not occurred on these faults for at least 40,000 years and probably more than 100,000 years. Some of the faults were crossed by unbroken dikes estimated to be at least 100 million years old. This means that the faults are inactive as indicated by definitions as listed in Section 3.1.2.5, Earthquakes and Faults. As such, since they are not active faults, they are less susceptible to Reservoir Triggered Seismicity (RTS) (*see* Section 3.1.3.3.8, below).

GeoSyntec (1996) indicates that other northwest trending fault segments exist in the proposed landfill area, but activity on these was indeterminable due to lack of dateable features. However, they argue that the structure of the northwest trending faults indicates a common age and tectonic stress regime during their formation. Therefore, they conclude that the other northwest trending fault segments have the same general age as the Bald Canyon Fault, the East Pit Fault and Fault A.

Detailed mapping of the upper reservoir (Central Pit) (PRA Group, 1991) indicates that northwest trending fault segments, similar to those in the area of the proposed landfill, extend across the upper reservoir. Based on the GeoSyntec (1996) investigations for the landfill site, it could be concluded that the northwest trending fault segments crossing the upper reservoir have also not experienced displacement within the past 40,000 years or more. All faults in the general Eagle Mountain mining area, whether northwest trending or oriented in other directions (e.g. the Substation and Victory Pass faults), are indicated as not displaying Quaternary (last 1.6 million years) movement on the State Fault Map (Jennings, 1994).

The DSOD criterion for active faults (Fraser, 2001) is displacement within the last 35,000 years. Using this criterion, the on-site faults are considered to be inactive.

3.1.3.3.2 *Ground Subsidence*

Because of the density of the natural soil and rock formations at the reservoir sites, and the engineering characteristics of the proposed dam construction, ground subsidence is not a potential hazard associated with this Project. No abandoned or active mines in rock units susceptible to subsidence are known. Furthermore, soil deposits potentially susceptible to hydro-compaction subsidence are also not present in the immediate Project area (EMEC, 1994).

Information about subsidence risk in the Chuckwalla Valley groundwater aquifer is found in Section 3.3 Groundwater.

3.1.3.3.3 *Active and Inactive Mines*

The proposed Project would utilize two of the four main mining pits at the inactive Eagle Mountain Mine site: the East Pit and the Central Pit. The two western-most of the four main pits, the North and South Black Eagle Pits, are outside the proposed Central Project Area and would not be affected by construction and operation of the pumped storage hydroelectric facility, access roads, or transmission line.

Two mine adits are located adjacent to the Central Project Area. There are no current plans to use or otherwise disturb these features in conjunction with the proposed construction. The adits appeared to be stable at the time of previous evaluations (EMEC, 1994), although natural minor collapses are possible in the future.

The CSLC holds a 100 percent reserved mineral interest in a 467-acre parcel of land in the Eagle Mountain Mine area (Figure 3.1-7). The CSLC had issued a lease to Kaiser in 1978 covering 145 acres of the 467-acre parcel. The lease expired in 2002. Kaiser made application to exchange the State's reserved mineral interest on the entire 467-acre parcel of school lands for a partial interest in a nearby mineral estate owned by Kaiser. This application remains in abeyance pending resolution of legal challenges to the proposed land exchange between Kaiser and the BLM (CSLC, 2007).

If the proposed Project is approved and constructed, and the CSLC retained these mineral rights, the State's ability to mine this parcel would be impeded during the life of the Project. The portion of the CSLC land that would be inaccessible would be the placer deposits at the east end of the lower (East) pit. Geosyntec (1992) estimated 21.4 million short tons ore reserve in the East Pit – Alluvial resource area. This is approximately 6.3 percent of the estimated Eagle Mountain ore reserves.

3.1.3.3.4 *Soil Erosion*

Soil erosion impacts could occur during development of the upper and lower reservoirs, access roads, power line towers, water supply corridor, and surface facilities. After licensing, ECE would prepare and implement an erosion control plan (*see* Section 12.2) as part of the detailed design. The erosion control plan describes the erosion and sediment control practices planned for implementation during construction of the Project, intended to minimize the erosion of soils in construction areas and prevent the transport of sediment into stormwater discharges away from the construction site.

Three main types of areas that would require erosion and sedimentation control measures based on their similar characteristics and anticipated impacts:

- Area Type 1 – represents the area of greatest potential risk of impact. This will include cleared and graded areas for minor cuts and fills (permanent roads, power cable conduit trench, interconnection switchyard at Desert Center, and transmission tower pads) and will have permanent structures, including roads, dams, piping, and tunnels remaining on site after construction activities are finished.
- Area Type 2 – represents medium potential risk of impacts. This will include cleared and graded areas containing temporary soil stockpiles, equipment staging/laydown areas, temporary access roads, water supply pipeline corridor, and construction trailer/field office areas
- Area Type 3 – represents the lowest potential risk of impacts. This will include areas near the upper and lower reservoir used for temporary stockpiling and general low impact use activities

3.1.3.3.5 *Landslides and Mass Movements*

There are areas within the Central and East Pits that have potentially unstable slopes because mining has exposed adversely oriented fracture sets on the pit walls. Consequently, slope raveling and localized, surficial slope failures and/or rock falls should be expected on these slopes.

Programs for geologic mapping and scaling to prevent loose rock are incorporated in the Project Plan. During site investigations, geologic mapping will be performed to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining.

3.1.3.3.6 *Liquefaction*

Liquefaction can occur when loose, saturated granular soils are subjected to vibratory motion, such as those induced by earthquakes. The vibrations cause a rise in pore water pressure, which if high enough, can cause the soil to lose strength and behave as a fluid. Liquefaction can result in settlements, lateral spreading, and other disruptions at the ground surface.

Screening criteria for determination of liquefaction hazard (Southern California Earthquake Center, 1999) indicates that liquefaction assessments are not required at sites if the substratum has any of the following characteristics:

- The estimated maximum past, current, and future ground water levels are determined to be deeper than 50 feet below the existing or proposed final site grade.
- Bedrock or other lithified formational material that is considered non-liquefiable directly underlies the site.

- The granular soils underlying the site are all determined to be dense to very dense based on corrected Standard Penetration Test blow count or corrected cone penetration test data.
- The underlying soils have a clay content (particle size <0.005 millimeters) greater than 15 percent.

In addition, Youd and Perkins (1978) indicates that Pleistocene-age alluvial fan and plain sediments, such as those that are found on the eastern edge of the East Pit and at locations farther east and to the southeast, have in general a low potential for liquefaction based on their geologic maturity, which typically is an indication of higher material density.

A review of groundwater data at the site (*see* Figure 3.3-11) indicates that natural groundwater levels are typically at depths much greater than 50 feet below the surface in the Project area. The exception appears to be near the bottom of the East Pit, where the most recent data available (CH2M Hill, 1996) indicates natural groundwater levels lie about 20 feet below the lowest portions of the East Pit. Facilities constructed near or within the planned areas of reservoir inundation (e.g. inlet/outlet structures) in the East Pit (Lower Reservoir) and Central Pit (Upper Reservoir) will be founded on bedrock materials. Other East Pit-bottom construction could include a hardscape blanket as a seepage control measure on the Pleistocene-age alluvial sediments that form the east and southeast edges of the pit. In either case, the density of the foundational material will negate (bedrock) or greatly reduce (Pleistocene alluvium) the potential for liquefaction-induced settlements.

In recognition of the potential for seepage from the reservoirs to raise local groundwater levels, systems will be established to maintain groundwater at near pre-Project levels in areas influenced by reservoir seepage, as described in Section 3.3.3.3.8, Hydrocompaction Potential. This coupled with the construction of Project facilities for the most part on shallow bedrock, dense Pleistocene-age sediments, or properly engineered and compacted fill, will render the potential for liquefaction-induced settlements very low to non-existent throughout the Project.

3.1.3.3.7 *Reservoir Triggered Seismicity*

A comparison of site characteristics with those most commonly associated with RTS indicates that the potential for RTS at the Eagle Mountain site is very low. In addition, RTS is not known to cause an increase in the maximum credible earthquake. Reservoir triggered seismicity is the activation of fault movement, and hence the production of earthquakes, by the impoundment or operation of a reservoir. This phenomenon is commonly referred to in the literature as Reservoir Induced Seismicity. However, because the crustal masses experiencing this phenomenon were likely only marginally stable to begin with, most experts consider the term “triggering” as more accurately describing increases in seismicity associated with reservoir impoundment.

From a worldwide perspective, only a small percentage of reservoirs impounded by large dams have triggered known seismic activity. It is generally accepted that reservoir filling will not cause damaging earthquakes in areas where they would not otherwise occur. Accordingly, the maximum credible earthquake for an area is not changed by reservoir filling, although the frequency of earthquakes may be increased, at least temporarily (Federal Emergency Management Agency, 2005).

General theory suggests that reservoir impoundment alters the stress regime within the crust of the earth by increasing shear stress due to the weight of the water, and reducing the shear strength by increasing pore-water pressure. While these changes appear insufficient to generate failure in unfractured rock, faulted rock under significant tectonic strain may be induced to slip by the compounding effects of reservoir impoundment (USCOLD, 1997). As such, zones of active faulting appear to be the most susceptible to RTS.

The mining pits selected to contain the upper and lower reservoirs were formed by the excavation of vast quantities of overburden and ore rock. The depth of excavation in the pit areas is estimated to range up to 290 feet in the upper reservoir and up to 480 feet in the lower reservoir. When the reservoirs are filled to maximum operation level, the deepest column of water will be about 255 feet in the upper reservoir and 377 feet in the lower reservoir. Considering that the weight of water is about 2 (overburden) to 2½ (ore rock) times less than that of the excavated material, the loads applied by the reservoirs at high-water will be substantially less than that originally imposed on the pit surfaces prior to mining. As such, the reservoir load may tend to restore some of the equilibrium lost through the site excavations rather than imposing potentially destabilizing stresses that could lead to earthquakes.

Because of the depth of the pit excavations, a dam with maximum height of 120-feet will be needed to contain the maximum water depth of about 377 feet at the upper reservoir. With 5 feet of freeboard, the maximum water thickness added to the pre-excavation land elevation by the impoundment of the reservoir will be about 115 feet (34.5 meters). Water storage (active and inactive) for both reservoirs combined is estimated at about 24,200 acre-feet (3×10^7 cubic meters).

A statistical examination of 234 reservoirs (with and without RTS) was performed by Baecher and Keeney (1982) to better understand site characteristics that correlate with RTS and to develop a model for predicting RTS from these characteristics. In their analysis, five attributes of reservoirs appear to correlate with RTS: depth, volume, stress state, presence of active faulting, and rock type. These attributes were chosen based solely on the ready availability of data (either site specific or regional) with the recognition that other attributes such as water level fluctuation and pore pressure changes may also be important in RTS. The model criteria define the attributes of shallow and small as less than 92 meters in depth and less than 12×10^8 cubic meters volume, respectively. Using this model, the proposed upper and lower reservoirs would be designated as shallow (assumes only the maximum depth of water above the original ground surface) and small in volume. In their study, Baecher and Keeney (1982) indicate that shallow, small reservoirs were not pursued further in their analyses since they would have a probability of RTS of “very near zero.”

As indicated on Figure 3.1-6, macro-seismicity within 12 miles of the proposed reservoirs is rare with only one M4.0 to M4.99 event recorded about 3 miles south of the proposed reservoirs, possibly on the east-west trending Substation Fault. In consideration of the size of the proposed reservoirs coupled with the apparent lack of active faults in and near the areas of impoundment and the rarity of local seismicity, the potential of RTS at the site appears remote and should not prove a hindrance to site development. Responding to the question of whether certain geologic settings are more prone to RTS than others, USCOLD (1997) states: "Studies that have examined the geologic setting of RTS have not been able to provide any clear guidance that would justify abandonment of any reservoir site because of concerns about the seismic safety of the dam."

International Commission on Large Dams (ICOLD, 2008) recommends that an earthquake monitoring program be initiated at reservoir sites prior, during and after impoundment. This long-term monitoring is important as it provides the only conclusive evidence as to whether or not storage impoundment triggers earthquakes. Based on the recommendations of ICOLD (2008), and as required by the FERC and DSOD, an earthquake monitoring program will be established in advance of impoundment, and maintained during and after impoundment in the Project area. These recommendations (LORS) ensure placement of instruments[1] to monitor ground shaking at the dams and water intakes and in the powerhouse, as well as, ensuring assignment of various instruments to measure stresses and deflections of structures. Such features are designed to not only record for seismic events but as a measurement tool for the correlation of behavior within the project structures.

Environmental Impact Assessment Summary:

(a) *Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving: rupture of an earthquake fault, strong seismic ground shaking, seismic-related ground failure, liquefaction or landslides?* No. On-site faults have been evaluated and found to be inactive. Therefore, the risk of surface rupture at the site caused by faulting is very low (GeoSyntec, 1993, 1996); therefore, the potential for impact is less than significant. Liquefaction-induced settlement risk is very low to non-existent.

(b) *Would the project result in substantial soil erosion or the loss of topsoil?* No. The impact of potential soil erosion is minimized to the extent possible by limiting surface disturbance to only those areas necessary for construction. Storm water and dust control best management practices will be employed to minimize erosion, sedimentation and fugitive dust. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, stabilized, and used during site restoration.

(c) *Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide,*

[1] The project would utilize several earthquake monitoring instruments, of which would be confirmed at the final engineering phase.

lateral spreading, subsidence, liquefaction or collapse? No. The Project is not located on a geologic unit or soil that is unstable or would become unstable as a result of the Project.

(d) *Would the project be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?* No. The site is characterized by Jurassic- to Cretaceous-age plutonic intrusive rocks and Paleozoic and Precambrian metamorphic and meta-sedimentary rocks (Jennings, 1967). At the Eagle Mountain site, the meta-sedimentary rocks are surrounded and underlain by intrusive granitic rocks. Iron ore deposits at the site are comprised of magnetite and hematite with minor amounts of pyrite, which were formed by the replacement of carbonate meta-sedimentary rocks. The most significant alluvial deposits are found on the eastern edge of the site area, where they form a laterally extensive alluvial fan that extends and thickens to the east into the Chuckwalla Valley. However, the proposed Project would not be built on soil. The reservoirs would occupy bare-rock mine pits and the tunnel would be constructed in granitic rock. The water pipeline would be constructed on sand fields and alluvium; however, the sands and soils in these areas are not expansive.

(e) *Would the project affect soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are unavailable for the disposal of waste water?* No. The waste system will be permitted, engineered, and constructed, and will not rely upon natural soils in or around the Project site.

(f) *Would the project result in loss of available mineral resources that would be of value to the region and the residents of the state?* No. A portion of CSLC mineral reserves, constituting a small percentage of the available iron ore on the site, would be inaccessible in the east end of the lower (East) pit during the 50-year life of the Project. However, there are no plans to reinitiate iron ore mining on the site. The mine owners intend to use portions of the mine as a regional landfill. Therefore, this impact would be *less than significant.*

The proposed Project would utilize two of the four main mining pits at the inactive Eagle Mountain Mine site: the East Pit and the Central Pit. The two western-most of the four main pits, the North and South Black Eagle Pits, are outside the proposed Central Project Area and would not be affected by construction and operation of the pumped storage hydroelectric facility, access roads, or transmission line.

(g) *Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?* No. Please see Response (f) above.

Impact 3.1-1 Earthquakes and Faults. On-site faults have been evaluated and found to be not active. Therefore, the risk of surface rupture at the site caused by faulting is very low (GeoSyntec, 1993, 1996); and therefore, this would be *less than significant* and no mitigation is required.

Impact 3.1-2 Ground Subsidence. Ground subsidence is not considered to be a potential hazard associated with this Project. This impact would be *less than significant* and no mitigation is required.

Information regarding subsidence risk in the Chuckwalla Valley groundwater aquifer is found in Section 3.3 Groundwater.

Impact 3.1-3 Active and Inactive Mines. There are no current plans to resume iron mining at the project site. The owners of the mine site property intend to develop the mine site as a regional landfill and have no plans to re-open the mines. Ore reserves within the Project boundary, constituting a small percentage of the available iron ore on the site, will not be accessible for the life of the Project, including a portion of CSLC mineral reserves. Iron ore and other rock resources in the mine site outside the Project boundary will remain accessible for mining. This impact would be *less than significant* and no mitigation is required.

Impact 3.1-4 Soil Erosion. There will be potential increases in soil erosion resulting from construction of this Project. This impact is *potentially significant and subject to the mitigation program* (MM GEO-1). The effects of soil erosion would be minimized to the extent possible by limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization best management practices (BMPs) will be undertaken for effective temporary and final soil stabilization during construction. These measures would be required by storm water regulations, which require preparation and implementation of a Storm Water Pollution Prevention Plan.

Impact 3.1-5 Landslides and Mass Movements. Slope raveling and localized, surficial slope failures and/or rock falls are expected in areas where mining has exposed adversely oriented fracture sets on the pit walls. This impact is *potentially significant and subject to the mitigation program* (PDF GEO-1 and PDF GEO-2).

Impact 3.1-6 Liquefaction. The potential for liquefaction-induced settlements is very low to non-existent. This impact is *less than significant* and no mitigation is required.

Impact 3.1-7 Reservoir Triggered Seismicity. The potential of reservoir triggered seismicity at the site is remote; therefore this impact is *less than significant* and no mitigation is required.

3.1.4   Mitigation Program

The Project's effects would be addressed through project design features (PDFs) and mitigation measures (MMs). Project design features are design elements inherent to the project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards have been built into the mitigation program.

As described under Regulatory Settings, measures required by Federal, State, or local laws, ordinances, regulations, and standards are frequently required independent of the California Environmental Quality Act review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

Project Design Features

PDF GEO-1. Subsurface Investigations. Detailed investigations to support final engineering will be conducted in two stages, as detailed in Section 12.1. These generally include:

- **Stage 1 Subsurface Investigations:** Based on available information and the current Project configuration, conduct a limited field program designed to confirm that basic Project feature locations are appropriate and to provide basic design parameters for the final layout of the Project features. Phase 1 Subsurface investigations will be initiated within 60 days of licensing and receipt of site access, field work will be completed within 4 months of the start of field investigations, and results filed with the FERC 6 months after the start of field investigations.

The Stage 1 subsurface site investigation program for the Project will commence as soon as site access is obtained. The Stage 1 program will provide the information needed to finalize Project features and to plan a second-stage program to support final design of the Project. Final design will be approved by the FERC and the DSOD (for dam design).

The detailed scope of the Stage 1 program is discussed in a technical memorandum found in Section 12.1.

- **Stage 2 Subsurface Investigations:** Using the results of the Stage 1 work, and based on any design refinements developed during pre-design engineering, conduct additional explorations that will support final design of the Project features and bids for construction of the Project.

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PDF GEO-2. Geologic Mapping. During site investigations, geologic mapping will be performed by Project Engineers to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining. The stability of the cut slopes and benches will be assessed at this time.

During construction, areas within the pits that exhibit unstable slopes because of adverse fracture sets exposed in the pit walls will be scaled of loose rock and unstable blocks. Material scaled from the side slopes will be removed and disposed of outside the pit, or pushed downslope and buried in the bottom of the pit. Rock slopes within the East and Central Pits that lie below an elevation of 5 feet above the maximum water level will be scaled of loose and unstable rock during construction. Existing cut slopes that lie above these elevations will not be modified unless there is evidence of potential failure areas that could impact project facilities. Final project design will be approved by FERC.

Mitigation Measures

MM GEO-1. Erosion Control Plan. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization BMPs will be undertaken as appropriate.

The contractor shall utilize and implement the following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water.

- Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary.
- The installation of riprap at the washes which will prevent or minimize erosion.
- Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion.
- Silt fences will be installed when working around a wash. Silt fences will prevent sediment from entering washes during a rain storm and will be

constructed as described in Attachment B of Section 12.2 (e.g., buried to a depth of at least 12 inches.

- The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations, personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods.
- Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff.
- Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water.

Erosion and sediment control measures for each area type, including proposed BMPs, are listed in the Erosion Control Plan in Section 12.2.

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Contractor/ Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

3.1.5 Level of Impact after Implementation of Mitigation Program

Impact 3.1-1 Earthquakes and Faults. Mitigation program not required.

Impact 3.1-2 Ground Subsidence. Mitigation program not required.

Impact 3.1-3 Active and Inactive Mines. Mitigation program not required.

Impact 3.1-4 Soil Erosion. There will be some increases in soil erosion resulting from construction of the Project. Adherence to MM GEO-1 will reduce soil erosion impacts to a *less than significant* level.

Impact 3.1-5 Landslides and Mass Movements. Slope raveling and localized, surficial slope failures and/or rock falls are expected in areas where mining has exposed adversely oriented fracture sets on the pit walls. Adherence to PDF GEO-1 and PDF GEO-2 will reduce landslide/mass movement impacts to a *less than significant* level.

Impact 3.1-6 Liquefaction. Mitigation program not required.

Impact 3.1-7 Reservoir Triggered Seismicity. Mitigation program not required.

No residual impacts to geology and soils would occur with Project implementation.

3.2 Surface Water

This section of the Draft Environmental Impact Report describes proposed hydrologic features at the Eagle Mountain Pumped Storage Hydroelectric Project (Project) site and addresses potential issues associated with surface water quality based on the mineralogy at the Project site. Information provided in this section has been based on field reconnaissance, existing regulations, from previously prepared reports as referenced throughout this document, and agency consultation. A mitigation program is provided in order to reduce or avoid potential impacts, where applicable.

Please note: This discussion of hydrology and water quality is broken down into Section 3.2 Surface Water and Section 3.3 Groundwater.

3.2.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of surface waters. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

3.2.1.1 Federal

Clean Water Act (CWA) of 1977 as amended, Sections 401, 402, and 404. The primary objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's surface waters. Pollutants regulated under the CWA include priority pollutants, including various toxic pollutants; conventional pollutants, such as biochemical oxygen demand, total suspended solids, oil and grease, and pH; and non-conventional pollutants, including any pollutant not identified as either conventional or priority.

Clean Water Act Section 401 requires certification from the State Water Resources Control Board (SWRCB and Lead Agency under the California Environmental Quality Act) that the proposed Project is in compliance with established water quality standards. Projects that have the potential to discharge pollutants are required to comply with established water quality objectives. These requirements include the implementation of best management practices (BMPs) during site grading activities and other activities associated with construction of the facility.

Section 401 provides the SWRCB with the regulatory authority to waive, certify, or deny any proposed federally permitted activity, which could result in a discharge to waters of the State. To waive or certify an activity, these agencies must find that the proposed discharge will comply with State water quality standards. According to the CWA, water quality standards include beneficial uses, water quality objectives/criteria, and compliance with the United States Environmental Protection Agency's anti-degradation policy. No license or permit may be issued by a Federal agency until certification required by Section 401 has been granted.

3.2.1.2 State

State of California Constitution Article X, Section 2 prohibits the waste or unreasonable use of water, regulates the method of use and method of diversion of water and requires all water users to conserve and reuse available water supplies to the maximum extent possible.

California Storm Water Permitting Program

California Construction Storm Water Program. Construction activities that disturb one acre or more are required to be covered under California's General Permit for Discharges of Storm Water Associated with Construction Activity, Water Quality Order 99-08-DWQ (General Construction Permit CAS 000002).

Activities subject to permitting include clearing, grading, stockpiling, and excavation. The General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that specifies BMPs that will reduce or prevent construction pollutants from leaving the site in stormwater runoff and will also minimize erosion associated with the construction Project. The SWPPP must contain site map(s) that show the construction site perimeter; existing and proposed structures and roadways; stormwater collection and discharge points, general topography both before and after construction; and drainage patterns across the site. Additionally, the SWPPP must describe the monitoring program to be implemented.

California Industrial Storm Water Program. Industrial activities with the potential to impact stormwater discharges are required to obtain a National Pollutant Discharge Elimination System permit for those discharges. In California, an Industrial Storm Water General Permit, Order 97-03-DWQ (General Industrial Permit CAS 000001) may be issued to regulate discharges associated with ten broad categories of industrial activities, including electrical power generating facilities. The General Industrial Permit requires the implementation of management measures that will protect water quality. In addition, the discharger must develop and implement a SWPPP and a monitoring plan. Through the SWPPP, sources of pollutants are to be identified and the means to manage the sources to reduce stormwater pollution described. The monitoring plan requires sampling of stormwater discharges during the wet season and visual inspections during the dry season.

California Water Code *Section 461* stipulates that the primary interest of the people of the State of California is the conservation of all available water resources and requires the maximum reuse of reclaimed water as an offset to using potable resources. There are no plans for the Project to use reclaimed water. However, the pumped storage facility will be developed to minimize water usage and recycle water where appropriate.

Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 et. seq. requires the SWRCB and the nine State of California, Regional Water Quality Control Boards

(RWQCB) to adopt water quality standards to protect State waters. These standards include the identification of beneficial uses, narrative and numerical water quality criteria, and implementation procedures. Water quality standards for the proposed Project area are contained in the Water Quality Control Plan for the Colorado River Basin Region (Basin Plan), which was adopted in 1994 and was amended in 2006. This Basin Plan sets numeric and/or narrative water quality criteria controlling the discharge of wastes to the State's waters and land. Relevant sections of the Basin Plan include:

> *Section 13050* stipulates surface waters (including ephemeral washes) that are affected by the Project are waters of the State and are subject to State requirements and the SWQCB has authority to issue Waste Discharge Requirements (WDRs) for construction and industrial stormwater activities.
>
> *Section 13260 et seq.* requires filing a Report of Waste Discharge (ROWD) for activities in which waste is discharged that could affect the water quality of the State. The report shall describe the physical and chemical characteristics of the waste and include the results of all tests required by regulations adopted by the board, any test adopted by the Department of Toxic Substances Control (DTSC) pursuant to Section 25141 of the Health and Safety Code for extractable, persistent, and bioaccumulative toxic substances in a waste or other material, and any other tests that the SWRCB may require.
>
> *Section 13240 et seq. (Water Control Plan).* The Basin Plan for the Colorado River Basin Region establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses of surface and ground waters in the region. The Basin Plan describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provide comprehensive water quality planning. The following chapters are applicable to determining appropriate control measures and cleanup levels to protect beneficial uses and to meet the water quality objectives: Chapter 2, Beneficial Uses; Chapter 3, Water Quality Objectives; and the sections of Chapter 4, Implementation, entitled Point Source Controls and Non-Point Source Controls.

Beneficial Uses. Chapter 2 of the Basin Plan describes beneficial uses of surface and ground waters. Beneficial uses of surface waters for the Chuckwalla Valley are not listed in the Basin Plan. The beneficial uses of ground waters of the Chuckwalla Valley Hydrologic Unit (717.00) are: municipal and domestic supply, industrial service supply, and agricultural supply.

Water Quality Objectives. Region-wide numeric and narrative objectives for general surface waters are described in Chapter 3 of the Basin Plan under the General Surface Water Quality Objective and region-wide objectives for groundwater under the Ground Water Objectives.

Waste Discharge Requirements. Chapter 4 of the Basin Plan describes Point Source Controls for wastewater reclamation and reuse, stormwater, and septic systems. The discussion of Non-

Point Source Controls in the Basin Plan describes the authority given to the SWQCB to certify projects for CWA Section 401 permits.

> *Section 13243.* Under this section, the RWQCBs are granted authority to specify conditions or areas where the discharge of waste will not be permitted. The discharge of designated waste can only be discharged to an appropriately designed waste management unit.
>
> *Section 13263 (Waste Discharge Requirements).* The SWQCB will regulate the proposed discharge of fill material, including structural material and/or earthen wastes into wetlands and other waters of the State through WDRs.
>
> *Section 13271 (Discharge Notification) of the CWC* requires any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharge or deposited where it is, or probably will be, discharged in or on any waters of the State to notify the Office of Emergency Services (OES) of the discharge as specified in that section. The OES then immediately notifies the appropriate regional board and the local health officer and administrator of environmental health of the discharge.
>
> *Section 13550.* The Legislature hereby finds and declares that the use of potable domestic water for non-potable uses, including, but not limited to, cemeteries, golf courses, parks, highway, landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available which meets all of the following conditions, as determined by the State Board. This section requires the use of recycled water for industrial purposes subject to recycled water being available and upon a number of criteria including: provisions that the quality and quantity of the recycled water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
>
> *Section 13551.* This section prohibits a person or public agency, including an agency, city, county, city and county, district, or any other political subdivision of the State, shall not use water from any source of quality suitable for potable domestic use for non-potable uses if suitable recycled water is available as provided in Section 13550.

State Water Resources Control Board Policies

> *Anti-Degradation Policy (Resolution No. 68-16)* requires the SWRCB, in regulating the discharge of waste, to: (a) maintain existing high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses, and will not result in water quality less than that described in State or Regional Water Boards policies; and (b) require that any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to

discharge to existing high quality waters, must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that: 1) a pollution or nuisance will not occur and 2) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

Water Reclamation Policy (Resolution No. 77-01) states that the SWRCB shall encourage reclamation and reuse of water in water-short areas. Reclaimed water will replace or supplement the use of fresh water or better quality water.

Sources of Drinking Water Policy (Resolution No. 88-63) designates all groundwater and surface waters of the State as potential sources of drinking water, worthy of protection for current or future beneficial uses, except where: (a) the total dissolved solids (TDS) are greater than 3,000 milligrams per liter; (b) the well yield is less than 200 gallons per day from a single well; (c) the water is a geothermal resource, or in a water conveyance facility; or (d) the water cannot reasonably be treated for domestic use using either BMPs or best economically achievable treatment practices.

Riverside County Title 15 Chapter 15.80 Regulating Flood Hazard Areas and Implementing the National Flood Insurance Program was developed to comply with Title 44 CFR Part 65 regarding requirements for the identification and mapping of areas identified as Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas. The ordinance is applicable to development within unincorporated areas of Riverside County and is integrated into the process of application for development permits under other county ordinances including, but not limited to, Ordinance Nos. 348, 369, 457, 460, and 555.

When the information required, or procedures involved, in the processing of such applications is not sufficient to assure compliance with the requirements of Chapter 15.80, a separate application must be filed.

Flood insurance rate maps for the Project site or surrounding areas have not been prepared by FEMA. According to the Riverside County General Plan (Riverside County, 2000) the Project site and surrounding lands do not lie within a 100- or 500-year flood plain.

3.2.2 Environmental Setting

There are no permanent surface water bodies at the site due to the low precipitation, high evaporation, and infiltration. Natural runoff flows rapidly toward the Chuckwalla Valley to the east, but much is lost to evaporation and infiltration. Some of the drainage over the Project area is directed to the East Pit where it pools before being lost to infiltration and evaporation.

Since there are no perennial streams in the Project area, there are no instream flow uses that would be affected by the construction and operation of the Project. Project waters will not be used for irrigation, domestic water supply, industrial, or any other purpose than power generation. The Project proposes to be established as a closed system where the working fluid will be re-used for power generation, and replenished as necessary to replace losses to evaporation and seepage. Beneficial uses specific to surface waters, including standards for the protection of aquatic life, recreation, aquaculture, do not apply to this unique setting. Small pools of surface water may accumulate within the existing pits in response to heavy precipitation events; however, the region is arid, averaging 3 to 4 inches of rainfall annually (RWQCB, 2007a).

Springs that are fed by groundwater in the Eagle Mountains (*see* Figure 3.3-1) are hydrologically disconnected to the Pinto or Chuckwalla Valley basin aquifers since they are located in the mountains above the Pinto and Chuckwalla basins. Therefore, they are fed by local groundwater systems that would be unaffected by the proposed Project (USDI and NPS, 1994). None of the springs are documented as permanent, year round springs, (SCS Engineers, 1990) (Table 3.2-1). None of these springs are identified by RWQCB Region 7 as having site-specific use classifications. Therefore, the default use classifications are assigned to miscellaneous unnamed tributaries (e.g., GWR, REC I, RED II, WARM, WILD, and RARE).

Table 3.2-1. Springs Located in the Northwest Chuckwalla Valley

Name	Locations	Elevation (ft)	Dry/Flowing
Eagle Tank	3S/13E-23	2040	
Buzzard	4S/14E-16	2010	Dry (March/88)
Unnamed	4S/14E-16	2400	
Hayfield Summit	5S/14E-19	1900	
Long Tank	6S/15E-2	1190	Flowing (June/61)

3.2.2.1 Project Created Surface Waters

The proposed Project will create surface water bodies through the construction of the two working fluid reservoirs. These reservoirs are strictly intended for use in hydropower production, which would carry industrial and power beneficial use designations. The proposed source water for the Project is groundwater from the Chuckwalla Valley aquifer (*see* Section 3.3 Groundwater for complete discussion). Operations will involve movement of water between the two reservoirs on a daily basis, precluding the development or support of a viable aquatic ecosystem including fish.

3.2.3 Potential Environmental Impacts

3.2.3.1 Methodology

Preparation of this section is based on a literature review, site investigations, aerial photo interpretation, and review of publicly available environmental documents for Projects within and adjacent to the Project area, including an extensive search of existing geologic literature for the site and adjacent region. Data were gathered from four sources to develop analyses and conclusions on how the geological and mineralogical setting of the Project area could affect the water quality of the Project. These sources include 1) literature on the mineralogy of the Eagle Mountain Project area and adjacent mining district, 2) water quality of groundwater in the Project area, 3) laboratory analysis of core samples taken from the Project area, and 4) literature on mines in other geographic areas with similar geology.

In addition, contacts were made with the following State and Federal agencies to collect data on mineralogy surveys from similar sites in the geologically relevant region:

1. U.S. Department of the Interior, Office of Surface Mine Reclamation and Enforcement
2. U.S. Department of the Interior, Geological Survey, Menlo Park
3. State of California, Regional Water Quality Control Board, Palm Desert (RWQCB)
4. State of California, State Water Resources Control Board, Sacramento (SWRCB)
5. State of California, Department of Conservation, Office of Mine Reclamation, Sacramento
6. State of California, Department of Conservation, Geological Survey, Sacramento
7. U.S. Department of the Interior, Bureau of Land Management, Palm Springs

3.2.3.2 Thresholds of Significance

The SWRCB concludes that the Project may have significant impacts on surface water if it does any of the following:

(a) Violate any water quality standards or waste discharge requirements

(b) Substantially alter the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on-or off- site

(c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, or that would result in flooding on- or off-site

(d) Create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional source of polluted runoff

(e) Otherwise substantially degrade water quality

(f) Place housing within a 100-year flood hazard area which would impede or redirect flood flows

(g) Expose people or structures results in risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam and/or

(h) Inundation by seiche, tsunami, or mudflow

3.2.3.3 Environmental Impact Assessment

The Project will have no impact on existing surface waters, as there are none in the Project area that will be affected by the proposed Project. A Project Drainage Plan has been developed to address stormwater management for the probable maximum storm event. Details for the Project Drainage Plan are included in Section 12.9.

Water quality in the two new reservoirs could be degraded through two processes. First, degradation would occur due to the evaporation of Project waters, resulting in increased concentrations of salts. Second, the contact of Project waters with pit material could result in elevated metals concentrations.

3.2.3.3.1 *Evaporative Water Losses*

Evaporative water losses from the reservoirs are estimated to be 1,760 acre-feet per year. Over time, evaporation will result in water in the reservoirs becoming increasingly saline. In order to maintain water quality within the reservoirs, a water treatment system has been added to the Project as a project design feature (PDF GW-1) to remove certain constituents from the reservoir water supply. This facility would treat the make-up water supply to the reservoir system, which will come from groundwater wells in the Chuckwalla Basin.

The design of the treatment facility comprises several pretreatment steps to ensure that the stored surface water is suitable for treatment by the reverse osmosis (RO) process, which will provide for the bulk of the salt concentration. Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. The treatment goal will be to maintain water quality levels in the reservoirs comparable to the existing groundwater quality.

Water quality data from wells in the Chuckwalla Aquifer were used to make assumptions about the source water quality. While the total replacement water need is estimated to be 2,360 acre-feet per year for evaporation and seepage, only the evaporation component (1,760 acre-feet per year) enters into the estimation of water treatment requirements. The RO treatment system would remove water from the upper reservoir at a rate of 2,055 GPM and remove sufficient TDS to maintain the in-reservoir TDS at the same average concentration of the source water.

Eutrophication

Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, periphyton attached algae, and nuisance plants weeds). This enhanced plant growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die. Nutrients can come from many sources, such as fertilizers applied to agricultural fields, golf courses, and suburban lawns; deposition of nitrogen from the atmosphere; erosion of soil containing nutrients; and sewage treatment plant discharges.

Water treatment in the RO will remove nutrients as well as salts, eliminating any risks of eutrophication.

3.2.3.3.2 *Elevated Metals Concentrations*

The iron deposits at Eagle Mountain Mine are contained within a low to medium grade metamorphosed series of sedimentary units consisting of quartzite, meta arkose, and marble. Locally the sediments are intruded by monzonite and granodiorite with minor mafic and andesitic dikes.

The Lower Quartzite, composed of 98 to 99 percent quartz has no significant oxide or sulfide minerals that could leach and impact water quality. This zone is most likely a zone formed by the hydrothermal replacement of an existing gneiss and marble.

The Meta-arkose, essentially a dirty sandstone with significant feldspar and some mafic minerals exhibits some iron oxide staining, possibly from the oxidation of biotite and “opaque” minerals that probably include magnetite. Some of the iron-bearing clays may also be oxidizing. This appears to be relatively minor with probably no impact on water quality other than some contribution of iron and manganese.

The Lower Marble is a metamorphosed limestone comprised of dolomite (Ca, Mg, Fe (CO3)2). It consists of hematite (Fe2O3) dolomite layers and contains ore horizons of magnetite (Fe3O4) and hematite with minor amounts of pyrite (FeS2), actinolite, tremolite, diopside, serpentine, calcite, gypsum, apatite, chalcopyrite, tourmaline, and garnet. Pyrite is reported to range up to 10 percent locally within the ore lenses, but averages 3 to 4 percent (Force, 2001). The presence of gypsum could be primary or it could be an indication of pyrite and the carbonates reacting to form the gypsum (CaSO4.2H2O). It seems that the mineralogy is primarily oxides with very minor sulfide, therefore, the probability of generating significant acidic metal leachate is low. Additionally, other than iron, calcium and magnesium, there do not appear to be any metals that would create notable toxicity.

The Middle Quartzite is mineralogically similar to the Lower Quartzite and appears to have no likelihood of significantly impacting water quality. The Upper Marble is mineralogically similar to the Lower Marble and does contain ore zones of hematite and magnetite with minor pyrite. It will react similarly. The Upper Quartzite is mineralogically similar to the other quartzites and appears to have no likelihood of significantly impacting water quality.

The mineralogy of the geologic units in the vicinity of the pits indicates that there is primarily oxide mineralization with minor pyrite and gypsum and therefore minor potential to generate acid leachate. Additionally there do not seem to be any oxide or sulfide minerals that contain significant toxic metals. Pyrite, which averaged 3 to 4 percent in the ore body (which has been mined from the pit areas) did contain 1.5 to 3 percent Co in some samples reported by Force (2001). While Force (2001) does report local concentrations of pyrite as high as 10 to 50 percent in the lower portions of the ore, this would be atypical as pyrite is typically present in low concentrations as reported by himself (3 to 4 percent) and by Lamey (1945) (averages 3 to 4 percent, ranges to no more than 10 percent).

Cannon (1986) in a study of Lake Superior banded iron formations noted that the ore zones generally contained trace elements at concentrations below crustal averages and that while the presence of pyrite could allow for some acid generation and enhanced leaching of metals, the trace amounts of carbonate present would provide fairly significant neutralization.

There is a potential for a slight increase in the concentration of iron, magnesium and calcium which could cause some iron oxide precipitation and scaling in equipment. However, these effects are likely to be insignificant due to additions of make-up water to offset water lost through evaporative losses. Additionally, the quality of the water would be maintained through the use of the water treatment plant.

Mineral Distribution

The original distribution of the ore minerals would be within the zones that were mined through the development of the pits. By design, most of the highest concentration of iron minerals would have been removed and processed in the mill.

Previous studies (Kaiser Steel Resources, 1991) indicate that approximately 195 million metric tons remain in the Central and East pits. Of the 99 million metric tons considered to be economically recoverable, approximately 65 million metric tons remain in the Central Pit and 34 million metric tons in the East Pit. The East Pit reserves include approximately 21.4 million metric tons of placer deposits (concentrated magnetite-rich sands).

Lamey (1945), Hadley (1948), DuBois and Brummett (1968), and Force (2001) report on the distribution of pyrite in which they cite averages of less than 3 percent for the ore body as a whole. A detailed summary of Bureau of Mines drilling and research by Hadley (1948) notes that pyrite is almost exclusively found in the deeper (more than 200 feet below ground surface), unoxidized portions of the ore bodies, which average 80 feet in thickness. Total sulfur, primarily as pyrite in the deeper portions of the ore body, averaged 1.5 percent (equivalent to approximately 3 percent pyrite). In the shallow portions of the ore bodies (from approximately 200 feet below ground surface to the surface), where pyrite was almost entirely oxidized to hematite and byproduct gypsum, total sulfur averaged 0.2 percent (equivalent to approximately 0.5 percent pyrite). Hadley (1948) only examined the area that approximates the East Pit as mined by Kaiser Steel. The ore zones were broken into the North, South and Bald Eagle zones. Approximately 65 percent of the ore in the North zone, 90 percent in the South zone, and 80 percent of the ore in the Bald Eagle zone are in the oxidized zone and contained from .08 to 0.13 percent sulfur (less than 0.5 percent pyrite)

Lower grade ore may also have been removed during pit development as waste rock and put on the waste rock dumps. Waste rock is typically dumped at the margins of the pits, usually on the down slope side (in this case to the south) to minimize haulage costs. Review of the air photographs of the site indicates that the pits are generally rimmed by dumps mostly to the south and that some may have been partially backfilled with waste rock.

After the ore is mined from the pit, it is hauled to the mill and processed. Here, the minerals of interest, in this case magnetite and hematite would be concentrated and the tailings that consist of non-ore minerals (quartz, dolomite, etc) and some fine-grained ore minerals that could not be effectively separated, would be conveyed (usually as a slurry) to the tailings pond where the water is decanted from the pond and recycled to the mill. The tailings eventually harden forming extensive, flat waste piles of very fine-grained material. The tailings ponds are located at a lower elevation than the mining pits and to the southeast.

Some impact on water quality could occur from interaction of ore left in the pit bottom or walls. The waste rock dumps and tailings ponds, given their location, are likely to have little impact on water quality in the pits used by the Project.

Davis et al. (2009) provide data on the post-closure water quality of the Homestake Mine, Lead, South Dakota. The gold deposits at Lead were hosted in sulfide-bearing Precambrian rock, averaging approximately 8 percent pyrite and containing siderite, an acid neutralizing iron carbonate. The mine was closed in 2003 and allowed to flood at about 750 gpm. The resulting pH, as monitored by the South Dakota Department of Environment and Natural Resources, ranged from 6.3 to 8.5, averaging approximately 7.6. The pyrite content at Homestake is higher than the average of 3 to 4 percent in the Eagle Mountain Mine, but does have similar acid buffering capacity through carbonate gangue.

Arsenic is present in the Homestake Mine ore body as arsenopyrite, ranging up to 6 percent. However, it's concentration in mine water averaged 0.012 milligrams per liter (mg/L) (Davis et al., 2009), just exceeding the South Dakota drinking water standard of 0.01 and below the surface water aquatic life standard of 0.15 mg/L. This would suggest that arsenopyrite, which is fairly soluble in low pH acid waters, is fairly immobile in the near neutral waters of the Homestake Mine. Based on similar geology, it is reasonable to speculate that trace metals in the Eagle Mountain sulfides will be similarly insoluble.

Leachate Analysis

Results of Literature Review. An exhaustive search of existing literature for the site and adjacent region identified comparable iron ore deposits based on mineralogy, primarily the percent sulfides and total sulfur, in the Upper Peninsula of Michigan and in Northern Minnesota (Cannon, 1986; Hendricksen and Doonan, 1966). Those authors determined that mining produced no significant impact on the pH of the mine waters.

The literature review for the Eagle Mountain Mine and adjacent area yielded several papers on the mine and adjacent mining district (Hadley, 1948; McColly, 1983; Force, 2001). The historic geology reports provided information on the percentage, composition and distribution of sulfide minerals. None of the documentation produced by Kaiser Steel Corporation (including the

Reclamation Plan submitted in 1978) submitted in support of the landfill project, including the ROWD dealt with the subject of the potential for acid mine leachate and dissolved metals. The ROWD discussed water quality from the perspective of landfill waste leachate, primarily how it would be collected and transported off-site for treatment at a waste water treatment facility. However, it did not offer any detail on the interaction of the leachate with the native soil and/or mine tailings that would be used as part of the liner design.

Results of Laboratory Sampling. In 1993, five samples were collected from the ore body in the East Pit and were analyzed for standard soil analyses and water soluble leachate from saturate paste extracts. During this sampling, an effort was made to obtain a variety of rock types representative of the geologic formations present in the pits. Analytical tests followed procedures from the U.S. Department of Agriculture Handbook 60 (USDA, 1954), where leachate is produced by adding distilled water to the homogenized core samples that pass through a 2 mm sieve. Initial water quality of the distilled water was not reported with the lab reports.

The results from these leachate analyses (Table 3.2-2) were compared to standards that would apply to the maximum contaminant levels (MCL), shown in Table 3.2-2. Based on this comparison, leachate concentrations are generally within the range of historic groundwater quality concentrations. Potential seepage from the reservoirs has a low potential to exceed the MCLs for cadmium and mercury. The potential for arsenic, barium, chromium, lead, selenium, and silver to exceed the MCLs is uncertain since detection limits for these analytes were higher than the MCL. For nitrate, one sample exceeded the 10 mg/L MCL, suggesting that potential seepage from the reservoirs may contain nitrate concentrations greater than the domestic MCL. Results for pH ranged from 6.5 to 9.8.

These results indicate sulfur as pyrite ranging from non-detected to 0.09 percent, consistent with the literature. In conversations with the laboratory analyst, it was reported that these samples were highly unlikely to generate acidity (personal telephone communication, 2009, Scott Habermehl, ACZ Laboratories).

Mines located in comparable iron ore deposits were located and the pH of waters in those mines was researched to determine if acid generation has been a problem at other mineralogically-similar locations. Comparison mines were located based on mineralogy, primarily the percent sulfides and total sulfur, in the Upper Peninsula of Michigan and in Northern Minnesota (Cannon, 1986; Hendricksen and Doonan, 1966). Those investigations determined that there was no significant impact on the pH of the mine waters.

Groundwater in the region of the mine pits is alkaline and would have some capacity to buffer the minor amount of acid generated by the oxidation of pyrite. In groundwater samples from on-site monitoring wells, pH generally ranged from 7.4 to 8.6. One well, MW10, had a higher pH of 9.7 possibly due to the dissolution of carbonate veins in the ore horizon by the oxidation of the minor pyrite. The existing groundwater quality in the Project area indicates that historic mining has not resulted in acid generation.

Overall, there are no notable factors related to the mining pits that should significantly impact the quality of the water stored in the pits compared to the naturally occurring groundwater. The mineralogy of the deposit is predominately magnetite and hematite with minor pyrite. The ability of the pyrite to oxidize and generate acidic solutions is somewhat limited by the alkaline nature of the groundwater and the presence of calcite and dolomite. Some of the cations and anions present could increase in concentration due to evaporation in the pits, but this can be offset by the addition of makeup water and RO treatment (PDF GW-1) prior to running water through the generation and pumping equipment.

Table 3.2-2. Results of 1993 geochemical analyses.
(Note: Bolded values exceed domestic or municipal supply MCLs)

Parameter	Units	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Acid Base Potential (CaCO3)	Tons/1000T	2	40	3	372	56
Sulfur, total	percent	0.06	<0.01	0.03	<0.01	0.09
Neutralization Potential	percent as CaCO3	0.4	4	0.4	37.2	5.9
Sulfur, organic	percent	0.04	<0.01	0.03	<0.01	<0.01
Sulfur, pyritic	percent	0.02	<0.01	<0.01	<0.01	<0.01
Sulfur, sulfate	percent	<0.01	<0.01	<0.01	<0.01	0.09
Nitrate as N, soluble	mg/kg	3.5	**11.7**	3.4	7.3	2
Calcium, soluble	meq/L	5.94	2.5	9.08	0.7	26.8
Magnesium, soluble	meq/L	2.47	1.81	3.13	3.62	3.37
Sodium, soluble	meq/L	0.7	2.7	1	0.74	0.96
pH, Saturated paste	units	6.8	8.5	6.5	9.6	8.5
Sodium Absorption Ratio		0.3	1.8	0.4	0.5	0.2
Conductivity, Saturated Paste	mmhos/cm	0.86	0.82	1.22	0.51	2.25
Sulfate, soluble	mg/kg	128	36	67	19	1597
Aluminum, extractable	mg/L	0.3	0.9	<0.3	<0.3	1.9
Arsenic, extractable	mg/L	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Boron, extractable	mg/L	0.2	0.2	<0.1	<0.1	0.2
Cadmium, extractable	mg/L	**<0.03**	**<0.03**	**<0.03**	**<0.03**	**<0.03**
Copper, extractable	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Iron, extractable	mg/L	7	0.3	<0.1	<0.1	<0.1
Lead, extractable	mg/L	**< 0.1**	**< 0.1**	**< 0.1**	**< 0.1**	**< 0.1**
Manganese, extractable	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Mercury, extractable	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Units	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Molybdenum, extractable	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium, extractable	mg/L	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
Zinc, extractable	mg/L	<0.05	<0.05	0.08	0.21	0.12
Sand (2.0 - 0.062 mm)	Percent	98	96	98	93	99
Silt (0.062 - 0.002 mm)	Percent	1	3	1	4	0
Clay (< 0.02mm)	Percent	1	1	1	3	1

3.2.3.3.3 *Construction Impact on Surface Water*

The primary project site (reservoirs, reverse osmosis water treatment plant, switchyard, and underlying tunnels and powerhouse) is located in the northeast portion of the Eagle Mountains. The site was formerly used for open pit mining, and extensive fine and coarse mine tailings are deposited near and around the Project site. There are no permanent water courses on the Project site and the only surface water occurring at the site is that associated with storm events. Both the upper and lower reservoirs are located in closed basins, with minimal drainage areas. Because of the extensive nature of the surface mining that has been conducted on the site, only remnants of natural stream channels are in the reservoir area. One ephemeral creek, Eagle Creek, exists on the southern edge of the pumped storage project site. Flows in Eagle Creek are presently captured in the bowl of the East Pit. Bald Eagle Canyon is a dry canyon which drains the mountains to the northwest of the East Pit. There are numerous washes south of the primary project site, which cross the water supply pipeline and transmission pipeline routes.

During construction, erosion may occur from disturbed areas during storm events. An erosion control plan will be implemented to prevent erosion from occurring, and keep sediment from entering washes.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project violate any water quality standards or waste discharge requirements?* No. Water quality will be maintained through the use of an RO water treatment facility (PDF GW-1).

(b) *Would the project substantially alter the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on-or off- site?* No. An erosion control plan is proposed which will incorporate best management practices to control erosion (MM GEO-2).

(c) *Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would* *result in substantial erosion or siltation on- or off-site, or that would result in flooding on- or off-site;* No. The existing drainage pattern will be maintained.

(d) *Would the project create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional source of polluted runoff?* A stormwater drainage plan has been developed to address water management in the event of a flood up to the size of the probable maximum flood.

(e) *Would the project otherwise substantially degrade water quality?* No. There are no notable factors related to the mining pits that should significantly impact the quality of the water stored in the pits compared to the naturally occurring groundwater.

(f) *Would the project place housing within a 100-year flood hazard area which would impede or redirect flood flows?* No. The Project does not entail construction of housing. In addition, flood insurance rate maps for the Project site or surrounding areas have not been prepared by FEMA. According to the Riverside County General Plan (Riverside County 2000) the Project site and surrounding lands do not lie within a 100- or 500-year flood plain.

(g) *Would the project expose people or structures results in risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?* The upper reservoir dams will be built to Federal Energy Regulatory Commission (FERC) and California Division of Safety of Dams standards and guidelines. The lower reservoir will be entirely included within the existing mining pit and will not require the construction of dams.

(h) *Would the project be at risk of inundation by seiche, tsunami, or mudflow*? No. Primary surface features include the reservoirs, brine ponds, wells, and transmission lines. The tunnels, powerhouse, and water pipeline are all located beneath the ground surface.

Impact 3.2-1 Existing Surface Water. There are no perennial streams in the Project area. Springs are located outside of the Project area, and are not hydrologically connected to groundwater in the Chuckwalla Aquifer. There is *potentially significant impact and subject to mitigation.* Erosion from construction areas will be controlled through the implementation of an Erosion Control Plan (MM GEO-1).

Impact 3.2-2 Eutrophication. This is *less than significant* impact, as the Project will not add nutrients to the environment. In addition, the RO water treatment facility (PDF GW-2) will maintain water quality at the level of existing groundwater quality.

Impact 3.2-3 Water quality impacts to the project created surface waters. This impact is *potentially significant and subject to mitigation*. Potential impacts include sedimentation from erosion as a result of land disturbing activities during construction and increased metals as a result former mining activities on the Project site. A RO water treatment facility (PDF GW-2) and groundwater quality monitoring (MM GW-6) has been incorporated into the project design and mitigation measures. An Erosion Control Plan (MM GEO-1) has been developed to reduce erosion and sedimentation to a level that is less than significant. A field and laboratory evaluation of acid production potential will be conducted pre-construction (MM SW-1).

3.2.4 Mitigation Program

MM SW-1. **On-site studies of acid production potential.** When access is granted to Eagle Crest Energy Company (ECE) for the purpose of collecting samples, field and analytical program will be undertaken as described in the Phase 1 Geotechnical Program detailed in Section 12.1. This program will:

1. Obtain samples from each pit (upper and lower) across the stratigraphic section (porphyritic quartz monzonite, upper quartzite, middle quartzite, schistose meta arkose, vitreous quartzite and the ore zones).
2. Perform analysis for total, pyrite and sulfate sulfur (ASTM Method 1915-97(2000) for total sulfur, and ASTM 1915-99 method E (2000) for sulfide sulfur.
3. Calculate acid production potential (APP) by the method of Sobek et al. (1978) and calculate acid production by the method of Lawrence (1990).
4. Determine the neutralization potential (NP) by the method of Sobek et al. (1978). Calculate the net neutralizing potential (NNP): NNP = NP – APP expressed as kg calcium carbonate/ton.

In the event that acid production potential is found, water treatment to neutralize acid will be added to the water treatment facility (PDF GW-2). The performance standard will be maintenance of water quality at a level comparable to the source water quality.

Implementation Timing: Pre-design geotechnical studies

Party responsible for implementation, monitoring and reporting: Applicant

Responsible Agencies for verification and enforcement: SWRCB and FERC

PDF GW-2. **Water Treatment Facility.** In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels.

Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. In addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well, preventing eutrophication from occurring.

MM GW-6. **Water Quality Sampling.** Water quality sampling will be done at the source wells, and within the reservoirs, and in monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Figure 3.3.3-18 shows the locations of these wells. Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and other potential contaminants as needed to maintain groundwater effects at less than significant levels.

Implementation Timing: Final engineering

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agency for verification and enforcement: SWRCB and FERC

MM GEO-1. **Erosion Control Plan**. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization BMPs will be undertaken as appropriate.

The contractor shall utilize and implement the following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water.

- Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary.
- The installation of riprap at the washes which will prevent or minimize erosion.
- Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion.
- Silt fences will be installed when working around a wash Silt fences will prevent sediment from entering into a wash during a rain storm. They will be constructed as described in Attachment B of Section 12.2, including being buried to a depth of at least 12 inches.
- The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations,

personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods.

- Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff.
- Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water.

Erosion and sediment control measures for each area type, including proposed BMPs are listed in the Erosion Control Plan in Section 12.2.

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Contractor/ Environmental Coordinator

Responsible Agency for verification and enforcement: SWRCB and FERC

3.2.5 Level of Impact after Implementation of Mitigation Program

Impact 3.2-1 Existing Surface Water. This potential impact is *less than significant*.

Impact 3.2-2 Eutrophication. This potential impact is *less than significant*.

Impact 3.2-3 Water quality impacts to the project created surface waters. Implementation of mitigation reduces this impact to *less than significant* (PDF GW-1) (MM GW-6).

No residual impacts to surface water would occur with Project implementation.

3.3 Groundwater

This section of the Draft Environmental Impact Report provides groundwater quality and supply data for the Chuckwalla Valley Groundwater Basin (Project vicinity), including water bearing formations and hydraulic characteristics, and identification of springs, wells, and the Colorado River Aqueduct (CRA). Baseline ground water levels, including direct flows, storage capacity, recharge sources, outflow and perennial yield are presented. The impact analysis section provides assessment of potential effects of using groundwater to supply the proposed Eagle Mountain Pumped Storage Hydroelectric Project's (Project) needs, and of potential impacts on groundwater quality. A mitigation program is identified to reduce or avoid potential impacts, where applicable.

Please note: Surface water hydrology, drainage, and water quality are assessed separately in Section 3.2 Surface Water.

3.3.1 Regulatory Setting

The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS). The following LORS apply to the protection of groundwater.

3.3.1.1 Federal

Water Quality Certification (Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. Sec. 1341(c)(1)), or waiver of certification, is required for hydropower projects licensed by the Federal Energy Regulatory Commission (FERC). Under the California Code of Regulations, Water Quality Certifications for FERC-licensed projects are issued by the State Water Resources Control Board (SWRCB); (Title 23, Waters; Division 3, SWRCB and State of California, Regional Water Quality Control Boards (RWQCB); Chapter 28 Certifications; Article 4, Water Quality Certification; Section 3855).

After review of the application, all relevant data, and any recommendations of the RWQCB, other State and Federal agencies, and any interested person, the SWCRB's Executive Director, acting as the SWRCB's designee, shall issue certification or deny certification for any discharge resulting from a pertinent activity. Conditions shall be added to any certification if necessary to ensure that all activities will comply with applicable water quality standards and other appropriate requirements.

3.3.1.2 State

Porter-Cologne Water Quality Control Act of 1967 (Water Code Section 13000 et seq.) requires the SWRCB and the nine RWQCBs to adopt water quality standards to protect State waters. Those standards include the identification of beneficial uses, narrative and numerical water quality criteria, and implementation procedures. Water quality standards for the proposed Project area are contained in the Water Quality Control Plan for the Colorado River Basin Region (Basin Plan), which was adopted in 1994 and amended in 2006. The Basin Plan sets numeric and/or narrative water quality criteria controlling the discharge of wastes to the State's waters and land.

> *Section 13571*. Requires that anyone who constructs, alters, or destroys a water well, cathodic protection well, groundwater monitoring well, or geothermal heat exchange well, must file a well completion report with the California Department of Water Resources (DWR). With no nearby sources of surface water available and no existing water supply wells on the Project site that could serve the Project, water supply wells, extraction wells, and groundwater monitoring wells will be constructed to meet Project needs for supply, seepage recovery, and monitoring of water levels and quality. A Well Completion Report will be filed with DWR for each well that is constructed. Measures will be undertaken to protect the groundwater wells (whether for water supply or for monitoring purposes) on the Project site through the use of physical barriers (e.g., fencing, traffic bollards, etc.). In the event that an existing well is altered or destroyed, a well completion report will be filed with the DWR.

California Code of Regulations Title 22, Article 3, Sections 64400.80 through 64445, requires monitoring for potable water wells, defined as non-transient, non-community water systems serving 25 people or more for more than 6 months.

State Water Resources Control Board Policies *(Resolution No. 88-63)* designates all groundwater and surface waters of the State as potential sources of drinking water, worthy of protection for current or future beneficial uses, except where: (a) the total dissolved solids (TDS) are greater than 3,000 milligrams per liter (mg/L), (b) the well yield is less than 200 gallons per day (gpd) from a single well, (c) the water is a geothermal resource, or in a water conveyance facility, or (d) the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices.

3.3.1.3 Local

Riverside County Ordinance Code, Title 13, Chapter 13.20 – Water Wells

> *Section 13-.20.160 Well Logs.* This section requires that a report of well excavation for all wells dug or bored for which a permit has been issued be submitted to the Riverside County Department of Environmental Health within 60 days after completion of drilling. DWR Form 188 shall satisfy this requirement as stipulated under California Water Code Section 13571.
>
> *Section 13.20.190 Water Quality Standards.* This section requires that water from wells that provide water for beneficial use shall be tested radiologically, bacteriologically and chemically as indicated by the Riverside County Department of Environmental Health. Laboratory testing must be performed by a State of California-certified laboratory. The results of the testing shall be provided to the Riverside County Department of Environmental Health within 90 days of pump installation.

Section 13.20.220 Well Abandonment. This section provides that all abandoned wells shall be destroyed in such a way that they will not produce water or act as a channel for the interchange of water, and will not present a hazard to the safety and well-being of people or animals. Destruction of any well shall follow requirements stipulated in DWR Bulletin No.74-81, provided that at a minimum the top 50 feet shall be sealed with concrete, or other approved sealing material. Applications for well destruction must be submitted 90 days following abandonment of the well and in accordance with Section 14.08.170.

Section 13.20.240 Declaration of Proposed Reuse. Requires that any well that has not been used for a period of 1 year shall be properly destroyed unless the owner has filed a Notice of Intent with the health officer declaring the well out of service and declaring their intention to use the well again.

Riverside County Title 15 Chapter 15.80 Regulating Flood Hazard Areas and Implementing the National Flood Insurance Program was developed to comply with Title 44 CFR Part 65 regarding requirements for the identification and mapping of areas identified as Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas. The ordinance is applicable to development within unincorporated areas of Riverside County and is integrated into the process of application for development permits under other county ordinances including, but not limited to, Ordinance Nos. 348, 369, 457, 460, and 555. When the information required, or procedures involved, in the processing of such applications is not sufficient to assure compliance with the requirements of Chapter 15.80, a separate application must be filed.

Flood insurance rate maps for the Project site or surrounding areas have not been prepared by FEMA. According to the Riverside County General Plan (Riverside County, 2000) the Project site and surrounding lands do not lie within a 100- or 500-year flood plain.

3.3.2 Environmental Setting

The Project site is located in the Eagle Mountains on a bedrock ridge along the northwestern margins of the Chuckwalla watershed which extends across portions of Riverside and Imperial counties. The central portions of the watershed contain the Palen and Chuckwalla valleys, with thick accumulations of alluvial sediments that comprise the Chuckwalla Valley Groundwater Basin (DWR, 2003). Most domestic and agricultural areas are located in the western portions of the basin near Desert Center, about 6 miles south of the Project site. This area has been historically referred to as the Upper Chuckwalla Valley. In the Lower Chuckwalla Valley, there is a large agricultural area of palm and citrus near the Corn Springs Exit off Interstate 10. The Chuckwalla Valley and Ironwood State prisons lie 30 miles east of Desert Center and south of Interstate 10.

There are five groundwater basins surrounding the Chuckwalla Valley Groundwater Basin. North of the Upper Chuckwalla Valley watershed is the Pinto Valley Groundwater Basin and north of the Palen Valley is the Cadiz Valley Groundwater Basin. To the west is the Orocopia Valley Groundwater Basin, which contains Hayfield Valley. About 45 miles east of the Project site are the

Palo Verde Mesa and Palo Verde Valley Groundwater Basins. Figure 3.3-1 shows the locations of the groundwater basins.

Although the Cadiz Valley Groundwater Basin is adjacent to the Chuckwalla Valley Groundwater Basin, mountains along the edge of the basin provide complete enclosure around the Cadiz Valley so both surface flows and groundwater flows are internal or confined to the Cadiz Valley Groundwater Basin (B&V, 1998). Surface water and groundwater flows are from the edges of the basin toward Cadiz Lake (DWR, update 2003; B&V, 1998).

The western portion of the Orocopia Valley Groundwater Basin drains eastward into the Hayfield (dry) Lake and into the Upper Chuckwalla Valley Groundwater Basin. The Hayfield Valley is about 17 miles long. An artificial groundwater recharge site was constructed in the Hayfield Lake area of the basin, and Metropolitan Water District of Southern California (MWD) stored about 88,000 acre-feet of water in the basin in the late 1990s as part of a conjunctive water management and use program.

The Chuckwalla Valley Groundwater Basin receives both surface and groundwater inflow from the Pinto Valley Groundwater Basin. The water enters into the Chuckwalla Valley Groundwater Basin through a gap in the bedrock about 6 miles north of the Project site (B&V, 1998). A portion of Joshua Tree National Park (JTNP) overlies the Pinto Valley Groundwater Basin. The JTNP also lies within 2 to 3 miles of the Project lands and extends into the bedrock areas of the Chuckwalla Valley watershed.

The Palo Verde Mesa and adjacent Palo Verde Valley groundwater basins are located east of the Chuckwalla Valley Groundwater Basin. A bedrock gap allows groundwater from the Chuckwalla Valley Groundwater Basin to flow into the Palo Verde Mesa Aquifer. Because there is no distinct physical groundwater divide, the groundwater is then connected to the Palo Verde Valley Groundwater Basin. The two groundwater basins are generally distinguished by water quality differences, with the Palo Verde Mesa aquifer having TDS levels of 1,000 to 2,000 mg/L or greater, and the Palo Verde Valley aquifer having TDS levels of about 800 mg/L, similar to the Colorado River, which forms the eastern edge of the Palo Verde Valley Groundwater Basin. This condition has resulted from many decades of irrigation on more than 100,000 acres of land in the Palo Verde Valley, which is constantly replenished and has raised the water table beneath the Valley.

3.3.2.1 Colorado River Aqueduct

The only aqueduct in the region is the CRA, owned and operated by the MWD. The CRA was constructed in 1926 through the upper portions of the Chuckwalla and Orocopia Valley Groundwater basins. Portions of the CRA are constructed on and through the bedrock. The MWD uses the CRA to supply water diverted from the Colorado River as a part of its water supply to approximately 18 million people in southern California. Figure 3.3-2 shows the CRA alignment.

3.3.2.2 Springs and Wells

Springs are present in the Eagle Mountains south of the Pinto Basin. Figure 3.3-1 shows the location of the springs.

The first high-capacity well was drilled in the Chuckwalla Valley Groundwater Basin in 1958 (Mann, 1984). There are now more than 60 wells in the Chuckwalla Valley Groundwater Basin (CH2M Hill, 1996). Existing wells in the area were located, to the extent possible, using driller's well logs obtained from the DWR and maps contained in various reports (CH2MHill, 1996; Greystone, 1994). Figure 3.3-2 shows the locatable wells in and near the Chuckwalla Valley Groundwater Basin. Other agricultural or domestic wells may be present but could not be located because their locations are not well documented in the records, and some older wells – in some cases dating back to the early 1900s – may have been destroyed.

Wells in the Chuckwalla Valley Groundwater Basin range up to 2,000 feet in depth (B&V, 1998) and have pumping capacities up to 3,900 gallons per minute (gpm) (DWR, 2003). The average pumping rate is about 1,800 gpm. Groundwater wells in the Desert Center area range up to 900 feet deep. Two wells in this portion of the Chuckwalla Valley are capable of producing 2,300 gpm (Greystone, 1994).

The National Park Service (NPS) owns one well in the Pinto Groundwater Basin (Pinto Well No. 2). Kaiser Resources Inc. (Kaiser) owns two additional wells near the NPS well in the southeastern portion of the Pinto Basin.

3.3.2.3 Water Bearing Formations

Water bearing units include quaternary alluvium and continental deposits. The maximum thickness of these deposits is about 1,200 feet in the central portions of the basin and up to 2,000 feet in the eastern portions of the basin (B&V, 1998), although DWR only considers there to be 1,200 feet of permeable sediments (DWR, 2003).

The alluvium (Qal) consists of fine to coarse sand interbedded with gravel, silt, and clay. The alluvium likely comprises the most substantial aquifer in the area (DWR, 1963). Locally windblown sand deposits (Qs) cover the alluvium.

The alluvium is underlain by Quaternary continental deposits (Qc) (Jennings, 1967). The continental deposits are exposed around the fringes of the basin, as shown on Figure 3.3-3. These deposits are composed of semi-consolidated coarse sand and gravel (fanglomerates), clay and some interbedded basalts.

Geologic profiles of the Chuckwalla Valley were developed to show the types of sediments and their distribution. The well logs did not distinguish between the Qal and Qc so all contacts are approximate. The profiles were developed based on available well logs. Figure 3.3-3 shows the location of the geologic profiles. Figure 3.3-4 shows the sediments along the east-west axis of the Chuckwalla Valley Groundwater Basin to have about 900 feet of sand and gravel with some thin clay and silt layers. The saturated sediments are about 600 feet thick near Desert Center. In the central portion of the Chuckwalla Valley, east of Desert Center, a relatively thick layer of clay has accumulated. Near the eastern portion of the Chuckwalla Valley the coarse sediment increases to up to 1,200 feet thick.

Figures 3.3-5 and 3.3-6 show the sediments in the Upper Chuckwalla Valley Groundwater Basin, from Desert Center north to the Pinto Basin, in the vicinity of the Project. The alluvial sediments were deposited on an irregular bedrock surface. Geophysical surveys suggest the bedrock surface is a large bowl opposite the Project site (GeoPentech, 2003). The southern edge of the bowl aligns with a narrow bedrock ridge that juts easterly into the basin.

The alluvium filling the Upper Chuckwalla Valley consists of about 300 feet of sand and gravel with a few discontinuous layers of silt and clay. About 150 feet of the alluvium is saturated. Underlying the coarse grained sediments are lake deposits consisting primarily of clay. The lakebed thickness varies and may be thinner near the margins of the basin and thicken towards the central portions of the basin based on geophysical surveys (gravity). However, no wells have fully penetrated the lakebeds to determine their actual thickness. One well (CW-1) penetrated over 900 feet of clayey lakebed deposits before being terminated. The coarse-grained sediments were deposited above the bowl rim and are in hydraulic continuity with the coarse grained sediments found near Desert Center, whereas the lakebed sediments are below the rim. The coarse grained sediments extend northward and connect with sediments in the Pinto Valley Groundwater Basin where inflow into the Chuckwalla Valley Groundwater Basin occurs. A basalt flow and several faults are present, as shown on Figure 3.3-5, but have an unknown effect on groundwater levels.

The lakebed deposits are potentially underlain by coarser sediments, based on geophysical surveys, but there are no wells to confirm the presence of this layer (GeoPentech, 2003). The sediments are likely to have a lower permeability than the coarse grained sediments above the lakebeds.

Geologic profile C-C’, Figure 3.3-6 shows the relationship of the sediments in the Chuckwalla and Pinto Basin Groundwater Basins. A subsurface volcanic dike or flow is at a shallow depth and blocks some of the inflow from the Pinto Basin into the Chuckwalla Valley basins.

Outflow from the Chuckwalla Valley Groundwater Basin occurs through a gap in the bedrock at the southeastern edge of the basin and into the Palo Verde Mesa Groundwater Basin. Geophysical surveys showed the gap is filled with a rather thin section of recent alluvium that is connected to the Palo Verde Mesa Groundwater Basin aquifers. The recent alluvium pinches out just after crossing into the Chuckwalla Valley Groundwater Basin, and is underlain by the clayey Bouse Formation. Clays and silts of the lower part of the Bouse Formation are almost impermeable and can confine water in the underlying fanglomerate. The fanglomerate consists of moderately to firmly cemented continental sandy gravel (Wilson, 1994).

The fanglomerate has a low capacity to transmit water. The fanglomerate hydraulically connects the Chuckwalla Valley and Palo Verde Mesa groundwater sub-basins, but because it is confined, the Colorado River cannot recharge the aquifer. The Colorado River cannot recharge the

Chuckwalla Valley Groundwater Basin because the recent alluvium pinches out just after it enters into the Basin and is isolated by the underlying almost impermeable Bouse Formation.

The profiles show that the coarse grained sediments are continuous throughout the Chuckwalla Valley Groundwater Basin and because they appear to be hydraulically connected, there is only one aquifer in the Chuckwalla Valley. Groundwater levels from 1963 and 1964 were plotted on the geologic profiles to show the saturated sediments. Based on the geology and the water levels the aquifer appears to be unconfined but within the central portion of the Chuckwalla Valley, where clays have accumulated, the aquifer may be semi-confined to confined.

3.3.2.4 Hydraulic Characteristics

Several terms are used to define the hydraulic characteristics of sediments and aquifers and their ability to store and transmit water. Hydraulic conductivity is the ability of the sediments to transmit water. Transmissivity, a term applied to aquifers, is the hydraulic conductivity multiplied by the thickness of the sediments capable of storing water. All sediments have some void space between the particles; this void space is reported as porosity. Water in the void spaces cannot be entirely removed. The storage coefficient is the percentage of water that can be removed from the pores by gravity drainage and is applied when describing unconfined aquifers. Storativity is similar to the storage coefficient, but is the percentage of water that can be released from the pores by a decrease in pressure. Storativity is used when referring to semi-confined or confined aquifers.

Limited information is available on the hydraulic characteristics of the sediments in the Chuckwalla Basin. The DWR estimated the average specific yield (specific yield is approximately equal to the storage coefficient for unconfined aquifers) to be 0.10 for the upper 220 feet of saturated sediments (DWR, 1979).

Figures 3.3-5 and 3.3-6 show that wells in the Upper Chuckwalla Valley obtain water from the alluvium and continental deposits. Table 3.3-1 summarizes the aquifer characteristics. Most tests were performed using only the pumping well which does not provide a storage coefficient or storativity for the aquifer and could result in a greater uncertainty in the aquifer characteristics.

The most representative hydraulic characteristics for the sediments near Desert Center where Project water supply wells will be constructed were determined from two long term aquifer tests in which the drawdown was measured in observation wells (Greystone, 1994). Table 3.3-1 summarizes hydraulic characteristics where storativities were within acceptable ranges, along with lower quality single well test results.

Table 3.3-1. Alluvial Aquifer Characteristics in Chuckwalla Groundwater Basin

Source of Test Data (Well Name)	State Well Log No.	Well Total Depth (feet)	Aquifer Test Storativity (unitless)	Assumed Storativity (unitless)	Flow Rate (gpm)	Drawdown (feet)	Saturated Aquifer Thickness (feet)	Distance from Well (feet)	Duration of Test (days)	Hydraulic Conductivity (ft/day)	Transmissivity (gpd/ft)
Upper Chuckwalla Valley											
CW-1		520		0.1	1,000	25	85	1	1.25	94	60,000
CW-2		535		0.1	2,400	78	166	1	1.25	36	45,000
CW-3		570		0.1	2,800	78	175	1	1.25	41	54,000
CW-4		500		0.1	1,150	32	150	1	1.25	48	54,000
MW-1		400					51			7.1	2,700
MW-2		455			33	37	65			0.02	10
							65			0.37	180
MW-5		245			20	25	30			2.01	450
							30			2.23	500
							30			7.13	1,600
4S/15E-11	395287	580		0.01-0.001	1,400	112	240	1	3.04	12 to 13	20,750-24,000
Desert Center Area											
Well 1				0.1	2,300	70.47	300	1	1.11	19	42,714
Well 3		789		0.1	2,350	46.91	300	1	1.99	32	71,902
OW-2			0.06		-	2.69	300	300	1.11	111	248,825
			0.06		-	2.69	300	300	1.11	118	264,002
			0.05		-	2.69	300	300	1.11	139	311,288
5S/15E-2	455508	800		0.01	1,200	40	220	1	0.33	22	36,000
5S/16E-5	069757	600		0.001	900	92	260	1	0.50	8	16,500
5S/16E-8F1		206		0.1	125	62	20	1	1.25	16	2,400
5S/16E-8K1		212		0.1	180	20	18	1	1.25	105	14,000
Lower Chuckwalla Valley											
6S/18E-29	217367	957		0.0001	600	120	380	1	1.38	3.5	10,000
6S/19E-32	353739	982		0.0001	450	175	50	1	3.00	12	4,500
7S/R20E-16M1	157672	1,200		0.0001	1,200	81	510	1	0.06	7	27,000
7S/R20-E17G1	15917	1,200		0.0001	1,200	75	510	1	1	9	34,000
7S/20E-17K1	15912	1,200		0.001	1,600	31	510	1	1	27	102,000
7S/20E-17L1	485765	1,200		0.0001	1,600	60	510	1	1	15	57,000
7S/20E-18A	27724	1,083		0.001	1,000	90	230	1	1	12	20,000
7S/20E-18K1	485768	1,200		0.0001	1,000	97	510	1	2	5	20,000
7S/20E-18R1	485766/485767	1,160		0.0001	1,500	90	450	1	5.42	12	39,000
7S/20E-20	157634	1,100		0.001	2,130	108	362	1	0.33	11	28,500
7S/18E-14	3645	960		0.0001	400	240	100	1	0.50	4	2,900
7S/18E-14	3647	1,000		0.0001	400	260	300	1	0.50	1	2,700
7S/19E-28	336234	1,100		0.01	2,000	3	400	1	0.08	434	1,300,000
7S/20E-17	218900	1,050		0.001	800	62	300	1	1	1	8,200

Unlocated Wells

Representative aquifer hydraulic characteristics for the upper portions of the Chuckwalla Valley Groundwater Basin, east of the Project site, were estimated from the Eagle Mountain iron mine water supply wells (CW-1 to CW-4). The characteristics were estimated from test results recorded on the well logs. The results show that the hydraulic conductivities are about half of those measured near Desert Center.

The alluvial aquifer near the Project site has lower hydraulic conductivities. Hydraulic characteristics of the sediments overlying the lakebeds were estimated during the investigation for the landfill. The hydraulic conductivity was estimated to be between 0.02 and 7.1 feet per day. Descriptions of the fanglomerate from monitoring well construction describe the sediments as ranging from boulders to coarse sand, and therefore the estimated hydraulic conductivities appear to be too low. Typical hydraulic conductivity values for well-sorted sand and gravel are from 3 to 180 feet per day (Fetter, 1988).

The bedrock portion of the Project site has a much lower hydraulic conductivity. In comparison to the alluvial aquifer, the bedrock is essentially impermeable. However, fracturing and faulting of the rock created secondary permeability. Groundwater movement in these formations is therefore associated with these faults, joints, and fractures.

3.3.2.5 Groundwater Levels

Groundwater levels are measured by the United States Geologic Survey in 12 wells within the basin. The DWR also reports groundwater levels for several other wells; however, there are only a few scattered measurements. A partial trend in groundwater levels can be developed by combining records from multiple wells.

Groundwater levels in the Desert Center area are represented by wells 5S/16E-7P1 and 5S/16E-7P2 covering about a 50-year period. Figure 3.3-2 shows the locations of these wells. Figure 3.3-7 shows the water level measurements. There were few measurements between 1950 and 1981, but levels appear to have been relatively stable. Between 1981 and about 1986 thousands of acres were irrigated for the first time to produce jojoba and asparagus that ended in economic failure. During this period, the water levels declined at local wells by about 130 feet. The effects of the pumping were not as extreme at well 5S/15E-12N1, which is located about 1.5 miles to the west of well 5S/16E-7P1. This relationship suggests the drawdown in well 5S/16E-7P1 is the result of localized effects of pumping.

Groundwater levels between 1986 and 2002 have recovered by over 100 feet. The recovery is due in part to a large decrease in agricultural pumping and potentially increased subsurface inflows (steeper gradients) from the Pinto, Orocopia (Hayfield Valley), and Cadiz valley groundwater basins (Hanson, 1992). However, the Cadiz Valley Groundwater Basin is now not considered to be a recharge source to the Chuckwalla Valley Groundwater Basin (B&V, 1998). In 2007 groundwater levels were about 17 feet lower than the static water level in 1980, before the heavy agricultural pumping occurred. The lower groundwater level may be the result of drawdown created by pumping for current agriculture and domestic uses.

Groundwater levels in the eastern portion of the Chuckwalla Valley near the outflow to the Palo Verde Mesa Groundwater Basin are conflicting. Well 7S/20E-18H1 shows a similar trend as the wells near Desert Center, while well 7S/20E-28C1 shows the groundwater levels were recovering during the overdraft period. The conflicting results suggest the water levels may be affected by local use (7S/20E-18H1) and that the groundwater levels in this area of the Chuckwalla Valley were actually rising and were not affected by pumping near Desert Center. Figure 3.3-2 shows the locations of these wells. Figure 3.3-8 shows water level measurements in comparison to the water levels near Desert Center.

Groundwater levels in the Palo Verde Mesa Groundwater Basin are flat lying (7S/21E-15A1) and show little to no effects of pumping within the Upper Chuckwalla Valley Groundwater Basin. Figure 3.3-2 shows the location of this well. Figure 3.3-8 shows water level measurements in comparison to the Upper Chuckwalla Valley Groundwater Basin water levels.

Groundwater levels in the Pinto Valley Groundwater Basin remained stable up until about 1960. Pumping by Kaiser in the Pinto and Upper Chuckwalla Valley lowered water levels by about 15 feet between 1960 and 1981. Thereafter, groundwater levels recovered, potentially due to Kaiser’s substantially reduced pumping, even though groundwater levels near Desert Center declined. A recent 2007 measurement shows that levels have continued to recover but are about 7 feet below the static water level recorded in 1960, likely due to pumping effects of existing users near Desert Center. Figure 3.3-9 shows the groundwater levels in both the Pinto Basin and Desert Center areas. These data show that groundwater levels in these two areas have different trends, suggesting that pumping in the Desert Center area does not have a significant effect on groundwater levels in the Pinto Valley Groundwater Basin.

3.3.2.6 Groundwater Flow Direction

Groundwater contours developed from 1974 groundwater level measurements for the Chuckwalla Valley Groundwater Basin show groundwater movement from the north and west toward the gap between the Mule and the McCoy Mountains at the southeastern end of the Chuckwalla Valley Groundwater Basin (DWR, 1979) and into the Palo Verde Mesa Groundwater Basin. Figure 3.3-10 shows the groundwater contours and flow directions.

Groundwater contours were also developed for portions of the Upper Chuckwalla Valley near the Project site (CH2M Hill, 1996). Bedrock groundwater contours show the water is moving both north and south from the Eagle Mountains towards Eagle Creek Canyon and then to the east until it intercepts the sediments in the groundwater basin. Groundwater levels in the sediments within the basin show the groundwater movement is from the northwest toward the southeast in the vicinity of the Project site. Figure 3.3-11 shows these groundwater contours.

3.3.2.7 Groundwater Storage

The total storage capacity of the Chuckwalla Valley Groundwater Basin was estimated to be about 9,100,000 acre-feet (DWR, 1975). A more recent analysis estimates that there are 15,000,000 acre-feet of recoverable water (DWR, 1979). The groundwater storage estimate for just the northwestern portion of the Upper Chuckwalla Valley, near the Project site is about 1,000,000 acre-feet. This is a very conservative estimate because only 100 feet of saturated sediments were considered in the calculation and there are several hundred feet of saturated sediments known to be remaining (Mann, 1986).

Using the geologic profiles shown on Figures 3.3-4 through 3.3-6 to assess the saturated thickness, and assuming a storage coefficient of 0.10, the storage capacity of the Chuckwalla Valley Groundwater Basin is estimated to be about 10,000,000 acre-feet (similar to DWR's 1979 estimate). This is a very conservative estimate as it includes only the coarse grained sediments, and does not include water in the clay deposits nor does it account for additional water that may be present due to confining conditions in the central portion of the Chuckwalla Valley.

3.3.2.8 Groundwater Pumping

The amount of groundwater historically pumped from the Chuckwalla Valley Groundwater Basin can be estimated from recordation data filed with the SWRCB or by the acres and types of crops grown multiplied by the evapotranspiration rates of the plants. Since the recorded pumping over the years has been erratic and may be incomplete, estimates using agricultural land usage were made (Mann, 1986).

The estimates were made by using water duties (evapotranspiration plus applied water losses) for crops and planted acreages measured using aerial photographs and field confirmation. Estimates were made for 1986 (Mann, 1986), 1992 (Hanson, 1992), 1996, 2005, and 2007 (GEI). Figures 3.3-12 through 3.3-16 show the crops grown in the Desert Center area in these years. Table 3.3-2 summarizes the acreages and estimated volume of groundwater pumped. The highest pumping occurred in 1986, at about 20,778 acre-feet per year (AFY), mostly for jojoba and asparagus. Most of the jojoba and asparagus fields have since been abandoned and agricultural water usage has significantly decreased. Only about 25 percent of land continues to be farmed. More recent endeavors in palm farming have slightly increased groundwater use in the area from 1,758 AFY in 2005 to about 1,800 AFY in 2007. East of Desert Center the agricultural use increased rather significantly due to an expansion of a palm and citrus grower.

Table 3.3-2. Chuckwalla Valley Agricultural Water Use Summary

Crop	Applied Water Duty / Acre (Feet/Acre)	Area 1986 (Acres)	Area 1992 (Acres)	Area 1996 (Acres)	Area 2005 (Acres)	Area 2007 (Acres)	Water Use 1986 (A.F.)	Water Use 1992 (A.F.)	Water Use 1996 (A.F.)	Water Use 2005 (A.F.)	Water Use 2007 (A.F.)
Desert Center Area											
Jojoba	2.2	4,005	1,351	120	120	120	8,811	2,972	264	264	264
Jojoba/Asparagus	4.6	457	0	0	0	0	2,102	0	0	0	0
Asparagus	8.3	1,157	200	110	0	0	9,603	1,660	914	0	0
Citrus	4.5	14	5	23	23	23	63	23	104	102	102
Dates	8.0	14	25	12		0	112	200	96	0	
Dates/Palms[1]	6.7				188	188				1,260	1,260
Vines	4.5	5	5	33	9	9	23	23	147	39	39
Pasture	6.4	10	0	0	0	0	64	0	0	0	0
Peaches/Apples	4.5	0	80	0	0	0	0	360	0	0	0
Melons/Peppers	3.5	0	100	0	0	0	0	350	0	0	0
Greenhouses[2]	8.3				0	5				0	42
Row Crops[2]	8.3				11	11				94	94
SUBTOTAL (Desert Center)		5,662	1,766	298	351	355	20,778	5,587	1,525	1,758	1,800
Lower Chuckwalla Valley											
Citrus	4.5					207				0	931
Dates/Palms[1]	6.7			106	250	546			710	1,675	3,658
SUBTOTAL (Lower Chuckwalla)				106	250	753			710	1,675	4,589
TOTAL		**5,662**	**1,766**	**404**	**601**	**1,108**	**20,778**	**5,587**	**2,235**	**3,433**	**6,389**

Notes:
All water duties based on Mann, 1986 unless otherwise noted
[1] Water duty based on Kc of 0.95 (FAO, 1998), ETo of 6.0ft/yr (CIMIS 1999), and application efficiency of 0.85 (Jensen, 1980)
[2] Crop type unknown, so the largest possible water duty assumed

Other pumping in the basin occurs for domestic and industrial use. Domestic use in the area is estimated at 50 AFY in Desert Center (Mann, 1986), and 1,090 AFY at the Lake Tamarisk development (average from State Recordation data filed with SWRCB between 2003 and 2008). Southern California Gas Company uses wells 5S/16E-7P1 and -7P2 to supply about 1 AFY to its natural gas pumping plant. Further east in the basin are the Chuckwalla Valley and Ironwood State Prisons that were opened in 1988 and 1994, respectively and are located directly adjacent to each other about 30 miles east of Desert Center. The two prisons pumped 2,100 acre-feet of groundwater in 2007 and recharged about 800 AFY of treated wastewater (California Department of Public Health, pers. comm., with David Fairman, 2008). However, populations at the prisons are projected to be reduced by about 35 percent by 2011 to alleviate overcrowding, which would reduce their pumping to about 1,500 AFY.

Groundwater production can affect local and regional groundwater levels. Figure 3.3-7 shows the plot of the groundwater levels versus estimates of groundwater pumping for agricultural, domestic, and industrial use. The figure shows that the decline of the water levels in the Desert Center area between 1981 and 1986 is due to groundwater pumping locally exceeding the perennial yield of the basin.

3.3.2.9 Recharge Sources and Perennial Yield

The Chuckwalla Valley Groundwater Basin is recharged by percolation of runoff from the surrounding mountains and from precipitation to the Chuckwalla Valley floor (DWR, 1979). The Upper Chuckwalla Valley is also recharged by subsurface inflow from the north by the Pinto Valley Groundwater Basin and from the west from the Orocopia Valley. Subsurface inflow from the Pinto Valley Groundwater Basin occurs as outflow through an alluvium-filled gap at the east end of the Pinto Valley (Kunkle, 1963). Recent studies have indicated there is no groundwater outflow from Cadiz Valley (B&V, 1998). Therefore, the Pinto Basin and the Orocopia Basin are considered tributary to the Chuckwalla Basin.

One of the most difficult estimates in desert basins is natural recharge (FAO, 1981). Several authors have made estimates of the groundwater recharge to the Chuckwalla Groundwater Basin varying from 10,000 to 20,000 AFY as shown in Table 3.3-3. In the Final License Application (FLA) submitted to the Federal Energy Regulatory Commission in June 2009, the Applicant reported these estimates and used what they considered to be a conservatively low value of 12,200 AFY (Hanson, 1992). The NPS suggested that the estimate used is too high and recommended re-evaluating the estimate of recharge (NPS 2009).

The Applicant then conducted additional studies to estimate recharge to the Chuckwalla Basin. The area evaluated included the Chuckwalla Groundwater Basin as well as the tributary Pinto and Orocopia Groundwater basins. Because the Pinto and Orocopia basins are tributary to the Chuckwalla and have little-to-no pumping, deep percolation in these basins becomes recharge to the Chuckwalla Groundwater Basin.

A literature search was conducted to find a representative method to estimate the deep percolation in the Chuckwalla groundwater basin using existing information. The results of this literature search are described in more detail in Section 12.4, Attachment F. The literature search found recoverable water estimates have been developed for the Fenner Basin using a variety of methods. The Fenner Basin is located approximately 20 miles north of the Chuckwalla Basin. A groundwater model, a water balance, a chloride mass balance, the Crippen method, and the Maxey-Eakin method were used to develop annual recoverable water estimates in the Fenner Basin (URS, 1999). The estimates also included professional opinions of the recharge using simple estimates by a MWD Review Panel.

A fairly broad range of estimates resulted from these studies. The Applicant identified two of these methods that could be used to estimate the recharge in the Chuckwalla Groundwater Basin using available data. Recharge was estimated using the Maxey-Eakin method (Maxey and Eakin, 1950) as well as using the methodology from the recommendations of the MWD Review Panel.

The Maxey-Eakin method was developed for large alluvial filled valleys that are surrounded by mountainous terrain with either shallow soils or exposed bedrock, similar to that present in the Chuckwalla and tributary basins. The method can be used where limited climatic and hydrogeologic information is available. This method uses average annual precipitation to classify areas of a basin into five recharge zones. The method has since been modified, using a continuous function to determine the fraction of recharge instead of the stepped function first proposed by Maxey-Eakin (Hevesi and Flint, 1998). The modified method was applied to the Fenner Basin and found to substantially underestimate the recharge in comparison to other, more exhaustive methods (USGS-WRD, 2000).

For the Chuckwalla and tributary basins, the surface area within the basins was measured from USGS topographic maps to determine the area at 820 foot (250 meter) intervals. Recharge was determined by using the continuous curve developed by Hevesi and Flint (1998). This produced a range of recharge values from 600 to 3,100 AFY, much lower than other estimates of recharge developed by other studies.

The MWD Review Panel applied an empirical approach to recharge in the Fenner Basin. Based on their professional experience they predicted that somewhere between 3 percent and 7 percent of precipitation over the area of the basin would become groundwater recharge. These estimates came very close to those from more exhaustive methods such as a water balance model by Geoscience (URS, 1999).

This method was repeated for the Chuckwalla and tributary Basins. However, only mountainous areas of the basin were considered, and valley floor areas were considered to contribute zero change. This conservative approach was used because the elevations of the basins are lower than in the Fenner Basin, and would receive less precipitation in the valley floors. Also, precipitation on the alluvial floor is much less likely to infiltrate and more likely to evaporate due to the presence of fine-grained silts and clays, especially in the dry lake beds. Precipitation was estimated using the local precipitation-elevation curve and the average elevation of the mountainous regions, 2,800 feet. Recharge using this approach is estimated to be between 7,600 and 17,700 AFY with a mean of 12,700 AFY (see Tables 3, 4, and 5 in Section 12.4 Attachment F).

Given the fact that an uncalibrated Maxey-Eakin method has been shown to substantially underestimate recharge, and that the Review Panel’s estimate of percentage of precipitation was in congruence with other estimates, a value of 12,700 AFY was used as the value for recharge in water balance calculations. This value is in line with previous estimates available in the published literature.

Table 3.3-3
Groundwater Basins Inflow Estimates in Acre-Feet/Year

Estimated Recharge to Chuckwalla Basin

Recharge Based on Precipitation Chuckwalla	Inflow from Pinto	Inflow from Orocopia (Hayfield)	Total
5,400 -5,600 [1]	2,500 [2]	1,700 [1]	9,600-9,800
	3,200 [5]		10,300-10,500

Recharge Based on Precipitation Chuckwalla	Subsurface Inflow Pinto + Orocopia		Total
5,400 -5,600 [1]	6,700 [4]		12,100-12,300

Independent Estimates of Total Inflow to Chuckwalla Basin:

Total
10,000-20,000 [2]
12,200 [3]
16,600 [6]
9,800 [7]

References

1 LeRoy Crandall and Associates (LCA) 1981
2 Mann 1986
3 Hanson 1992
4 CH2MHill 1996
5 GEI 2009
6 Greystone 1994
7 NPS 2009 (total 10,631 AFY = natural recharge 9,800 AFY + wastewater recharge 831 AFY)

3.3.2.10 Outflow

Outflow is limited to the subsurface, as no surface waters leave the basin. Underflow from the Chuckwalla Valley Groundwater Basin discharges to the Palo Verde Mesa Groundwater Basin at an estimated rate of 400 AFY (Metzger et al., 1973). Additional geophysical surveys were performed to assess the outflow area (Wilson, 1994). Although the outflow area was found to be shallower, the length was larger resulting in no significant change.

3.3.2.11 Groundwater Quality

The TDS content across the basin ranges from 274 to 12,300 mg/L (DWR, 1979). The best water quality is found in the western portion of the basin, where TDS concentrations range from 275 to 730 mg/L (DWR, 1979). In the northwest portions of the Chuckwalla Valley, arsenic concentrations have ranged from 9 to 25 ug/L (Greystone, 1994). Table 3.3-4 lists water quality results in the Desert Center area near the Project's proposed pumping wells, in the Upper Chuckwalla Valley near the central Project site and in Palen Valley, east of Desert Center.

Water quality in the Desert Center area and in the Upper Chuckwalla Valley has concentrations of nitrate, boron, fluoride, arsenic and TDS that are higher than recommended levels for drinking water use (DWR, 1975). The water from well 5S/16E-7M2 has a TDS of 577 mg/L (Greystone, 1994). High concentrations of boron impair groundwater for irrigation use (DWR, 1975). TDS concentrations appear to have increased by about 160 mg/L between 1961 and 1994.

Groundwater quality to the east in Palen Valley is of lower quality. TDS concentrations range from about 500 up to 4,200 mg/L.

Miscellaneous water quality results are reported by the Department of Public Health and co-operators for 10 wells in the Chuckwalla Valley Groundwater Basin. Although the results from only one well were available, radiological, nitrate, pesticides, and volatile and synthetic organic chemicals have been below the maximum contaminant level for drinking water (DWR, 2003).

The proposed Project would be located in eastern Riverside County, within the Colorado River Basin – Region 7 of the SWRCB. Potential beneficial uses that may be applied to surface water or groundwater resources within this Region are listed in Table 3.3-5.

Table 3.3-4. Upper Chuckwalla and Palen Valley Groundwater Quality

WELL NAME	DATE SAMPLED	TDS (mg/L)	pH	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	CO3 (mg/L)	HCO3 (mg/L)	SO4 (mg/L)	Cl (mg/L)	NO3 as N (mg/L)	As (ug/L)	B mg/L	F mg/L	CaCO3 (mg/L)	Se (ug/L)
	MCLs [1]	500 [2]	6-8							250*	250*	10	10		2		50
						Upper Chuckwalla Valley											
4S/16E-29R1	10-May-61	730	8.3		1	274	4.3	18	290	165	110	5.6		1.2	4.4	3	
4S/16E-30D1 (Well 1)	8-Mar-61	584	8.0	17	1	179	2.7	0	82	219	90	9.3		0.6	3.6		
4S/16E-30D1 (Well 1)	23-Sep-94	567	8.5	16.8	1.21	201	3.2	<1.0	74.3	240	87.7	0.65	9	0.6	10.9		<5
4S/16E-31D1	6-Oct-61	626	8.0	16	0	201	2.7	0	134	212	96	5.6		0.6	9.5	40	
4S/16E-32D1	10-Jun-61	925	7.1	14	0	176	2	0	63	171	113	1.2		0.4	7.9	35	
4S/16E-32M1	10-Nov-61	532	8.2	12	0	16	16	0	43	162	124	3.7		0.7	7.4	30	
5S/14E-24R1	31-Jan-33	987									398					82.5	
5S/15E-01L1	21-Mar-60	445	8.7	72	10	130	1.6	7	59	112	69	1.9		0.5	12	221	
5S/15E-12N1	18-May-61	424	7.9	14	0	129	2.7	0	88	115	74	8.7		0.3	8.7	35	
5S/15E-13B1	18-May-61	865	7.8	49	5	251	5.5	0	67	128	351	6.8		0.6	6.8	143	
5S/15E-27H1	18-May-60	2072		7.3				0	76		782				4	455	
5S/15E-29F1	10-Nov-61	274		8	12	2	2.3	0	204	9	14	25		0.3	3.9	40	
5S/16E/18M1	11-Jul-61	459	8.6	5	0	158	0.8	12	67	122	85	9.9		0.4	8.9	13	
5S/16E-05B1	16-May-61	516	7.9	16	0	161	3.1	0	107	147	94	12		0.2	7	40	
5S/16E-05B2	17-May-61	400	7.5	9	0	129	1.6	0	79	108	74	10		0.4	8.7	23	
5S/16E-06N1	26-Sep-61	390		8.4	0.5	134	0	73	110	82	8.1	10		0.5	10	23	
5S/16E-07M1	10-Aug-61	418	8.2	12	0	134	2.3	0	79	105	82	14		0.3	6.8	30	
5S/16E-07M2 (Well 3)	11-Jul-61	413	8.7	6	0	143	1.6	12	55	106	89	1.9		0.3	6.9	15	
5S/16E-07M2 (Well 3) [3]	12-Sep-94	577	8.4	14.1	0.69	157	2.8	<1.0	74.3	112	116	4.1	25	0.6	7.62		<5
5S/16E-07P1	18-May-59	420	7.6	8	0.6	141	2.6	0	88	105	78	12		0.3	7.8	23	
5S/16E-08F1	16-May-57	481	8.0	8	2	156	2.1	0	409	140	82	3		0.6	8		
5S/16E-10Z1	17-Dec-17	3460		399	7.3	699	0	129	1950	286	8.8					1020	
5S/16E-22N1	9-Dec-61	1310	8.0	72	0	409	4.7	0	21	144	645	5.6		0.9	3.1	178	
Charpied Well	15-May-08	550	8.2	19	<1.0	160	2.6	<3.0	59	200	94	2.7	5.8		6		<5
CW#3	30-Apr-91	1170	8.0	74	4	350	7	0	195	490	185	17	<10		5.4		<5
CW#4	30-Apr-91	635	8.2	21	1	215	4	0	177	215	100	3	<10		10		<5
Kaiser Well#4 Deep	5-May-93	685	8.2	19	1	216	4	0	162	230	100	4	10		10		<5
						Palen Valley											
4S/17E-06C1	10-Sep-61	4160	7.4	393	14	1130	18	0	49	442	2100	9.3		1.8	2.9	1040	
5S/16E-25F1	6-May-58	648	8.0	40		200		0	92	120	238	3.7		0.9			
5S/16E-36M1	9-Nov-59	524	8.3	20	2	159	4.3	6	116	113	131	6.2		0.7	5.2	60	
						Hayfield Valley											
5S/14E-33L	9-Feb-80	420	7.9									17			5.2	0.08	<1

Notes

[1] California Title 22 Drinking Water Maximum Contaminant Level (MCL)
[2] Recommended MCL
[3] Iron exceeds MCL

Table 3.3-5. Potential beneficial uses that could apply to surface water and groundwater resources in Region 7 (RWQCB, 2007a)

Category		Definition
MUN	Municipal and domestic supply	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
AGR	Agriculture supply	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
AQUA	Aquaculture	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
IND	Industrial service supply	Supply Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.
GWR	Groundwater recharge	Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting salt water intrusion into fresh water aquifers.
REC I	Water contact recreation	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.
REC II	Non-contact water recreation	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
WARM	Warm freshwater habitat	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
COLD	Cold freshwater habitats	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
WILD	Wildlife habitat	Uses of water that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources
POW	Hydropower generation	Uses of water for hydropower generation
PFRSH	Freshwater Replenishment	Uses of water for natural or artificial maintenance of surface water quantity or quality
RARE	Preservation of rare, threatened or endangered species	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or Federal law as rare, threatened or endangered.

Waters of the State presently located at the proposed Project site include only groundwater resources. The primary groundwater resource in the Eagle Mountain area is the water table aquifer of the Chuckwalla Valley Groundwater Basin. Beneficial uses that apply to the groundwater in the Chuckwalla hydrologic unit include municipal and domestic supply, industrial service supply, and agriculture supply. By definition, all surface and groundwater is considered suitable or potentially suitable for municipal or domestic water supply, unless one or more of the following conditions applies (RWQCB, 2005):

- TDS exceeds 3,000 mg/L and it is not reasonably expected by the RWQCB to supply a public water system.
- Contamination exists either by natural processes or by human activity that cannot reasonably be treated.
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gpd.
- The aquifer is regulated as a geothermal energy producing source.

Historic groundwater quality TDS concentrations only occasionally exceed the 3,000 mg/L (Table 3.3-3) and none of the other exceptions would apply to the aquifer of the Chuckwalla Valley Groundwater Basin, reinforcing that the current municipal or domestic water supply classifications are generally appropriate. Therefore, the federally approved Region 7 water quality standards (Table 3.3-6) for groundwater, based on maximum contaminant levels (MCLs) for use of the groundwater for drinking water, would apply to the Project waters.

Table 3.3-6. California Regional Water Quality Control Boards, Region 7 (RWQCB, 2007a) and EPA numeric standards for inorganic chemical constituents that apply to waters designated for domestic or municipal supply use

Inorganic Chemical Constituent	CA Region 7 MCL	EPA MCL
	(mg/L)	(mg/L)
Arsenic	0.01	0.01
Barium	1.0	2
Cadmium	0.01	0.005
Chromium (total)	0.05	0.1
Lead	0.05	0.015
Mercury	0.002	0.002
Nitrate as N	10	10
Selenium	0.01	0.05
Silver	0.05	0.1

Historic water chemistry data for groundwater in the Chuckwalla Valley Groundwater Basin are variable, depending on the depth and location of the well (Table 3.3-4), and suggest treatment would be necessary for domestic water supplies to maintain the water quality at levels below the concentrations listed in Table 3.3-6. Selenium has not been detected at concentrations above the laboratory detection limits of 0.005 mg/L and therefore it is not expected to accumulate in the reservoirs and require treatment. Annual sampling of the reservoirs is recommended to confirm that selenium is not accumulating.

3.3.3 Potential Environmental Impacts

3.3.3.1 Methodology

Evaluation of potential impacts is based upon literature review, review of State and private databases, aerial photo interpretation, and publicly available environmental documents for projects within and adjacent to the Project area.

3.3.3.2 Thresholds of Significance

The SWRCB concludes that the Project may have significant impacts on groundwater resources if it does any of the following:

(a) Violate any water quality standards or waste discharge requirements

(b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)

(c) Cause local groundwater level reductions that affect local residents and businesses dependent upon overlying wells and/or

(d) Cause water table drawdown that depletes water in plant root zones on overlying lands

3.3.3.3 Environmental Impact Assessment

The Central Project Area facilities are located primarily on and within bedrock. Jointing and fracturing of the bedrock has locally increased the permeability of the rock. Groundwater in the joints and fractures may discharge to the sediments in the adjacent upper Chuckwalla Valley Groundwater Basin. The Lower Reservoir is located on bedrock but the eastern wall of the pit exposed about 400 feet of alluvium that is part of the Chuckwalla Valley Groundwater Basin sediments. Residual seepage from the reservoirs could cause groundwater levels to rise in the sediments beneath the CRA and cause structural instability or subsidence.

The Project will require about 8,100 AFY for the 4-year start-up period and 1,800 AFY of water for replenishment water. Groundwater pumped from wells in the Desert Center area is proposed to be used for the Project. The following sections analyze the potential effects of seepage from the Project reservoirs, and of Project pumping and existing water uses in the basin.

3.3.3.3.1 *Seepage*

Seepage from the Project's reservoirs has the potential to transport pollutants down gradient resulting in degraded water quality of the aquifer. Estimates of seepage from the proposed upper and lower reservoirs were performed for the Project. Details of this analysis are found in Section 12.5. In addition, estimates of the potential effectiveness of seepage control blankets and other seepage control measures were also assessed. Geologic cross sections for seepage modeling were developed based on available geologic maps, surface exposures, and data from a total of ten borings located throughout the Project area. The upper reservoir is entirely incised in moderately fractured bedrock, consisting of granitic and metasedimentary rock units. The lower reservoir is divided into two geologic zones; the western three quarters which is underlain by slightly-to-moderately fractured bedrock, and the eastern quarter which is made up of alluvial deposits having relatively high horizontal permeability.

Based on the seepage analyses, and assuming that no reservoir seepage treatments are applied, the maximum average annual seepage volume from the upper and lower reservoirs is approximately 1,200 acre-feet, and 1,700 acre-feet, respectively.

If a seepage blanket and grouting of rock fractures are utilized at the upper reservoir, the average annual seepage volume could potentially be reduced to 700 acre-feet. Similarly, if a seepage blanket, grouting of rock fractures and roller-compacted concrete (RCC) or soil cement treatment of the alluvium on the east wall are utilized at the lower reservoir, the average annual seepage volume could potentially be reduced to 900 acre-feet.

The Applicant has proposed that water that may escape the engineered seepage solutions will be captured by groundwater wells that will be operated to mitigate above-normal hydrostatic pressures, and maintain groundwater levels with ±5 feet of the historic levels in the area. Based on inclusion of these proposed Project Design Features to minimize and collect seepage as part of Project approval, the potential for seepage to impact the surrounding facilities would be negligible.

3.3.3.3.2 *Perennial Yield*

The Proposed Project will rely upon groundwater pumped from the Chuckwalla Basin. When pumping exceeds the annual recharge, groundwater levels will decline, and outflow from the basin may decrease over time. Over many decades, inflow from adjacent groundwater basins may increase, which could lead to a decrease in water levels in those basins.

Historically pumping exceeded the perennial yield of the basin between 1981 and 1986. During this 5-year period the cumulative pumping exceeded the perennial yield, assumed to be a conservative 12,700 AFY, and resulted in a reduction in groundwater storage by a cumulative total of about 36,200 acre-feet. Table 3.3-7 shows these estimates. Figure 3.3-7 shows that the groundwater levels recovered to near historic water levels after pumping was reduced to below the perennial yield.

A groundwater balance was developed to show the potential effects of groundwater pumping over the 50-year life of the Project, in combination with existing users of groundwater. Table 3.3-8 shows a summary of the balance. The proposed Project is projected to start construction in 2012 and the initial fill of 8,100 AFY in about 2014, with replacement pumping of 1,800 AFY starting in 2018 and continuing through the 50-year life of the Project. Usage by the Chuckwalla and Ironwood State prisons is assumed to decrease by about 30 percent by 2011, in response to relief from overcrowding. Other than these exceptions, pumping rates are assumed to continue at the most recently recorded rate.

Some water will recharge the basin by recycling of the water through septic systems and could also occur from seepage from the reservoirs. However, as discussed below, seepage from the reservoirs will be monitored and captured to prevent its return to the groundwater basin. The prisons are recycling about 800 AFY of treated wastewater through seepage ponds (Department of Public Health personnel comm., with David Fairman, 2008).

Using 2008 as the start of the water balance, recharge will exceed pumping until the start of the Project pumping in 2014 at which time pumping will exceed recharge by about 4,600 AFY for 4 years. After 2018, recharge will exceed pumping by about 1,700 AFY and will continue for the remainder of the Project life. By 2060, at the end of the 50-year FERC Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet.

Table 3.3-7. Estimated Overdraft in Acre-Feet for 1981 to 1986 Chuckwalla Valley Groundwater Basin

Year	Eagle Mountain Mine [1]	Agricultural Pumping [1]	Aquaculture Pumping [2]	Sum of other Pumping [3]	Subsurface Outflow [4]	Subtotal Outflow	Average Inflow [5]	Inflow minus Outflow	Cumulative Change
1981	3,006	11,331	302	920	400	15,959	12,700	-3,259	-3,259
1982	1,574	13,220	302	920	400	16,416	12,700	-3,716	-6,975
1983	47	15,108	302	920	400	16,777	12,700	-4,077	-11,052
1984	790	16,997	302	920	400	19,409	12,700	-6,709	-17,761
1985	484	18,885	302	920	400	20,991	12,700	-8,291	-26,052
1986	450	20,774	302	920	400	22,846	12,700	-10,146	-36,198

Notes:

[1] From Greystone 1994.

[2] Pumping required to account for evaporation from open water bodies associated with fish ponds or tanks. Based on 1996 aerial photos.

[3] Includes domestic, Lake Tamarisk, and So Cal Gas.

[4] From Metzger, et al, 1973.

[5] From Section 12.7, Attachment F

Table 3.3-8. Chuckwalla Valley Groundwater Basin Groundwater Balance Existing and Project Pumping Effects on Groundwater Storage (AF)

Year	Subtotal Outflow	Subtotal Inflow	Inflow minus Outflow	Cumulative Change
2008	10,640	13,531	2,891	2,891
2009	10,640	13,531	2,891	5,781
2010	10,640	13,531	2,891	8,672
2011	10,040	13,531	3,491	12,163
2012	10,348	13,531	3,183	15,345
2013	10,348	13,531	3,183	18,528
2014	19,734	15,159	-4,575	13,953
2015	19,734	15,159	-4,575	9,377
2016	19,734	15,159	-4,575	4,802
2017	19,734	15,159	-4,575	226
2018	14,356	15,159	803	1,029
2019	13,435	15,159	1,724	2,753
2020	13,431	15,159	1,728	4,480
2021	13,431	15,159	1,728	6,208
2022	13,431	15,159	1,728	7,936
2023	13,431	15,159	1,728	9,663
2024	13,431	15,159	1,728	11,391
2025	13,431	15,159	1,728	13,119
2026	13,431	15,159	1,728	14,846
2027	13,431	15,159	1,728	16,574
2028	13,431	15,159	1,728	18,302
2029	13,431	15,159	1,728	20,029
2030	13,431	15,159	1,728	21,757
2031	13,431	15,159	1,728	23,484
2032	13,431	15,159	1,728	25,212
2033	13,431	15,159	1,728	26,940
2034	13,431	15,159	1,728	28,667
2035	13,431	15,159	1,728	30,395
2036	13,431	15,159	1,728	32,123
2037	13,431	15,159	1,728	33,850
2038	13,431	15,159	1,728	35,578
2039	13,431	15,159	1,728	37,306
2040	13,431	15,159	1,728	39,033
2041	13,431	15,159	1,728	40,761
2042	13,431	15,159	1,728	42,489
2043	13,431	15,159	1,728	44,216
2044	13,431	15,159	1,728	45,944
2045	13,431	15,159	1,728	47,671
2046	13,431	15,159	1,728	49,399
2047	13,431	15,159	1,728	51,127
2048	13,431	15,159	1,728	52,854
2049	13,431	15,159	1,728	54,582
2050	13,431	15,159	1,728	56,310
2051	13,431	15,159	1,728	58,037
2052	13,431	15,159	1,728	59,765
2053	13,431	15,159	1,728	61,493
2054	13,431	15,159	1,728	63,220
2055	13,431	15,159	1,728	64,948
2056	13,431	15,159	1,728	66,676
2057	13,431	15,159	1,728	68,403
2058	13,431	15,159	1,728	70,131
2059	13,431	15,159	1,728	71,858
2060	13,431	15,159	1,728	73,586
2061	10,040	13,531	3,491	77,077
2062	10,040	13,531	3,491	80,567
2063	10,040	13,531	3,491	84,058
2064	10,040	13,531	3,491	87,549
2065	10,040	13,531	3,491	91,039
2066	10,040	13,531	3,491	94,530
2067	10,040	13,531	3,491	98,021
2068	10,040	13,531	3,491	101,511
2069	10,040	13,531	3,491	105,002

Year	Subtotal Outflow	Subtotal Inflow	Inflow minus Outflow	Cumulative Change
2070	10,040	13,531	3,491	108,493
2071	10,040	13,531	3,491	111,983
2072	10,040	13,531	3,491	115,474
2073	10,040	13,531	3,491	118,964
2074	10,040	13,531	3,491	122,455
2075	10,040	13,531	3,491	125,946
2076	10,040	13,531	3,491	129,436
2077	10,040	13,531	3,491	132,927
2078	10,040	13,531	3,491	136,418
2079	10,040	13,531	3,491	139,908
2080	10,040	13,531	3,491	143,399
2081	10,040	13,531	3,491	146,890
2082	10,040	13,531	3,491	150,380
2083	10,040	13,531	3,491	153,871
2084	10,040	13,531	3,491	157,362
2085	10,040	13,531	3,491	160,852
2086	10,040	13,531	3,491	164,343
2087	10,040	13,531	3,491	167,833
2088	10,040	13,531	3,491	171,324
2089	10,040	13,531	3,491	174,815
2090	10,040	13,531	3,491	178,305
2091	10,040	13,531	3,491	181,796
2092	10,040	13,531	3,491	185,287
2093	10,040	13,531	3,491	188,777
2094	10,040	13,531	3,491	192,268
2095	10,040	13,531	3,491	195,759
2096	10,040	13,531	3,491	199,249
2097	10,040	13,531	3,491	202,740
2098	10,040	13,531	3,491	206,231
2099	10,040	13,531	3,491	209,721
2100	10,040	13,531	3,491	213,212

3.3.3.3.3 *Regional Groundwater Level Effects*

The water balance shows a positive change in storage from the start of the Project to the end indicating that groundwater levels will continue to rise, but not by very much. There are about 9.1 to 15 million acre-feet of water in storage in Chuckwalla Valley Groundwater Basin. Assuming the low estimate of 9.1 million acre-feet and a conservative average saturated thickness of 600 feet, there is about 15,000 acre-feet per foot of saturated aquifer. Table 3.3-8 shows a net increase in groundwater in storage by about 74,000 acre-feet. This would result in a net increase in water level by about 5 feet. During the initial fill between 2014 and 2017, groundwater use will exceed recharge, so groundwater levels are expected to decrease during this period.

3.3.3.3.4 *Colorado River Effects*

The Colorado River is located about 60 miles east of the central Project site and 50 miles east of the proposed water supply wells. Due to these large distances, no impacts of groundwater pumping will be detectable on the river. The USGS has developed a model in which it is assumed that the Chuckwalla Valley Groundwater Basin is hydraulically connected to the river, and therefore any potential impacts that groundwater extraction in the Basin may have on the Colorado River must be addressed (Water-Resources Investigations Report 94-4005, USGS 1994).

To determine if water pumped from groundwater wells will be replaced by Colorado River water, the USGS developed an “accounting surface” for groundwater basins that may be connected to the river (of which the Chuckwalla basin is one). If static water levels in wells are equal to or below the accounting surface, it is assumed that this water would ultimately be replaced by Colorado River water. The accounting surface in the Chuckwalla Valley was determined to be between 238 and 240 feet above mean sea level (feet msl) (Scientific Investigations Report 2008-5113, USGS 2008). A proposed policy for using this method for determining well impacts to the Colorado River was published in the Federal Register for the Department of the Interior on July 16, 2008, but was withdrawn and has not been acted upon since that time. However, for purposes of full examination of potential effects in this EIR, the draft accounting surface criteria were assessed relative to the Project’s well water use. As shown in Figure 3.3-10, groundwater levels in the area of the Project’s wells are approximately 500 feet msl, hundreds of feet well above the contemplated accounting surface elevation. On that basis, it is concluded that the Project will not use groundwater that could ultimately be replaced by the Colorado River, and the Project’s groundwater use would have no impact on the contemplated Colorado River Accounting Surface.

More recently, the USGS published another method for assessing whether wells deplete groundwater that would otherwise recharge the Colorado River aquifer. This superposition model is intended to simulate the percentage of water that could ultimately (over 100-years of constant pumping) be depleted from the river (Scientific Investigations Report 2008-5189, USGS 2008). The assumption is that when a well is initially pumped, virtually all the water comes from groundwater storage, but over time as the cone of depression grows, the percentage of water from the river or other recharge sources increases. For the Desert Center area where Project pumping would occur, this depletion from the Colorado River was determined by the USGS to be less than 1 percent after 100 years. Because this percentage is so low (essentially zero), the potential impacts of Project pumping on the Colorado River by this method of analysis are also concluded to be negligible and undetectable.

3.3.3.3.5 *Local Groundwater Level Effects*

The local effects of pumping the Project’s wells were modeled to estimate the amount of drawdown at varying distances from the wells (Section 12.4). A transmissivity of 280,000 gpd-per-foot with a storage coefficient of 0.05 was used. It was assumed that each Project water supply well would pump at 2,000 gpm for the first 4 years of the Project and that the wells would be spaced a sufficient distance away from each other (about 1 mile) to minimize well interference.

The modeling predicts Project water supply pumping will cause drawdown of the groundwater levels in the Chuckwalla Valley Groundwater Basin. During the initial fill about 50 feet of drawdown will be created in the immediate vicinity at the cone of depression of the pumping wells for about 4 years, but thereafter when pumping is reduced to annual makeup water only, the drawdown at the well will be reduced to about 14 feet. At distances of 1 mile from the pumping wells the drawdown will be about 6 feet. After 50 years of pumping, the drawdown created by Project pumping will be about 3.6 to 4.3 feet near the CRA in the upper Chuckwalla and Orocopia valleys (Figure 3.3-20). Groundwater levels could be lowered by about 3.4 feet at the mouth of the Pinto Basin. Project pumping by itself would not exceed the maximum historic drawdown that occurred in the late 1970s through mid-1980s.

Existing pumping is causing variable baseline conditions. Projections show the groundwater levels near Desert Center are declining by about 0.1 foot per year due to local pumping. The existing pumping is lowering groundwater levels and will exceed the maximum historic drawdown in the Orocopia Valley by the end of the Project in 2060. Project and existing pumping would not exceed maximum historic drawdown in Desert Center or at the mouth of the Pinto Valley, but would exceed the maximum historic drawdown beneath the CRA by 5 feet in the upper Chuckwalla and by 4 feet in the Orocopia Valley.

The effects of Project pumping on inflow from the Pinto Valley Groundwater Basin were evaluated using the model. The inflow is based on estimates of the hydraulic conductivity, the area that water can flow through, and the groundwater gradient. The potential effects of the Project showed groundwater levels would be lowered by less than 4 feet at the mouth of the Pinto Valley Groundwater Basin. The gradient was adjusted based on the drawdown produced by the pumping. The inflow area (height) was reduced by 4 feet to simulate the affects after 50 years of pumping. A hydraulic conductivity of 50 feet per day was used to simulate flow for sediments above the basalt layer. The hydraulic conductivity was reduced to 25 feet per day to conservatively simulate groundwater flow below the basalt layer where the sediments may be more consolidated, weathered, or cemented. It is likely that the hydraulic conductivities are higher which would result in higher estimates of subsurface inflow that would be consistent with the revised recharge estimates.

The results of the calculations show inflow from the Pinto Basin prior to Project pumping is about 3,173 AFY. After 50 years of Project pumping the inflow would decrease to about 3,143 AFY, a reduction of about 30 AFY. The results show that Project pumping will have little effect on the groundwater gradient, changing it from 0.00576 to 0.00579, which is beyond detection (beyond the accuracy of the measurements). The decrease in the inflow area has a greater affect on the inflow from the Pinto Basin to the Chuckwalla Basin, and is producing the reduction of groundwater subsurface inflow in the calculations.

Project pumping is not likely to have any effects on springs in the Eagle Mountains. Based on available water resource information, it appears unlikely that these springs are hydrologically connected to the Pinto or Chuckwalla Valley basin aquifers since they are located in the mountains above the Pinto and Chuckwalla basins. Rather, they appear to be fed by local groundwater systems that would be unaffected by withdrawals from the proposed Project (NPS, 1994).

3.3.3.3.6 *Groundwater Flow Direct Effects*

The groundwater flow is generally from the west and north and flows towards the south and east (DWR, 1979). The modeling and groundwater levels show existing pumping near Desert Center has created a localized pumping depression. The Project pumping will temporarily deepen the pumping depression during the initial fill which thereafter only create about 14 feet of cone of depression drawdown near the pumping wells. Overall the short- and long-term pumping effects will not significantly change regional groundwater flow directions.

3.3.3.3.7 *Subsidence Potential*

The potential of drawdown associated with pumping of the wells to cause subsidence is typically associated with the lowering of confined aquifer groundwater levels below historic low levels. The aquifer in the Upper Chuckwalla Valley Groundwater Basin is unconfined and there is no reported evidence of subsidence in the area as a result of historic or present pumping.

Groundwater levels beneath the CRA in the upper Chuckwalla Valley have historically fluctuated by 1 to 15 feet between 1965 and 1986 as a result of historic pumping for mine operations and irrigated farming. Because the water levels have been lowered over multiple years, inelastic subsidence – to the extent it would occur – should have already occurred, without affecting the tight tolerance of ¼ inch of drop per 200 linear feet of the CRA (MWD, 2008).

Over a 50-year period, projected effects of existing and Project pumping could lower water levels by about 4 to 5 feet below the maximum historic drawdown beneath the CRA in the Upper Chuckwalla and Orocopia valleys (Figure 3.3-19 and 3.3-20). The geologic conditions favorable for subsidence related to groundwater extraction are not prevalent in the area, and based upon historic effects of pumping apparently having not resulted in subsidence; it is unlikely that lowering of water levels below their historic lows by up to additional 5 feet will have a significant effect. Nonetheless, subsidence monitoring should be implemented to confirm that drawdown effects remain within the projected drawdown levels and that significant inelastic subsidence is not induced.

The maximum drawdown due to Project water supply pumping at the mouth of the Pinto Basin will be approximately 4 feet. The amount of drawdown will be less than this in the interior of the Pinto Basin, at greater distance from the Project's wells. Because of the small amount of drawdown and the coarse-grained sediments in the Pinto Basin, the potential for subsidence is low to non-existent as a result of the Project's water supply pumping.

The potential for drawdown under the cumulative effects scenario (including Kaiser's water use for the proposed landfill, water use for multiple proposed solar projects, and water use for the prisons), is larger than the drawdown for the Project pumping alone (9 feet). With total saturated depth of 600 feet or greater, subsidence potential remains low under this scenario.

3.3.3.3.8 *Hydrocompaction Potential*

The sediments around the fringes of the Chuckwalla Valley Groundwater Basin were deposited as alluvial debris flows. These types of sediments are susceptible to settling and compaction leading to subsidence if wetted from above or below. The CRA is constructed on these sediments at the base of the Eagle Mountains. Seepage from the reservoir or brine ponds could raise groundwater levels and consolidate the sediments leading to subsidence. Direct contact of the seeped water with the CRA is unlikely because groundwater levels are about 150 feet below ground surface.

The results of MODFLOW modeling for the Lower Reservoir area indicate that groundwater levels beneath the reservoir would rise by about 4 to 12 feet if not controlled by pumping. In the vicinity of the CRA, groundwater levels would increase by 3 to 6 feet (*see* Section 12.8). Seepage monitoring and pump-back recovery is planned to prevent this potential for hydrocompaction.

A seepage recovery well array was designed to capture the average seepage volume from the Lower Reservoir. The design consists of six wells, each pumping 92 gpm, resulting in capture of seepage from the Lower Reservoir, with groundwater elevations only being reduced beneath the CRA by about 3 feet. Although the seeped water could be allowed to flow unimpeded to offset drawdown related to water supply pumping, this does not allow for unanticipated conditions. Therefore, seepage recovery wells will be installed. Once the reservoirs are at full capacity and the actual operating conditions are observed, groundwater management actions may be altered (i.e., reduced pump back recovery) to further minimize groundwater level changes beneath the CRA.

Seepage from the Upper Reservoir will be along joints, fractures, and faults that cross beneath the reservoir. This seepage may cause water levels to rise and be transmitted into the alluvial aquifer of the upper Chuckwalla Valley. Seven seepage control wells will be needed to control the seepage losses, assuming they will each pump about 70 gpm. Additional seepage recovery wells will be constructed along the axis of the Eagle Creek Canyon to provide secondary control and to prevent groundwater levels from rising beneath this area of the proposed landfill.

3.3.3.3.9 *Potential Impacts to Groundwater Quality*

Limited groundwater quality analyses have been performed in the Chuckwalla Valley. Samples were collected in 1960 at various locations throughout the Chuckwalla Valley. Samples were also collected in 1994 during pilot testing of groundwater wells for use by the Project. These wells are the same or in close proximity to the previously sampled wells so a comparison of historic to present water quality can be made. Table 3.3-4 presents these analyses.

The water quality analyses show conflicting patterns. Wells 4S/16E-32M and -30D1 show there has been very little change even though the groundwater basin experienced overdraft during 1981 through 1991. However, wells 5S/16E-7P1 and -7M2 show TDS increased by about 160 mg/L. The increase appears to be related to irrigation return water. Nitrate concentrations increased by about 2 mg/L over the same time, presumably due to the use of fertilizers and other aquaculture practices, and to a lesser degree, the use of septic systems in the areas.

Although pumping for the Project and by existing wells will cause temporary overdraft, groundwater levels for the most part will be within the range of drawdown that has occurred in the past when little to no change in water quality occurred. For that reason, projected pumping is not expected to adversely affect the water quality in the groundwater basin.

The bedrock, and to a limited extent the tailing piles, contain metal ore that could be mobilized by water seepage from the reservoirs. Water in contact with the bedrock could migrate into sediments of the Chuckwalla Valley Groundwater Basin and could affect water quality. The geochemical analysis indicates that metals present in the underlying rock are not likely to produce acid leachate, however, it is possible that metals in seepage water could be transported into the groundwater basin.

Seepage from the reservoirs is estimated to be 1,800 AFY. Unchecked, this seepage water would mix with down-gradient groundwater. Seepage will be recovered and returned to the reservoirs unless long term monitoring demonstrates that no adverse effects of contaminant transport are occurring. Thereafter, seepage may be managed to offset water supply pumping drawdown effects.

Salt and metal laden water could seep through the brine disposal ponds and degrade the groundwater quality in the basin. As required by State law, the brine ponds will be double-lined to prevent seepage and a detection groundwater monitoring network will be constructed to confirm that seepage is not occurring.

Based upon data from existing wells in the Chuckwalla Basin, the water table is measured to be approximately 110 to more than 150 feet below ground surface. At this depth, the underlying aquifer does not support any vegetation on the overlying desert floor. For this reason, it is concluded that water table drawdown from groundwater pumping does not have any potential to alter or deplete water that is a source for any overlying plant root zones.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project violate any water quality standards or waste discharge requirements?* No. Seepage water would migrate into the Chuckwalla Valley Groundwater Basin and could affect water quality. This impact is potentially significant and subject to mitigation (PDF GW-1 and PDF GW-2). Metals in the bedrock are not likely to be mobilized or produce acid leachate, but it is possible that metals could be transported into the groundwater basin.

(b) *Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells* *would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?* Pumping in the basin will exceed recharge for approximately 4 years of the 50-year Project life. During the remaining years, recharge will exceed pumping. By 2065, at the end of the 50-year FERC Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet. This potential impact for the basin is therefore considered to be *less than significant.* Potential local effects on nearby wells are addressed in (c) below. (However, *see* the analysis of cumulative effects in Section 5. In combination with pumping for all reasonably foreseeable projects, basin overdraft of about 9 feet is likely to occur over the life of the Project, in which case, this Project would contribute to a *significant adverse cumulative effect*.)

(c) *Would the project cause local groundwater level reductions that affect local residents and businesses dependent upon overlying wells?* During the initial fill time period, groundwater use would exceed recharge, so groundwater levels will decrease during this period. This impact is considered potentially significant and subject to mitigation. Mitigation measures MM GW-1 through MM GW-7 are identified to reduce or offset this potential impact. Over the life of the Project, for existing and Project pumping only, groundwater levels will increase by about 5 feet over the Basin as a whole, which does not cause any net depletion of regional groundwater supplies. (However, *see* the analysis of cumulative effects in Section 5. In combination with pumping for all reasonably foreseeable projects, Basin overdraft of about 9 feet is likely to occur over the life of the Project, in which case, this Project would contribute to a *significant adverse cumulative effect*.)

(d) *Would the project cause water table drawdown that depletes water in plant root zones on overlying lands?* Groundwater level reductions will have no impact on plant root zones, as the groundwater level from which Project pumping would occur is currently more than 110 feet below the root zone of plants.

Impact 3.3-1 Perennial Yield and Regional Groundwater Level Effects. Pumping will exceed recharge for approximately 4 years of the 50-year Project life. During the remaining years, recharge will exceed pumping. By 2065, at the end of the 50-year FERC Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet. This will not result in depletion of groundwater supplies. Therefore, this potential impact is *less than significant*. (However, *see* the analysis of cumulative effects in Section 5. In combination with pumping for all reasonably foreseeable projects, basin overdraft of about 9 feet is likely to occur over the life of the Project, in which case, this Project would contribute to a *significant adverse cumulative effect*.)

Impact 3.3-2 Local Groundwater Level Effects. Although not significant Basin-wide, the modeling predicts initial Project water supply pumping will cause drawdown of the groundwater levels in the vicinity of the Project's wells. During the initial fill about 50 feet of drawdown will be created at the cone of depression of the pumping wells for about 4 years, but thereafter the drawdown will be reduced to about 14 feet. At distances of 1 mile from the pumping wells the drawdown will be about 6 feet. The greatest drawdown will occur after the first 4 years of pumping. The drawdown created by just Project pumping will be approximately 3.6 to 4.3 feet near the CRA in the upper Chuckwalla and Orocopia valleys. Project pumping by itself would not exceed the maximum historic drawdown, and this impact is not considered a substantial depletion of the local groundwater level. Local drawdown effects do have the potential to interfere with pumping costs and yields from nearby neighboring wells. This impact is considered *potentially significant and subject to mitigation* (MM GW-1 and MM GW-2).

Impact 3.3-3 Groundwater Flow Direction Effects. The short- and long-term pumping effects will not significantly change groundwater flow directions. The groundwater flow is generally from the west and north and flows towards the south and east (DWR, 1979). The modeling and groundwater levels show existing pumping near Desert Center has created a localized pumping depression. The Project pumping will temporarily deepen the pumping depression during the initial fill in the first 4 years of pumping, and thereafter will create about 14 feet of cone of depression drawdown at the pumping wells. Due to the size of the basin (more than 45 miles across), the total volume of water in storage (9.1 to 15 million acre-feet), and the volume of water to be pumped in the first 4 years (approximately 32,000 acre-feet), it is concluded that Project pumping does not have potential to substantially alter flow throughout the basin, and this potential impact is considered to be *less than significant*.

Impact 3.3-4 Subsidence and Hydrocompaction Potential. It is unlikely that lowering of water levels below their historic lows by up to additional 5 feet at the CRA will cause subsidence. Although unlikely, the impact is deemed *potentially significant and subject to mitigation (*MM GW-3, MM GW-4, and MM GW-5). Because of the small amount of drawdown and the coarse-grained sediments in the Pinto Basin, the potential for subsidence in the Pinto Basin is low to non-existent as a result of Project water supply pumping. The potential for drawdown under the cumulative effects scenario (including Kaiser's water use for the proposed landfill, water use for the proposed solar projects, and water use for the prisons), is larger than the drawdown for the Project pumping alone (estimated total of 9 feet). Subsidence potential remains low under this scenario.

With regard to hydrocompaction, direct contact of seepage water with the CRA is unlikely because groundwater levels are about 135 feet below ground surface at the CRA. Therefore, no direct impact to MWD's infrastructure is anticipated. The results of MODFLOW modeling for the lower reservoir area indicate that groundwater levels beneath the reservoir would rise by about 4 to 12 feet if not controlled by pumping. In the vicinity of the CRA groundwater levels could increase by 3 to 6 feet if not controlled by pumping to minimize seepage losses. This impact is considered *potentially significant and subject to mitigation* (MM GW-3, MM GW-4, and MM GW-5).

Impact 3.3-5 Groundwater Quality. Seepage water could migrate into the Chuckwalla Valley Groundwater Basin and could affect water quality in the aquifer. This impact *is potentially significant and subject to mitigation* (MM GW-6, PDF GW-1 and PDF GW-2). Metals in the bedrock are not likely to be mobilized or produce acid leachate, but it is possible that contaminants could be transported into the groundwater basin.

Without water quality treatment, the water in the reservoirs would change over time due to evaporation, resulting in increasing levels of TDS. In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using Reverse Osmosis (RO) is proposed as a part of the Project. This consists primarily of an RO desalination facility and brine disposal ponds to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to the source water quality (PDF GW-2).

In addition, a groundwater quality monitoring program will be implemented to collect the data necessary to assess and maintain groundwater effects at less than significant levels. Water quality sampling will be done within the reservoirs, production wells, and in wells up gradient and down gradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27 (MM GW-6). Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results.

Compliance with State Title 27 requirements will prevent salt and metal-laden water from seeping through the brine disposal ponds, preventing degradation of groundwater quality from this source.

Impact 3.3-6 Colorado River Effects. The Colorado River "accounting surface" policy contemplated by the United States Bureau of Reclamation would apply to groundwater in the Chuckwalla Valley below between 238 and 240 feet msl. The Project will have *no impact* on the Colorado River or this potential future policy because groundwater levels in the area are around 500 feet msl, and will not deplete groundwater levels in a manner that could encounter the accounting surface elevations.

Impact 3.3-7 Loss of Existing Wells. This impact is *considered potentially significant and subject to mitigation* (MM GW-7). Existing wells within the central and eastern mining pits would be destroyed by development of the Project reservoirs.

3.3.4   Mitigation Program

The mitigation program includes Project design features (PDFs) and mitigation measures (MMs). Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards built have been into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of California Environmental Quality Act review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

This section lists mitigation for lower groundwater level, higher groundwater level, groundwater quality, and loss of (well) facilities.

3.3.4.1 Mitigation Pertaining to Potential Impacts of Changed Groundwater Levels

Groundwater levels near the Project's water supply wells will decline during the Project pumping. Local decline of groundwater levels within the cone of depression could affect nearby wells. Project wells have been intentionally sited so that they are approximately 1 mile or more from each other to prevent overlapping cones of depression and increasing this potential impact.

MM GW-1. **Groundwater Level Monitoring.** A groundwater level monitoring network will be developed to confirm that Project pumping is maintained at levels that are in the range of historic pumping. The monitoring network will consist of both existing and new monitoring wells to assess changes in groundwater levels beneath the CRA, as well as in the Pinto Basin, and in areas east of the water supply wells. Table 3.3-10 lists the proposed monitoring network and Figure 3.3-17 shows their proposed locations. In addition to the proposed monitoring wells, groundwater levels, water quality, and production will be recorded at the Project pumping wells.

If monitoring indicates that groundwater is being draw down at greater levels and faster rates than expected (exceeding the "Maximum Allowable Changes" identified in Table 3.3-9), pumping rates for the initial fill will be reduced to a level that meets the levels specified in Table 3.3-9. The initial fill period would therefore be extended to a maximum of 4.5 to 6 years.

Implementation Timing: Final Design, construction and life of the Project

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

Table 3.3-9. Mitigation Monitoring Network and Maximum Allowable Changes

Existing Monitoring Wells	New Monitoring Wells Well	Maximum Allowable Drawdown (feet)	Minimum Allowable Elevation (feet)
3S/15E-4J1 (OW18)		10	906
C-9		11	
	MW-109 (near OW03)	14	
	MW-110 (near OW13)	12	
	MW-112 (near OW15)	9	
	MW-111 (CRA in Palen Valley) [2]	Unknown	
5S/6E-25F1 (OW17) [2]		13	

Existing Water Supply Well	New Water Supply Well	Maximum Allowable Drawdown (feet)	Maximum Allowable Elevation (feet)
	WS-1	51	382
	WS-2	51	382
	WS-3	51	382

Existing Extensometers	New Extensometers	Maximum Subsidence (feet)	Maximum Allowable Elevation (feet)
	E-1	0.125	
	E-2	0.125	

Notes:
[1] Maximum allowable drawdown may be revised upon completion of project aquifer testing
[2] Boring shall be drilled to bedrock or first water. If saturated alluvium is encounter construct a monitoring well.
[3] Drawdown could be greater depending upon the confinement of the aquifers in the eastern portion of the valley and pumping by solar facilities

MM GW-2. **Well Monitoring.** Wells on neighboring properties whose water production may be impaired by Project groundwater pumping will be monitored during the initial fill pumping period. If it is determined that Project pumping is lower water levels in those wells by 5 feet or more, the Project will either replace or lower the pumps, deepen the existing well, construct a new well, and/or compensate the well owner for increased pumping costs to maintain water supply to those neighboring properties.

Implementation Timing: Pre-construction and initial fill pumping period

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

3.3.4.2 Mitigation Pertaining to Seepage, Hydrocompaction and Subsidence

PDF GW-1. **Groundwater Seepage.** The Owner will limit seepage from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the brine disposal ponds that will be part of the water quality management system for the Project. Final design for seepage control will be approved by FERC prior to construction. Seepage control from the Project reservoirs will be accomplished using systematic procedures such as design and construction control measures that will include the following:

- During final engineering design, a detailed reconnaissance of the reservoir basins and pond areas will be conducted to identify zones where leakage and seepage would be expected to occur. These areas will include faults, fissures and cracks in the bedrock, and zones that may have direct connection to the alluvial deposits of the Chuckwalla Valley. During the reconnaissance, the effectiveness of various methods for seepage and leakage control to mitigate the effects of these particular features will be evaluated, including grouting, seepage blankets, and RCC or soil cement treatments, and other methods if needed.
- Potential methods for seepage and leakage control will include curtain grouting of the foundation beneath the dam footprint and around the reservoir rim, as needed; backfill concrete placement and/or slush grouting of faults, fissures, and cracks detected in the field reconnaissance; placement of low permeability materials over zones too large to be grouted and over areas of alluvium within the lower reservoir; seepage and leakage collection systems positioned based upon the results of the hydrogeologic analyses; and clay or membrane lining of the brine ponds associated with the Project's

water quality management system. The collection systems would recycle water into the Project reservoirs or the reverse osmosis system.

- Design and construction of the seepage and leakage control measures.
- Design and construction of a Comprehensive Monitoring Program, consisting of observation wells and piezometers that will be used to assess the effectiveness of the seepage and leakage control measures.
- Based on monitoring results, additional actions may be taken to further control leakage and seepage from the reservoirs and ponds. Such measures may include curtain grouting and the expansion of seepage and leakage collection systems.
- Other measures, such as use of stepped RCC or soil cement overlay on the eastern portion of the lower reservoir may also be used depending on results of final engineering design analyses.
- Portions of the tunnels and shaft of the Project will experience very high water pressures. Current plans are based on lining of the tunnels with concrete, and in some locations steel liners will be installed. This was assumed primarily for hydraulic efficiency reasons. However, these liners will also effectively block seepage from occurring.

MM GW-3. **Extensionmeters.** Two extensiometers shall be constructed to measure potential inelastic subsidence that could affect operation of the CRA; one in the upper Chuckwalla Valley near OW-3 and the other in the Orocopia Valley near OW15. Figures 3.3-17 and 18 shows the locations of the extensometers.

In the unlikely event that the data shows inelastic subsidence is occurring due to Project groundwater pumping the Project will eliminate inelastic subsidence by:

- Redistributing pumping by constructing additional wells and modifying the pumping rates to reduce drawdown.
- Reducing pumping or by artificially increasing recharge in order to better match the net annual groundwater withdrawal to the net annual recharge.

If structures are impacted, they will be mitigated through engineered solutions that may consist of re-leveling, placement of compacted fill, soil-cement, pressure grouting, installation of piles and grade-beams, or steel-reinforcement. As necessary, portions or all of the impacted structure will be repaired or replaced in consultation with MWD.

Implementation Timing: Pre-construction and life of the Project

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM GW-4. **Seepage Recovery Wells.** Seepage from the <u>Lower Reservoir</u> will be extracted through seepage recovery wells. The proposed recovery well locations are shown on Figure 3.3-18. Seepage from the Lower Reservoir will be maintained to prevent a significant rise in water levels beneath the CRA. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. Aquifer tests will be performed during final engineering design to confirm the seepage recovery well pumping rates and aquifer characteristics. The tests will be performed by constructing one of the seepage recovery wells and pumping the well while observing the drawdown in at least two seepage recovery or monitoring wells. Upon completion of this testing, the model will be re-run and the optimal locations of the remainder of the seepage recovery wells will be determined to effectively capture water from the Lower Reservoir and maintain groundwater level changes at less than significant levels beneath the CRA. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties.

If needed based upon monitoring results, and acceptable based upon water quality monitoring results, as an adaptive management measure Project pumping drawdown can be mitigated by allowing seepage from the reservoirs to occur without pump-back recovery. If seepage from the reservoirs is unimpeded, groundwater levels could rise beneath the CRA by up to 3 feet.

Implementation Timing: Final engineering and life of Project. Monitoring on a quarterly basis for the first 4 years of Project pumping. As a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary.

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM GW-5. **Seepage Recovery Wells.** Seepage from the <u>Upper Reservoir</u> will be controlled through a separate set of seepage recovery wells, locations of which are shown on Figure 3.3-18. Seepage from the upper reservoir will be maintained below the bottom elevation of the landfill liner. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. A testing program will also be employed for seepage recovery wells for the Upper Reservoir to assess the interconnectedness of the joints and fractures and the pumping extraction rate. Drawdown observations will be made in nearby observation wells to support final engineering design. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties.

Implementation Timing: Final engineering and life of Project; monitoring on a quarterly basis for the first 4 years of Project pumping; as a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary.

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

Table 3.3-10. Proposed Mitigation Well Network and Maximum Allowable Changes from Seepage Recovery Pumping[1]

Existing Monitoring Wells or Piezometer

Well No./Name	Aquifer Material	Monitoring Purpose	Total Borehole Depth (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	Screen Interval (feet bgs)		Maximum Allowable Drawdown (feet)	Maximum Allowable Water Elevation (feet msl)
						Top	Bottom		
Existing Monitoring Wells to be Replaced									
P-1R	Alluvium	Lower Reservoir Pumping Contol	550	10	4	490	540	6	
MW-4R	Bedrock	Background Lower Reservoir	774	10	4	704	764		
MW-5R	Alluvium	Lower Reservoir Pumping Contol	418	10	4	348	408	6	
MW-10R	Bedrock	Background Upper Reservoir	1,672	10	4	1,558	1,662		1,464
New Monitoring Wells to be Constructed									
MW-101A	Alluvium	Brine Pond Downgradient	110	10	4	60	100	dry	
MW-101B	Bedrock	Brine Pond Downgradient	599	10	4	549	589		
MW-102A	Alluvium	Brine Pond Downgradient	110	10	4	60	100	dry	
MW-102B	Bedrock	Brine Pond Downgradient	658	10	4	608	648		
MW-103A	Alluvium	Brine Pond Downgradient	200	10	4	150	190	dry	
MW-103B	Bedrock	Brine Pond Downgradient	658	10	4	608	648		
MW-104	Alluvium	Lower Reservoir Pumping Contol	575	10	4	525	565	6	
MW-105	Alluvium	Lower Reservoir Seepage	552	10	4	502	542	4	
MW-106	Alluvium	Lower Reservoir Seepage	383	10	4	333	373	4	
MW-107	Alluvium	Lower Reservoir Seepage	353	10	4	303	343	4	
MW-108	Alluvium	CRA	318	10	4	268	308	2	
MW-109	Alluvium	CRA	497	10	4	447	487	3	

Seepage Recovery Wells to be Constructed

Well No./Name	Aquifer Material	Purpose	Total Borehole Depth (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	Screen Interval (feet bgs)		Maximum Allowable Drawdown (feet)	Maximum Allowable Water Elevation (feet msl)
						Top	Bottom		
SRW-01	Bedrock	Upper Reservoir Seepage Recovery	1,477	10	6	1,353	1,467		2,540
SRW-02	Bedrock	Upper Reservoir Seepage Recovery	1,421	10	6	1,297	1,411		586
SRW-03	Bedrock	Upper Reservoir Seepage Recovery	1,359	10	6	1,235	1,349		586
SRW-04	Bedrock	Upper Reservoir Seepage Recovery	1,297	10	6	1,173	1,287		586
SRW-05	Bedrock	Upper Reservoir Seepage Recovery	1,522	10	6	1,398	1,512		586
SRW-06	Bedrock	Upper Reservoir Seepage Recovery	696	10	6	614	686		940
SRW-07	Bedrock	Upper Reservoir Seepage Recovery	1,043	10	6	969	1,033		2,060
SRW-08	Alluvium	Lower Reservoir Seepage Recovery	650	18	12	493	640	7	
SRW-09	Alluvium	Lower Reservoir Seepage Recovery	495	18	12	328	485	7	
SRW-10	Alluvium	Lower Reservoir Seepage Recovery	645	18	12	463	635	7	1,560
SRW-11	Alluvium	Lower Reservoir Seepage Recovery	575	18	12	385	565	7	
SRW-12	Alluvium	Lower Reservoir Seepage Recovery	640	18	12	453	630	7	
SRW-13	Alluvium	Lower Reservoir Seepage Recovery	695	18	12	513	685	7	

Footnote: [1] Drawdown projections soley due to Seepage Recovery Pumping

3.3.4.3 Mitigation Pertaining to Groundwater Quality

Without treatment, water quality of the water in the reservoirs would change over time due to evaporation, resulting in increasing concentrations of TDS. In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using RO for TDS removal is proposed as a project design feature (PDF GW-2 below).

Specific mitigation measures and project design features include:

PDF GW-2. **Water Treatment Facility.** In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels.

Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. In addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well, preventing eutrophication from occurring.

MM GW-6. **Water Quality Sampling.** Water quality sampling will be done at the source wells, and within the reservoirs, and in monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Figure 3.3-18 shows the locations of these wells. Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and other potential contaminants as needed to maintain groundwater quality under the direction of the State Board and FERC.

Implementation Timing: Final engineering

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agency for verification and enforcement: SWRCB and FERC

3.3.4.4 Loss of Existing Wells Mitigation

MM GW-7. **Replacement Wells.** Existing wells located within the central and eastern mining pits to be developed as Project reservoirs will be replaced at locations outside of the reservoirs as shown on Figure 3.3-18. Table 3.3-10 lists those wells scheduled for replacement.

Implementation Timing: Final engineering

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

3.3.5 Level of Significance after Implementation of Mitigation Program

Impact 3.3-1 Perennial Yield and Regional Groundwater Level Effects. As noted above, on an individual project-basis, this potential impact is *less than significant, and no mitigation is required*. As discussed in Section 5, over its 50-year Project life, this Project would contribute to a *significant adverse cumulative effect* in combination with pumping for all other currently proposed projects in the Chuckwalla Basin.

Impact 3.3-2 Local Groundwater Level Effects. With full implementation of the mitigation measures identified (MM GW-1 and MM GW-2), *potentially significant adverse effects on local groundwater levels will be reduced to a level that is less than significant*.

Impact 3.3-3 Groundwater Flow Direction Effects. As noted above, on an individual project-basis, this potential impact is *less than significant, and no mitigation is required*.

Impact 3.3-4 Subsidence and Hydrocompaction Potential. With full implementation of the mitigation measures identified (MM GW-3, MM GW-4, and MM GW-5), *potentially significant adverse effects of subsidence and hydrocompaction will be reduced to a level that is less than significant*.

Impact 3.3-5 Groundwater Quality. With full implementation of the mitigation measures identified (MM GW-6, PDF GW-1 and PDF GW-2) *potentially significant adverse effects on groundwater quality will be reduced to a level that is less than significant.*

Impact 3.3-6 Colorado River Effects. The Project will have *no impact* on the Colorado River or the potential future “accounting surface” policy because groundwater levels will not be depleted that could possibly encounter the accounting surface elevations.

Impact 3.3-7 Existing Wells. With adherence to MM GW-7, potential impacts to the existing wells (as noted on Figure 3.3-18) would be *less than significant*.

3.4 Agricultural and Forestry Resources

This section of the Draft Environmental Impact Report evaluates the consistency of the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) with the applicable plans and policies that govern agricultural land use and forestry in and around the Project area. This section discusses and evaluates agricultural and forestry resources in the Project area.

3.4.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of agricultural and forestry resources. The Proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

3.4.1.1 State

Williamson Act of California (California Land Conservation Act of 1965) is a law that provides relief of property tax to owners of farmland and open-space land in exchange for a 10-year agreement that the land will not be developed or otherwise converted to another use. The intent of the Williamson Act is to promote voluntary land conservation, particularly farmland conservation. The proposed Project would not convert farmland to a non-agricultural land.

3.4.1.2 Local

Riverside County General Plan – Eastern Riverside County Land Use Plan. Local government jurisdiction of non-federal lands includes Riverside County, which has plans and controls land uses within their jurisdictional boundaries through the development of land use planning and zoning ordinances. The Project study area lies within Riverside County's Desert Center Land Use Planning Area. The vast majority of the planning area is classified as Rural Open Space and zoned as Natural Assets.

Within the Desert Center Land Use Planning Area, Riverside County has established two specific Policy Areas. Policy Areas are specific geographic districts that contain unique characteristics that merit detailed attention and focused policies. The Eagle Mountain Policy Area encompasses the Project site, proposed landfill, and the Eagle Mountain townsite. Outside this specific policy area boundary, "Rural Open Space" dominates Riverside County land use designation, with the exception of an area of "Rural Open Space-Mineral Resources" to the north/northwest of the central Project site.

3.4.1.3 Private Lands

The Desert Center Policy Area encompasses currently undeveloped land located adjacent to and north of the small, unincorporated community of Desert Center. The terminus of the proposed transmission line and substation are included within this Policy Area.

Private lands in the study area consist of a few residential/undeveloped parcels, some commercial area near Desert Center, scattered agricultural areas, and property owned by the

Metropolitan Water District of Southern California (MWD) and Kaiser Eagle Mountain, LLC (Kaiser). The transmission line and water pipeline routes will cross some of these private land holdings.

3.4.2 Existing Conditions

Several small agricultural areas used for irrigated cropland are located southeast of the Central Project site (Figures 3.4-1). While the area is not mapped as Important Farmland by the State Department of Conservation or considered to be an important agricultural area as described in the Riverside County General Plan, approximately 994 acres within three areas are under California Land Conservation (Williamson) Act Contracts (Figure 3.4-2). Williamson Act contracts basically enable local governments to provide tax incentives to landowners in turn for protection of agricultural land. Currently, agriculture on the indicated Williamson Act lands is inactive and appears to be abandoned.

Irrigated crops grown in the area initially included jojoba, a seed crop, and asparagus. Approximately 5,000 acres of jojoba were grown in 1992 (Riverside County Agricultural Commissioner, 1992). However, due to difficulty in harvesting the seed crop, this acreage has been decreasing. An evaluation of agricultural land use inventoried in 2005 (field verified by Eagle Crest Energy Co. in 2007) verifies this decrease in agricultural production. Agricultural lands, which are currently inactive and/or abandoned cropland, total approximately 5,200 acres. A small number of crop types that are currently in production in the area including jojoba, asparagus, citrus, dates, and palms. Based on a field verification of aerial photo information, it is concluded that currently active cropland in the Project vicinity is approximately 1,200 acres.

3.4.3 Potential Environmental Impacts

3.4.3.1 Methodology

The methodology used for impact analysis involved a comparison and assessment of the proposed Project to relevant land use objectives and policies, surrounding land uses, and site features including agricultural resources. The analysis was conducted through a combination of document review, field visits and communication with resource agency staff.

3.4.3.2 Thresholds of Significance

The State Water Resources Control Board (SWRCB) concludes that the Project may have significant impacts on agricultural of forestry resources if it does any of the following:

(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agriculture use

(b) Conflict with existing zoning for agriculture use or a Williamson Act contract

(c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104(g))

(d) Result in the loss of forest land or conversion of forest land to non-forest use and/or

(e) Involve other changes in the existing environment which due to their location or nature could result in conversation of Farmland to non-agriculture use or conversion of forest land to non-forest land

3.4.3.3 Environmental Impact Assessment

The Project would not convert prime farmland, conflict with existing county zoning for agricultural use or a Williamson Act contract, or result in the conversion of farmland to a non-agricultural use.

The Project does not conflict with zoning for, or cause rezoning of forest land, timberland or timberland zoned Timberland Production. The Project does not result in the loss of forest land or conversion of forest land to non-forest use.

The proposed water pipeline will cross undeveloped desert and some previously farmed lands. In spring 2009, inventories indicate that farmed lands are not presently in active use for agriculture (Figure 3.4-2). The open-cut, sidecast construction method proposed for the pipeline would cause temporary impacts to any active cropland. After pipeline installation and settling of restored surface soils, farming activity can be resumed over the pipeline. Pipeline construction will follow best management practices identified in the Erosion Control Plan Section 12.2. Construction-related impacts to farmed lands have been avoided through placement of the route adjacent to the road and transmission line ROWs.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agriculture use?* No. There is no active farmland within the Project boundary.

(b) *Would the Project conflict with existing zoning for agriculture use or a Williamson Act contract?* No. There are no conflicts with existing zoning for agriculture of Williamson Act contracts.

(c) *Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?* No. There are no forested lands in the Project area.

(d) *Would the Project result in the loss of forest land or conversion of forest land to non-forest use?* No. There are no forested lands in the Project area.

(e) *Would the Project involve other changes in the existing environment which due to their location or nature could result in conversion of Farmland to non-agriculture use or conversion of forest land to non-forest land?* No. There are no active farmlands or forested lands in the Project boundary.

Impact 3.4-1. Impacts to Agricultural Lands or Forestry Lands. None of the facilities or structures of the Project are anticipated to have a significant adverse effect on existing agricultural lands or forest; therefore this impact is *less than significant.* No currently active farmland or forest is proposed to be crossed by the water pipeline or transmission line corridor. The Central Project Area is within mining pit and therefore does not have the ability to impact active farmland or forestry resources.

3.3.4 Mitigation Program

No mitigation is required for impacts to agricultural or forestry resources.

3.4.5 Level of Significance after Mitigation Program

No mitigation is required for impacts to agricultural or forestry resources.

No residual impacts to agricultural or forestry resources would occur with Project implementation.

3.5 Biological Resources

This section of the Draft Environmental Impact Report addresses potential impacts of the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) on biological resources. Biological resources include plant communities, wildlife communities, fishery resources, and sensitive species and sensitive habitats. Information provided in this section has been based on field reconnaissance, resource agency consultation (as noted), and from other reports and information available in the literature (as referenced throughout this document). Where applicable, a mitigation program intended to avoid or reduce potentially significant adverse environmental impacts is identified.

Please note: The treatment of biological resources is broken down into Section 3.5 Biological Resources and Section 3.6 Threatened and Endangered Species.

3.5.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of biological resources. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the Bureau of Land Management (BLM) and therefore subject to the biological LORS of the agency.

3.5.1.1 Federal

The **Federal Endangered Species Act of 1973** (FESA) prohibits acts of disturbance that result in the “take” of threatened or endangered species. As defined by the FESA, “endangered” refers to any species that is in danger of extinction throughout all or a significant portion of its current range. The term “threatened” is applied to any species likely to become endangered within the foreseeable future throughout all or a significant portion of its current range. Take is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” Violation of this section can result in penalties of up to $50,000 and up to 1 year of imprisonment. Sections 7 and 10 of the FESA provide a method for permitting an action that may result in "incidental take" of a federally listed species. Incidental take refers to take of a listed species that is incidental to, but not the primary purpose of, an otherwise lawful activity.

Incidental take is permitted under FESA Section 7 for projects on Federal land or involving a Federal action, while FESA Section 10 provides a method for permitting incidental take resulting from State or private action.

The Eagle Act, Title 50, Code of Federal Regulations (*Section 22.26*) authorizes the limited take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Eagle Act, where the taking is associated with, but not the purpose of activity, and cannot practicably be avoided.

> *(Section 22.27)* provides for the intentional take of eagle nests where necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure or; the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests would be allowed to be taken except in the case of safety emergencies.

Bald and Golden Eagle Protection Act (Title 16, United States Code Section 668) provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.

California Desert Conservation Area (CDCA) comprises one of two national conservation areas established by Congress at the time of the passage of the Federal Land and Policy Management Act (FLPMA). The FLPMA outlines how the BLM will manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.

Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan is the regional amendment to the CDCA Plan approved in 2002. NECO protects and conserves natural resources while simultaneously balancing human uses in the northern and eastern portion of the Colorado Desert.

Migratory Bird Treaty Act (MBTA) (Title 16, United States Code, Sections 703 through 711) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 California Federal Regulations (CFR) Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Most of the birds found in the study area are protected under the MBTA.

Executive Order 11312 Prevention and Control of Invasive Species (1999) directs all Federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of Federal agencies and departments and a supporting Invasive Species Advisory Committee composed of State, local, and private entities. The Invasive Species Council and Advisory

Committee oversees and facilitates implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

Desert Tortoise (Mojave Population) Recovery Plan (USFWS 1994a) and Draft Revised Recovery Plan (USFWS 2008a) describe a strategy for recovery and delisting of the desert tortoise.

Federal Noxious and Invasive Weed Laws. A number of Federal laws pertain to noxious and invasive weeds, including the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 as amended (16 U.S.C. 4701 et seq.), Lacey Act as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal Noxious Weed Act of 1974 as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (Section 1453 "Management of Undesirable Plants on Federal Lands;" U.S.C. 2801 et seq.), the Carlson-Fogey Act of 1968 (Public Law 90-583), and Federal Executive Order 11312 released February 3, 1999. The BLM and other Federal, State, and local agencies are also concerned about weed infestation and dispersal on private and public lands. The BLM and U.S. Department of Agriculture maintain lists of pest plants of economic or ecological concern.

3.5.1.2 State

The California Endangered Species Act (CESA) of 1984 (California Department of Fish and Game [CDFG] Code, Sections 2050 through 2098) protects California's rare, threatened, and endangered species. The CDFG has the responsibility for maintaining a list of endangered and threatened species (CDFG Code 2070). CDFG also maintains a list of "candidate species," which are species that CDFG formally notices as being under review for addition to the list of endangered or threatened species. In addition, CDFG maintains lists of "species of special concern," which serve as species "watch lists." Pursuant to the requirements of CESA, an agency reviewing a proposed Project within its jurisdiction must determine whether any species that are state listed as endangered or threatened may be present in the Project study area and, if so, whether the proposed Project would have a potentially significant impact on any of these species. In addition, CDFG encourages informal consultation on any proposed project that may affect a species that is a candidate for state listing.

Project-related impacts to species listed as endangered or threatened under the CESA would be considered significant. State-listed species are fully protected under the mandates of the CESA. "Take" of protected species incidental to otherwise lawful management activities may be authorized under Section 2081 of the CDFG Code.

Protected furbearing mammals (California Code of Regulations [CCR], Title 14, Section 460) protects fisher, marten, river otter, desert kit fox and red fox that may not be taken at any time.

California Code of Regulations (Title 14, Sections 670.2 and 670.5) lists the plants and animals of California that are declared rare, threatened, or endangered.

Fully Protected Species (CDFG Code, Sections 3511, 4700, 5050, and 5515) designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (*see* CCR Title 14, Section 670.7).

Nest or Eggs (CDFG Code Section 3503) protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

Birds of Prey (CDFG Code Section 3503.5) makes it unlawful to take, possess, or destroy any birds in the orders *Falconiformes* and *Strigiformes* or to take, possess, or destroy the nest or eggs of any such bird.

Migratory Birds (CDFG Code Section 3513) protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame birds.

Nongame mammals (CDFG Code Section 4150) makes it unlawful to take or possess any non-game mammal or parts thereof except as provided in the CDFG Code or in accordance with regulations adopted by the commission.

Significant Natural Areas (CDFG Code Section 1930 and following) designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.

California Environmental Quality Act (CEQA) Guidelines §15380 defines rare species more broadly than the definitions for species listed under the State and Federal ESAs. Under Section 15830, species not protected through State or Federal listing but nonetheless demonstrable as endangered or rare under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFG's Special Animals List.

Streambed Alteration Agreement (CDFG Code Sections 1600 and following) regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.

Native Plant Protection Act (CDFG Code Sections 1900-1913) prohibits the taking, possessing, or sale within the State of any plants with a state designation of rare, threatened, or endangered, as defined by CDFG. Project impacts to these species are not considered significant unless the species are known to have a high potential to occur in the area of disturbance associated with construction of the Project.

California Desert Native Plants Act of 1981 (Food and Agricultural Code Section 80001 and following and CDFG Code Sections 1925-1926) protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.

Porter-Cologne Water Quality Control Act regulates discharges of waste and fill material to waters of the State, including isolated waters and wetlands.

3.5.1.3 Local

Riverside County General Plan provides protection and preservation of wildlife for the maintenance of the balance of nature.

Desert Renewable Energy Conservation Plan (Interim Planning). In addition to the Federal, State, and local LORS summarized above, Federal and State agencies are currently collaborating to establish joint policies and plans to expedite development of California's utility scale renewable energy projects. On October 12, 2009, the State of California and the United States Department of Interior (DOI) entered into a Memorandum of Understanding (MOU) on renewable energy, building on existing efforts by California and its Federal partners to facilitate renewable energy development in the State. The MOU stems from California and DOI energy policy directives, and California's legislative mandate to reduce greenhouse gases to 1990 levels by 2020, and meet the goal of 33 percent of California's electricity production from renewable energy sources by 2020.

3.5.2 Environmental Setting

3.5.2.1 Plant Communities

The Project lies in the California portion of the western Sonoran Desert, commonly called the "Colorado Desert." This includes the area between the Colorado River Basin and the Coast Ranges south of the Little San Bernardino Mountains and the Mojave Desert. Rainfall amounts are low, approximately 2.8 to 5.4 inches per year (Turner and Brown, 1982). This is a warmer, wetter desert than the Mojave Desert and while substantial rainfall may occur in the winter months, there is a strong summer component, with warm, monsoonal rains emanating from the Gulf of Mexico. Winter temperatures average approximately 54 degrees Fahrenheit (°F) (Turner and Brown, 1982). Ambient, summer temperatures are extreme, commonly reaching 110+ °F for long periods and averaging approximately 90 °F. This period of extremely warm weather is also lengthy, extending from mid-spring through the fall. As a consequence of these climatic conditions, the vegetation is highly drought-adapted, but contains subtropical elements. Where the summer rainfall is more reliable (extreme southeastern California), the arboreal community, largely consisting of microphyllous trees, is a primary component of the flora. But in general, species richness and density are relatively low due to the low rainfall and high temperatures, whether compared to more mesic environments or simply other regions of the Sonoran Desert.

The Project area can be described as rural. The population of the Eagle Mountain townsite was 1,890 at the time of the 1980 census, when the mine was still in operation. At that time the town had 914 dwelling units as wells as shopping, churches, and a school. A few years after the mine closed in 1983, a prison was opened in the town. That facility has since been closed. At this time, the school is still in use, and Kaiser has offices at the site. If the landfill is developed, the town is proposed to be redeveloped to house the landfill workers. Therefore, there is considerable past, present, and future human use of the project area.

The Project extends from the edge of the Eagle Mountains into the adjacent Chuckwalla Valley, via a gently sloping bajada (Figure 3.5-1). The presence of coarse particles in the substrate varies and is largely dependent on the proximity of the Project to mountains and attendant hydrologic forces. Hence, boulders and cobbles are common in the upper bajadas and toeslopes with smaller particles downslope. Desert pavement is intermittently present along the bajada. Soils generally range from soft sand to coarse-sandy loams. Elevations range from approximately 500 to 1,300 feet.

Drainage patterns reflect the local topography. Along the broad bajada traversed by the Project's linear facilities, drainage is primarily characterized both by scattered, well-defined washes and numerous narrow runnels (sheet flow). The former are several-yards-wide, sandy to cobbly drainages that carry periodic runoff to a regional drainage. They are often incised, from a half to several yards deep, and vegetated along the banks by both shrubs and trees. By contrast, the numerous, shallow runnels are typically only a yard or less wide, one-to-a-few inches deep, and irregularly vegetated by locally common shrub species. Where there is greater runoff into these runnels, arboreal elements commonly seen in the larger washes are also present, albeit in a stunted form. These small channels often fail to either flow or provide through-flow to larger drainages. Sheet flow is evident across those bajadas where overland flows result from a combination of heavy precipitation, low permeability surface conditions, and local topography; the substrates there tend to be more gravelly than non-sheeting habitats due to the hydrologic transport of materials. East of the Project in the Chuckwalla Valley percolation into the plain or nearby playa occurs where slopes are negligible.

Two basic native plant communities (after Holland, 1986) are encountered by Project components: Sonoran Creosote Bush Scrub (*see* CNPS Element Code 33100) and Desert Dry Wash Woodland (*see* CNPS Element Code 62200) (Figure 3.5-1). The variations of Sonoran Creosote Bush Scrub that occur in the Project vicinity are dominated by two species: creosote bush (*Larrea tridentata*) and burro bush (*Ambrosia dumosa*). However, common elements variously include brittlebush (*Encelia farinosa*), white rhatany (*Krameria grayi*), chollas (*Cylindropuntia echinocarpa*, *C. ramosissima*, and occasionally *C. bigelovii*), indigo bush (*Psorothamnus schottii*), and ocotillo (*Fouquieria splendens*). Desert Dry Wash Woodland in the Project area is characterized by broad plains of contiguous runnels (i.e., sheet flow) with ephemeral, well-defined washes. For the latter, the wash banks and islands are densely vegetated with aphyllous or microphyllous trees, primarily ironwood (*Olneya tesota*) and blue palo verde (*Cercidium floridum*), with occasional to common smoke tree (*Psorothamnus spinosus*) and catclaw (*Acacia greggii*). In the sheeting areas, the tree species typically found in arboreal drainages are, instead, aspect-dominant elements of the landscape and appear to be homogeneous across the landscape, forming a desert "woodland." Other common wash associates – cheesebush (*Ambrosia [=Hymenoclea] salsola*), galleta grass (*Pleuraphis rigida*), desert lavendar (*Hyptis emoryi*), desert peach (*Prunus fasciculatum*), chuparosa (*Justicia californica*), and jojoba (*Simmondsia chinensis*) grow in both the arboreal drainages as well as the less distinct runnels. (*See* Appendix B for a list of species observed in the Project area.)

The Central Project Area (i.e., the hydropower plant) is located in the edge of the Eagle Mountains and on the adjacent gently sloping bajada. The Biological Assessment (BA) (RECON, 1992) and EIS (County of Riverside and BLM, 1996) for the Eagle Mountain Landfill and Recycling Center identified Sonoran Creosote Bush Scrub in the Central Project Area, surrounding a substantial area heavily disturbed by prior iron ore mining activities and the related townsite. Based on inspection of current aerial photos, there do not appear to be any changes in the amount or quality of habitat in these disturbed areas since the 1992 BA was written. Based on Central Project Area configuration, no native habitats should be affected on the Central Project Area (Table 3.5-1).

The transmission line extends south from the Central Project Area along the bajada and over one very low mountain near the Metropolitan Water District (MWD) substation (Figure 3.5-1). The northern approximately 2.8 miles segment is on private property (Kaiser Ventures, Inc.). A request to access the property to conduct field surveys was denied. However, it is evident from aerial photos and surveys that were completed along the accessible portions of the transmission line right-of-way (ROW) that approximately one mile of the ROW is in developed land (i.e., disturbed by mining) and 5.3 miles is in Sonoran Creosote Bush Scrub. In the south, the ROW intersects 7.2 miles of Desert Dry Wash Woodland (Table 3.5-1).

The water pipeline runs southeast on the bajada from the Central Project Area, approximately 4.6 miles along the east edge of the Kaiser Road ROW (Figure 3.5-1). The vegetation community is a sheeting Sonoran Creosote Bush Scrub. The water line then travels parallel to an existing 161 kilovolt line ROW, initially through approximately 2 miles of native Sonoran Creosote Bush Scrub and then through abandoned jojoba (*Simmondsia chinensis*) fields to State Route (SR) 177. A dirt access road is present along this portion of the route between Kaiser Road and SR 177. At SR 177, the ROW splits, with one route travelling along SR 177 (paved), mostly through agriculturally developed parcels, but also through approximately 0.3 miles of native Sonoran Creosote Bush Scrub. The other ROW fork travels southeast along an existing dirt road, primarily through abandoned jojoba, but also through approximately 1.2 miles of Sonoran Creosote Bush Scrub. The combined acreage of native Sonoran Creosote Bush Scrub intersected by the water pipeline ROWs is 20.9 acres (Table 3.5-1).

Table 3.5-1. Acreage of native habitats and developed areas on the Eagle Mountain Pumped Storage Project[1,2,3]

Project Element	**Total Acreage (acres)**	**Sonoran Creosote Bush Scrub (acres)**	**Desert Dry Wash Woodland (acres)**	**Developed (acres)**
Central Project Area	1101.5	0	0	1101.5
Transmission Line ROW	328 (13.5 miles)	129 (5.3 miles)	175 (7.2 miles)	24 (1 mile)
Tower Footprint plus Construction Area	4.5 – 5.6 (54-68 towers)	1.7-2.1 (21-26 towers)	2.4-3.0 (29-36 towers)	0.3-0.4 (4-5 towers)
Access Road	32.7	12.7	17.3	2.4
Pulling/Tensioning Sites	Currently Unknown (intended to fall within the T-Line ROW and substation site)	Currently Unknown	Currently Unknown	Currently Unknown
Equipment Laydown Sites	Currently Unknown	Assume 0	Assume 0	Assume 100%
Proposed Interconnection Collector Substation	25	25	0	0
Water Pipeline	55.6 (15.3 miles)	20.9[4] (8.1miles)	0 (0 miles)	34.7[4] (7.2 miles)
TOTAL PROJECT ACREAGE	≥1219.8	≥60.3	≥19.7	≥1139

1. Acreage is calculated based on the following assumptions:
- Transmission Line
  - 13.5 mi long, 200-foot ROW
  - Approximately four towers per linear mile, with more in mountainous terrain (54 to 68 total)
  - Estimated access road width is 20 feet; towers will be immediately adjacent to the access road with no stub road. (Note: This assumption may change when specific towers are engineered.

In the 2 miles, small mountainous areas, stub roads are more likely to be present to accommodate both the access road and the necessary tower location.)
  - Total tower footprint (40 by 40 feet) plus construction area is 3600 ft^2 (60 by 60 feet)
  - Tensioning and pulling sites are unknown at this time, but are intended to be located within the transmission line ROW and substation site.
  - Equipment laydown areas will be on previously disturbed lands and/or overlapping with other Project acreage.
- Water Pipeline and Wells
  - 15.3 mi long, 30-foot ROW, with access road included in the ROW
  - Along Kaiser Road, half of the ROW is in the disturbed (bladed) road shoulder
  - Three groundwater wells; total estimated disturbance footprint for each is 2500 ft^2 (50 by 50 feet)

2. All calculations of acreage on the Central Project Area are based upon AutoCAD mapping.
3. Acreage based on acres of land disturbed, rather than total acreage within the Project boundary
4. Part of the mileage was adjacent to Kaiser Road, where only half the width of the ROW was in native habitat. The other half was in the road shoulder.

3.5.2.2 Wildlife

Common wildlife species in this region are adapted to arid conditions and/or are migratory. In the habitats intersecting the Project, taxa include ungulates (hoofed animals), small and midsized mammals, birds, reptiles, and invertebrates. Common species include black-tailed hare (*Lepus californicus*), desert kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), antelope ground squirrel (*Ammospermophilus leucurus*), Merriam's kangaroo rat (*Dipodomys merriami*), desert woodrat (*Neotoma lepida*), California leaf-nosed bat (*Macrotus californicus*), pallid bat (*Antrozous pallidus*), western pipistrelle (*Pipistrellus hesperus*), California myotis (*Myotis californicus*), black-throated sparrow (*Amphispiza bilenata*), California horned lark (*Eremophila alpestris actia*), ash-throated flycatcher (*Myiarchus cinerascens*), mourning dove (*Zenaida macroura*), cactus wren (*Campylorhynchus brunneicapillus*), lesser nighthawk (*Chordeiles acutipennis*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*). Common species specifically associated with drainages include desert mule deer (*Odocoileus hemionus*), verdin (*Auriparus flaviceps*), black-tailed gnatcatcher (*Polioptila melanura*), and phainopepla (*Phainopepla nitens*).

Side-blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis*), zebra tailed lizard (*Callisaurus draconoides*), western whiptail (*Cnemidophorus tigris*), desert horned lizard (*Phrynosoma platyrhinos*), gopher snake (*Pituophis melanoleucus*), and coachwhip (*Masticophis flagellum*) are commonly occurring reptiles. Amphibians are comparatively uncommon in the Project area due to lack of permanent water and unreliable ephemeral water. However, a few species are known from the area and may breed in ephemeral water sources as they become available during summer or winter rains. The most common species are red-spotted toad (*Bufo punctatus*) and Pacific treefrog (*Pseudacris regilla*). Commonly occurring invertebrate taxa include spiders (Class: Arachnidae), beetles (Order: Coleoptera), true bugs (Order: Hemiptera), and wasps and ants (Order: Hymenoptera).

The draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Eagle Mountain Landfill (County of Riverside and BLM, 1996) also identified several common species that inhabit the disturbed Kaiser Eagle Mountain Mine and surrounding mine shafts as a result of that disturbance. These include common raven (*Corvus corax*), house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), European starling (*Sturnus vulgaris*) and several bat species that may now use the mine structures (but are generally intolerant of human activity) including California leaf-nosed bat, Townsend's big-eared bat [*Corynorhinus townsendii*], and pallid bat.

3.5.2.3 Fishery Resources

No perennial streams are present in the Project area. Ephemeral surface water features in the central Project site and vicinity are Eagle Creek, other smaller unnamed washes, and temporary pools at the bottom of mine pits that form from stormwater runoff. Ephemeral springs within the vicinity of the central Project site are Buzzard Spring, an unnamed spring near Buzzard Spring, and Eagle Tank Spring. All of these water sources are temporary and seasonal and are not capable of supporting fish.

The Colorado River Aqueduct (CRA) lies at the base of the Eagle Mountain Mine site. South of the central Project site is a forebay (part of the aqueduct system) at the MWD's Eagle Mountain Pumping Plant. The CRA diverts water from Lake Havasu on the Colorado River, and fish species that may be present in the aqueduct system are the same as those found in the Lake and Colorado River. Most are introduced game species, including largemouth bass, striped bass, catfish (whitehead, bullhead, flathead, and channel), threadfin shad, green sunfish, black crappie, warmouth, and carp. Native species that may be present in the aqueduct are razorback sucker, bonytail chub, and desert pupfish. Although the CRA may support game fish, it is not accessible to the public.

No fish-related recreational opportunities exist in or near the Project area, and there are no plans to introduce fish into the Project reservoirs. The reservoirs will be unsuitable for aquatic species due to daily and weekly cycling up and down for power generation. While it is conceivable that fish could be accidentally introduced to the proposed reservoirs by birds that captured them in the open channel segment of the nearby aqueduct, it is not likely to occur in this desert environment and very unlikely that they would subsequently survive the operational conditions.

Both reservoirs would be drawn down on a daily cycle. The upper reservoir will fluctuate between elevation 2,343 feet and elevation 2,485 feet. At minimum pool the surface area will be 48 acres, with 2,300 acre-feet of dead storage volume. At full pool the upper reservoir will be 191 acres surface area and volume of 20,000 acre-feet. The lower reservoir will fluctuate between elevation 925 and elevation 1,092 feet. At minimum pool, the lower reservoir will have a surface area of 63 acres, and will contain 4,200 acre-feet of dead storage and at full pool will be 163 acres surface area and 21,900 acre-feet volume. Fish introduced to the reservoirs would be subjected to over 140 feet of vertical fluctuation on a daily basis. Entrainment rates would be high and fish habitat essentially non-existent.

3.5.2.4 Special-Status Species

Several species known to occur on or in the vicinity of the Project are accorded "special status" because of their recognized rarity or potential vulnerability to extinction (*see* Section 3.6 Threatened and Endangered Species for complete discussion). These species are listed in Table 3.5-2. Frequently, they have an inherently limited geographic range and/or limited habitat. Some are Federal or State-listed as Threatened or Endangered and receive specific protection as defined in one or both of the Federal or State of California endangered species acts (FESA and CESA, respectively).

Candidate species for listing, species designated as "Species of Concern" or "Sensitive" by State or Federal agencies, and plant species from Lists 1A, 1B, and 2 of the CNPS, (2009) Electronic Inventory of Rare and Endangered Vascular Plants of California (http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi) are protected under CEQA by the statement that "a species not included in any listing in subsection (c) shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria in subsection (b)" (CEQA Guidelines §15380, Subsection d). These species and listed species are referred to collectively as "special-status" species. While plant species from CNPS Lists 3 and 4 are "watchlist" species and generally not included for special-status consideration, several species from these two lists have been included by the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan as species for which surveys must be completed where a project intersects the species ranges, as mapped in the NECO Plan. Therefore, these plants are also included in the list of special-status species for the Project. Similarly, any wildlife species listed by the NECO Plan as special-status, even if not otherwise considered special-status, is included[1]. Finally, two species, burro deer and Nelson bighorn sheep, in the Project area receive protection and management as game species and burros are afforded protection by the Wild, Free-Roaming Horse and Burro Act.

Special-status, game, and protected species that may occur or have been documented to occur in the Project vicinity and have potential to be affected by Project activities are listed in Table 3.5-2. The methods used to survey for these species is found in Section 3.5.3.1. (A summary of the habitat and range of each special-status species is presented in Appendix A.) This list only includes those species with the potential to be found in the area of Project components, not all special-status species that are regionally known. The list is based on (1) records of the California Natural Diversity Data Base (CDFG CNDDB 2008 and 2009) for special-status species that are

[1] The only exception is LeConte's thrasher, for which the BLM "Sensitive" and CDFG "SSC" designations refer to the San Joaquin Valley subspecies only (CNDDB 2009).

known to occur in the Project survey area; (2) records from the CNPS for special-status plants (CNPS 2009); (3) results from recent, relevant surveys and reviews (County of Riverside and BLM 1996); (4) the NECO Plan (BLM and CDFG, 2002); and (5) known habitats in the area (i.e., experience of the consulting biologist). Recent, relevant biological surveys in the Project area include:

- *Eagle Mountain Pumped Storage Project* – 2008 and 2009 surveys (Karl)
- *Southern California Edison Devers-Palo Verde 2* – 1985 (Karl and Uptain, 1985; E. Linwood Smith and Associates, 1987), 1993 (E. Linwood Smith and Associates, 1993), 2002 (Karl, 2002), 2003 (EPG, 2003), 2004 (Blythe Energy LLC, 2004; EPG, 2004), 2005 (Karl, 2005a; Tetra Tech EC, Inc., 2005) and 2008 (Karl, 2009)
- *FPL Energy Blythe Energy Project Transmission Line* – 2004 (Blythe Energy LLC, 2004; EPG, 2004) and 2005 (Karl, 2005a; Tetra Tech EC, Inc. 2005)
- *District Desert Southwest Transmission Line Project* – 2002 (BLM and IID, 2003) and 2005 (Karl, 2005a; Tetra Tech EC, Inc. 2005)
- *Eagle Mountain Landfill and Recycling Center* – 1989-90 and 1995 EIS (County of Riverside and BLM, 1996), BA (RECON, 1992) and supporting studies for these Eagle Mountain Landfill permits

Four Federally- or State-listed species are included in the list of special-status species with the potential to be on the Project site: Coachella Valley milkvetch, desert tortoise, American peregrine falcon, and Gila woodpecker. Please *see* Section 3.6 Threatened and Endangered Species, for full treatment of these species.

3.5.2.4.1 *Golden Eagle*

Golden eagle nest surveys were conducted by contractors for Eagle Crest Energy Company in spring 2010 (Section 12.15). The survey for the Eagle Mountain project area was conducted simultaneously with surveys for three nearby solar projects, over a total area encompassing 13 mountain ranges. A total of 34 golden eagle nests were located in the entire area (including areas surveyed for the nearby solar projects). These nests account for an estimated 14 golden eagle territories; six active, three possibly active (meaning they appeared to have a small amount of new material or the nest appeared to have been worked on this season), and five inactive. One incubating golden eagle was found in the northern part of the Coxcomb Mountains.

3.5.2.4.2 *Bighorn Sheep*

Nelson’s Bighorn Sheep are listed as by the BLM as a sensitive species. Nelson’s or desert bighorn are widely distributed from the White Mountains in Mono County to the Chocolate Mountains in Imperial County (CNDDB, 2001). They live most of the year close to the desert floor in canyons and rocky areas (Ingles, 1965). In summer, they move to better forage sites and cooler conditions in the mountains. Migration routes can occur across valleys between mountain ranges.

BLM management of desert bighorn sheep is guided by the Mountain Sheep Ecosystem Management Strategy (EMS) in the 11 western states and Alaska (BLM 1995). The EMS goal was to “ensure sufficient habitat quality and quantity to maintain and enhance viable big game populations, and to sustain identifiable economic and social contributions to the American people” (BLM and CDFG 2002). This management plan identified eight metapopulations, two of which are included in the NECO Planning Area: the Southern Mojave and Sonoran metapopulations. These metapopulations were further divided into demes, or populations. The Project is located in the Southern Mojave Metapopulation, adjacent to the Eagle Mountain deme and near the Coxcomb deme (Figure 3.5-9).

NECO further provides for enhancing the viability of these populations through maintenance of genetic variability, providing connectivity between demes, enhancing and restoring habitat, augmenting depleted demes, and re-establishing demes. To this end, a Bighorn Sheep Wildlife Habitat Management Area (WHMA) has been established that encompasses and connects the Eagle Mountain and Coxcomb demes (BLM and CDFG 2002) (Figure 3.5-9).

Bighorn scat were observed at the main project site during 1989-90 and 1995 surveys for the Eagle Mountain Landfill and Recycling Center and during related project surveys (County of Riverside and BLM 1996). The bighorn sheep monitoring program for the Eagle Mountain Landfill Project described a population of desert bighorn ewes that congregate in areas surrounding and near the Central Project Area in spring, fall, and winter. This document also describes migration patterns for this population between areas surrounding the Central Project Area and Buzzard Spring, located to the south of the project.

The report theorizes that the purpose of this migration is to access available water at Buzzard Spring during the hot summer months when water is less available within the habitat occupied during the other seasons.

Table 3.5-2. Special-status, game, and protected species that may occur or have been documented to occur in the Project vicinity and have potential to be affected by Project activities[1]

Species	Status[2] Federal	State	CNPS[3]	Habitat	Likelihood of Occurrence on the Project Site
Plants					
Abrams's Spurge (*Chamaesyce abramsiana*)	---	---	2	Sandy sites in Mojavean and Sonoran Desert scrubs in eastern California; 0-3000 ft	Possible along the water pipeline; fall flowering
Arizona Spurge *(Chamaesyce arizonica)*	---	---	2	Sandy flats in Sonoran Desert scrubs, below ~1000 ft	Possible along the water pipeline; not observed
Ayenia *(Ayenia compacta)*	---	---	2	Sand and gravelly washes and canyons in desert scrubs, 450-3600 ft	Possible around the Central Project Area; not observed on 2008 or 2009 surveys.
California Ditaxis *(Ditaxis serrata* var. *californica)*	---	---	3	Sonoran Creosote Bush Scrub from 100 to 3000 ft	Observed on both linear ROWs
Coachella Valley Milkvetch (*Astragalus lentiginosus* var. *coachellae)*	E BLM Sensitive	---	1B	Loose to soft sandy soils, often in disturbed sites; 100 to 2200 ft	Highly unlikely – little to no habitat on Project and local reported populations appear to have been misidentifed ; not observed
Coue's Cassia (*Senna covesii)*	---	---	2	Dry washes and slopes in Sonoran Desert scrubs, 1000 to 3500 ft	Possible, especially on the bajadas and on/near the Central Project Area. Species not observed in 2008, 2009 or on related surveys
Crucifixion Thorn *(Castela emoryi)*	---	---	2	Mojavean and Sonoran Desert scrubs; typically associated with drainages	Observed on the water pipeline
Desert Sand-parsley (*Ammoselinum giganteum)*	---	---	2	Sonoran Desert scrub; known from only one site, near Hayfield Dry Lake, at 1200 ft; last seen in 1922	Highly unlikely; not observed
Desert Unicorn Plant	---	---	4	Sandy areas in Sonoran Desert	Observed near the well

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
(Proboscidea altheaefolia)				scrubs throughout southeastern California, below 3300 ft.	sites; possible throughout the valley
Dwarf Germander (*Teucrium cubense depressum)*	---	---	2	Sandy soils, washes, playa edges, and fields in Sonoran Desert scrubs, below 1300 ft.	Possible on the water pipeline, in the valley; not observed
Flat-seeded Spurge (*Chamaesyce platysperma)*	BLM Sensitive	---	1B	Sandy flats and dunes in Sonoran Desert scrubs; below 350 ft; may be extirpated in CA	Possible on the water pipeline, in the valley; not observed
Foxtail Cactus (*Coryphantha alversonii*)	---	---	4	Primarily rocky substrates between 250 and 4000 ft. Creosote Bush Scrub	Observed on both linear ROWs
Glandular Ditaxis *(Ditaxis claryana)*	---	---	2	Sandy flats in Mojavean and Sonoran Creosote Bush scrubs in Imperial, San Bernardino, and Riverside counties; below 1500 ft	Possible; not observed
Harwood's Eriastrum *(Eriastrum harwoodii)*	---	---	1B	Range restricted to loose-sandy areas of eastern Riverside and San Bernardino counties	Unlikely due to lack of habitat; not observed
Harwood's Milkvetch *(Astragalus insularis* var. *harwoodii)*	---	---	2	Dunes, windblown sands, and soft sands below 1200 ft., east and south of Desert Center	Unlikely, no apparent habitat; not observed
Jackass Clover *(Wislizenia refracta* var. *refracta)*	---	---	2	Sandy washes, roadsides, flats; 1900 to 2700 ft	Unlikely due to lack of habitat' not observed
Las Animas Colubrina (*Colubrina californica*)	---	---	2	Sonoran Creosote Bush Scrub, <3300 ft	Possible on/near the Central Project Area; not observed in 2008, 2009 or on related surveys
Mesquite Neststraw (*Stylocline sonorensis*)	---	---	1A	Open sandy drainages; known from one site near Hayfield Spring; not seen since 1930 and presumed extinct in California	Highly unlikely; not observed
Orocopia Sage (*Saliva greatae)*	BLM Sensitive	---	1B	Mojavean and Sonoran Desert scrubs; gravelly/rocky bajadas, mostly near washes; below 3000 ft;	Unlikely but possible near/on the Central Project Area. Reported

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
				only known west of the Project	south of the Central Project Area in earlier surveys but not observed in 2008 and 2009 on the linear ROWs
Sand Evening Primrose (*Camissonia arenaria)*	---	---	2	Sandy washes, rocky slopes, Sonoran desert scrubs; below 1500 (3500?) ft	Possible; not observed
Slender Woolly-heads (*Nemacaulis denudate* var. *gracilis)*	---	---	2	Dunes in coastal and Sonoran Desert scrubs, primarily in the Coachella Valley; below 1500 ft	No habitat; not observed
Spearleaf *(Matelea parvifolia)*	---	---	2	Rocky ledges and slopes, 1000 to 6000 ft, in Mojave and Sonoran Desert scrubs	Possible habitat near/on the Central Project Area.
Spiny Abrojo (*Condalia globosa* var. *pubescens*)	---	---	4	Sonoran Creosote Bush Scrub; 500 to 3300 ft	Possible on/near the Central Project Area; not observed in 2008 or 2009 surveys
Wiggins' Cholla (*Opuntia wigginsii*)	---	---	3	Eastern Riverside County, under approximately 3000 ft	Observed in 2009 surveys
Invertebrates					
Cheeseweed Owlfly (*Oliarces clara)*	---	---	---	Creosote bush scrub in rocky areas	Possible, especially near the Central Project Area
Amphibians					
Couch's Spadefoot *(Scaphiopus couchii)*	BLM Sensitive	SSC	---	Various arid communities in extreme southeastern California and east, south	Possible on entire Project; no artificial impoundments
Reptiles					
Chuckwalla *(Sauromalus ater)*	---	---	---	Rock outcrops in Mojave and Sonoran desert scrubs	Observed; also likely on/near the Central Project Area
Desert Rosy Boa *(Charina trivirgata gracia)*	BLM Sensitive	---	---	Rocky uplands and canyons; often near stream courses	Possible, especially near the Central Project Area
Mojave Fringe-toed Lizard		SSC	---	Restricted to aeolian sandy habitats	Does not occur on Project

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
(Uma scoparia)	BLM Sensitive			in the Mojave and northern Sonoran deserts	due to lack of habitat
Desert Tortoise *(Gopherus agassizii)*	T	T	---	Most desert habitats below approximately 5000 ft in elevation	Observed on both linear ROWs in 2008 and 2009. Likely on Central Project Area
Birds					
American Peregrine Falcon *(Falco peregrinus anatum)*	Delisted BCC	E Fully Protected	---	Dry, open country, including arid woodlands; nests in cliffs	Possible forager onsite, may nest in adjacent mts.; not observed
Bendire's Thrasher (*Toxostoma bendirei*)	BCC BLM Sensitive	SSC	ABC:WLBCC	Arid to semi-arid brushy habitats, usually with yuccas, cholla, and trees	Possible; not observed
Burrowing Owl (*Athene cunicularia*)	BCC BLM Sensitive	SSC	---	Open, arid habitats	Observed on linear ROWs; possible on Central Project Area
Crissal Thrasher (*Toxostoma crissale*)	BCC	SSC	---	Dense mesquite and willows along desert streams and washes	Unlikely, but possible on Central Project Area only; no habitat on linear ROWs and not observed
Ferruginous Hawk (*Buteo regalis*)	BCC BLM Sensitive	WL	---	Arid, open country	Possible winter resident only
Gila Woodpecker (*Melanerpes uropygialis*)	BCC	E	---	Desert woodland habitats	Possible; not observed
Golden Eagle (*Aquila chrysaetos*)	BCC BLM Sensitive	WL Fully Protected	---	Open country; nests in large trees in open areas or cliffs	Possible forager on site, may nest in adjacent mts. Observed in 2008.
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	SSC	---	Arid habitats with perches	Common; observed
Mountain Plover (Charadrius montanus)	BCC BLM Sensitive	SSC	ABC:WLBCC	Dry upland habitats, plains, bare fields	Unlikely, but possible winter visitor to agricultural fields in the Project area
Northern Harrier (*Circus cyaneus*)	---	SSC	---	Open habitats; nests in shrubby pen land and marshes	Possible; not observed

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
Prairie Falcon (*Falco mexicanus*)	BCC	WL	---	Dry, open country, including arid woodlands; nests in cliffs	Likely forager on site, may nest in adjacent mts.; not observed
Short-eared Owl (*Asio flammeus*)	---	SSC	ABC:WLBCC	Open habitats: marshes, fields; nests on ground and roosts on ground and low poles	Possible winter visitor
Sonoran Yellow Warbler (*Dendroica petechia sonorana*)	BCC	SSC	---	Riparian habitats, woodlands, orchards	Possible - no habitat on linear ROWs and habitat on the Central Project Area is unknown; observed at Kaiser townsite reservoir on previous survey; not observed during 2008 and 2009 surveys
Vermilion Flycatcher (*Pyrocephalus rubinus*)	---	SSC	---	Wooded and shrubby sites near water, especially with willows, mesquite and cottonwoods	Highly unlikely except as transient- no habitat on linear ROWs and unlikely to be habitat on the Central Project Area; not observed
Yellow-breasted Chat (*Icteria virens*)	---	SSC	---	Dense streamside thickets, willows; brushy hillsides and canyons	Highly unlikely except as transient- no habitat on linear ROWs and unlikely to be habitat on the Central Project Area; transients observed in area on two previous surveys, but not observed during 2008 and 2009 surveys
Mammals					
American Badger (*Taxidea taxus*)	---	SSC	---	Many habitats	Observed in 2008 and 2009

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
Big Free-tailed Bat (*Nyctinomops macrotis*)	---	SSC	WBWG:MH	Cliffs and rugged rocky habitats in arid, country, also riparian woodlands	Possible forager on site, especially near mountains
Burro Deer (*Odocoileus hemionus eremicus*)	---	Game Species	---	Arboreal and densely vegetated drainages	Observed
California Leaf-nosed Bat (*Macrotus californicus*)	BLM Sensitive	SSC	WBWG:H	Lowland desert associate, found in caves, mines, tunnels and old buildings	Known from Kaiser Mine so possible near or on the Central Project Area
Colorado Valley Woodrat (*Neotoma albigula venusta*)	---	---	---	Under mesquite in creosote bush scrub; southeastern California	Possible
Mountain Lion (*Puma concolor browni*)	---	SSC	---	Colorado River bottomlands	Possible
Nelson's Bighorn Sheep (*Ovis canadensis nelsoni*)	BLM Sensitive	Game Species	---	In mountains and adjacent valleys in desert Scrub	Likely near the Central Project Area; detected on previous surveys
Pallid Bat (*Antrozous pallidus*)	BLM Sensitive	SSC	WBWG:H	Several desert habitats	Possible, primarily near the Central Project Area; detected on previous surveys
Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*)	---	SSC	WBWG:M	Variety of arid areas in pinyon-juniper woodland, desert scrubs, palm oases, drainages; always near rocky areas	Possible near the Central Project Area
Spotted Bat (*Euderma maculatum*)	BLM Sensitive	SSC	WBWG:H	Arid scrub and grasslands, to coniferous forests, roosts in cliffs, forages along streams and in woodlands, fields	Possible near the Central Project Area
Townsend's Big-eared Bat (*Corynorhinus townsendii*)	BLM Sensitive	SSC	WBWG:H	Broad habitat associations. Roosts in caves and manmade structures; feeds in trees	Possible, primarily near the Central Project Area and transmission line; detected on previous surveys
Western Mastiff Bat		SSC	WBWG:H	Cliffs, trees, tunnels, buildings in	Highly likely near/on the

Species	Status[2]			Habitat	Likelihood of Occurrence on the Project Site
	Federal	State	CNPS[3]		
(*Eumops perotis californicus*)	BLM Sensitive			desert scrub	Central Project Area; detected on previous surveys

1/ *See* text for method of determination of those species potentially in Project area.

2/ Source: California Department of Fish and Game Wildlife and Habitat Data Analysis Branch, http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/ (2009c)
Applicable Status codes are as follows:

E Endangered
T Threatened
Federal C Candidate species for listing
Federal SC Species of Special Concern (species whose conservation status may be of concern to the USFWS, but have no official status [formerly C2 species])
Federal BCC USFWS Bird of Conservation Concern
State SSC CDFG Species of Special Concern (species that appear to be vulnerable to extinction)
State Protected Species that cannot be taken without a permit from the CDFG
State Fully Protected Species that cannot be taken without authorization from the Fish and Game Commission
State WL Watchlist species: species that are not SSC, state-listed, or fully protected (Note: State WL species have not been included in this table if they have no other protection designation.)
BLM Sensitive Species under review, rare, with limited geographic range or habitat associations, or declining. BLM policy is to provide the same level of protection as USFWS candidate species

3/ CNPS : List 1A - Plants presumed extinct in California
List 1B - Plants rare and endangered in California and elsewhere
List 2 - Plants rare and endangered in California but more common elsewhere
List 3 - Plants about which CNPS needs more information
List 4 - Plants of limited distribution
(Note: CNPS lists 1 and 2 require CEQA consideration.)

ABC:WLBCC = American Bird Conservancy Unite States Watchlist of Birds of Conservation Concern
WBWG = Western Bat Working Group (http://wbwg.org)
H – High Priority – These species should be considered the highest priority for funding, planning, and conservation actions.
M – Medium Priority – These species warrant closer evaluation, more research, and conservation actions of both the species and the threats
L- Low Priority – Most of the existing data support stable populations of the species and that the potential for major changes in status is unlikely

Table 3.5-3. Results of Spring 2008 Surveys for Non-listed Special-Status Species. (Note: Only those 2008 observations that were in the area of the Project configuration are presented here due to relevance.)

Species	Type of Sign	Location (NAD 83)			Comments
		Zone	Easting	Northing	
Plants					
California Ditaxis	Individual	11 S	648100	3736724	
California Ditaxis	Individual	11 S	650953	3737484	
Foxtail Cactus	Individual	11 S	643894	3745288	
Foxtail Cactus	Individual	11 S	643877	3745261	
Foxtail Cactus	individuals	11 S	641619	3745840	
Reptiles					
Chuckwalla	Scat	11 S	646095	3742669	
Birds					
Black-tailed Gnatcatcher	Individual	11 S	653554	3734695	
Black-tailed Gnatcatcher	Individual	11 S	643705	3745413	
Black-tailed Gnatcatcher	Pair	11 S	642271	3745116	
Golden Eagle	Individual	11 S	656436	3733422	
Stick Nest (Raptor or Raven)		11 S	654147	3734217	In Tower 169095E
Mammals					
American Badger	Den	11 S	648076	3738819	

Table 3.5-4. Results of spring 2009 Surveys for Non-listed Special-Status Species

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Plants						
California Ditaxis	5 individuals	11	S	643464	3734532	In swale with *Ditaxis neomexicana* and *Bromus tournefortii*
California Ditaxis	10 individuals	11	S	642898	3731526	
California Ditaxis	1 individual	11	S	641679	3730995	
California Ditaxis	Several individuals	11	S	643270	3732021	
California Ditaxis	~20 individuals	11	S	642256	3731712	Along 800 m of transect
California Ditaxis	10-20 individuals	11	S	643072	3731723	
California Ditaxis	1 individual	11	S	642603	3733273	
California Ditaxis	65 individuals	11	S	642959	3731237	Within ~50 m
California Ditaxis	1 individual	11	S	642612	3732902	
California Ditaxis	Several individuals	11	S	642917	3731448	
California Ditaxis	Several individuals	11	S	643109	3731805	
California Ditaxis	2 individuals	11	S	642603	3734104	
California Ditaxis	8 individuals	11	S	642928	3731379	
California Ditaxis	31 individuals	11	S	642891	3731423	Within ~50 m
California Ditaxis	5 individuals	11	S	643022	3734258	In 10 m radius
California Ditaxis	1 individual	11	S	644919	3732959	
California Ditaxis	1 individual	11	S	642705	3731475	
California Ditaxis	3 individuals	11	S	642859	3731410	
California Ditaxis	Many	11	S	642829	3731660	Along 1000 m of transect
California Ditaxis	15 individuals	11	S	642828	3731869	In 10 m radius
California Ditaxis	1 individual	11	S	642759	3731408	
California Ditaxis	6 individuals	11	S	642568	3731411	In 5 m radius
California Ditaxis	5 individuals	11	S	642713	3731265	
California Ditaxis	1 individual	11	S	642676	3731282	
California Ditaxis	4 individuals	11	S	643218	3732229	In 10 m area
California Ditaxis	37 individuals	11	S	642773	3731498	Between waypoints
California Ditaxis	2 individuals	11	S	644673	3732864	
California Ditaxis	1 individual	11	S	642572	3739484	
California Ditaxis	7 individuals	11	S	642589	3738993	Within 400 m along transect
California Ditaxis	2 individuals	11	S	644132	3742366	
California Ditaxis	11 individuals	11	S	642624	3737768	
California Ditaxis	1 individual	11	S	642955	3739755	
California Ditaxis	1 individual	11	S	643069	3741405	
California Ditaxis	2 individuals	11	S	642558	3741045	
California Ditaxis	3 individuals	11	S	646678	3742974	
California Ditaxis	50+ individuals	11	S	643214	3732072	
California Ditaxis	1 individual	11	S	643155	3731989	
California Ditaxis	1 individual	11	S	642823	3731444	
California Ditaxis	15 individuals	11	S	642873	3731587	Within 100 m
California Ditaxis	18 individuals	11	S	643161	3732052	Within 18 m
California Ditaxis	150+ individuals	11	S	643488	3732276	
California Ditaxis	12+ individuals	11	S	643309	3731898	
California Ditaxis	12+ individuals	11	S	643337	3731815	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
California Ditaxis	50+ individuals	11	S	643286	3731665	
California Ditaxis	5+ individuals	11	S	643789	3732035	
California Ditaxis	50+ individuals	11	S	643832	3731405	
California Ditaxis	1 individual	11	S	647644	3742050	
Crucifixion Thorn	1 individual	11	S	648552	3740059	
Crucifixion Thorn	1 individual	11	S	648410	3740229	
Crucifixion Thorn	1 individual	11	S	648803	3739844	
Crucifixion Thorn	6 individuals	11	S	648466	3740002	Within 20 m radius
Crucifixion Thorn	3 individuals	11	S	654228	3734400	Within 40 m
Crucifixion Thorn	1 individual	11	S	654187	3734350	
Desert Unicorn Plant	1 individual	11	S	654460	3733967	
Desert Unicorn Plant	1 individual	11	S	654917	3734261	1 pod
Desert Unicorn Plant	1 individual	11	S	654052	3737502	Seed pod only
Desert Unicorn Plant	1 individual	11	S	654296	3738162	
Foxtail Cactus	2 individuals	11	S	643374	3736115	
Foxtail Cactus	1 individual	11	S	643628	3737903	
Foxtail Cactus	Several individuals	11	S	641679	3730995	
Foxtail Cactus	Several individuals	11	S	643443	3737458	
Foxtail Cactus	3 individuals	11	S	643377	3736464	
Foxtail Cactus	1 individual	11	S	643612	3738256	
Foxtail Cactus	3 individuals	11	S	643376	3736689	
Foxtail Cactus	2 individuals	11	S	643463	3735279	
Foxtail Cactus	1 individual	11	S	643599	3738534	
Foxtail Cactus	Several individuals	11	S	643439	3737159	
Foxtail Cactus	4 individuals	11	S	643385	3737177	
Foxtail Cactus	2 individuals	11	S	643564	3739762	
Foxtail Cactus	Several individuals	11	S	643439	3736816	
Foxtail Cactus	3 individuals	11	S	643379	3737478	
Foxtail Cactus	1 individual	11	S	643554	3739858	
Foxtail Cactus	Several individuals	11	S	643438	3736337	
Foxtail Cactus	2 individuals	11	S	643500	3737654	
Foxtail Cactus	8 individuals	11	S	643555	3739912	
Foxtail Cactus	1 individual	11	S	643436	3735721	
Foxtail Cactus	Several individuals	11	S	643409	3735952	
Foxtail Cactus	3 individuals	11	S	643507	3737011	
Foxtail Cactus	1 individual	11	S	643556	3739966	
Foxtail Cactus	58 individuals	11	S	643457	3735567	Between waypoints
Foxtail Cactus	3 individuals	11	S	643501	3736688	
Foxtail Cactus	1 individual	11	S	643518	3740326	
Foxtail Cactus	1 individual	11	S	643452	3735124	
Foxtail Cactus	Several individuals	11	S	643873	3741325	
Foxtail Cactus	Several individuals	11	S	643448	3737794	
Foxtail Cactus	3 individuals	11	S	643514	3740279	
Foxtail Cactus	1 individual	11	S	643302	3740346	
Foxtail Cactus	Several individuals	11	S	643770	3741179	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Foxtail Cactus	1 individual	11	S	643433	3738228	
Foxtail Cactus	3 individuals	11	S	643313	3739809	
Foxtail Cactus	Several individuals	11	S	643748	3741172	
Foxtail Cactus	Several individuals	11	S	643418	3738468	
Foxtail Cactus	2 individuals	11	S	643526	3739905	
Foxtail Cactus	Several individuals	11	S	643726	3741135	
Foxtail Cactus	Several individuals	11	S	643412	3738805	
Foxtail Cactus	2 individuals	11	S	643525	3739715	
Foxtail Cactus	10 individuals	11	S	643318	3738925	
Foxtail Cactus	Several individuals	11	S	643545	3740868	
Foxtail Cactus	Several individuals	11	S	643366	3739788	
Foxtail Cactus	1 individual	11	S	643578	3738130	
Foxtail Cactus	2 individuals	11	S	643419	3740434	
Foxtail Cactus	Several individuals	11	S	643452	3740761	
Foxtail Cactus	Several individuals	11	S	643363	3740056	
Foxtail Cactus	4 individuals	11	S	643910	3741002	Within 20 m
Foxtail Cactus	1 individual	11	S	643439	3739700	
Foxtail Cactus	Several individuals	11	S	642614	3744511	
Foxtail Cactus	Several individuals	11	S	643349	3740247	
Foxtail Cactus	3 individuals	11	S	644042	3741172	Within 20 m
Foxtail Cactus	3 individuals	11	S	643488	3738221	
Foxtail Cactus	Several individuals	11	S	642529	3744597	
Foxtail Cactus	49 individuals	11	S	643339	3740530	Between waypoints
Foxtail Cactus	4 individuals	11	S	644077	3741285	Within 20 m
Foxtail Cactus	1 individual	11	S	643496	3737939	
Foxtail Cactus	Several individuals	11	S	643287	3743731	
Foxtail Cactus	1 individual	11	S	643361	3740531	
Foxtail Cactus	Several individuals	11	S	643864	3741369	
Foxtail Cactus	4+ iIndividuals	11	S	643543	3740777	
Foxtail Cactus	1 individual	11	S	643811	3741299	
Foxtail Cactus	39 individuals	11	S	643800	3741134	Between waypoints
Foxtail Cactus	16 individuals	11	S	642628	3737261	
Foxtail Cactus	Several individuals	11	S	643770	3741234	
Foxtail Cactus	1 individual	11	S	644475	3742603	
Foxtail Cactus	1 individual	11	S	643254	3735172	
Foxtail Cactus	6 individuals	11	S	643517	3740633	
Foxtail Cactus	Several individuals	11	S	643347	3740738	
Foxtail Cactus	15 individuals	11	S	643245	3736090	Between waypoints
Foxtail Cactus	3 individuals	11	S	643543	3740679	
Foxtail Cactus	6 individuals	11	S	642614	3736796	
Foxtail Cactus	1 individual	11	S	643798	3743387	
Foxtail Cactus	Several individuals	11	S	643472	3743632	
Foxtail Cactus	17 individuals	11	S	643276	3736503	Between waypoints
Foxtail Cactus	2 individuals	11	S	643841	3741090	
Foxtail Cactus	4 individuals	11	S	642626	3736265	
Foxtail Cactus	Several individuals	11	S	643362	3740790	
Foxtail Cactus	1 individual	11	S	643601	3743572	
Foxtail Cactus	1 individual	11	S	643673	3743592	
Foxtail Cactus	1 individual	11	S	644284	3741679	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Foxtail Cactus	3 individuals	11	S	642633	3735778	
Foxtail Cactus	Several individuals	11	S	643494	3740940	
Foxtail Cactus	1 individual	11	S	643740	3743520	
Foxtail Cactus	1 individual	11	S	643026	3744106	
Foxtail Cactus	3 individuals	11	S	642618	3735277	
Foxtail Cactus	2 individuals	11	S	643252	3738050	
Foxtail Cactus	1 individual	11	S	644231	3741049	
Foxtail Cactus	1 individual	11	S	644526	3742651	
Foxtail Cactus	1 individual	11	S	642852	3745078	
Foxtail Cactus	1 individual	11	S	643021	3735770	
Foxtail Cactus	Several individuals	11	S	643581	3741048	
Foxtail Cactus	5 individuals	11	S	643182	3739782	
Foxtail Cactus	2 individuals	11	S	644122	3740898	
Foxtail Cactus	1 individual	11	S	642446	3745540	
Foxtail Cactus	1 individual	11	S	643159	3740345	
Foxtail Cactus	1 individual	11	S	643919	3740599	
Foxtail Cactus	1 individual	11	S	642829	3744549	
Foxtail Cactus	1 individual	11	S	642963	3731810	
Foxtail Cactus	2 individuals	11	S	642316	3745455	
Foxtail Cactus	Several individuals	11	S	643726	3741249	
Foxtail Cactus	3 individuals	11	S	643195	3740171	Within 100 m
Foxtail Cactus	1 individual	11	S	643261	3743346	
Foxtail Cactus	1 individual	11	S	642401	3745370	
Foxtail Cactus	11 individuals	11	S	643038	3736738	
Foxtail Cactus	1 individual	11	S	643266	3738398	
Foxtail Cactus	1 individual	11	S	643815	3739101	
Foxtail Cactus	Several individuals	11	S	641951	3743929	
Foxtail Cactus	1 individual	11	S	642537	3740439	
Foxtail Cactus	1 individual	11	S	642465	3745313	
Foxtail Cactus	5 individuals	11	S	643035	3737730	
Foxtail Cactus	2 individuals	11	S	643279	3738006	Within 70 m
Foxtail Cactus	1 individual	11	S	642622	3743298	
Foxtail Cactus	1 individual	11	S	643570	3735634	
Foxtail Cactus	1 individual	11	S	642598	3745159	
Foxtail Cactus	1 individual	11	S	643282	3737798	
Foxtail Cactus	2 individuals	11	S	642814	3743140	
Foxtail Cactus	6 individuals	11	S	643563	3735854	Within 100 m
Foxtail Cactus	1 individual	11	S	643304	3737910	Within 100 m
Foxtail Cactus	1 individual	11	S	644153	3740314	
Foxtail Cactus	1 individual	11	S	643150	3742824	
Foxtail Cactus	4 individuals	11	S	642586	3739011	Within 600 m along transect
Foxtail Cactus	3 individuals	11	S	643306	3738128	Within 100 m
Foxtail Cactus	Several individuals	11	S	643340	3743253	
Foxtail Cactus	7 individuals	11	S	643564	3736125	Within 100 m
Foxtail Cactus	5 individuals	11	S	643265	3738831	Within 100 m
Foxtail Cactus	1 individual	11	S	643943	3742608	
Foxtail Cactus	5 individuals	11	S	642615	3738161	Within 10 m
Foxtail Cactus	1 individual	11	S	643268	3739008	Within 100 m
Foxtail Cactus	Several individuals	11	S	643990	3742559	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Foxtail Cactus	Many	11	S	643567	3736859	
Foxtail Cactus	7 individuals	11	S	643245	3739709	Within 100 m
Foxtail Cactus	2 individuals	11	S	644081	3742429	
Foxtail Cactus	Many	11	S	643538	3737665	
Foxtail Cactus	4 individuals	11	S	642623	3737768	
Foxtail Cactus	1 individual	11	S	643220	3740603	Within 100 m
Foxtail Cactus	3 individuals	11	S	643276	3740231	Within 100 m
Foxtail Cactus	Several individuals	11	S	643667	3742351	
Foxtail Cactus	Many	11	S	643533	3736704	
Foxtail Cactus	1 individual	11	S	643027	3738058	
Foxtail Cactus	8 individuals	11	S	643279	3739877	Within 100 m
Foxtail Cactus	5 individuals	11	S	643587	3742435	
Foxtail Cactus	1 individual	11	S	642957	3739582	
Foxtail Cactus	1 individual	11	S	642969	3739719	
Foxtail Cactus	1 individual	11	S	643313	3741279	
Foxtail Cactus	3 individuals	11	S	643540	3740585	Along 300 m of transect
Foxtail Cactus	1 individual	11	S	647449	3741888	
Foxtail Cactus	4 individuals	11	S	643313	3737740	Within 100 m
Foxtail Cactus	3 individuals	11	S	643776	3740875	Along 300 m of transect
Foxtail Cactus	3 individuals	11	S	643314	3737524	Within 100 m
Foxtail Cactus	4 individuals	11	S	642950	3740296	
Foxtail Cactus	6 individuals	11	S	643304	3737192	Within 100 m
Foxtail Cactus	5 individuals	11	S	643963	3741134	Along 300 m of transect
Foxtail Cactus	7 individuals	11	S	643308	3737053	Within 100 m
Foxtail Cactus	4 individuals	11	S	643315	3736677	Within 100 m
Foxtail Cactus	1 individual	11	S	644418	3745014	
Foxtail Cactus	3 individuals	11	S	643310	3736332	Within 100 m
Foxtail Cactus	7 individuals	11	S	643974	3741196	Along 300 m of transect
Foxtail Cactus	3 individuals	11	S	643308	3736015	Within 100 m
Foxtail Cactus	2 individuals	11	S	643523	3740599	
Foxtail Cactus	2 individuals	11	S	643313	3735788	Within 100 m
Foxtail Cactus	1 individual	11	S	643303	3735550	
Foxtail Cactus	13 individuals	11	S	643271	3740712	In 1300 m of transect
Foxtail Cactus	1 individual	11	S	643348	3735341	
Foxtail Cactus	1 individual	11	S	643953	3741595	
Foxtail Cactus	2 individuals	11	S	644402	3745362	Along 300 m of transect
Foxtail Cactus	1 individual	11	S	643355	3736796	
Foxtail Cactus	12 individuals	11	S	643895	3741553	In 1100 m of transect
Foxtail Cactus	2 individuals	11	S	644349	3742533	
Foxtail Cactus	1 individual	11	S	644330	3742494	
Foxtail Cactus	3 individuals	11	S	643835	3745456	
Foxtail Cactus	1 individual	11	S	643810	3743030	
Foxtail Cactus	1 individual	11	S	643345	3735205	
Foxtail Cactus	4 individuals	11	S	643325	3737665	Within 100 m
Foxtail Cactus	1 individual	11	S	643323	3737422	Within 100 m
Foxtail Cactus	9 individuals	11	S	643321	3737190	Within 100 m
Foxtail Cactus	2 individuals	11	S	643837	3735373	
Foxtail Cactus	2 individuals	11	S	643319	3737019	Within 100 m
Foxtail Cactus	5 individuals	11	S	643317	3736723	Within 200 m

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Foxtail Cactus	2 individuals	11	S	643845	3735970	
Foxtail Cactus	7 individuals	11	S	643846	3736641	
Foxtail Cactus	5 individuals	11	S	643854	3737028	
Foxtail Cactus	1 individual	11	S	643848	3737532	
Foxtail Cactus	8 individuals	11	S	643314	3736007	Along 1300 m of transect
Foxtail Cactus	3 individuals	11	S	643857	3737813	
Foxtail Cactus	6 individuals	11	S	643348	3735893	Along 800 m of transect
Foxtail Cactus	3 individuals	11	S	644259	3737646	
Foxtail Cactus	10 individuals	11	S	643348	3736653	Along 800 m of transect
Foxtail Cactus	1 individual	11	S	644262	3736910	
Foxtail Cactus	2 individuals	11	S	643664	3735497	
Foxtail Cactus	7 individuals	11	S	643352	3737628	Along 800 m of transect
Foxtail Cactus	2 individuals	11	S	643658	3735759	
Foxtail Cactus	1 individual	11	S	643658	3736167	
Foxtail Cactus	3 individuals	11	S	643661	3736569	
Foxtail Cactus	6 individuals	11	S	643542	3738453	Along 800 m of transect
Foxtail Cactus	7 individuals	11	S	643661	3737015	
Foxtail Cactus	5 individuals	11	S	643504	3739643	Along 800 m of transect
Foxtail Cactus	11 individuals	11	S	643667	3737493	
Foxtail Cactus	7 individuals	11	S	643450	3740278	Along 800 m of transect
Foxtail Cactus	11 individuals	11	S	643666	3737712	
Foxtail Cactus	1 individual	11	S	643631	3737447	
Foxtail Cactus	4 individuals	11	S	643492	3738902	Within 50 m
Foxtail Cactus	1 individual	11	S	643632	3737225	
Foxtail Cactus	1 individual	11	S	643633	3736835	
Foxtail Cactus	1 individual	11	S	643635	3736471	
Foxtail Cactus	3 individuals	11	S	643524	3737972	Along 400 m of transect
Foxtail Cactus	1 individual	11	S	643629	3735778	
Foxtail Cactus	2 individuals	11	S	644012	3745455	
Foxtail Cactus	1 individual	11	S	643795	3745633	
Foxtail Cactus	Several individuals	11	S	642753	3744448	
Wiggins' Cholla	1 individual	11	S	644080	3733741	
Wiggins' Cholla	1 individual	11	S	641679	3730995	
Wiggins' Cholla	1 individual	11	S	647533	3732431	
Wiggins' Cholla	Several individuals	11	S	644416	3733960	
Wiggins' Cholla	1 individual	11	S	645728	3732455	
Wiggins' Cholla	1 individual	11	S	642612	3732902	
Wiggins' Cholla	1 individual	11	S	643860	3733366	
Wiggins' Cholla	3 individuals	11	S	642619	3734529	In 100 m radius
Wiggins' Cholla	1 individual	11	S	653778	3734517	
Wiggins' Cholla	6 individuals	11	S	642600	3735108	In 250 m radius
Wiggins' Cholla	1 individual	11	S	654437	3733985	
Wiggins' Cholla	2 individuals	11	S	643025	3732892	In 100 m length of transect
Wiggins' Cholla	1 individual	11	S	654111	3734140	
Wiggins' Cholla	1 individual	11	S	643239	3732995	
Wiggins' Cholla	1 individual	11	S	642718	3731687	
Wiggins' Cholla	1 individual	11	S	643251	3735020	
Wiggins' Cholla	1 individual	11	S	643253	3735123	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Wiggins' Cholla	8 individuals	11	S	642628	3737261	
Wiggins' Cholla	2 individuals	11	S	642614	3736796	
Wiggins' Cholla	2 individuals	11	S	642626	3736265	
Wiggins' Cholla	1 individual	11	S	652075	3740775	
Wiggins' Cholla	12 individuals	11	S	643266	3735059	Between waypoints
Wiggins' Cholla	3 individuals	11	S	642633	3735778	
Wiggins' Cholla	3 individuals	11	S	643272	3733232	Between waypoints
Wiggins' Cholla	2 individuals	11	S	642618	3735277	
Wiggins' Cholla	8 individuals	11	S	643021	3735770	
Wiggins' Cholla	2 individuals	11	S	642976	3731834	In 10 m area
Wiggins' Cholla	6 individuals	11	S	643038	3736738	
Wiggins' Cholla	4 individuals	11	S	643035	3737730	
Wiggins' Cholla	1 individual	11	S	642580	3739658	
Wiggins' Cholla	1 individual	11	S	645233	3732601	
Wiggins' Cholla	Many	11	S	643553	3736109	
Wiggins' Cholla	2 individuals	11	S	645497	3732466	
Wiggins' Cholla	Many	11	S	643566	3736580	
Wiggins' Cholla	2 individuals	11	S	645973	3732232	
Wiggins' Cholla	1 individual	11	S	642611	3738152	
Wiggins' Cholla	2 individuals	11	S	646713	3731888	
Wiggins' Cholla	Many	11	S	643533	3737259	
Wiggins' Cholla	2 individuals	11	S	646961	3731758	
Wiggins' Cholla	Many	11	S	643531	3736234	
Wiggins' Cholla	8 individuals	11	S	645773	3732360	
Wiggins' Cholla	Many	11	S	643527	3735275	
Wiggins' Cholla	2 individuals	11	S	644217	3733122	Along 400 m of transect
Wiggins' Cholla	1 individual	11	S	642959	3739841	
Wiggins' Cholla	3 individuals	11	S	647593	3741664	Within 20 m radius
Wiggins' Cholla	4 individuals	11	S	643808	3740932	Along 300 m of transect
Wiggins' Cholla	2 individuals	11	S	642944	3740433	
Wiggins' Cholla	2 individuals	11	S	643971	3741150	Along 300 m of transect
Wiggins' Cholla	1 individual	11	S	643689	3745634	
Wiggins' Cholla	3 individuals	11	S	644092	3741360	Along 300 m of transect
Wiggins' Cholla	3 individuals	11	S	645617	3743954	
Wiggins' Cholla	1 individual	11	S	646328	3743284	
Wiggins' Cholla	1 individual	11	S	645756	3743774	
Wiggins' Cholla	1 individual	11	S	645525	3744000	
Wiggins' Cholla	4 individuals	11	S	644686	3744720	
Wiggins' Cholla	3 individuals	11	S	643872	3745437	
Wiggins' Cholla	1 individual	11	S	647486	3742200	
Wiggins' Cholla	1 individual	11	S	644386	3732303	
Wiggins' Cholla	1 individual	11	S	643311	3735161	
Wiggins' Cholla	1 individual	11	S	653679	3734845	
Wiggins' Cholla	1 individual	11	S	647279	3742366	
Wiggins' Cholla	1 individual	11	S	643323	3731917	
Wiggins' Cholla	1 individual	11	S	643522	3732964	
Wiggins' Cholla	1 individual	11	S	646531	3731701	
Wiggins' Cholla	3 individuals	11	S	645818	3732045	
Wiggins' Cholla	2 individuals	11	S	643850	3735855	

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Wiggins' Cholla	1 individual	11	S	643322	3736538	
Wiggins' Cholla	1 individual	11	S	643317	3736419	
Wiggins' Cholla	4 individuals	11	S	643312	3735939	Within 100 m
Wiggins' Cholla	1 individual	11	S	643856	3733015	
Wiggins' Cholla	1 individual	11	S	643856	3732915	
Wiggins' Cholla	1 individual	11	S	643852	3737656	
Wiggins' Cholla	2 individuals	11	S	643340	3735743	Within 100 m
Wiggins' Cholla	1 individual	11	S	643853	3732495	
Wiggins' Cholla	1 individual	11	S	643347	3737020	
Wiggins' Cholla	1 individual	11	S	654899	3733633	
Wiggins' Cholla	1 individual	11	S	643565	3737733	
Wiggins' Cholla	1 individual	11	S	643513	3738321	
Wiggins' Cholla	1 individual	11	S	654561	3733313	
Wiggins' Cholla	1 individual	11	S	654435	3733733	
Wiggins' Cholla	1 individual	11	S	654768	3734122	
Wiggins' Cholla	2 individuals	11	S	654554	3734191	Within 10 m
Wiggins' Cholla	1 individual	11	S	654969	3733971	
Reptiles						
Chuckwalla	Scat	11	S	644665	3742190	Rock outcrop
Chuckwalla	Scat	11	S	644680	3742211	Fresh scat on rock outcrop
Birds						
Burrowing Owl	Burrow	11	S	646900	3731948	10+ pellets and white wash
Burrowing Owl	Burrow	11	S	650652	3737636	Whitewash; not currently used by owl; old coyote den
Loggerhead Shrike	1 individual	11	S	642615	3735280	
Loggerhead Shrike	1 individual	11	S	642614	3736795	
Loggerhead Shrike	Pair	11	S	643047	3735904	
Loggerhead Shrike	1 individual	11	S	642989	3736199	Also, sharp-shinned hawk
Loggerhead Shrike	1 individual	11	S	644845	3741176	
Loggerhead Shrike	1 individual			644856	3741176	
Loggerhead Shrike	1 individual	11	S	645317	3732550	
Loggerhead Shrike	Pair	11	S	646985	3742526	
Loggerhead Shrike	Pair	11	S	643316	3736647	
Loggerhead Shrike	Pair	11	S	643110	3733638	
Red-tailed Hawk	Nest	11	S	643005	3732244	Adult bird on nest and defensive
Mammals						
American Badger	Den	11	S	654696	3733855	Active; fresh tracks and digs
Kit Fox	Den Complex	11	S	643065	3731723	5 burrows
Kit Fox	Den Complex	11	S	643369	3733309	
Kit Fox	Den Complex	11	S	643832	3733413	
Kit Fox	Den Complex	11	S	642978	3731567	8 burrows
Kit Fox	Den Complex	11	S	643865	3733425	6 burrows
Kit Fox	Den Complex	11	S	643692	3733560	8 burrows
Kit Fox	Den Complex	11	S	645291	3732801	6 burrows
Kit Fox	Den Complex	11	S	643314	3731893	11 entrances

Species	Type of Sign	Location (NAD 83)				Comments
		Zone		Easting	Northing	
Kit Fox	Den Complex	11	S	655871	3732800	5 active entrances
Kit Fox	Den Complex	11	S	646583	3743137	9 entrances; active
Kit Fox	Den Complex	11	S	643612	3734118	10 entrances
Kit Fox	Den Complex			645796	3732416	

3.5.2.5 Special Habitats

Desert Dry Wash Woodland. The arboreal washes that are common in the landscape traversed by the linear components of the Project are considered biologically significant habitat features to which biodiversity in the Colorado Desert is strongly linked (National Research Council, 1995). These assemblages provide critical breeding, refuge, and foraging habitat for a variety of birds, amphibians, and invertebrates and many local species concentrate their activities in these lush drainages. Because of its value to wildlife and natural processes, Desert Dry Wash Woodland is considered sensitive by the California Resources Agency (DOI, BLM and CDFG, 2002).

A total of 19.7 acres of Desert Dry Wash Woodland is located on the transmission line ROW (Figure 3.5-1, Table 3.5-1).

Wetlands, Seeps and Springs, and Streams. There are no perennial streams, or associated riparian habitats, in the Project vicinity.

No natural wetlands occur in the Project vicinity. Drainages in this part of Riverside and Imperial counties are generally limited to high-energy runoff via washes that are usually dry. As water from these runoff events quickly percolates into the surrounding soil, the establishment of wetland vegetation is precluded. The additional soil moisture during these brief periods is enough to allow the growth of aphyllous or microphyllous trees, but the lack of residual soil moisture and less importantly, the scouring action from the high-energy ephemeral flow, prohibits the growth of most species of plants.

Six seeps, springs, or water catchments were identified by the proposed NECO Plan (DOI, BLM and CDFG, 2002) in the immediate vicinity of the Project, all on or near the MWD pumping facility (Figure 3.5-8). Four of these – Buzzard Spring, Dengler Tank, Eagle Tank, and Cactus Spring are outside the Project boundary by at least 2 miles (County of Riverside and BLM 1996). All may be intermittent (*see* Section 3.3 Groundwater). The NECO Plan identified two other springs (unnamed), one of which might be adjacent to, in, or borderline with the Project. However, part of the NEPA compliance for the Federal lead agency the Federal Energy Regulatory Commission (FERC) included investigations of these sites for the Project Pre-Application Document which were unsuccessful in locating any further details on these springs. A May 1994 helicopter survey of all water sources in the Eagle Mountains also did not note them (Devine and Douglas, 1996), and it is possible that they no longer exist or were incorrectly mapped. During final engineering design a pre-construction surveys (PDF BIO-1) will determine the presence any springs within the Project's area of potential effects, their quality, and value for wildlife.

Artificial Water Impoundments. Onsite water sources plus nearby water sources currently provide a variety of water resources for ravens and coyotes and other native and non-native species. There is a 1.2-acre wastewater treatment pond that can be seen on aerials and is assumed to still support these human uses of the site (Figure 3.5-10). Photos of this pond, and other water sources in the Project area, are found in Figures 3.5-11 through 3.5-18. As one of the few easily accessible water sources in that area, it is highly likely to provide water for both coyotes and ravens. Seasonal water is likely to pool in the pits and on other hard, mined surfaces. NECO identified a developed tank along the northern edge of the Central Project Area (Figure 3.5-8). Buzzard Spring, approximately 3 miles south of the Central Project Area, has pooled water (Divine and Douglas, 1996). There is a 10-acre pond used by the Metropolitan Water District's Eagle Mountain Pumping Station, approximately 4 miles south of the Central Project Area (Figures 3.5-13 and 3.5-14). The CRA has 8 acres of exposed water near the Central Project Area and transmission corridor. Access to the CRA by wildlife is likely to be limited by physical characteristics of the channel and fencing, although it is accessible to ravens and other birds (Figures 3.5-15 and 3.5-16). Two large ponds (17 acres) are present within the community of Lake Tamarisk (Figure 3.5-17 and 3.5-18).

Biological Soil Crusts. Biological crusts, also variously known as crytobiotic, cryptogamic, microbiotic, and micryphytic crusts, form in the upper layers of soils. These soil crusts include a community of microscopic bacteria, fungi, algae, and other microorganisms that function mechanically, chemically, and biologically to stabilize soils against erosion; provide nutrients and water for plant growth; and modify ambient temperatures (West, 1990; Belnap et al., 2001). Their function in arid systems has only relatively recently been addressed, especially as it relates to crust disturbance (Rowlands, 1980; Belnap et al., 1998; Evans and Belnap, 1999). Crusts are highly susceptible to crushing, especially when dry, which can occur via a number of mechanisms, including grazing, vehicular traffic, surface grading, and hiking. Not only do crushed crusts lose their function, but crushed crusts release a flush of nutrients that support the growth of exotic annual species (e.g., *Bromus* spp., *Schismus arabicus*) (Pendleton et al., 2004).

3.5.2.6 Invasive Species

Several species of exotic plants have been introduced to the southwestern deserts. Tamarisk (*Tamarix* spp.), a medium-sized tree, was introduced to the United States as an ornamental and windbreak. Brought to the United States in the early 1800s (Allen, 2002), old hedges of tamarisk are still common along farms and railroads in many areas of the desert. It has especially invaded riparian areas, including springs, rivers, and canals, outcompeting native vegetation for available resources. On the Project, a tamarisk grove was identified in the East Pit, although this species is not apparent in recent aerial photographs (Kaiser and MRC, 1991).

Highly successful annual exotics in the desert include three grasses – red brome (*Bromus madritensis rubens*), cheatgrass (*B. tectorum*), and split grass (*Schismus* spp) – and two dicots –

Tournefort's mustard (*Brassica tournefortii*) and filaree (*Erodium cicutarium*). Most were established in the desert in the mid-twentieth century primarily via grazing and agriculture (Allen, 2002), but also by road-building and other anthropogenic activities that disturb soil surfaces and/or use equipment capable of transporting exotic seed from sources elsewhere. Brooks (2007) also cited nitrogen deposition from vehicle exhaust as potentially promoting plant invasions.

Exotic species use available resources, thereby competing with native plant species and altering species composition and evenness (a measure of biodiversity). This, in turn, alters the availability of resources (e.g., cover, forage) to wildlife, which may alter species diversity in the affected wildlife community. Lack of native vegetation may also be implicated in the inability of species that are periodically stressed by drought – a normal and relatively frequent phenomenon in the desert – to withstand that stress. Furthermore, exotic annuals are responsible for promoting wildfires in the desert (Brown and Minnich, 1986; Brooks, 1998; and Allen, 2002).

3.5.3 Potential Environmental Impacts

3.5.3.1 Methodology

The environmental impact analysis is based on field reconnaissance, resources agency consultation (as noted), and literature review of pertinent biological reports as referenced throughout this document.

During March and early April in 2008, 2009, and 2010 surveys were conducted for special-status species along the Project linear elements and at potential well sites.

In all years spring surveys were conducted at the appropriate time to identify plants – i.e., when special-status species were flowering or easily identifiable. For the special plant species in the Project area, this begins in mid-March, which is prior to the survey timing requirement for USFWS desert tortoise protocol surveys – March 25 to May 31. However, because tortoises are known to be active in the Project area much earlier than March 25, the USFWS permitted the consulting biologist to begin tortoise surveys on March 18 in 2009 (Tannika Engelhardt, USFWS Carlsbad Field Office, personal communication with Alice Karl [Project Biologist], March 18, 2009) concurrent with plant surveys.

In all years of biological reconnaissance surveys, Kaiser Ventures, LLC. (Kaiser) denied access to the Project Applicant to their properties for surveying. This exclusion included a short segment of the Project water pipeline ROW north of the MWD aqueduct, and a short segment of the transmission line ROW west of the aqueduct (north of UTM 3745200N, North American Datum [NAD] 83). As a result, onsite surveys of the mine pits that will form the reservoirs and other Central Project Area features were not conducted. Tables 3.5-3 and 3.5-4 and Figures 3.5-3 to 3.5-7 report the results of Project surveys in 2008 and 2009, respectively. The extreme level of habitat disturbance in the pits and surrounding mine tailings piles is readily observable from the edge of the property and on recent aerial photos, permitting a reasonable assessment of these lands in the absence of detailed on the ground surveys.

In 2008, the Project water pipeline and transmission line routes were preliminary, so surveys were conducted both on areas where the Project would ultimately occur and areas that were eliminated in 2009. Because of the uncertain nature of the routes in 2008, the extensive survey protocol required by USFWS for desert tortoises was not used. Rather, evidence of desert tortoises and other special-status species, including habitat mapping, was gathered via the following procedures:

- Transmission Line ROW: Inside Wildlife Habitat Management Areas (WHMAs), four, 50-foot-wide, adjacent transects were walked in the 200-foot transmission line ROW; outside WHMAs, 2 miles, 100-foot-wide, adjacent, meandering transects were walked in the ROW. (The NECO Plan places special emphasis on WHMAs; hence the more intensive surveys inside WHMAs; Figure 3.5-2.)
- Water Pipeline ROW: Where the ROW was precise, a 30-foot-wide transect was walked; where the ROW was imprecise, 2 miles, 100-foot-wide, adjacent, meandering transects were walked.
- For ROWs through jojoba fields that had access roads, only the roadsides were surveyed.
- Potential Well Sites: All known commercial wells in the Project area that had the potential to supply water to the Project were examined, photographed, and analyzed for biological issues (especially ephemeral impoundments that could host Couch’s spadefoot).

In 2009 and 2010, pedestrian transects were completed consistent with the NECO Plan, USFWS “protocol” desert tortoise transects (DOI and USFWS, 1992; Revised Draft, 2008), and the California Burrowing Owl Consortium (CBOC) Guidelines (CBOC, 1993). The NECO Plan identified situations for which surveys must be completed for projects in the NECO planning area. Those that are relevant to the Project include the following:

- In Multi-species Conservation Zones – Survey for all special-status species
- Special-status Plants – Survey in all mapped ranges
- Special-status Wildlife – Survey at all known locations
- Townsend’s Bat – Identify maternity roosts within 5 miles of riparian habitat
- Other Bats – Identify all significant roosts within 1 mile
- Prairie Falcon and Golden Eagle – Identify all eyries within 0.25 miles
- Burrowing Owl – Identify presence and locations
- Crissal Thrasher – Identify presence
- Couch’s Spadefoot – Identify all ephemeral impoundment areas
- Natural and Artificial Water Sources – Identify presence within 0.25 miles

Desert Tortoise. Per the USFWS (1992) protocols, 100 percent of the ROWs were surveyed using parallel, 30-foot-wide, pedestrian belt transects. The transmission ROW was 200 feet wide. The surveyed water pipeline ROW was 60 feet wide to account for minor route shifts in the final 30-foot-wide ROW. In addition, 30-foot-wide “Zone-of-influence” (ZOI) transects were walked on both sides of the ROWs at 100, 300, 500, 1200, and 2400 feet from the outer edges of the ROWs. (The 500-foot ZOI coincided with the 500-foot buffer transect for burrowing owls; *see* Burrowing Owls below.) The exception to this occurred where the ROWs went through jojoba farms. These are not tortoise habitat, although it is recognized that a tortoise could move in from adjacent native habitat, even if unlikely. Burrowing owls and other special-status vertebrates were, however, possible. So, in addition to full ROW transects, ZOIs/buffer transects were walked at 100-foot intervals out to 500 feet. ZOIs through fenced or residential properties also were not walked, but were visually inspected from the edges of the property.

In all years, all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains) that were observed were measured, mapped and described relative to condition, size, and (where applicable) gender. Current and recent weather conditions were recorded to identify the potential for tortoise activity and the topography, drainage patterns, soils, substrates, plant cover, anthropogenic disturbances, and aspect-dominant, common and occasional plant species were described and mapped. Mapping sign and habitat features was achieved using Global Positioning System (GPS) units. Every mile of ROW and ZOI transects was photographed.

Burrowing Owl. CDFG require protocol surveys for burrowing owls that are consistent with the CBOC Guidelines (CBOC 1993). The guidelines project a set of consecutive surveys, each following the previous based on the latter's results:

- Phase I: Habitat Assessment – This "first step in the survey process is to assess the presence of burrowing owl habitat on the project site including a 150-meter (approximately 500 feet) buffer zone around the project boundary..."

  "The Phase II burrow survey is required if burrowing owl habitat occurs on the site. If burrowing owl habitat is not present on the project site and buffer zone, the Phase II burrow survey is not necessary."

- Phase II: Burrow Survey – "A survey for burrows and owls should be conducted by walking through suitable habitat over the entire project site and in areas within 150 meters (approximately 500 feet) of the project impact zone. This 150-meter buffer zone is included to account for adjacent burrows and foraging habitat outside the project area and impacts from factors such as noise and vibration due to heavy equipment which could impact resources outside the project area."

- Phase III: Owl Presence – "If the project site contains burrows that could be used by burrowing owls, then...surveys in the breeding season are required to describe if, when, and how the site is used by burrowing owls. If no owls are observed using the site during the breeding season, a winter survey is required." The survey methodology requires four site visits, each on a separate day. Birds are observed from two hours before sunset to one hour after sunset, or from one hour before sunrise to two hours after sunrise. The four visits are initially conducted during the nesting season, February 1 to August 31, although

> it is preferable to survey at the height of the breeding season, between April 15 and July 15. If no owls are observed during the nesting season, then “winter surveys should be conducted between December 1 and January 31... (to) count and map all owl sightings, occupied burrows, and burrows with owl sign.”

The Project area is known to host burrowing owl habitat based on surveys in 2008 (i.e., Phase I requirement). In 2009, Phase II surveys were completed concurrent with the desert tortoise/ biological surveys because the latter cover the entire site. The CBOC Guidelines suggest a buffer (≅ ZOI) transect every 100 feet from the Project footprint for the Phase II surveys. To meet this objective, a buffer transect was walked at 100-foot intervals from all ROW edges, even through jojoba farms. Transects at 100 and 300 feet coincided with those for the desert tortoise at 100 and 300 feet. To meet the burrowing owl requirement for a buffer transect at 500 feet, the desert tortoise ZOI was moved to 500 feet, from 600 feet.

Other Special-Status Species. Surveys for other special-status wildlife and plants were concurrent with the desert tortoise and burrowing owl surveys. A plant and wildlife inventory was made during the general biological survey. Raptor nests and eyries were sought during ZOI transects.

Vegetation Mapping and Special Habitats. Habitats were described and mapped during the biological surveys. Surrounding anthropogenic and natural features that could provide insight into populations of special-status species, including population functioning (e.g., corridors), and existing or anticipated impacts to special-status species were identified and mapped.

Natural and Artificial Water Sources. During biological surveys, any ephemeral, permanent, natural, or artificial water sources, including ephemeral impoundments, on or affected by the Project were sought and mapped.

Golden Eagle Surveys. Helicopter surveys for golden eagles were conducted using the 2010 USFWS Interim Guidelines for Golden Eagle Surveys within a 10-mile radius of the proposed Project.

3.5.3.2 Significance Criteria

The State Water Resources Control Board (SWRCB) concludes that the Project may have significant impacts on biological resources if the Project does any of the following:

(a) Have a substantial adverse effect, either directly or through habitat modifications, on any species indentified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community indentified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

(c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other measures.

(d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

(e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

(f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

3.5.3.3 Environmental Impact Assessment

Project effects and potential impacts to biological resources are analyzed for two project phases: (1) the construction phase and (2) the operation/maintenance (O&M) phase.

3.5.3.3.1 *Construction*

Construction activities associated with the Project include: (1) development of the Central Project Area to accommodate the Project, (2) construction of the transmission line, and (3) construction of the water conveyance and supply system.

Construction of the Central Project Area facilities includes:

- Building of the dams at the upper reservoir.
- Application of seepage control grouting in the lower reservoir.
- Construction of the tunnels, and underground surge control facilities and powerhouse using blasting and boring.
- Construction of storage and administration buildings.
- Excavation of water treatment ponds.

Construction of the transmission line includes:

- Preparation of staging/laydown areas.
- Access road and spur road construction/improvement.
- Clearing and grading of lattice tower sites.
- Foundation preparation and installation of lattice towers.
- Wire stringing and conductor installation.
- Temporary parking of vehicles and equipment in construction zones.
- Equipment laydown/storage.
- Cleanup and site reclamation.

Construction of the water pipeline collection system includes:

- Site preparation and trenching.
- Installation, covering and testing of the pipeline.
- Temporary parking of vehicles and equipment in construction zones.
- Equipment laydown/storage.
- Cleanup and site reclamation.

Equipment required for construction includes bulldozers, backhoes, graders, air compressors, man lifts, generators, drill rigs, truck-mounted augers, flatbed trucks, boom trucks, rigging and mechanic trucks, small wheeled cranes, concrete trucks, water trucks, crew trucks, a tunnel boring machine, and other heavy equipment.

The Project is scheduled to begin the 4-year construction period in June 2012, beginning operations in July 2015, with the entire Project becoming operational in 2016. The expected term of the FERC license is 50 years.

Plants. Based on occurrences identified from Project surveys in 2008 and 2009, plus other surveys in the Project area (Table 3.5-2 and Appendix A), there are six special-status plant species that are unlikely to be affected by Project construction: Abram's spurge, Arizona spurge, dwarf germander, flat-seeded spurge, glandular ditaxis, and sand evening primrose. All but sand evening primrose would be restricted to the water pipeline in the valley portions of the ROW. None was found during surveys, but the possibility exists that these plants might be present. Because of the low likelihood of their presence, impacts to populations by the loss of individuals or habitat should be considered low.

Five special-status plants – California ditaxis, crucifixion thorn, desert unicorn plant, foxtail cactus, and Wiggins' cholla – were observed on the ROWs and will experience loss during construction. All are likely to also occur on those portions of the transmission line and water pipeline that were unable to be surveyed due to denied access. Population effects are likely to be minor.

1. Three of the species – California ditaxis, foxtail cactus, and Wiggins' cholla – are common in the Project area. Inherently, then, losses are unlikely to create a major impact on the populations. Furthermore, Project mitigation will incorporate avoidance, transplanting, and site reclamation techniques that will mitigate and enhance plant survival and population growth.

2. Wiggins' cholla is not recognized as a species, but as a hybrid. The parent species, pencil cholla and silver cholla, are very common.

3. Very few individuals (<5) of either crucifixion thorn or desert unicorn plant will be affected. Crucifixion thorn can probably be avoided. Desert unicorn is a species of disturbed places that receive increased water, including washes, but also road shoulders.

Site reclamation techniques will include the construction of swales to promote growth of desert unicorn plant.

Three species – Coue's cassia, Las Animas colubrina, and Orocopia sage – may occur on those portions of the transmission line and water pipeline that were unable to be surveyed due to denied access. They were not found on the remainder of the ROWs, so the total number of plants likely to be affected is probably low. Invasive, non-native plant species are already present in the area but may be spread as a result of construction. Pre-construction surveys, controls during construction, and post-construction weed abatement will be employed to minimize or eliminate this impact.

Construction in the Central Project Area will take place entirely on highly disturbed, heavily mined areas. The water conveyance tunnels connecting the two reservoirs and the powerhouse will be entirely underground. However, there may be some areas in the mined pits that have biological resources that have regenerated naturally. If regeneration has occurred, it is likely that the plant population will be represented by exotic, invasive species.

On the transmission line and water pipeline corridors, impacts to vegetation will be limited to the loss of habitat and individuals. Based on habitat mapping, it is anticipated that a Project total of at least 60.3 acres of Sonoran Creosote Bush Scrub and 19.7 acres of Desert Dry Wash Woodland will be lost or impacted during construction[2] (Table 3.5-1). Among these communities are a number of species that are not special-status, but are protected by the CDNPA, including the following species that occur in the Project area:

- Catclaw acacia
- Smoke tree
- Ironwood
- Ocotillo
- Mojave yucca (Y*ucca schidigera*)
- Desert Unicorn Plant
- Blue palo verde
- All cacti

While the loss of native habitat for the sole purpose of construction (as opposed to maintenance) is temporary, it should be considered semi-permanent for the Colorado Desert. Natural regrowth is constrained by limited and unpredictable precipitation and can require several decades to approach pre-disturbance conditions. Population impacts are generally expected to be both minor and highly localized for those species that might be affected by habitat loss or loss of individuals during construction of the linear facilities. This is due to the small footprint of habitat physically

[2] The only acreage not included in this calculation is pulling and tensioning sites for transmission line construction, assumed to be included in the corridor ROW.

disturbed relative to the surrounding available habitat and probable and/or documented populations.

There will be no permanent impacts on plant growth that could affect either foraging or shelter for wildlife.

Wildlife. The schedule of construction for the entire Project spans 4 years, but construction of the linear facilities will be completed in less than 1 year. The assessment of the effects on wildlife must include not only the presence of wildlife, but the anticipated activity levels, which will be affected by weather conditions, forage and prey availability, and season.

Disturbance of wildlife due to construction in the Central Project Area may temporarily deter wildlife from using the Central Project Area. Due to lack of habitat for most wildlife species (except bats), avoidance of the Central Project Area due to construction activities should not cause an impact. Noise levels during construction in the Central Project Area are not anticipated to exceed typical noise levels for construction, and blasting and boring for the tunnels and powerhouse facilities will be conducted deep underground with concomitant buffering of associated noise (*see* Section 3.14 Noise).

Construction activities, which will produce noise and increased human activity, may temporarily disrupt bighorn sheep movement in the Central Project Area, although all existing springs that are used by bighorn sheep will still accessible through native habitat outside the Central Project Area and inside the Central Project Area outside of the reservoirs.

No effects on Couch's spadefoot are anticipated unless artificial impoundments that could support reproduction are found to be present. In the event this occurs, the mitigation program includes the NECO Plan which would be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments (MM BIO-9).

There is a possibility for several special-status bat species that may roost or feed in the Central Project Area to be affected. The Pallid bat, California leaf-nosed bat, Townsend's big-eared bat, and western mastiff bat are known from the Central Project Area; pallid bat and western mastiff bat, which roost in rock crevices as opposed to adits and mine shafts, particularly may be affected by any disturbance of rock faces, including pit walls (MM BIO-15).

Construction and filling of reservoirs may result in losses of any bats that are roosting in the pit walls. Birds and resident bats could be exposed to sodium, and other elements harmful to birds, in the brine ponds. On the linear facilities, direct impacts from construction will include habitat loss and may include temporary disturbance to and/or the loss of individuals. With the exception of bats, population impacts are generally expected to be both minor and highly localized for those wildlife species that might be affected by habitat loss, temporary loss of use of the construction area, or loss of individuals during construction.

Increased traffic during construction may result in increased losses of terrestrial wildlife, although these are expected to be minor (MM BIO-16 through MM BIO-20).

On the linear facilities, direct impacts from construction will include habitat loss and may include temporary disturbance to and/or the loss of individuals. Special habitat resources, such as specific burrowing sites, may be lost during Project construction (MM BIO-12 and MM BIO-13). Any population impacts to those species that are affected by habitat loss on the linear facilities are generally expected to be minor due to the small footprint of habitat physically disturbed relative to the surrounding available habitat. However, all surface disturbance during construction that results in the removal or displacement of vegetation and soil is considered to be a semi-permanent loss.

Wildlife may experience temporary disruption of normal movements to achieve feeding, breeding, sheltering, and dispersal on the linear facilities. This could occur due to the noise and congestion associated with construction, but also may result from mitigation associated with construction of any Project component that includes erecting temporary exclusion fencing. Although some animals may be temporarily disturbed by construction activities and abandon the area, others will become habituated to human activity (e.g., loggerhead shrike). All animals displaced due to construction on the linear facilities would be able to return to the area once construction activities cease (BIO MM-16 through BIO MM-20).

On the linear facilities, those species with relatively limited mobility – i.e., those that are underground or sequestered during most of the day or year (e.g., Couch's spadefoot) or those that have a life stage in the soil or on plants (e.g., insects, nesting birds) – are more likely to experience losses of individuals than more mobile species. Similarly, species with highly localized and specific microhabitat preferences that may be unavoidable (e.g., chuckwalla), may experience losses due to lack of detection, even with a diligent construction monitoring program.

With the exception of bats, population impacts are generally expected to be both minor and highly localized for those wildlife species that might be affected by habitat loss, temporary loss of use of the construction area, or loss of individuals during construction. This is due to the small footprint of habitat physically disturbed relative to the surrounding available habitat and probable and/or documented populations.

Indirect impacts from Project construction will include increased traffic on roads that service the Project. This may result in increased losses of terrestrial wildlife, although these are expected to be minor based on Project traffic assessments (*see* Section 3.12 Transportation and Traffic).

Indirect impacts could also include dust deposition on neighboring vegetation. This is expected to be both temporary and minimized by maintaining air quality standards (*see* Section 3.13 Air Quality).

Seeps, Springs and Dry Desert Washes. NECO requires the following mitigation measures for seeps and springs:

- Avoid construction disturbance of any seep or spring for the duration of a project.
- Close any routes within ¼-mile of any seep, spring, or guzzler.

Also encouraged under NECO is the improvement of seeps and springs that may be in need of rehabilitation, including but not limited to, removing exotic vegetation (e.g., tamarisk), planting native species, excluding livestock and burrows, eliminating water diversions, and controlling bird pests (e.g., starlings).

At this time, it is not anticipated that any seeps, springs or guzzlers will be affected or be within a ¼-mile of the Project. A thorough examination of the Central Project Area during pre-construction surveys (PDF BIO-1) will provide information to determine if any avoidance or adaptive management is required.

Available information indicates that springs in the mountains surrounding the Central Project Site are not hydrologically connected to the Pinto or Chuckwalla Valley basin aquifers since they are located in the mountains above the Pinto and Chuckwalla basins. These springs appear to be fed by local groundwater systems that would be unaffected by pumping for the proposed Project (NPS, 1994; *see also* Section 3.3, Groundwater Resources). Since flow from the springs is unlikely to be affected by the Project, the vegetation and functions supported by these springs is also unlikely to be affected by the Project.

Since there are no wetlands in the Project vicinity, there will be *no impacts* to wetlands.

There are many small washes crossed by the pipeline and transmission line that will be regulated by the CDFG under Section 1602 of the CDFG Code. Transmission line towers will be sited to avoid dry desert washes. However, the water pipeline will be a continuous linear feature that will be buried under any dry washes along the route. A Streambed Alteration Agreement will be developed with the CDFG to address the condition and location of all washes and mitigation measures to protect those washes.

3.5.3.3.2 *Operation and Maintenance*

Operation and maintenance activities associated with the Project will primarily be restricted to the Central Project Area, but will also include infrequent routine, as well as unscheduled, maintenance on the transmission line, pipeline, and wells. The following discussion summarizes the impacts to biological resources that may result from the presence and functioning of the Project.

Plants. Plant community structure and resulting fauna may be altered if non-native invasive species that are currently in the area spread during construction and/or maintenance activities.

Maintenance of tower pads, access and spur roads on the transmission line would perpetuate the vegetation loss of tower pads and roads and, potentially, increase the spread of non-native, invasive vegetation.

It is unlikely that native vegetation will proliferate in the reservoir sides as they are exposed by daily and weekly rising and falling water levels. Cattails (*Typha* sp.) and sedges that grow in inundated mud and shallow water could begin to grow. However, with each reservoir filling, any plants that grew below the high water mark would be submerged, a situation that would probably eliminate them.

Wildlife. Continued loss of resources to wildlife due to habitat lost during construction is expected to be functionally negligible for most species, based on the minor expected habitat loss on the linear facilities and lack of habitat on the Central Project Area. However, two taxa, birds and bats, may experience non-negligible losses (discussed in more detail below).

Due to the small footprint of the transmission line, and infrequent maintenance activities, it is anticipated that losses of individuals or resources provided by intact habitat from onsite Project impacts will be minor to negligible.

Offsite, wildlife may also experience indirect, adverse effects from Project operation. Such effects that are considered include:

- Loss of special biological resources (e.g., springs and seeps) due to their proximity to Project operations.
- Loss of dispersal areas and connectivity to other areas.
- Altered home ranges and social structure.
- Facilitated ingress into the Project area from Project features.
- Altered plant species composition due to the introduction of exotic vegetation.
- Increased depredation by predators attracted to the site.

On neither the Central Project Area nor the transmission or pipeline corridors will project operations result in greater disturbance than currently exists. The water pipeline and transmission line will present no physical barrier or deterrent to movement, so will not affect the normal movements of wildlife to achieve feeding, breeding, sheltering, dispersal migration, or access to resources currently utilized. The substation would present a small barrier to movement, but it is adjacent to the town of Desert Center, the frontage road and Interstate 10, so it is unlikely that many wildlife species would be further affected. The Central Project Area has been developed as a mine for decades, so its development for the Project would not cause an incremental change that would affect wildlife use of the site.

Because of the existence of many roads in the area of the water pipeline, it is not anticipated that any new recreational access, with concomitant habitat degradation and potential species loss, will be provided by the water pipeline ROW. Similarly, roads that service the Project are already in regular daily use by Kaiser employees and local residents. Long-term operational traffic associated with the Project is anticipated to provide a negligible incremental increase over current levels (*see* Section 3.12 Transportation).

While the current use of the Central Project Area by bighorn sheep is unknown, it is assumed that sheep may still be in the vicinity of the Central Project Area. The existing mining pits, which will become Project reservoirs, are not habitat that can be used by sheep for migration or other activities. The site has been extensively mined for decades and development of a hydroelectric project will not increase negative impacts. Access to Buzzard Spring, as well as other movements, will not be further affected by use of the mining pits for the Project.

Once operational, the reservoirs will provide a consistent water source for bighorn sheep in a relatively safe environment. Water emptying from the upper reservoir will do so at a slow rate, and the reservoirs will always contain some water in storage. Permanent security fences will be installed around the upper and lower reservoirs, switchyard and brine ponds, for security, safety and general liability purposes, and will prevent wildlife access except at designated drinking points. Fences will contain "dips" where the fence will go below the high water mark so that wildlife can reach the water for drinking (*see* attached figure). These fences will also be equipped with tortoise exclusion fencing. In addition, temporary tortoise exclusion fences will be installed around work zones during construction, and will be sufficiently low (3 feet) to permit passage by sheep. These temporary fences will be removed at the end of construction.

Post-construction operations will include only limited vehicular traffic (less than 5 round trips per day) in the area where sheep previously have been observed. No further disturbance will occur.

Project lands include no streams or ponds that could support any species of fish, and there will be *no impacts* to fish resources. No artificial water impoundments were detected in examination of recent aerial photographs of the Central Project Area.

Predators. Predators in the project area include common ravens and coyotes. It is known that both ravens and coyotes are present on in the Project area. Ravens were detected during biological surveys for the proposed landfill project, and were also observed during biological surveys for the pumped storage project. Coyote scat was detected during biological surveys for the pumped storage project. The presence of both species reflects past and present human use in the project area which provides these animals food, water and some shelter. Coyotes are another predator species of concern in the Project area.

Common ravens, in particular, are predators as well as scavengers, and may increase as a result of the reservoirs providing a new and secure water supply. However, the Eagle Mountain townsite currently appears to have open water resources (water treatment plant) that support the school and employees. Other open water sources include the CRA, the MWD Eagle Mountain Pump Station, and the ponds at Lake Tamarisk. A simple increase in the quantity of water when it is already fully available does not change the availability to opportunistic predators.

Both construction and operational activities consist of project design features and mitigation measures such as designed trash deposition, avoidance areas, biological monitoring (MM BIO-

1), as well as Raven Monitoring and Control Plan (MM TE-5) to reduce predator abundance. As such, it is not likely that there would be a measurable change in the density of predators, or, as a result, a significant change in impacts to local fauna.

Birds. The transmission line will be the first such structure along this route. As such, the elevated structures and wires will be new to birds in the area, which could experience losses through collisions with wires or electrocution. Project design features, which increase the distance between wires so that birds cannot touch the ground wire and "hot" wires simultaneously will eliminate electrocutions.

It is anticipated that birds protected by the Migratory Bird Treaty Act (MBTA), plus resident shorebird species, other birds, and resident bats may be attracted to the brine ponds at the Project that are associated with the reverse osmosis system, as well as the main reservoirs. The ponds and reservoirs would comprise a new water source in the region, and one located in the Pacific Flyway for migrating waterfowl. The reservoirs are not expected to constitute a significant impact to waterfowl as a water source, and the drawdown of water during peak power production is slow enough and at depth in the reservoirs such that floating birds could not be entrained in the intakes.

By virtue of their collection and evaporative function the brine ponds may concentrate naturally occurring arsenic, sodium, and other harmful elements. The source water has concentrations of nitrate, boron, fluoride, arsenic and total dissolved solids (TDS) that can exceed recommended drinking water standards (*see* Section 3.3 Groundwater). All water quality samples to date have found selenium levels to be below detection.

Groundwater TDS for the Project area has been measured at 275 to 730 mg/L; sodium has been measured at 16 to 350 mg/L (*see* Section 3.3 Groundwater). At a solar facility evaporation pond near Blythe, California, approximately 40 miles east of the Project, groundwater TDS of 960 to 1200 mg/L resulted in pond TDS of 41,000 and 53,000 mg/L. Sodium was calculated at approximately 37 percent of TDS, or approximately 355-444 mg/L in the groundwater and 15,170-19,610 mg/L in the pond water. The California Energy Commission determined that sodium concentrations >17,000 mg/L could cause physiological harm to migrating birds. (*See* Karl, 2005b, for a thorough treatment of this condition.) Based on this analysis, and the known levels of sodium and TDS in the groundwater that would serve the Project, it is likely that sodium in the Project brine ponds would exceed safe levels for migratory birds.

Exposure to arsenic, and/or other harmful elements may be exacerbated by bioaccumulation. This occurs when the harmful elements accumulate in plants (including phytoplankton, algae, and rooted plants) and invertebrates and then successively higher trophic levels in the food chain (e.g., bacteria, phytoplankton, algae, rooted plants, invertebrates, fish, waterfowl). Solute concentrations can also "biomagnify" (Lemly, 1977; Ohlendorf, 1989). Sodium toxicity to waterfowl has been documented to occur in desert brine ponds (LUZ Solar Partners, 2008) and is dependent not only on the water salinity, but exposure time; toxic effects can be enhanced by cooler ambient temperatures. The brine ponds will be managed to minimize access and attractiveness, and include a monitoring program to determine effectiveness of deterrent and water quality (MM BIO-11).

Golden Eagles. The Central Project Site is located in a highly disturbed, previously mined area. Therefore, operation of the proposed Project will not impact golden eagles. The water pipeline will be buried, and therefore will also not impact golden eagles. The transmission line has the potential to pose a threat of electrocution or collision to golden eagles. The risk of collision will be minimized because the transmission line will be very large (500 kV) and will use very large wires which will maximize visibility to birds. Electrocution risks will be minimized by designing the line using raptor guidelines. Wire spacing will be too large to allow birds to come in contact with more than one wire at a time.

Bats. In addition to potential impacts from ingesting potentially harmful levels of elements in the brine ponds, those bats that currently inhabit the Central Project Area may be affected.

Four species have been documented to roost in or near the Central Project Area: pallid bat, California leaf-nosed bat, Townsend's big-eared bat, and western mastiff bat. The initial debris clearing, seepage controls and filling of reservoirs may result in losses of any bats that are roosting in the pit walls. Pre-construction surveys will be conducted to determine the presence and condition of any roosting bat colonies (MM BIO-15). Once in operation, maximum reservoir volumes are fixed, and daily and weekly volume fluctuations in the two reservoirs as water is moved back and forth between them will have no effects on roosting bats.

Another possible consequence of the Project on the California leaf-nosed bat population is the loss of foraging habitat in close proximity to the Central Project Area. In radio-telemetry studies of *Macrotus* in the Cargo Muchacho Mountains, most bats foraged in the winter within a ½ of their deep warm mine roosts and stayed on the surface for brief periods. In the summer, bats traveled further, at least 5 miles from their roost while foraging among desert wash vegetation (Brown, 2000).

<u>Environmental Impact Summary</u>:

(a) *Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species indentified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service*? No. The Project is conditioned with Project design features and mitigation to reduce, avoid, or offset potential impacts.

(b) *Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community indentified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?* No riparian habitat is found in the project area, compensation is proposed for losses of desert tortoise habitat, dry desert washes, borrowing owl, and desert dry wash woodland.

(c) *Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other measures?* No federally protected wetlands occur on the Project site.

(d) *Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?* No. The Project is conditioned with Project design features and mitigation to reduce, avoid, or offset potential impacts. These measures include pre-construction surveys to further detect potential habitat paths on-site and measures to reduce any effect, minimizing site disturbance, and avoidance of known habitat areas, where possible. Resource agency standards for habitat compensation will be adopted for habitat loss for desert tortoise, burrowing owl, and Desert Dry Wash Woodland.

(e) *Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?* No. As designed the Project would conform to regulatory LORS.

(f) *Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?* No. As designed the Project would conform to regulatory LORS, and in [continued] agency consultation, where applicable.

Impact 3.5-1 Construction Impacts on Plants. This impact is *potentially significant and subject to the mitigation program* (MM BIO-1 through MM BIO-9, and PDF BIO-1 through PDF BIO-2). Pre-construction surveys and construction controls such as an employee awareness program, on-site Project Biologist, restricted areas, revegetation plan, and minimal surface disturbance plans will be employed avoid or reduce these impacts.

Impact 3.5-2 Construction Impacts on Wildlife Species. Within in the Central Project Area, the baseline condition of the habitat is highly disturbed, with limited wildlife use. The transmission line and water pipeline will cross higher quality habitat areas and may impact species occupying those areas. These impacts are *potentially significant and subject to the mitigation program* (MM BIO-1 through MM BIO-4, MM BIO-9 through MM BIO-20, MM BIO-22, PDF BIO-1, and PDF BIO-3). Pre-construction surveys and construction controls such as an employee awareness program, on-site Project Biologist, restricted hours and areas, habitat compensation, and minimal surface disturbance plans will be employed minimize or eliminate these impacts.

Impact 3.5-3 Operational Effects on Plant Species. Plant community structure and resulting fauna may be altered if non-native invasive species that are currently in the area spread during construction and/or maintenance activities increase both abundance and distribution of those species. These impacts are *potentially significant and subject to the mitigation program* (MM BIO-1 through MM BIO-8, PDF BIO-1, and PDF BIO-2). Pre-construction surveys and operational controls such as implementing an invasive plant monitoring and control plan, revegetation plan, and minimal surface disturbance plans will be employed minimize or eliminate this impact.

Impact 3.5-4 Operational Effects to Wildlife Species. Loss of resources to wildlife is expected to be functionally negligible for most species. The primary onsite impacts to species from operation of the Project are limited to loss of individuals that move onto the site, including during transmission line maintenance. Faunal community structure may be altered if predators are attracted to reservoirs due to available water or night lighting. These impacts are considered *potentially significant and subject to the mitigation program* (MM BIO-1 through MM BIO-4, MM BIO-9 through MM BIO-16, MM BIO-20, and MM BIO-22, and PDF BIO-4). Pre-construction surveys and operational controls such as wildlife fencing, brine pond management, employee awareness programs, adherence to survey recommendations, minimal surface disturbance plans, and habitat compensation will be employed to minimize or eliminate these impacts.

Impact 3.5-5 Indirect Impacts of Operation and Maintenance. Neither the Central Project Area nor the transmission or pipeline corridors will experience greater disturbance than currently exists. The Project will not affect the normal movements of wildlife. It is not likely that there would be a measurable change in the density of predators, or, as a result, a significant change in impacts to local fauna. Therefore, this impact is *less than significant*.

Impact 3.5-6 Impacts of Brine Ponds. Birds and bats may be affected by ingesting harmful elements and/or highly saline water in the brine ponds. This impact is *potentially significant and subject to the mitigation program* (MM BIO-11).

Impact 3.5-7 Transmission Impacts to Birds. Birds (including golden eagles) could be affected by collision with transmission lines or electrocution. This impact is *potentially significant and subject to the mitigation program* (PDF BIO-4).

Impact 3.5-8 Wetlands, Seeps, and Springs. Since there are no wetlands in the Project vicinity, there will be *no impacts* to wetlands. There will be *no impact* on seeps and springs in the Eagle Mountains. Available information indicates that these springs are not hydrologically connected to the Pinto or Chuckwalla Valley Basin aquifers since they are located in the mountains above the Pinto and Chuckwalla basins. Rather, they appear to be fed by local groundwater systems that would be unaffected by pumping for the proposed Project (NPS, 1994); also see Section 3.3 Groundwater Resources. Since flow from the springs is unlikely to be affected by the Project, the vegetation and functions supported by these springs is also unlikely to be affected by the Project.

Impact 3.5-9 Dry Desert Washes. There are many small washes crossed by the pipeline and transmission line that will be regulated by the CDFG under Section 1602 of the CDFG Code. This impact top local washes may include degradation or loss of wash habitat, which would be monitored and limited under standard terms of the Streambed Alteration Agreement; and which will identify the condition and location of all State jurisdictional waters, impacts, and mitigation measures. This impact is considered *potentially significant and subject to the mitigation program* (MM BIO-21).

Impact 3.4-10 Operational Effects to Fish Species. Project lands include no streams or ponds that could support any species of fish, and there will be *no impacts* to fish resources.

3.5.4 Mitigation Program

The mitigation program includes project design features and mitigation measures. Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts to below a level of significance, where applicable. As appropriate, performance standards have been built into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of CEQA review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

PDF BIO-1. **Pre-Construction Special Species and Habitat Survey**. Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2.

PDF BIO-2. **Pre-construction Plant Survey.** Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 and 2009 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape.

Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approvedin the Re-Vegetation Plan. Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).

PDF BIO-3. **Pre-construction Mammals Surveys.** Prior to construction, surveys will be conducted for all burrows that might host a badger or kit fox. (These surveys can be simultaneous with those for desert tortoise burrows.) Active burrows and all fox natal dens will be avoided, where possible. The perimeters of all avoidance areas will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape.

Where avoidance is infeasible, occupancy of burrows will be determined through fiberoptics and/or night vision equipment. All occupants will be encouraged to leave their burrows using one-way doors, burrow excavation in the late afternoon/early evening (to encourage escape at night), or other approved methods. All burrows from which badgers or foxes have been removed will be fully excavated and collapsed to ensure that animals cannot return prior to or during construction.

PDF BIO-4. **Raptor Protection of Transmission Line**. Eagle Crest Energy Company (ECE) will design and construct raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation. The design plan (filed for Commission approval) will include adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.

3.5.4.1.1 *General Biological Mitigation Measures*

Mitigation measures proposed in this section are based on the presence of biological resources – especially special-status resources and those protected by laws and regulations – and the analysis of Project effects on those species.

These mitigation measures are consistent with the NEPA Handbook (BLM, 2007), NECO Plan (BLM and CDFG, 2002), and standard agency recommendations for similar impacts. Avoidance of biological resources is the preferred method to minimize Project impacts. If avoidance is not possible, then minimization techniques are identified that will mitigate Project effects. Additionally, site restoration along the transmission line and water pipeline corridors will assist in repairing affected habitats and minimizing long-term Project effects. Off-site compensation is a final category of mitigation that can be used to mitigate impacts to special-status species and habitats when avoidance and disturbance cannot be avoided.

Several monitoring and/or control plans are identified here that have been developed, in draft, in consultation with the resource agencies (USFWS, NPS, CDFG, and the BLM). These plans are included in Section 12.14. Continuing consultation will be conducted concurrent with review of the Draft EIS and Draft EIR and development of the Final EIS and Final EIR. The salient features for all measures and plans are summarized here to verify that they are a part of Project environmental measures.

Several mitigation measures that are identified for desert tortoises (*see* Section 3.6 Threatened and Endangered Species) will also assist in minimizing impacts to other wildlife species. In order to reduce redundancy, they are not repeated here as stand-alone BIO mitigation measures, but include the following:

- Construction Monitoring (MM TE-2)
- Raven Monitoring and Control (MM TE-5)
- Habitat Compensation (MM TE-6)

MM BIO–1. **Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG).

Implementation Timing: final engineering/pre-construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Biological Technical Advisory Team/Project Biologist

Responsible Agency(ies) for verification and enforcement: FERC/SWRCB/BLM/ USFWS/CDFG

MM BIO-2. **Biological Reporting to Resource Agencies.** As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies.

Implementation Timing: final engineering/pre-construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist

Agency for verification and enforcement: FERC/SWRCB/BLM/ USFWS/CDFG

MM BIO–3. **Designation of an Authorized Project Biologist.** An authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - “Authorized Biologist.” Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist.

Implementation Timing: final engineering/pre-construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator / Biological Technical Advisory Team/ Project Biologist

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

MM BIO–4. **Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance.

The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas, looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee.

The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors.

All workers completing the education program shall be given a wallet card with site “rules” and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program.

Implementation Timing: construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB/BLM

Plants

MM BIO–5. **Minimize Surface Disturbance.** During construction in native habitats, all surface disturbance shall be restricted to the smallest area necessary to complete the construction. New spur roads and improvements to existing access roads shall be designed to preserve existing desert wash topography and flow patterns. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires the following mitigation measures for plants:

- Avoid plant populations during construction. Where avoidance is not practical, Project effects on the species and population must be assessed.
- Require mitigation of project impacts in suitable habitat within the range of the impacted species, using commonly applied mitigation measures.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB/BLM

MM BIO-6. **California Desert Native Plants Act.** In compliance with the California Desert Native Plants Act (CDNPA),, the County Agricultural Commissioner shall be consulted for direction regarding disposal of plants protected by the CDNPA. This may include salvage for subsequent revegetation of temporarily disturbed areas on site, salvage by an approved nursery, landscaper or other group, or other methods of disposal.

Implementation Timing: final engineering/construction

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/County Agricultural Commissioner

MM BIO-7. **Revegetation Plan.** A revegetation plan (*see* Section 12.14) shall be implemented for areas that are temporarily disturbed during construction. In order to accommodate the specific features of the desert that make revegetation difficult – namely lack of predictable rainfall, lack of an “A” soil horizon, and the difficulty of re-establishing a soil community of micro-organisms – a detailed Revegetation Plan shall address the following measures and include:

- Quantitative identification of the baseline community, both annual, herbaceous perennial and woody perennial species.
- Soil salvage and replacement on areas to be revegetated.
- Final site preparation and grading to include features that enhance germination and growth of native species. This includes surface pitting for the accumulation of sediments, water and seed and the construction of small swales for such species as California ditaxis and desert unicorn plant, which are commonly found in road swales and shoulders. All disturbed washes shall be recontoured to eliminate erosion and encourage the reestablishment of the drainage to its pre-construction condition.
- Vertical mulching and other techniques to promote a hospitable environment for germination and growth.
- Seeding and/or planting of seedlings of colonizing species.
- Development of a soil micro-community by inoculation of mycorrhizal fungi and planting species that develop a mycorrhizal net.
- Weed control.
- Initial irrigation, if necessary.
- A realistic schedule of regrowth of native species, and remedial measures, if needed.
- Monitoring and reporting.

Implementation Timing: final engineering/construction

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB/BLM

MM BIO-8. Invasive Species Monitoring and Control. To minimize the spread of invasive non-native vegetation a weed control program shall be implemented during construction. This program (*see* Section 12.14) includes:

- Baseline surveys for weed species that are present and/or are most likely to invade the Project site and surrounding area.
- Methods quantifying weed invasion.
- Methods for minimizing weed introduction and/or spread.
- Triggers which prompt weed control.
- Methods and a schedule for weed control and eradication.
- Success standards.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB/BLM/ USFWS/CDFG

Wildlife

MM BIO-9. **Couch's Spadefoot.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requirements shall be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments. Surveys on the Central Project Area shall elucidate the presence of any artificial impoundments that could subsidize Couch's spadefoot reproduction. Should those exist then surveys shall be conducted at the appropriate time to determine if larvae are present. If present, the impoundment will be avoided, if possible. If avoidance is not possible, then a new impoundment will be constructed as close as is feasible, to replicate and replace each lost impoundment. All larvae shall be removed to the new impoundment with similar characteristics.

During construction on all Project facilities, should ephemeral pools develop in response to intense rainfall showers from early spring through fall these shall be examined for larvae of Couch's spadefoot. If larvae are present, the pools shall be flagged and avoided by construction activities. Where pools cannot be avoided, new pools shall be constructed and larvae transplanted by the Authorized Project Biologist.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB

MM BIO-10. **Breeding Bird Surveys and Avoidance.** For all construction activities in vegetated habitat that are scheduled to occur between approximately February 15 and July 30, surveys shall be completed in all potential nesting sites for active bird nests. Unless otherwise directed by the CDFG, if an active bird nest is located, the nest site shall be flagged or staked a minimum of five yards in all directions. This flagged zone shall not be disturbed until the nest becomes inactive. Alternatively, grading and site preparation may occur prior to February 15 to preclude interference with nesting birds.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/CDFG

MM BIO-11. **Brine Ponds Management.** Brine ponds shall be managed to minimize their attractiveness and access to migratory birds. This consists of making resources provided by the ponds less available (by designing the ponds to be unattractive to birds) and netting the ponds to prevent access by birds (Figure 3.5-19).

Implementation Timing: final engineering/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/SWRCB

MM BIO-12. Burrowing Owls Phase III Survey. Based on the results of the 2009 surveys, a Phase III survey shall be completed to further assess bird use of the Project area and potential impacts (CBOC, 1993). This includes a nesting season survey, followed by a winter survey if no burrows or owls are observed during the nesting season. Each of these surveys shall spansseveral visits and days.

A pre-construction survey shall be conducted within 30 days of the start of Project construction to assess species presence on-site. Recommendations from the surveys shall be implemented as adaptive management measures.. In consultation with CDFG, the pre-construction survey may obviate the need for the Phase III survey.

Implementation Timing: pre-construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/SWRCB

MM BIO-13. Burrowing Owl Breeding Season. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan limits the construction period to September 1 through February 1 if burrowing owls are present, to avoid disruption of breeding activities. CDFG (1995) has recommended several mitigation measures for resident owls. Disruption of burrowing owl nesting activities shall be avoided during construction. Active nests shall be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging, owls may be passively relocated.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB

MM BIO-14. Raptor Buffer. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan identifies ¼-mile as an important buffer distance for prairie falcon or golden eagle aerie. No aeries or nests have been observed within a ¼ mile, but pre-construction surveys on the Central Project Area will confirm if a ¼-mile construction buffers will be required during the nesting seasons.

Implementation Timing: pre-construction/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/BLM

MM BIO-15. **Bat Survey.** The following applicable measures are required by the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan:

- Survey for bat roosts within 1 mile of a project, or within 5 miles of any permanent stream or riparian habitat on a project site.
- Projects authorized within 1 mile of a significant bat roost site would have applicable mitigation measures, including, but not restricted to seasonal restrictions, light abatement, bat exclusion, and gating of alternative sites. Any exclusion must be performed at a non-critical time, by an authorized bat biologist.

Pre-construction bat surveys shall be completed by a qualified bat biologist to determine the existence, location and condition of bat roosts on the site. Because foraging areas used by resident bats may be critical to the functioning of those colonies, foraging habitat on the Project also will be identified, if possible. If needed based on the results of these surveys, a mitigation plan shall be developed to avoid roosting and foraging impacts to resident bats, minimize that disturbance or, as an inescapable measure, evict bats. This plan shall include (as relevant):

- Designation of avoidance areas and associated measures.
- Eviction of bats outside of the maternity season.
- A monitoring program to determine impacts from the Project.
- Extending the monitoring program for the brine ponds to include bats, as deemed necessary.

Implementation Timing: pre-construction/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB

MM BIO-16. **Wildlife Fencing.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan recommends fencing potential hazards to bighorn sheep. A security fence shall be constructed around portions of the Central Project Area to *exclude larger terrestrial wildlife* – bighorn sheep, deer, coyotes, foxes, badgers – from entering Project areas that could pose a hazard to these species (Figure 3.6-4). Such areas shall include the transmission switchyard and other structures that may be dangerous to wildlife. Where exclusion fencing is required, security gates will be remain closed except during specific vehicle entry and may be electronically activated to open and close immediately after vehicle(s) have entered or exited.

Permanent security fences will be installed around the upper and lower reservoirs, switchyard and brine ponds, for security, safety and general liability purposes, and will prevent wildlife access except at designated drinking points. Fences will contain "dips" where the fence will go below the high water mark so that wildlife can reach the water for drinking. These fences will also be equipped with tortoise exclusion fencing. In addition, temporary tortoise exclusion fences will be installed around work zones during construction, and will be sufficiently low (3 feet) to permit passage by sheep. These temporary fences will be removed at the end of construction. Figure 3.6-4 shows the concept for the temporary construction fencing, if additional fencing is needed during construction to protect tortoises, this fencing will be installed and maintained during the construction period.

All required exclusion fencing shall be maintained for the life of the Project. All fences will be inspected monthly and during/following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately, followed by permanent repair within one week.

Implementation Timing: final engineering/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: FERC/BLM

MM BIO-17. **Construction and Operation Restricted Areas.** Construction and maintenance activities shall be restricted to minimize Project impacts. These restrictions shall include vehicle speed limits on both paved and dirt roads (the speed limit shall be based on County regulations); avoidance areas, work areas in which workers must be accompanied by a biological monitor, specified parking areas, trash deposition, repair, and refueling areas; looking under parked vehicles prior to movement; and the appropriate response upon finding a special-status species. For construction, this will include the entire construction period. For operations, this will apply to scheduled and unscheduled maintenance activities.

Implementation Timing: final engineering/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist/Contractor

Responsible Agency for verification and enforcement: BLM

MM BIO-18. **Construction during Daylight Hours.** The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan requires that, in areas without wildlife exclusion fencing or those areas that have not been cleared of tortoises, construction activities will only take place during daylight hours. This permits avoidance of construction-related mortalities of fossorial, diurnal species such as the desert tortoise, or nocturnally active species, such as the desert rosy boa.

Implementation Timing: final engineering/construction

Party responsible for implementation, monitoring and reporting: Project Biologist/ Contractor

Responsible Agency for verification and enforcement: BLM

MM BIO-19. Construction of Pipeline Trenches. The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan identifies that pipeline trenches must be closed, covered, and/or inspected. Pipeline trenches shall be closed, temporarily fenced, or covered each day. Each day, any open trenches shall be inspected by an approved biological monitor, under the supervision of the Authorized Biologist, at first light, midday, and at the end of each day to ensure animal safety. Ramps shall be provided to encourage animals to escape on their own. The biological monitor shall be confirmed by the Approved Project Biologist.

Implementation Timing: final engineering/construction

Party responsible for implementation, monitoring and reporting: Project Biologist/ Contractor

Responsible Agency for verification and enforcement: FERC/BLM

MM BIO-20. Minimize Nightime Lighting Impacts. Facility lighting will be designed, installed, and maintained to prevent casting of nighttime light into adjacent native habitat. *See also* MM AES-1.

Implementation Timing: final engineering/construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agency for verification and enforcement: FERC/SWRCB

Special Habitats

MM BIO-21. Dry Desert Washes. There are many small washes crossed by the pipeline and transmission line that are regulated by the CDFG. A Streambed Alteration Agreement (Section 1602 of the CDFG Code) shall be obtained, which will identify the condition and location of all State jurisdictional waters, impacts, and mitigation measures. Mitigation includes the acreage assessment of washes that may be affected, construction requirements associated with working on or near the washes, and compensation for lost or damaged acreage. It is anticipated that this compensation will be included in the habitat compensation for special-status species (MM BIO-22 and MM TE-6).

Implementation Timing: pre-construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist

Responsible Agency for verification and enforcement: FERC/CDFG

MM BIO-22. Habitat Compensation. CDFG standard off-site compensation for loss of occupied burrowing owl habitat consists of a minimum of 6.5 acres of lands, approved by CDFG and protected in perpetuity, for each pair of owls or unpaired resident bird. In addition, existing unsuitable burrows on the protected lands should be enhanced (i.e., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1. Habitat compensation for burrowing owls, if needed, will be subsumed by compensation for lost desert tortoise habitat, which also constitutes burrowing owl habitat.

The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires compensation for disturbance of Desert Dry Wash Woodland in WHMAs at the rate of 3:1. The Project does not disturb any Desert Dry Woodland inside a WHMA. However, the compensation for desert tortoise habitat (148.9 acres of compensation habitat) that is lost to the Project will compensate for the loss of approximately 19.7 acres of Desert Dry Wash Woodland expected to be lost or disturbed during construction activities.

Implementation Timing: construction/life of Project

Party responsible for implementation, monitoring and reporting: Environmental Coordinator / Biological Technical Advisory Team/Project Biologist

Responsible Agency for verification and enforcement: FERC/BLM/CDFG/ USFWS

3.5.5 Level of Impact after Implementation of the Mitigation Program

Impact 3.5-1 Construction Impacts on Plants. Adherence to the mitigation program (MM BIO-1 through MM BIO-9, and PDF BIO-1 through PDF BIO-2) will result in *less than significant impacts.*

Impact 3.5-2 Construction Impacts on Wildlife Species. Adherence to the mitigation program (MM BIO-1 through MM BIO-4, MM BIO-9 through MM BIO-20, MM BIO-22, PDF BIO-1, and PDF BIO-3) will result in *less than significant impacts.*

Impact 3.5-3 Operational Effects on Plant Species. Adherence to the mitigation program (MM BIO-1 through MM BIO-8, PDF BIO-1, and PDF BIO-2) will result in *less than significant impacts.*

Impact 3.5-4 Operational Effects to Wildlife Species. Adherence to the mitigation program (MM BIO-1 through MM BIO-4, MM BIO-9 through MM BIO-16, MM BIO-20, and MM BIO-22 and PDF BIO-4) will result in *less than significant impacts.*

Impact 3.5-5 Indirect Impacts of Operation and Maintenance. Neither the Central Project Area nor the transmission or pipeline corridors will experience greater disturbance than currently exists. The Project will not affect the normal movements of wildlife. It is not likely that there would be a measurable change in the density of predators, or, as a result, a significant change in impacts to local fauna. Therefore, this impact is *less than significant.*

Impact 3.5-6 Impacts of Brine Ponds. Adherence to the mitigation program (BIO-11)will result in *less than significant impacts*.

Impact 3.5-7 Transmission Impacts to Birds. Adherence to the mitigation program (PDF -4) will result in *less than significant impacts.*

Impact 3.5-8 Wetlands, Seeps, and Springs. Since there are no wetlands in the Project vicinity, there will be *no impacts to wetlands*. There *will be no impact on seeps and springs* in the Eagle Mountains.

Impact 3.5-9 Dry Desert Washes. Adherence to the mitigation program (MM BIO-21) will result in *less than significant impacts.*

Impact 3.5-10 Operational Effects to Fish Species. Project lands include no streams or ponds that could support any species of fish, and there will be *no impacts to fish resources*.

All potential biological impacts can be mitigated to less than significant levels, and therefore, there are no significant impacts after the implementation of mitigation measures.

Environmental measures proposed here to minimize Project effects on biological resources have specifically addressed all potential Project effects, as well as agency concerns and known mitigation measures and approaches. Environmental measures that entail construction, such as fencing, include maintenance requirements so that the effectiveness is maintained for the life of the Project. Based on this approach, it is believed that all Project effects can be successfully and fully mitigated.

3.6 Threatened and Endangered Species

This section of the Draft Environmental Impact Report discuses Federal and State listed threatened and/or endangered species having the potential to occur on-site, or having suitable habitat on-site or in the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) vicinity. Information provided in this section has been based on field reconnaissance, resources agency consultation (where noted), and from previously prepared reports as referenced throughout this document. A mitigation program is provided in order to reduce or avoid potential impacts, where applicable.

Please note: This discussion of biological resources is broken down into Section 3.5 Biological Resources and Section 3.6 Threatened and Endangered Species.

3.6.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of threatened and/or endangered species. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the Bureau of Land Management (BLM) and therefore subject to the biological LORS of the agency.

3.6.1.1 Federal

Federal Endangered Species Act of 1973 (FESA) prohibits acts of disturbance that result in the "take" of threatened or endangered species. As defined by the Federal Endangered Species Act, "endangered" refers to any species that is in danger of extinction throughout all or a significant portion of its current range. The term "threatened" is applied to any species likely to become endangered within the foreseeable future throughout all or a significant portion of its current range. Take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Violation of this section can result in penalties of up to $50,000 and up to one year of imprisonment. Sections 7 and 10 of the FESA provide a method for permitting an action that may result in "incidental take" of a federally listed species. Incidental take refers to take of a listed species that is incidental to, but not the primary purpose of, an otherwise lawful activity.

Incidental take is permitted under Section 7 for projects on Federal land or involving a Federal action, while Section 10 provides a method for permitting incidental take resulting from State or private action.

Eagle Act (Title 50, Code of Federal Regulations [CFR]).

> Section 22.26 authorizes the limited take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Eagle Act, where the taking is associated with, but not the purpose of activity, and cannot practicably be avoided.
>
> Section 22.27 provides for the intentional take of eagle nests where necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure or; the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests would be allowed to be taken except in the case of safety emergencies.

Bald and Golden Eagle Protection Act (Title 16, United States Code [USC], Chapter 5A, Section 668) provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.

California Desert Conservation Area (CDCP) comprises one of two national conservation areas established by Congress at the time of the passage of the Federal Land and Policy Management Act (FLPMA). The FLPMA outlines how the BLM will manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.

Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan is the regional amendment to the CDCA Plan approved in 2002, the NECO Plan protects and conserves natural resources while simultaneously balancing human uses in the northern and eastern portion of the Colorado Desert. The NECO Plan is a landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over five million acres and hosts 60 sensitive plant and animal species. Lands within the planning area are also popular for hiking, hunting, rockhounding, and driving for pleasure. Several commercial mining operations, livestock grazing, and utility transmission lines exist in the area as well. The NECO Plan amends the 1980 CDCA Plan.

Migratory Bird Treaty Act (MBTA) (Title 16, USC, sections 703 through 711) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Most of the birds found in the study area are protected under the MBTA. Thus, Project construction has the potential to directly take nests, eggs, young, or individuals of protected species.

Further, Project construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to the abandonment of nests, a violation of the MBTA. Measures that may be instituted to help ensure compliance with the MBTA include the following:

- Grading and other construction activities should be scheduled to avoid the nesting season to the extent possible. The nesting season for most birds in Riverside County extends from March through August.

- If the nesting season cannot be avoided, the following measures should be instituted:
    - A qualified biologist should conduct pre-construction surveys no more than 1 week prior to the initiation of construction in any given area to ensure that no nests of species protected by the MBTA would be disturbed during Project implementation.
    - If an active nest more than half completed is found, a construction-free buffer zone should be established around the nest. The size of the buffer zone should be determined by a qualified biologist in consultation with.
    - If vegetation is to be removed by the Project and all necessary approvals have been obtained, potential nesting substrate (e.g., bushes, trees, grass, buildings, and burrows) that will be removed by the Project should be removed before the onset of the nesting season (March) to help preclude nesting. Pre-removal surveys are required for some species. Removal of vegetation or structures slated for removal by the Project should be completed outside of the nesting season (i.e., between September 1 and March 1).

Executive Order 11312 Prevention and Control Invasive Species (1999) directs all Federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of Federal agencies and departments and a supporting Invasive Species Advisory Committee composed of State, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

Wild Free-Roaming Horse and Burro Act (Public Law 92-195) protects wild horses and burros from capture, branding, harassment, and death, and managed with the intent to achieve and preserve the natural ecological balance on public lands.

Desert Tortoise (Mojave Population) Recovery Plan (United States Fish and Wildlife Service [USFWS] 1994a) and Draft Revised Recovery Plan (USFWS 2008a) Describes a strategy for recovery and delisting of the desert tortoise.

Federal Noxious and Invasive Weed Laws pertaining to noxious and invasive weeds, including the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 as amended (16 USC

4701 et seq.), Lacey Act as amended (18 USC 42), Federal Plant Pest Act (7 USC 150aa et seq.), Federal Noxious Weed Act of1974 as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (Section 1453 “Management of Undesirable Plants on Federal Lands;” USC 2801 et seq.), the Carlson-Fogey Act of 1968 (Public Law 90-583), and Federal Executive Order 11312 released February 3, 1999. The BLM and other Federal, State, and local agencies are also concerned about weed infestation and dispersal on private and public lands. The BLM and United States Department of Agriculture maintain lists of pest plants of economic or ecological concern.

3.6.1.2 State

California Endangered Species Act (CESA) of 1984 (California Department of Fish and Game [CDFG] Code, sections 2050 through 2098) protects California’s rare, threatened, and endangered species. The CDFG has the responsibility for maintaining a list of endangered and threatened species (CDFG Code 2070). CDFG also maintains a list of “candidate species,” which are species that CDFG formally notices as being under review for addition to the list of endangered or threatened species. In addition, CDFG maintains lists of “species of special concern,” which serve as species “watch lists.” Pursuant to the requirements of CESA, an agency reviewing a proposed Project within its jurisdiction must determine whether any species that are State listed as endangered or threatened may be present in the Project study area and, if so, whether the proposed Project would have a potentially significant impact on any of these species. In addition, CDFG encourages informal consultation on any proposed project that may affect a species that is a candidate for State listing.

Project-related impacts to species listed as endangered or threatened under the CESA would be considered significant. State-listed species are fully protected under the mandates of the CESA. “Take” of protected species incidental to otherwise lawful management activities may be authorized under Section 2081 of the CDFG Code.

Protected furbearing mammals (California Code of Regulations [CCR], Title 14, Section 460) states fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.

California Code of Regulations (Title 14, sections 670.2 and 670.5) lists the plants and animals of California that are declared rare, threatened, or endangered.

Fully Protected Species (CDFG Code, sections 3511, 4700, 5050, and 5515) designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (*see also* CCR Title 14, Section 670.7).

Nest or Eggs (CDFG Code Section 3503) protects California’s birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

Birds of Prey (CDFG Code Section 3503.5) makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird.

Migratory Birds (CDFG Code Section 3513) protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame birds.

Nongame mammals (CDFG Code Section 4150) makes it unlawful to take or possess any non-game mammal or parts thereof except as provided in the CDFG Code or in accordance with regulations adopted by the commission.

Significant Natural Areas (CDFG Code Section 1930 and following) designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.

California Environmental Quality Act (CEQA), Guidelines §15380 defines rare species more broadly than the definitions for species listed under the State and Federal Endangered Species Acts. Under Section 15830, species not protected through State or Federal listing but nonetheless demonstrable as endangered or rare under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFG's Special Animals List.

Streambed Alteration Agreement (CDFG Code sections 1600 and following) regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.

Native Plant Protection Act (CDFG Code sections 1900-1913) prohibits the taking, possessing, or sale within the State of any plants with a State designation of rare, threatened, or endangered, as defined by CDFG. Project impacts to these species are not considered significant unless the species are known to have a high potential to occur in the area of disturbance associated with construction of the Project.

California Desert Native Plants Act of 1981 (Food and Agricultural Code Section 80001 and following and CDFG Code sections 1925-1926) protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.

Porter-Cologne Water Quality Control Act regulates discharges of waste and fill material to waters of the State, including isolated waters and wetlands.

3.6.1.3 Local

Riverside County General Plan provides protection and preservation of wildlife for the maintenance of the balance of nature.

3.6.2 Environmental Setting

Four federally and/or State listed species included in the list of special-status species which may occur or have been documented to occur in the Project vicinity, and have potential to be affected by Project activities include: Coachella Valley milkvetch, American peregrine falcon, Gila woodpecker, and desert tortoise (A summary of the habitat and range of each special-status species is presented in Appendix A). Federally listed species are denoted by the USFWS and United States Department of the Interior, BLM designation; whereas State listed species are denoted by the CDFG and/or the CNPS.

The four listed species only includes those species with the potential to be found in the area of Project components, not all special-status species that are regionally known. As discussed in Section 3.5 Biological Resources, the list of special-status, game, and protected species that may occur or have been documented to occur in the Project vicinity and have potential to be affected by Project activities is based on: (1) records of the California Natural Diversity Data Base ([CNDDB] 2008 and 2009a) for special-status species that are known to occur in the Project survey area; (2) records from the CNPS for special-status plants (CNPS 2009); (3) results from recent, relevant surveys and reviews (Riverside County and BLM, 1996); (4) the NECO (BLM and CDFG, 2002); and (5) known habitats in the area (i.e., experience of the consulting biologist).

Recent, relevant biological surveys in the Project area include:

- *Eagle Mountain Pumped Storage Project* – 2008 and 2009 surveys (Karl, 2009)
- *Southern California Edison Devers-Palo Verde 2* – 1985 (Karl and Uptain, 1985; E. Linwood Smith and Associates, 1987), 1993 (E. Linwood Smith and Associates, 1993), 2002 (Karl, 2002), 2003 (EPG, 2003), 2004 (Blythe Energy LLC, 2004; EPG, 2004), 2005 (Karl, 2005a; Tetra Tech EC, Inc., 2005) and 2008 (Karl, 2009)
- *FPL Energy Blythe Energy Project Transmission Line* – 2004 (Blythe Energy LLC, 2004; EPG, 2004) and 2005 (Karl, 2005a; Tetra Tech EC, Inc., 2005)
- *District Desert Southwest Transmission Line Project* – 2002 (BLM and IID, 2003) and 2005 (Karl, 2005a; Tetra Tech EC, Inc., 2005)
- *Eagle Mountain Landfill and Recycling Center* – 1989-90 and 1995 EIS (Riverside County and BLM, 1996), BA (RECON, 1992) and supporting studies for these Eagle Mountain Landfill permits

Coachella Valley Milkvetch. (*USFWS: Endangered; BLM: Sensitive*[1]*; CDFG: None; CNPS: List 1B*). This subspecies (of root plant) is known primarily from the Coachella Valley, east to approximately Desert Center (Karl and Uptain, 1985; NECO, 2002; CNPS, 2009). Many Coachella Valley populations are threatened by Off Highway Vehicle (OHV) recreational use and may no longer exist. A population was also allegedly found in the aeolian areas of Chuckwalla Valley, along State Route (SR) 177 (BLM and CDFG 2002, CNPS 2009). However, it is likely that this record was mistakenly identified and is actually a population of *Astragalus lentiginosus* var. *variabilis* instead (N. Fraga, Rancho Santa Ana Botanical Gardens, pers. comm. to K. Hughes, 2008). During Spring 2008 surveys for the Project, all of the plants found in the aforementioned population keyed to *A. l.* var. *variabilis*. The strongly inflated, two-celled, papery, speckled pods of this silky-haired milkvetch easily distinguish it from other milkvetches. It is an herbaceous perennial whose above-ground portions die back during drought periods. While it is restricted to loose-sandy, including aeolian, soils, the substrate over the soil may be slightly gravelly. Microhabitat sites are often associated with disturbance, consistent with many legumes, and in a 1987 survey of the proposed Southern California Edison (SCE) Devers-PaloVerde No. 2 Transmission Line, individuals were commonly found in road berms (Karl and Uptain 1985).

Coachella Valley milkvetch is highly unlikely to be found on the Project due to lack of habitat and lack of nearby verified populations. It was not seen during field surveys in 2008, 2009 or 2010; nor on several previous surveys in the area (BLM and IID, 2003; Karl, 2002, 2003, 2005, and 2007 field notes; EPG, 2004; Blythe Energy, 2004).

American Peregrine Falcon. (*USFWS: Delisted, Bird of Conservation Concern; BLM: none: CDFG: Endangered, Fully Protected*). This is a falcon of open country, cliffs, and occasionally cities. It breeds from Alaska south to Baja California, wintering in Baja California, the Gulf of California, and extreme southern California. The nest is a scrape on a high cliff ledge and, as such, this species may forage on the Project, but nest offsite.

There are no records in the CNDDB data base for peregrine falcon in Riverside or Imperial counties (CNDDB 2008, 2009b) and no peregrine falcons or possible aeries have been observed on previous surveys in the Project area, including in the mountains adjacent to the transmission line in 2009 Project surveys or during surveys on the Central Project Area for the Eagle Mountain Landfill EIR. So, it is highly unlikely that peregrine falcon is present. The Project only offers foraging habitat for this species, although nesting could occur in the mountains adjacent to much of the Project, especially the Central Project Area. In the 1992 Biological Opinion that USFWS issued for the Eagle Mountain Landfill, their analysis determined that the American peregrine falcon did not warrant consultation (i.e., not present)[2].

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[1] BLM Sensitive refers to a species under review, rare, with limited geographic range or habitat associations, or declining. BLM policy is to provide the same level of protection as USFWS candidate species.
[2] The American peregrine falcon was still a federally listed species in 1992. It was de-listed in 1999.

Gila Woodpecker. (*USFWS: Bird of Conservation Concern; BLM: none; CDFG: Endangered*). The Gila woodpecker inhabits desert scrub and washes, saguaros, river groves, and woodlands, including residential shade trees. Its range extends from the Imperial Valley to the southern tip of Nevada, southern and central Arizona, extreme southwestern New Mexico, all of Baja California, and much of western and central Mexico.

There is no Gila woodpecker habitat on the Project. Within the Project area, the species is possible at the residential development at Lake Tamarisk, but this seems unlikely due to this small island of compromised habitat in a broad area of inhospitable habitat. No Gila woodpecker has been observed on any surveys in the Project area.

Desert Tortoise. (*USFWS: Threatened; BLM: none; CDFG: Threatened*). The desert tortoise is one of five species of North American tortoises, four of which belong to the genus *Gopherus*: *G. agassizii* (desert tortoise), *G. berlandieri* (Texas tortoise), *G. flavomarginatus* (bolson tortoise), and *G. polyphemus* (gopher tortoise). A fifth potential species, is likely in southern Sonora, two individuals of which were found in southern Baja California, Mexico and named *Xerobates lepidocephalus* (scaley-headedtortoise) (Ottley et al., 1989). The desert tortoise inhabits the southwest north of Baja California, with a current range extending from southwestern Utah, west to the Sierra Nevada Range in California, and south through Nevada and Arizona into Sonora, Mexico (Ernst et al. 1994; Germano et al., 1994).

The desert tortoise occupies arid habitats below approximately 4,000 feet in elevation (Karl 1983; Weinstein 1989). Common vegetation associations in the Mojave Desert include creosote bush scrub, saltbush scrub, Joshua tree woodland, and Mojave yucca communities. In the Colorado and Sonoran deserts of southern California and Arizona, desert tortoises occupy somewhat lusher desert habitats, with increased bunch grasses, cacti, and trees; thornscrub is occupied in the Sinaloan Desert. Because of the burrowing nature of tortoises, soil type is an important habitat component (Karl, 1983; Weinstein et al., 1986). In California, tortoises typically inhabit soft sandy loams and loamy sands, although they are also found on rocky slopes and in rimrock that provide natural cover-sites in crevices. In portions of Nevada and elsewhere, where a near-surface durapan limits digging, tortoises often occupy caverns in the exposed caliche of wash banks. Hills with rounded, exfoliating granite boulders often host higher densities than the surrounding flats, especially in Arizona. Valleys, alluvial fans, rolling hills, and gentle mountain slopes are inhabited; only playas and steep, talus-covered slopes are avoided.

The USFWS emergency-listed the desert tortoise as endangered on August 4, 1989 (USFWS, 1989). The Mojave population – the species in California, Nevada, Utah, and parts of Arizona north of the Colorado River – was listed in the final rule on April 2, 1990 as threatened (USFWS, 1990). The Sonoran population, the species in the remainder of Arizona, is not listed and does not have protected status under the ESA. On June 22, 1989, the California Fish and Game Commission listed the species as threatened under the CESA (CDFG, 1989). On February 8, 1994, the USFWS designated critical habitat for the Mojave population of the desert tortoise

(USFWS 1994b), encompassing approximately 6,446,200 acres (2,608,741 ha). One critical habitat unit (CHU), the Chuckwalla CHU, intersects 16.7 acres of the Project (Table 3.6-1; Figure 3.6-1).

The 1994 Desert Tortoise Recovery Plan (USFWS, 1994a) identified six evolutionarily significant units of the desert tortoise in the Mojave region, based on differences in tortoise behavior, morphology and genetics, vegetation and climate. Within those recovery units, the Desert Wildlife Management Areas (DWMAs) act as reserves in which recovery actions are implemented. The NECO Plan (BLM and CDFG, 2002) furthers this recovery goal by prescribing conservation and management measures for Chuckwalla DWMAs. The Chuckwalla DWMA intersects 16 acres of the Project (Table 3.6-1; Figure 3.6-1).

Table 3.6-1. Acreage of desert tortoise habitat within the Eagle Mountain Pumped Storage Project [1,2]

Project Element	In DWMA	In Critical Habitat	In Category 3 Habitat	Total in Desert Tortoise Habitat[3]
Central Project Area	0	0	0	0
Transmission Line ROW				
Tower Footprint plus Construction Area	1.9 (23 towers)	2.04 (24 towers)	2.1 (25 towers)	4.1 (59 towers)
Access Road	14.1	14.7	15.4	30.1
Pulling/Tensioning Sites	Currently Unknown (intended to fall within the T-Line ROW and substation site)	Currently Unknown (intended to fall within the T-Line ROW and substation site)	Currently Unknown (intended to fall within the T-Line ROW and substation site)	Currently Unknown (intended to fall within the T-Line ROW and substation site)
Equipment Laydown Sites	0	0	0	0
Proposed Interconnection Collector Substation	0	0	25	25
Water Pipeline	0	0	22.9[3]	22.9[3]
TOTAL PROJECT ACREAGE	16	16.7	65.4	82.1

1. Acreage is calculated based on the following assumptions:

- Transmission Line
  - 13.5 mi long, 200-foot ROW
  - Approximately four towers per linear mile, with more in mountainous terrain (54 to 68 total)
  - Estimated access road width is 20 feet; towers will be immediately adjacent to the access road with no stub road. (Note: This assumption may change when specific towers are engineered. In the two, small mountainous areas, stub roads are more likely to be present to accommodate both the access road and the necessary tower location.)
  - Total tower footprint (40 by 40 feet) plus construction area is 3600 ft^2 (60 by 60 feet)
  - Tensioning and pulling sites are unknown at this time, but are intended to be located within the transmission line ROW and substation site.
  - Equipment laydown areas will be on previously disturbed lands and/or overlapping with other Project acreage.

[3] Total is Critical Habitat plus Categor 3 and Category 1 (DWMA) Habitats outside Critical Habitat. In many areas, Critical Habitat and Category 1 and Category 3 Habitat overlap (see Figures 4-1 and 4-4).

- Water Pipeline and Wells
    - 15.3 mi long, 30-foot ROW, with access road included in the ROW
    - Along Kaiser Road, half of the ROW is in the disturbed (bladed) road shoulder
    - Three groundwater wells; total estimated disturbance footprint for each is 2500 ft^2 (50 by 50 feet)

2. All calculations of acreage on the Central Project Area are estimates based upon AutoCAD mapping.
3. Part of the mileage was adjacent to Kaiser Road, where only half the width of the ROW was in native habitat. The other half was in the road shoulder.

The results of the 2008 and 2009 surveys are exhibited in Table 3.6-2. Desert tortoises have been observed on all previous surveys in the Project vicinity (Riverside County and BLM, 1996; Karl, 2002; BLM and IID, 2003; EPG, 2004; TetraTech EC, Inc., 2005) and in spring 2008 and 2009 Project surveys. Habitat for this species exists on all native habitats on the Project, a total of 82.1 acres (Table 3.6-2).

Table 3.6-2. Desert Tortoise Survey (Spring 2008 and Spring 2009)

(**Note:** Only those 2008 observations that were in the area of the current Project configuration are presented here due to relevance.)

Sign Type[1]	Location[2] Zone		Easting	Northing	Class or Age[3]	Size (mm)[4]	Comments
2008 Data							
Burrow	11	S	656191	3733160	3	240	
Burrow	11	S	648196	3741316			
Carcass	11	S	643262	3743984	>4 yrs		Bone fragments, more than 4 years old
Burrow	11	S	656191	3733160	5	230	
2009 Data							
Burrow	11	S	646365	3732299	1	240	
Burrow	11	S	643856	3733544	3	280	
Burrow	11	S	643179	3731957	4	280	
Burrow	11	S	645796	3732416	1	340	Part of a kit fox den complex; tracks
Burrow	11	S	643435	3734695	1	270	
Burrow	11	S	643526	3740268	2	340	Wash bank
Burrow	11	S	643868	3733423	1	150	Tracks; in a kit fox den complex
Burrow	11	S	643307	3739696	2	350	Caliche cave; sct
Burrow	11	S	644069	3733378	5	220	
Burrow	11	S	646372	3732240	4	260	
Burrow	11	S	642842	3731144	3	340	2 burrows
Burrow	11	S	646718	3732096	5	270	
Burrow	11	S	643326	3740341	1	265	Tortoise inside
Burrow	11	S	642777	3731436	5	250	
Burrow	11	S	646517	3732188	1	270	Pallet
Burrow	11	S	643331	3740258	1	330	Tortoise and scat inside
Burrow	11	S	643374	3734752	1	270	Tracks inside
Burrow	11	S	643435	3738580	4	600	Under boulder on mountainside
Burrow	11	S	643496	3734096	2	280	Adjacent to road
Burrow	11	S	644380	3742725	3	240	

Sign Type[1]	Location[2]				Class or Age[3]	Size (mm)[4]	Comments
	Zone		Easting	Northing			
Burrow	11	S	647403	3731608	3	250	
Burrow	11	S	643817	3739125	3	460	Caliche cave
Burrow	11	S	643824	3739096	2	320	
Burrow	11	S	643842	3738407	2	300	3 caliche caves, with scat, within 2 m
Burrow	11	S	644220	3738117	1	340	Scat and tracks; rock/soil burrow
Burrow	11	S	643284	3739693	2	380	
Burrow	11	S	643067	3741096	3/4	350	Caliche cave
Burrow	11	S	643309	3739697	1	450	Tracks and scat
Burrow	11	S	644109	3742316	3/4	530	Caliche cave; no other sign
Burrow	11	S	642573	3741027	1	410	Caliche cave; tracks and TY-2 scat (21 mm)
Burrow	11	S	642743	3740840	3	360	Caliche cave; large scat inside
Burrow	11	S	647989	3741323	5	195	
Burrow	11	S	645265	3731885	1	300	With tracks
Burrow	11	S	643470	3739656	2	~800	Cave; old scat (11 mm) plus TY-2/3 scat (2)
Carcass	11	S	641758	3731149	2-3 yrs	265	Male
Carcass	11	S	642595	3732874	4 yrs	~230	
Carcass	11	S	642998	3732353	>4 yrs	Adult	Single plastron bone
Carcass	11	S	643262	3743981	>4 yrs	Adult	Probably road kill - next to road and very fractured
Carcass	11	S	644946	3744904	>4 yrs	Adult	
Carcass	11	S	643369	3731924	>4 yrs	Adult	1 plastron fragment
Carcass	11	S	643252	3731668	>4 yrs	Unknown	1 bone fragment
Carcass	11	S	643128	3731406	>4 yrs	Adult	1 carapace fragment
Scat	11	S	642875	3731512	NTY-4	17	
Scat	11	S	646075	3732278	TY-2	18	
Scat	11	S	645619	3732548	TY-1	18	
Scat (3)	11	S	643000	3731571	TY-2	16	
Scat	11	S	643403	3734751	TY-2	14	
Scat	11	S	642615	3733739	NTY-3	12	
Scat	11	S	645639	3732602	NTY-4	18	

Sign Type[1]	Location[2]				Class or Age[3]	Size (mm)[4]	Comments
	Zone		Easting	Northing			
Scat	11	S	643251	3734554	2	Not recorded	
Scat (4)	11	S	646442	3732006	TY-2	12	
Scat	11	S	646343	3732082	TY-2	13	
Scat	11	S	642567	3741037	TY-2	17	
Scat	11	S	645071	3745270	TY-1	20	
Scat (3)	11	S	643062	3731886	TY-2	17	
Scat (3)	11	S	645251	3731877	TY-2	15	
Scat	11	S	646858	3742316	TY-2	18	
Scat	11	S	643496	3738860	NTY-3	15	
Tortoise	11	S	643420	3738853		260	Female
Tortoise	11	S	643482	3731568		235	Female

1. Number in parentheses is number of sign.
2. All coordinates are Universal Transverse Mercator North American Datum 83.
3. Class of burrow describes its condition and age of use:

1 Definitely tortoise, fresh (tracks, tortoise inside, freshly disturbed soil on mound/runway indicating tortoise use within last few days)
2 Definitely tortoise – Used this season
3 Definitely tortoise – Not used this season
4 Possibly tortoise – In good condition but unsure of species using burrow
5 Definitely tortoise – Deteriorated
6 Possibly tortoise – Deteriorated

Class of scat describes age of use:

TY-1 This year, fresh
TY-2 This year, dried, possible glaze, unexposed surfaces dark brown, slight odor
TY-3 This year, dried, no glaze, at least partially faded on exterior, very slight odor
NTY-3 Not this year, dried, no glaze, at least partially faded on exterior, no or very slight odor
NTY-4 Not this year, dried, loosening, pale or bleached

4. Although U.S. Equivalent measurements are presented throughout this document, it is standard procedure to collect data on desert tortoises using the metric system.

3.6.3 Potential Environmental Impacts

3.6.3.1 Methodology

Impact analysis has been based on field reconnaissance, resources agency consultation (as noted), and literature review of pertinent biological reports as referenced throughout this document.

During March and early April of 2008, 2009, and 2010 surveys were conducted for special-status species along the Project linear elements and at potential well sites.

In 2008, the Project routes were preliminary, so surveys were conducted both on areas where the Project would ultimately occur and areas that were eliminated in 2009. Because of the uncertain nature of the routes in 2008, the extensive survey protocol required by USFWS for desert tortoises was not used. Rather, evidence of desert tortoises and other special-status species, including habitat mapping, was gathered via the following procedures:

- Transmission Line Right of Way (ROW): Inside WHMAs, four, 50-foot-wide, adjacent transects were walked in the 200-foot transmission line ROW; outside WHMAs, two, 100-foot-wide, adjacent, meandering transects were walked in the ROW. (The NECO Plan places special emphasis on WHMAs; hence the more intensive surveys inside WHMAs; Figure 3.5-2)
- Water Pipeline ROW: Where the ROW was precise, a 30-foot-wide transect was walked; where the ROW was imprecise, two, 100-foot-wide, adjacent, meandering transects were walked.
- For ROWs through jojoba fields that had access roads, only the roadsides were surveyed.
- Potential well sites: All known commercial wells in the Project area that had the potential to supply water to the Project were examined, photographed and analyzed for biological issues (especially ephemeral impoundments that could host Couch's spadefoot).

In 2009 and 2010, pedestrian transects were completed consistent with the USFWS "protocol" desert tortoise transects (USFWS, 1992). The transmission ROW surveyed in 2009 was 200 feet wide. The surveyed water pipeline ROW in 2009 was 60 feet wide to account for minor route shifts in the final 30-foot-wide ROW. In addition, 30-foot-wide "Zone-of-Influence" (ZOI) transects were walked on both sides of the ROWs at 100, 300, 500, 1,200, and 2,400 feet from the outer edges of the ROWs. (The 500-foot ZOI coincided with the 500-foot buffer transect for surveying burrowing owls; *see* Section 3.5 Biological Resources). The exception to this occurred where the ROWs went through jojoba farms. These are not tortoise habitat, although it is recognized that a tortoise could move in from adjacent native habitat, even if unlikely. Burrowing owls and other special-status vertebrates were, however, possible. So, in addition to full ROW transects, in 2009 ZOIs/buffer transects were walked at 100-foot intervals out to 500 feet. ZOIs through fenced or residential properties also were not walked, but were visually inspected from the edges of the property.

In all years all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains) that was observed were measured, mapped and described relative to condition, size, and (where applicable) gender. Current and recent weather conditions were recorded to identify the potential for tortoise activity and the topography, drainage patterns, soils, substrates, plant cover, anthropogenic disturbances, and aspect-dominant, common and occasional plant species were described and mapped. Mapping sign and habitat features was achieved using Global Positioning System (GPS) units. Every mile of ROW and ZOI transects were photographed.

The timing requirement for USFWS desert tortoise protocol surveys is March 25 to May 31. However, because tortoises are known to be active in the Project area much earlier, the USFWS granted permission to conduct Project-area tortoise surveys on March 18 in 2009 (Tannika Engelhardt, USFWS Carlsbad Field Office, personal communication with Alice Karl [Project Biologist], March 18, 2009).

During all years, Kaiser Ventures, Inc. (Kaiser) denied access to the Project Applicant to Kaiser properties for surveying. This exclusion included the Project water pipeline ROW north of the MWD aqueduct and the transmission line ROW north of UTM 3745200N (North American Datum [NAD] 83). As a result, onsite surveys of the mine pits that will form the reservoirs and other Central Project Area features were not conducted. However, conditions on the Central Project Area were assessed using the extensive available literature about the area, previous survey data, and aerial photography.

3.6.3.2 Significance Criteria

The California State Water Resources Control Board concludes that the Project may have significant impacts on threatened and endangered species if it does any of the following:

(a) Have a substantial adverse effect, either directly or through habitat modifications, on any species indentified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

3.6.3.3 Environmental Impact Assessment

Project issues and impacts to biological resources are analyzed in two phases; the construction phase and the operation and maintenance phase.

3.6.3.3.1 *Construction*

Construction activities associated with the Project include: (1) development of the Central Project Area to accommodate the Project, (2) construction of the transmission line, and (3) construction of the water conveyance and supply system. Construction of the Central Project Area facilities includes:

- Building of the dams at the upper reservoir
- Application of a seepage control blanket in the reservoirs

- Construction of the below-ground tunnels, surge control facilities, powerhouse using blasting and boring
- Construction of storage and administration buildings
- Excavation of water treatment ponds

Construction of the transmission line includes:

- Preparation of staging/laydown areas
- Access road and spur road construction/improvement
- Clearing and grading of pole sites
- Foundation preparation and installation of poles
- Wire stringing and conductor installation
- Temporary parking of vehicles and equipment in construction zones
- Equipment laydown/storage
- Cleanup and site reclamation

Construction of the water pipeline collection system includes:

- Site preparation and trenching
- Installation, covering and testing of the pipeline
- Temporary parking of vehicles and equipment in construction zones
- Equipment laydown/storage
- Cleanup and site reclamation

Equipment required for construction includes bulldozers, backhoes, graders, air compressors, man lifts, generators, drill rigs, truck-mounted augers, flatbed trucks, boom trucks, rigging and mechanic trucks, small wheeled cranes, concrete trucks, water trucks, crew trucks, and other heavy equipment.

For this analysis, the Project was assumed to receive a 50-year FERC license. The Project is scheduled to begin the 4-year construction period in June 2012; beginning operations in July 2015, with entire Project becoming operational in 2016. While construction spans 4 years, construction of the linear facilities will be completed in under a year. The assessment of the effects on desert tortoise must include not only by the tortoise presence, but the anticipated activity levels, which will be affected by weather conditions, forage availability, and season. These latter variables cannot be known at this time so the full extent of construction effects on desert tortoise (i.e., incidental take) cannot be assessed, although the effects in the discussion below conservatively assume that construction will occur during high activity of desert tortoises.

Construction on the Central Project Area will take place entirely on highly disturbed, heavily mined areas (but *see* discussion of the transmission line, below). The water conveyance tunnels connecting the two reservoirs and the power generating equipment will be located in an underground powerhouse. Although future surveys on the Central Project Area will confirm this, it appears that there is no desert tortoise habitat in the Central Project Area. This conclusion concurs with the conclusion of the Biological Assessment prepared for the Eagle Mountain Landfill Project (RECON, 1992), which stated that the proposed landfill does not extend into desert tortoise habitat. Tortoises are known to dig burrows into road berms, however, and may enter roadways or work areas from unfenced adjacent native habitat and thereby be subject to injury or death. So, it is possible that a few tortoises might be directly affected by construction on the Central Project Area. Based on monitors' observations for numerous construction projects and oft-observed tortoises adjacent to heavily travelled roads, there is no reason to believe that there would be any indirect construction effects (e.g., due to noise and activity levels) to tortoises living in native habitat adjacent to the Central Project Area.

On the linear facilities, direct impacts from construction will include habitat loss and may include loss of individuals. The greatest amount of tortoise sign found on the Project in 2008 and 2009 is along the transmission line ROW (Figure 3.6-2). There is tortoise habitat along 11.8 miles of the 15.3 mile water pipeline ROW; 9.8 miles of this is degraded because half of the ROW is in Kaiser Road or the ROW is either dissected by agriculture, is adjacent to SR 177 or is in the Eagle Mountain Mine site. Translating sign into a reliable tortoise density from the methods mandated for data collection at the Project is not possible. (The USFWS [1992] protocols identify tortoise presence, relative abundance [i.e., an apparent dearth of wealth of sign], and areas that will require more intensive monitoring during construction. Tortoise density is not a possible result from these surveys.) However, a very rough estimate of relative tortoise abundance can be made for the transmission line ROW from the number of burrows and assuming an average of 10 burrows used per year per tortoise (Bulova et al., 1994; Duda et al., 1999). Counting all burrows, even those that were not recent because of the early spring timing of the surveys (i.e., tortoises had only been active for a few weeks), a total of 11 burrows were found in 10.7 miles of the 200-foot ROW. (This does not include the 2.8 miles of ROW on Kaiser property that were not surveyed.) This translates into 27 burrows per square mile. Dividing by 10 burrows per tortoise yields an estimate of three tortoises per square mile on the transmission line ROW, a very low density.

No other surveys in the Project area have provided reliable density estimates. Surveys in the late 1970's using broadly spaced samples estimated tortoise densities in the Project area at 0 to 20 tortoises per square mile (Berry and Nicholson, 1984) for all but an approximately 3-mile segment south of the MWD substation; this was estimated (from one sample) at 20 to 50 tortoises per square mile. While these surveys were unable to provide reliable estimates of tortoise density or reliable geographic divisions in tortoise abundance (*see* Karl, 2001, for review), they were still useful in suggesting extremes of tortoise abundance. In the Project area, then, the general lack of tortoise sign suggests that in the 1970's tortoise densities were quite low. During tortoise studies for the Eagle Mountain Landfill EIR (RECON, 1992; Riverside County and BLM, 1996), tortoise sign and tortoises were observed where the Project transmission line enters the Central Project Area, and along the Project transmission line ROW, from the MWD substation south. No estimates of tortoise density were made.

Due to relatively low densities and intensive, continuous construction monitoring (*see* Section 3.6.4 Mitigation Program), tortoise losses in the construction zones are expected to be absent to very low. Traffic during Project construction will increase on Kaiser Road, Eagle Mountain Road and SR 177 for 3 years. This is likely to result in increases in tortoise losses on those roads over current conditions.

Habitat loss on the linear facilities, including the substation, is expected to total 82.1 acres (Table 3.6-2). Functionally, this loss is expected to be a minor impact as the footprint of habitat physically disturbed is discontinuous (i.e., small patches) and is small relative to the surrounding available habitat.

A total of 16.7 acres of designated desert tortoise critical habitat overlaps the Project, along the transmission line (Table 3.6-2; Figure 3.6-2). The Chuckwalla CHU totals 1,020,600 acres (USFWS 1994b), so the Project will affect 0.0019 percent of the CHU.

The Chuckwalla DWMA intersects 16 acres of the Project. The Chuckwalla DWMA totals 820,077 acres (BLM and CDFG, 2002), so the Project will affect 0.0021 percent of the DWMA. The NECO Plan identifies a maximum of 1 percent surface disturbance limit in a DWMA.

Special habitat resources, such as nesting areas or important wintering or summering burrows, may be lost during Project construction. Desert tortoises occupy from two to twenty burrows per year (Bulova et al., 1994; Duda et al., 1999), with one estimate of five new burrows in a year. While most desert tortoise biologists would agree that some burrows appear to be important because (a) there is limited burrowing potential in the area due to a near-surface hardpan or other factors, or (b) accumulations of variably aged scat are present, there are no available studies that specifically identify important burrows. Pre-construction surveys for desert tortoises (*see* Section 3.6.4 Mitigation Program) will attempt to identify special-resource burrows, which will be avoided if possible.

Loss of native habitat for the sole purpose of construction (as opposed to maintenance) is temporary, but should be considered semi-permanent for the Colorado Desert. Natural regrowth is constrained by limited and unpredictable precipitation and can require several decades to approach pre-disturbance conditions. During this time, the habitat is unavailable for use by native wildlife. As such, all surface disturbances during construction that results in the removal or displacement of vegetation and soil should be considered semi-permanent.

In addition to the semi-permanent loss of habitat, tortoises may experience temporary disruption of normal movements to achieve feeding, breeding, sheltering, and dispersal. Based on anecdotal behavioral observations of hundreds of resident tortoises in many projects, there is no evidence that tortoises are disrupted to the point of potential harm from construction of pipelines and transmission lines. However, if mitigation associated with construction of any Project component includes erecting temporary or permanent exclusion fencing, this could disrupt normal movement patterns. With the exception of the substation (25 acres) tortoises displaced due to construction will be able to return to the area once construction activities have ceased.

Indirect construction impacts also could include dust deposition on neighboring vegetation. This is expected to be both temporary and minimized by maintaining air quality standards (*see* Section 3.13 Air Quality). There will be no permanent impacts on plant growth that could affect desert tortoise forage or shelter.

3.6.3.3.2 *Operation and Maintenance*

Operation and maintenance activities associated with the Project will primarily be restricted to the Central Project Area, but will also include routine, as well as unscheduled, maintenance on the transmission line, pipeline, and wells. The following discussion summarizes the impacts to desert tortoises that may result from the presence and functioning of the Project.

In general, the primary onsite impacts to desert tortoises from operation of the Project are limited to loss of individuals that move onto the site, including during transmission line maintenance.

Habitat loss was addressed in the section on construction impacts. Maintenance of tower pads, access and spur roads on the transmission line would perpetuate the vegetation loss of tower pads and roads. The 57.1 acres of disturbed habitat on the transmission line and water pipeline (not including the substation) would be available to use by desert tortoises, but degraded. This is expected to be functionally negligible for desert tortoise because it will exist as small patches of open space, 0.08 acres for each tower pad and an approximately 20-foot road width, interspersed through native habitat.

Based on the lack of desert tortoise habitat on the Central Project Area, the small footprint of the transmission line, low Project area tortoise densities, and infrequent maintenance activities, it is anticipated that losses of desert tortoises and tortoise resources from onsite Project impacts will be minor to negligible.

No impacts are anticipated from operation of the water pipeline.

Offsite, desert tortoises may experience indirect, adverse effects from Project operation. The following effects were considered:

- Loss of dispersal areas and connectivity to other areas
- Altered home ranges and social structure
- Facilitated ingress into the Project area from Project features
- Altered plant species composition due to the introduction of exotic vegetation
- Increased depredation by predators attracted to the site

The water pipeline and transmission line will present neither physical barriers nor deterrents to movement, so they will not affect the normal movements of tortoise to achieve feeding, breeding, sheltering, dispersal or migration. The substation will present a small barrier to movement, but it is adjacent to the town of Desert Center, the frontage road and Interstate 10, so it is unlikely that tortoises would be further affected. The Central Project Area has been developed for decades and does not currently contain habitat that could be considered a corridor, so its development for the Project will not cause an incremental change that would affect tortoise use.

Because of the existence of many roads in the area of the pipeline and transmission line, it is not anticipated that any new recreational access, with concomitant habitat degradation and potential species loss, will be provided by these ROWs. Similarly, paved roads that service the Project are already well-used by Kaiser employees and local residents. Traffic associated with the Project is anticipated to provide a negligible incremental increase over current levels.

Plant community structure and resulting fauna may be altered if non-native invasive species that are currently in the area spread during construction and/or maintenance activities increase both abundance and distribution of those species. (*See* Section 3.5 Biological Resources for a discussion the invasive species in the Project vicinity and their attendant impacts on native habitats.) Pre-construction surveys, controls during construction, and post-construction weed abatement will be employed minimize or eliminate this impact.

Faunal community structure may be altered if predators are attracted to reservoirs due to available water or night lighting. Common ravens, in particular, are predators as well as scavengers, and may increase as a result of the reservoirs providing a new and secure water supply. Coyotes are another predator species of concern in the Project area. However, onsite water sources plus nearby water sources currently provide a variety of water resources for ravens and coyotes and other native and non-native species. There is a 1.2-acre wastewater treatment pond that can be seen on aerials and is assumed to still support human uses of the site (Figure 3.5-10). Photos of this pond, and other water sources in the Project area, are found in Figures 3.5-11 through 3.5-18. As one of the few easily accessible water sources in that area, it is highly likely to provide water for both coyotes and ravens. Seasonal water is likely to pool in the pits and on other hard, mined surfaces. NECO identified a developed tank along the northern edge of the Central Project Area (Figure 3.5-8). Buzzard Spring, approximately 3 miles south of the Central Project Area, has pooled water (Divine and Douglas, 1996). There is a 10-acre pond used by the Metropolitan Water District's Eagle Mountain Pumping Station, approximately 4 miles south of the Central Project Area (Figures 3.5-13 and 3.5-14). The CRA has 8 acres of exposed water near the Central Project Area and transmission corridor. Access to the CRA by wildlife is likely to be limited by physical characteristics of the channel and fencing, although it is accessible to ravens and other birds (Figures 3.5-15 and 3.5-16). Two large ponds are present within the community of Lake Tamarisk (Figure 3.5-17 and 3.5-18). Because of these baseline, continuous, water subsidies, it is likely that ravens and coyotes already exist at the Central Project Area. In fact, these species were detected during field surveys within and adjacent to the Project boundary. A simple increase in the quantity of water, when it is already fully available, does not change the availability to opportunistic predators. As such, it is not likely that there would be a measurable change in the density of predators, or, as a result, a significant change in impacts to local fauna.

Because of these baseline conditions, it is possible that ravens may increase over baseline levels, but this increase may not be either measurable or have a significant impact on local fauna. A raven monitoring and control plan will implemented as part of the Project's environmental measures to ensure that raven increases due to the Project, if any, will not cause a biologically significant impact to the local fauna (*see* discussion below and MM TE-5).

Indirect impacts to desert tortoises on Joshua Tree National Park (JTNP) from Project operation are unlikely to occur. First, the impacts in the Project area are anticipated to be low and fully mitigated. Second, there is no reasonable scenario that would suggest that impacts to tortoises would increase farther away from the Project area, in the JTNP.

If ravens were to increase in response to resources at the Project, these ravens could forage in the JTNP or disperse into the JTNP from enhanced reproductive opportunities at the Project. The nearest JTNP tortoise population is in Pinto Basin, approximately 5 miles away. Ravens have been known to forage up to 30 miles from their roosts (B. Boarman pers. comm. to A. Karl), although this is unusual. Mean distances from a roost to a point resource have been reported as 3.9 miles (Kristan and Boarman, 2003) and 16.8 miles (Mahringer, 1970). In two studies observing distances to roosts from landfills, 68 percent of 142 birds remained within 0 miles (Mahringer, 1970 [in Boarman and Heinrich, 1999], with 94 percent within 4 miles of a landfill. Nesting ravens generally remain within a quarter-mile (Kristan and Boarman, 2003) to 0.35 miles of the nest. (B. Boarman, Pers. Comm. to A. Karl). Overall, raven densities tend to decline with increasing distance from point subsidies (Kristan and Boarman, 2003).

While the JTNP tortoise population is well within flight distance for a raven, it is expected that the Project will not provide new or enhanced resources over those already existing on the Kaiser site. A raven monitoring and control plan will be implemented as part of the Project's environmental measures to ensure that raven increases due to the Project, if any, will not cause a biologically significant impact to the local fauna (*see* MM TE-5).

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species indentified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS?* No. Construction on the Central Project Area will take place entirely on highly disturbed, heavily mined areas. Desert tortoise may be affected by Project construction, particularly along the proposed transmission corridor. In addition, there is tortoise habitat along 11.8 miles of the 15.3 mile water pipeline ROW; yet, 9.8 miles of this is degraded because half of the ROW is in Kaiser Road or the ROW is either dissected by agriculture, is adjacent to SR 177 or is in the Eagle Mountain Mine site. As such, potential impacts require adherence to the mitigation program. No significant impacts after implementation of the mitigation program are anticipated.

Impact 3.6-1 Coachella Valley Milkvetch. Based on site reconnaissance and literature review, this species is not expected to be located on-site, or in areas that will be affected by the Project. Therefore, it is highly unlikely that there would be any Project effects on the milkvetch. However, if found on site, this impact would be *potentially significant and subject to the mitigation program*; as such, pre-construction surveys will be conducted to insure that no Coachella Valley Milkvetch will be disturbed (PDF BIO-2).

Impact 3.6-2 American Peregrine Falcon. Based on site reconnaissance and literature review, this species is not expected to be located on-site or in areas affected by the Project. This species is unknown from Riverside and Imperial counties, and has not been found during previous surveys in the Project area, including the Central Project Area. Therefore it is highly unlikely that there would be any Project effects on peregrine falcon. However, if found on site, this impact would be *potentially significant and subject to the mitigation program*; as such, pre-construction surveys will be conducted to insure that no American Peregrine Falcon will be disturbed (PDF BIO-1).

Impact 3.6-3 Gila Woodpecker. Based on site reconnaissance and literature review, this species is not expected to be located on-site or in areas affected by the Project, nor residential areas. Between the small residential areas and the Project is a broad area of inhospitable habitat. However, if found on site, this impact would be *potentially significant and subject to the mitigation program*; as such, pre-construction surveys will be conducted to insure that no Gila Woodpecker will be disturbed (PDF BIO-1).

Impact 3.6-4 Desert Tortoise. Desert tortoise may be affected by Project construction, particularly along the proposed transmission corridor. The Project may adversely affect desert tortoise, as such, this impact is *potentially significant and subject to the mitigation program* (MM TE-1 through MM TE-4, MM TE-6 through MM TE-7, and MM BIO-1 through MM BIO-4). A Biological Assessment has been prepared by Eagle Crest Energy Company and submitted to the FERC. The recommendations and findings from the Biological Assessment are incorporated as mitigation (MM BIO-1).

Impact 3.5-5 Increase to Raven Population. If ravens were to increase in response to additional water resources at the Project, these ravens could forage in the JTNP or disperse into the JTNP from enhanced reproductive opportunities at the Project. This *potentially significant and subject to the mitigation program* (MM TE-5).

3.6.4 Mitigation Program

3.6.4.1.1 *Surveys on the Central Project Area*

Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species (including plants and mammals) will be conducted (listed as a project design feature in Section 3.5 Biological Resources; PDF BIO-1 through PDF BIO-3). Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, necessary protection measures will be modified and/or developed in consultation with the USFWS and the CDFG.

3.6.4.1.2 *General Mitigation Measures*

Mitigation measures proposed in this section are based on the presence of the desert tortoise (the only threatened and endangered species that might be affected by the Project) and the analysis of Project effects on desert tortoises (above).

These mitigation measures are consistent with the NEPA Handbook (BLM 2007), the NECO Plan (BLM and CDFG, 2002), and standard agency recommendations for similar impacts. Avoidance of desert tortoise and biological resources that support this species is the preferred method to minimize Project impacts. If avoidance is not possible, then minimization techniques are identified that will mitigate Project effects. Additionally, site restoration along the transmission line and water pipeline corridors will assist in repairing affected habitats and minimizing long-term Project effects. Off-site compensation is a final category of mitigation that can be used to mitigate impacts to special-status species and habitats when avoidance and disturbance cannot be avoided.

Several monitoring and/or control programs are identified here that will require development through discussion and review with the resource agencies required as a part of FESA and CESA consultation, and as part of permitting for streambed alteration as required in the CDFG Code. Consultation will be conducted concurrent with review of the Draft EIS and Draft EIR and development of the Final EIS and Final EIR. The salient features for all measures and plans are summarized here to verify that they are a part of Project environmental measures.

Several mitigation measures that were identified for other special-status wildlife (Section 3.5 Biological Resources) will also assist in minimizing impacts to the desert tortoise. In order to reduce redundancy, they are not repeated here as stand-alone **TE** mitigation measures, but include the following:

- Comprehensive Biological Mitigation Monitoring Program (MM BIO-1)
- Biological Reporting to Resource Agency (MM BIO-2)
- Designation of an Approved Project Biologist (MM BIO-3)
- Worker Environmental Awareness Program (MM BIO-4)
- Revegetation Plan (MM BIO-7)
- Invasive Species Monitoring and Control (MM BIO-8)

Habitat protection measures for desert tortoises include: (1) a thorough construction-associated clearance and monitoring program to minimize tortoise injuries and loss, (2) habitat compensation, and (3) insuring that Project operations do not result in an indirect effect, specifically, increased raven depredation.

MM TE-1. **Desert Tortoise Pre-construction Surveys and Clearance Surveys.** Desert tortoises shall be removed from construction areas by the Project Biologist. Such tortoises shall be processed (cataloged, photographed, and numbered) prior to placement outside the construction zones but on public or private land, or the Project ROW (*see* Appendix 12.14 Desert Tortoise Removal and Translocation Plan). On the linear facilities, this is achieved by first surveying for all desert tortoises that might be within construction zones or are likely to enter construction zones, immediately prior to the start of construction. (These surveys can be simultaneous with those for badger and kit fox.). Active burrows will be identified, measured, and the entrance "gated" (a 3-inch twig inserted into the floor of the runway) for monitoring tortoise use. The locations of all desert tortoises will be mapped so that those locations can be monitored for tortoise use during construction.

On the Central Project Area, there is little likelihood of desert tortoises except along the southern and eastern edges because of the altered landscape and massive and abundant tailings piles. Surveys first will be conducted in the Central Project Area to determine the presence of desert tortoise. If there is any suggestion of tortoise presence, either due to the presence of tortoise habitat and/or tortoise sign, a clearance survey (*see* Appendix 12.14 Desert Tortoise Removal and Translocation Plan) will be completed in those areas after tortoise-proof fencing is installed (*see* MM TE-3: Desert Tortoise Exclusion Fencing). A minimum of two clearance passes will be completed. Surveys will coincide with heightened tortoise activity, from mid-March to mid-April and during October. This will maximize the probability of finding all tortoises. Any tortoises found will be removed per mitigation MM TE-3: Desert Tortoise Translocation or Removal.

Surveys and clearance on the substation will proceed identically to that on the Central Project Area, with the exception that a pre-construction survey prior to clearance surveys is not necessary.

Implementation Timing: pre-construction

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/USFWS/CDF&G

MM TE-2. **Desert Tortoise Construction Monitoring.** No construction in unfenced areas (*see* MM TE-3: Desert Tortoise Exclusion Fencing) on the linear facilities will occur without biological monitors. This includes both construction monitoring and maintenance activities that require surface disturbance. An adequate number of trained and experienced monitors must be present during all construction activities, depending on the various construction tasks, locations, and season. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan suggests that construction activities occur when tortoises are inactive – November 1 to March 15 – where possible. However, adequate monitoring will mitigate concerns about take due to heightened activity levels the remainder of the year.

All desert tortoises will be removed from harm's way by a biologist approved by the Project Biologist (MM BIO-2). The Project Biologist must be sufficiently qualified to ensure approval by USFWS and CDFG for all tortoise protection measures that may be implemented by the Project. USFWS describes a single designation for biologists who can be approved to handle tortoises, "Authorized Biologist." Such biologists have demonstrated to USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist.

Active burrows and special-resource burrows will be avoided, where possible. Where avoidance of any burrow is infeasible, occupancy will first be determined through the use of fiberoptics, probes or mirrors. All burrows that could potentially host a tortoise will be excavated with hand tools in the method prescribed by the Desert Tortoise Council (1994, rev. 1999), *Guidelines for handling desert tortoises during construction projects.* Any tortoises found will be removed from the construction area per MM TE-4: Desert Tortoise Translocation or Removal Plan.

Pipeline trenches will be closed, temporarily fenced, or covered each day. Each day, any open trenches will be inspected by an approved biological monitor at first light, midday, and at the end of each day to ensure tortoise safety.

If necessary, temporary fencing will be installed in the active work area to separate a tortoise from active construction, in order to maximize protection.

If a tortoise is injured or killed, surface disturbing activities must cease in the area of the killed or injured tortoise and the Project Biologist contacted. Injured tortoises will be taken to a qualified veterinarian if their survival is expected.

USFWS will determine if the tortoise can be returned to the wild, should it recover.

As a mitigation performance standard, following site clearance, a report will be prepared by the Project Biologist to document the clearance surveys, construction monitoring, the capture and release locations of all tortoises found, individual tortoise data, and other relevant data. This report will be submitted to the CDFG and USFWS.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

MM TE–3. **Desert Tortoise Exclusion Fencing.** The substation will be enclosed with a permanent tortoise exclusion fence to keep adjacent tortoises from entering the site. The fencing type will be one- by two-inch vertical mesh galvanized fence material, extending at least two feet above the ground and buried at least one foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent the tortoise from digging under the fence. Tortoise-proof gates will be established at all site entry points. All fence construction will be monitored by qualified biologists to ensure that no tortoises are harmed. Following installation, the fencing will be inspected monthly and during all major rainfall events. Any damage to the fencing will be repaired immediately. Parking and storage will occur within the substation and disturbed, previously fenced areas.

Any areas on the Central Project Area that are determined through surveys to require fencing will be fenced as outlined above (Figure 3.6-4). Where a fence is discontinuous (between tailings piles for example), the fence ends will extend well up the slope of the piles, to ensure that tortoises cannot go around the end. Alternative methods may be explored to ensure that the fences are functional at excluding tortoises.

Implementation Timing: construction and life of the Project

Party responsible for implementation, monitoring and reporting: Project Biologist and contractor

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

MM TE–4. **Desert Tortoise Removal and Translocation Plan.** The Desert Tortoise Removal and Translocation Plan is found in its entirety within Section 12.14. For both the Central Project Area and the linear facilities, it is anticipated that any tortoises removed would not be “translocated” or “relocated” in the biological sense of putting an animal in a location outside its home range. Instead, any tortoise would simply be removed to another part of its home range. Because construction on the Central Project Area will occur on highly disturbed previously mined areas, any tortoise found there during clearance would likely be a transient or in a peripheral part of its home range, certainly outside its core use areas or parts of its home range that could support its survival. By moving such a tortoise to a location immediately adjacent to its capture site outside the fenced construction area, the Project would be maintaining the tortoise within its home range, not translocating it. The tortoise merely would be excluded from undesirable areas. For utility corridors and fence construction, tortoises would be removed a short distance from the construction zone. Tasks will include the following:

- Tortoise handling and temperature requirements
- Data gathered on removed tortoises
- Translocation site preparation (if any) and choice
- Monitoring – All tortoises removed will be monitored sufficiently to ensure safety.

Implementation Timing: construction

Party responsible for implementation, monitoring and reporting: Project Biologist and contractor

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

MM TE-5. **Raven Monitoring and Control Program.** The Raven Monitoring and Control Plan is found in its entirety within Section 12.14. Proposed projects on Federal lands that may result in increased raven populations must incorporate mitigation to reduce or eliminate the opportunity for raven proliferation. The USFWS has developed a program to monitor and manage raven populations in the California desert in an effort to enhance desert tortoise recovery. In order to integrate monitoring and management, the USFWS has agreed to an "in-lieu" fee to replace quantitative raven monitoring on new projects in the range of the desert tortoise. The Project owner will pay in-lieu fees to USFWS that will be directed toward a future quantitative regional monitoring program aimed at understanding the relationship between ongoing development in the desert region, raven population growth and expansion and raven impacts on desert tortoise populations. The vehicle for this program is a Memorandum of Understanding between the Project owner, CDFG and USFWS.

The Raven Monitoring and Control Plan may include this in-lieu fee if it is determined that ravens may increase over current levels due to the Project. In addition to this in-lieu fee, the program will include, at a minimum:

- A suite of construction and operations measures to reduce food scavenging and drinking by ravens (e.g., trash containment, minimization of pooling water)
- Roadkill removal
- Qualitative monitoring of raven use of the site during operations, conducted on a pre-determined schedule by the onsite Project environmental compliance officer and
- Breeding season nest surveys

A draft Raven Control Plan is found in Section 12.14.

Implementation Timing: construction and life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

MM TE-6. **Habitat Compensation.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan states that all lands within a DWMA will be designated as Category I Desert Tortoise Habitat[4], with required compensation of 5 acres for every acre disturbed. All lands outside a DWMA are considered Category III habitat, with a 1:1 compensation ratio.

The Project overlaps 16.7 acres of Category I Habitat and 65.4 acres of Category III Habitat. The habitat compensation is 148.9 acres (Figure 3.6-3).

This land would need to be purchased in the same population of desert tortoises as occupy the site. In addition, the following features should apply to compensation lands:

- Be part of a larger block of lands that are currently protected or able to be protected
- Are not subject to intensive habitat degradation (e.g., recreational use, grazing use, agriculture)
- Have inherently moderate to good habitat that will naturally and ultimately regenerate when current disturbances are removed
- Preferably are bordered by native habitat suitable for tortoises and/or
- In part, may represent a buffer for a block of good habitat

[4] BLM habitat categories (BLM 1988), ranging in decreasing importance from Category I to Category III, were designed as management tools to ensure future protection and management of desert tortoise habitat and its populations. These designations were based on tortoise density, estimated local tortoise population trends, habitat quality, and other land-use conflicts. Category I habitat areas are considered essential to the maintenance of large, viable populations.

Implementation Timing: final engineering/pre-construction

Party responsible for implementation, monitoring and reporting: Project Applicant

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

Selection of compensation lands will be done in consultation with CDFG and USFWS.

MM TE-7. **Operations and Maintenance.** Tortoises observed during routine maintenance activities will be allowed to voluntarily move out of harm's way. Transmission line repair activities that will result in surface disturbance will require biological monitoring, per mitigation MM TE-2.

Implementation Timing: pre-construction/construction/life of Project

Party responsible for implementation, monitoring and reporting: Project Biologist contractor

Responsible Agency for verification and enforcement: FERC/USFWS/CDFG

3.6.5 Level of Significance after Implementation of Mitigation Program

Impact 3.6-1 Coachella Valley Milkvetch. As designed, PDF BIO-2 would result in a *less than significant* impact to the Coachella Valley Milkvetch.

Impact 3.6-2 American Peregrine Falcon. With adherence to PDF BIO-1, potential impacts to the American Peregrine Falcon are concluded to be *less than significant*.

Impact 3.6-3 Gila Woodpecker. With adherence to PDF BIO-1, potential impacts to the Gila Woodpecker are concluded to be *less than significant*.

Impact 3.6-4 Desert Tortoise. Adherence to MM TE-1 through MM TE-4, MM TE-6 through MM TE-7, and MM BIO-1 through MM BIO-4, would result in *less than significant* impact to desert tortoise.

Impact 3.5-5 Increase to Raven Population. With inclusion of the identified mitigation program MM TE-5, which has been designed to avoid or reduce potential effects, biological impacts to ravens are concluded to be *less than significant*.

No residual impact to threatened and endangered species would occur with implementation of the proposed Project.

3.7 Aesthetic Resources

This section of the Draft Environmental Impact Report describes the potential impacts of the proposed Eagle Mountain Pumped Storage Hydroelectric Project (proposed Project) on aesthetics and visual resources. The primary focus of the analysis is on scenic areas and scenic views from the Project location and from adjacent properties. The impact analysis is based upon field reconnaissance and review of pertinent documents.

3.7.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of visual resources. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the Bureau of Land Management (BLM) and is therefore subject to the visual resource LORS of that agency. No State or local regulatory settings pertaining to aesthetics or visual resources apply to the proposed Project. Therefore, the BLM's Visual Resource Management (VRM) System is utilized as the basis for this analysis.

3.7.1.1 Federal

Bureau of Land Management Visual Resource Management System is based on a three-step process that involves an assessment of (1) scenic quality; (2) visual sensitivity; and (3) viewing distance zones. Under this system, Key Observation Points (KOPs) are established and the visual sensitivity of an area determined based on defined landscape character types and scenic quality ratings. Results of these three assessment categories are grouped into established VRM Classes, which are used by the BLM to evaluate the significance of visual impacts from proposed projects.

BLM's VRM classes help establish management objectives and provide a framework for characterizing the relative value of the visual resource and degree of acceptable change in visual character. The four VRM classifications are described briefly below:

> **VRM Class I.** The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

> **VRM Class II.** The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

<u>VRM Class III</u>. The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or low. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

<u>VRM Class IV</u>. The objective is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

3.7.2 Existing Conditions

Visual resources were identified and analyzed primarily within a three mile limit of the principal Project components, which include (a) the pumped storage facility site, (b) the transmission line and related interconnection site, and (c) the pipeline. The Project components traverse an area that is visually characterized by broad, flat desert valleys bordered by highly eroded mountain ranges. The proposed Project facilities will be located within a formerly mined site in a desert mountain range known as the Eagle Mountains. A regional landfill proposed by Kaiser Ventures, LLC (Kaiser) would also occupy portions of the formerly mined lands. The transmission and pipeline routes cross mostly flat, desert valley land known as the Chuckwalla Valley.

3.7.2.1 Regional Landscape Setting

The proposed Project lies within a geographic area known as the Basin and Range Province (Fenneman, 1931). This area is characterized by a combination of arid and semi-arid landscapes set at the base of rugged mountain ranges including the San Jacinto, San Bernardino, Little San Bernardino, and Santa Rosa Mountains. These contrasting landforms with their varied colors and dappled vegetation patterns result in exceptional scenic quality and dramatic long views from key viewpoints. Elevations range from a high of 11,502 feet mean sea level (msl) at Mt. San Gorgonio Peak 100 miles west of the Eagle Mountain site, to a low of -228 feet below msl at the Salton Sea about 50 miles to the south.

The lower elevations include numerous alluvial fans, which are washes that form at the mouth of many of the canyons draining the mountains. These areas create a visually interesting transition between the mountains and the valley floor. The valley floor is comprised of a mix of sand dunes and sand fields that are enhanced by the presence of mesquite hummocks that provide a vivid contrast of green against the lighter sand color. In the spring, particularly after an above average precipitation event, the dunes and sand fields are covered with a profusion of annual plants that create a mosaic of color (CVMSHCP, 2007).

The mountainous portions of the Project area include the Eagle Mountains, Coxcomb Mountains, Palen Mountains, and Chuckwalla Mountains. These ranges give way to the lower Chuckwalla

Valley and the small communities of Desert Center and Lake Tamarisk. Interstate 10 (I-10), a major east-west travel route, crosses the Chuckwalla Valley in the southern section of the Project area. The relatively flat landscape and sparse vegetation creates a strong visual contrast to the rugged desert mountains, which rise abruptly from the valley floor.

3.7.2.2 Scenic Quality of the Study Area

The visual character of the study area was documented using scenic quality classes and guidelines from the VRM system. According to this system, scenery is rated Class A (unique), Class B (above average), or Class C (common) based on scenic quality rating criteria including landform, vegetation, color, architectural/cultural modifications, water, and adjacent scenery influence. Scenic quality classes and landscapes within the Project vicinity are summarized below.

Class A: Class A landscapes encompass unique natural features and landscapes with high ratings in a variety of the assessment parameters. Class A landscapes within the Project study area include the Coxcomb Mountains, located approximately 5 miles to the east of the Project site (Figure 3.7-1).

Class B: Class B landscapes in the study area encompass landforms/areas that exhibit above average ratings based on scenic quality assessment parameters. Class B landscapes include most of the Eagle Mountains surrounding the Project site, and the Chuckwalla Mountains (Figure 3.7-2).

Class C: Class C landscapes are represented by areas and features that exhibit relatively low ratings in several of the scenic quality assessment parameters, or exhibit discordant visual values due to man-made modifications or intrusions. Class C landscapes within the study area include the Chuckwalla Valley and the Eagle Mountain Mine and townsite (Figures 3.7-3 through 3.7-6).

3.7.2.3 Central Project Area Scenic Character Assessment

The Project is proposed within an inactive iron ore mine complex that is located along the eastern edge of the Eagle Mountains. Mined areas within the Project area represent highly disturbed, human-modified landscapes consisting of large open pits, tailing piles and ponds, the skeletons of ore processing facilities, and mining equipment areas. The Eagle Mountain Mine extends into the mountain slopes and presents a distinctly different visual character from the surrounding undisturbed portions of the mountains. The disturbed slopes exhibit regular, curved terraces extending into the open pits. Tailing piles are smooth-sloped and contrast in both texture and color with the natural topography. Some vegetation has invaded the idle mine areas, including both the open pits and the slopes of tailing piles.

Remnants of the ore processing facilities can be seen inside the fence that controls entry to the mine. Outside the fence, the town of Eagle Mountain is largely comprised of deserted homes and vacant buildings. A few of the homes are still used to house Kaiser employees.

Though the mined area provides significant visual variety to the area, the landscape modifications are not visually compatible with the adjacent form, line, color, and texture of the surrounding mountains. The overall scenic quality of this area is low (Figures 3.7-4 and 3.7-5).

While the mine area itself is a highly disturbed, human-modified environment with common (low) scenic quality, the surrounding mountains, with their rugged, rocky and steep grades, sparse vegetation, and variety of colors create a very scenic backdrop. The nearby Coxcomb Mountains to the east, rise higher, are more rugged, and exhibit a variety of colors from grays, to mauve to tan and brown. These mountains are more visually diverse and their scenic quality is high (Class A). The landscape character of the Eagle and Chuckwalla mountains are more typical of the regional landscape setting, and therefore, their scenic quality is moderate (Class B).

Chuckwalla Valley Scenic Character Assessment. Access to the Eagle Mountain mine site, and the transmission line and water pipeline corridors are through the Chuckwalla Valley. The Chuckwalla Valley is representative of desert basin features, as is the Pinto Basin, which is located north of the Project on the other side of the Eagle Mountains and effectively out of the Project viewshed. These expansive basins consist of relatively flat to gently sloping topography that visually separate and accent adjacent mountain ranges. The basins consist of a variety of colors created by the combinations of alluvial washes, wind-blown landforms, and vegetation.

The natural features of the Chuckwalla Valley are modified by residential and commercial developments, including the Eagle Mountain townsite, Lake Tamarisk, and Desert Center. Linear landscape elements within this landscape unit include roads, transmission lines, railroad tracks, off-highway vehicle tracks, the Colorado River Aqueduct (CRA), numerous stormwater training dikes for the interstate and CRA, and the Metropolitan Water District's (MWD) Eagle Mountain Pump Station and related facilities. Primary transportation corridors within the unit include I-10 and State Route (SR) 177.

The expansive scale and flat topography of the basin offers panoramic views of the surrounding mountain ranges from many locations. However, the overall scenic quality of the Chuckwalla Valley within the viewshed of the Project is considered common (Class C). The relatively flat and uniform landscape character is typical of the regional landscape setting. Existing developments within it additionally detract from the natural qualities of the landscape (Figure 3.7-6).

Scenic Quality designations for the Project area are summarized in Table 3.7-1.

3.7.2.4 Visual Sensitivity Analysis

An analysis of visual sensitivity takes into account several elements. These include viewer activity and expectations, viewer numbers, view duration, and viewer distance. Noted sites were analyzed for visual sensitivity according to these evaluation factors as summarized in Table 3.7-1. Locations and sites contributing to the area's visual sensitivity are described below.

Joshua Tree National Park (JTNP) surrounds the Central Project Area on three sides. While the rugged terrain and focus on backcountry use limits viewer numbers, viewer expectations of natural landscapes and view durations from ridge top trails would be high. Additionally, the view distance from nearby ridgetops is relatively short (foreground/middleground views, ¼ to 3 miles). Consequently, visual sensitivity from within the JTNP surrounding the Project is considered high.

Residential/Commercial Areas (townsite, Lake Tamarisk, Desert Center). Visual sensitivity of the various developed communities in the vicinity range from low to high. The Eagle Mountain townsite currently has few permanent residents and most of the facility is inactive. The proposed landfill project would open and restore the town for some activity. However, this population is not expected to be large. Furthermore, because area workers would be familiar with the visual surroundings, visual sensitivity is rated as low.

View durations from residents of Lake Tamarisk and Desert Center are long, and user expectations or sensitivity to visual change generally is high for residents. Both sites have relatively low viewer numbers. While view distances to proposed Project features are far (8 to 12 miles) and views of the mine site are partially blocked by intervening landforms and screening (for Lake Tamarisk) visual sensitivity is considered to be moderate to high for Lake Tamarisk residents. Desert Center's combination of commercial and work-related residential uses serves to create a visual sensitivity that is rated low to moderate.

Travel Routes. Motorists traveling on I-10 in the vicinity of Desert Center represent the largest numbers of viewers in the Project vicinity. Additionally, according to the Riverside County Comprehensive General Plan, the section of I-10 that passes by the Project vicinity is designated as an Eligible County Scenic Highway. This is based on the long, panoramic views of the surrounding mountains created by the flat landscape of the Chuckwalla Valley. While off-site views of the mountains are dramatic, view durations are relatively short as motorists are traveling this corridor at high rates of speed (posted 70 miles per hour). Due to the high viewer numbers and elevated significance of I-10 as an Eligible County Scenic Highway, the visual sensitivity is considered high.

SR 177 is similar in landscape setting, but viewer numbers are much less and it has no scenic corridor designation. However, use increases particularly during the fall and winter months by travelers passing through from visiting recreation destinations and enjoying the scenery. Consequently, visual sensitivity is rated moderate for SR 177.

Kaiser and Eagle Mountain Roads have low visual sensitivity ratings. They are not through routes, have low volumes of traffic, and are used primarily by commuters (work expectations).

Table 3.7-1. Visual Sensitivity Analysis Results

Locations/Sites	User Expectations	View Duration	Use Volume	**Visual Sensitivity**
Residents				
Eagle Mountain Town	Low	Long	Low	**Low**
Lake Tamarisk	Moderate/High	Long	Low	**Moderate/High**
Desert Center	Low/Moderate	Long	Low	**Low/Moderate**
Recreation Sites				
JTNP and Wilderness Area	High	Long	Low	**High**
Travel Routes				
I-10	High	Short	High	**High**
State Route 177	High	Short	Moderate	**Moderate**

3.7.2.5 Distance Zones and Visibility

Another element of the visual resource assessment process is consideration of distance zones and visibility. Distance zone thresholds can vary, depending on a variety of factors. For this Project, a review of previous studies was conducted in addition to field assessment to establish visibility thresholds. The perception of form, texture, color, and line vary as a result of viewing distance relative to Project features. Geographical and landscape settings can impact viewing zones and visibility thresholds. For example, the mottled color and texture of this region's desert basins create a situation in which lattice tower structures become very hard to detect beyond 2 to 2.5 miles if they are not visible above the skyline. Generally, elements of form and line become more dominant than color and texture at longer viewing distances. Visibility thresholds or distance zones for this Project are presented in Table 3.7-2.

Table 3.7-2. Distance Zone Thresholds

Visibility Threshold	**Project Components**	
	500kV Transmission Line	**Central Project Site**
Foreground	0 to ¾ mile	0 to ¾ mile
Middleground	¾ mile to 2.5 miles	¾ mile to 5 miles*
Background/Seldom Seen	Beyond 2.5 miles	Beyond 5 miles*
* - Larger threshold due to greater scale and configuration of features		

The distance zone thresholds follow the BLM's VRM methodology according the following categories:

- Foreground – The limit of a viewed area in which details are perceived and obvious. Texture and other aesthetic qualities of vegetation are most notable within 0 - ½ to ¾ miles.

- Middleground – The zone in which details of foliage and fine texture ceases to be perceptible and outlines and patterns become more discernable than details. Distance is ½ to ¾ to 2.5 to 5 miles.

- Background – The portion of the landscape where texture and color are usually weak and landforms and line become the most dominant elements. Distance is 2.5-5 to 15 miles.

- Seldom Seen – Those areas of the landscape where topographic relief or vegetation screen viewpoints or when viewing distance is beyond 15 miles.

Figure 3.7-8 presents a general summary of the Project area's visual sensitivity, analyzed for foreground/middleground distance zones from KOPs (Figures 3.7-11 – 3.7-19). These KOPs or areas are briefly described below:

- KOP#1 **–** View from Desert Center near the Kaiser Road and SR 177 intersections. View looking north toward the Project site in the background.

- KOP#2 **–** View from Lake Tamarisk. View looking north toward the Project site in the background.

- KOP#3 **–** View from Eagle Mountain/I-10 Interchange. View looking north toward the Project transmission line approximately 2 miles in distance.

- KOP#4 **–** View from I-10 westbound lane. View looking northwest across part of Desert Center, and toward the Project transmission line and Interconnection Substation.

- KOP#5 **–** View north from SR 177 of the proposed water pipeline crossing.

- KOP#6 **–** View from Kaiser Road. View looking northwest toward the Project site.

- KOP#7 **–** View from Eagle Mountain townsite. View looking north toward the Project site.

- KOP#8 **–** View from Kaiser and MWD road intersection. View looking south-southwest toward the proposed Project transmission line approximately 1 mile away.

- KOP#9 **–** All of the JTNP and Wilderness Boundary Edge. Due to greater expectations of visitors within these areas, visual sensitivity within foreground and middleground distance zones from these boundaries was given a high rating. Note: KOP #9 is a general area, not a specific viewpoint, so no figure was prepared to illustrate KOP #9. However, *see* Figure 3.10-8 in Section 3.10, Recreation, which illustrates Project visibility from designated trails within JTNP.

- KOP#10 – View southeast from Eagle Mountain Road and Railroad intersection. Alligator Rock and Community of Desert Center approximately 5+ miles in the distance. Viewpoint is at approximate location where the proposed transmission line exits the BLM utility corridor boundary. The BLM boundary continues to the southwest while the transmission line continues south and southeast.

The visual sensitivity/distance zone analysis represents a very conservative estimate of the area's visual sensitivity zones, based on potential visibility from various locations. Local vegetation, structures and topography could completely or partially block views from select areas shown as being visible within the Project's current, composite viewshed.

3.7.3 Potential Environmental Impacts

3.7.3.1 Methodology

Preparation of this section included site visits and the use of photographs to pictorially represent the features of the Project as accurately as possible. The area was reviewed to identify any designated visual resources that could occur on site or in the area.

Analysis of impacts to visual character is subjective by nature, because the qualities that create an aesthetically pleasing setting will vary from person-to-person. For purposes of this analysis, the Project vicinity was surveyed to evaluate the existing community visual character. Site photographs presented in this section depict the existing visual character of the Project site and have contributed to the visual analysis of the Project.

A detailed visual assessment was conducted through field investigations during 2008-2009, utilizing the BLM's VRM System (BLM handbook H-8410-1, 1986). This system is based on a three-step process that involves an assessment of (1) scenic quality, (2) visual sensitivity, and (3) viewing distance zones. Under this system, KOPs are established and the visual sensitivity of the area characterized based on defined landscape character types and scenic quality ratings. Results of these three assessment categories are grouped into established VRM Classes described above.

Private and non-federal lands generally are not inventoried and assessed utilizing the BLM VRM system. Private lands are not required to adhere to the same restrictions and mandates as the BLM. However, since the BLM visual methodology is a well-developed analytical process, it was applied to all Project lands, public and private, to assess the overall degree of visual impact.

The visual resource assessment study includes review of existing mapping and aerial photography, identification of key viewpoints, evaluation of scenic quality and visual sensitivity and development of visual resource summary exhibits. Field investigations were conducted in 2008, 2009, and 2010 to support the effort.

Project Area VRM Summaries. Although much of the Central Project Area is in private ownership, the VRM classifications have been applied to both private and public lands within the Project site to provide a framework for assessment. VRM Class II designations apply to the higher slopes of the Eagle Mountains surrounding the disturbed lands and Central Project Area. Due to the extensive disturbance from past mining activities, the majority of the Central Project Area falls within VRM Class IV, which allows for modification of the existing character of the landscape.

Outside of the Central Project Area, VRM Class IV covers lands north of the MWD Eagle Mountain Pump Station, which reflects the extent and dominance of the area's manmade features and its low visual sensitivity ratings. South of the MWD Eagle Mountain Pump Station, the transmission line and water pipeline will cross through the Chuckwalla Valley and lands designated as VRM Class III.

3.7.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on aesthetics and visual resources if it does any of the following:

(a) Has a substantial adverse effect on a scenic vista

(b) Substantially damages scenic resources, including but not limited to trees, rock outcroppings and historic buildings within a State scenic highway

(c) Substantially degrades the existing visual character or quality of the site and its surroundings and/or

(d) Create a new source of substantial light and/or glare that would adversely affect day or nighttime views in the area

3.7.3.3 Environmental Impact Assessment

Assessment of the area's existing visual resources and summarization of visual resource management classes allow assessment of the significance of Project impact from the Project on visual resources. The impact findings are based on assessment of the changes attributable to implementation of the Project relative to thresholds of significance. Ten KOPs were identified to help support the impact assessment. Locations of the KOPs are shown on Figure 3.7-9 and details provided in Figures 3.7-11 to 3.7-19.

3.7.3.3.1 *Central Project Area*

Most of the Central Project Area and proposed pumped storage facilities fall into VRM Class IV categories due to the highly disturbed setting of the mine site. Most views of the Project site lie within background zones from the KOPs and intervening landforms block views of many of the surface facilities.

Hikers on surrounding ridge tops within the JTNP and Wilderness Area may view some of the Project features (mainly reservoirs and dams) which would be within middleground distance zones (*see* Figure 3.10-8 in Section 3.10 Recreation). Access to these ridge tops is very difficult and viewer numbers are low. Hikers would view Project features across lands not designated as wilderness, and would view Project features associated with an existing disturbed setting as well as existing transmission lines, the Eagle Mountain townsite, and the MWD Eagle Mountain Pump Station. Generally, most hikers use lower elevation canyons and washes and cannot see the proposed Project site at all.

VRM Class II designations encompass the higher, undisturbed slopes of the Eagle Mountains surrounding the Project site. These slopes will not be disturbed by the proposed Project. Overall visual resource impacts within the Project site are not expected to be significant given the highly disturbed nature of the existing landscape setting from past mining activities and facilities.

During meetings with agencies, JTNP representatives noted that the backcountry portions of the JTNP (areas near the Project site) are very light-sensitive areas and expressed concern regarding increases in night lighting. Existing lighting from the Eagle Mountain townsite, Desert Center, and Lake Tamarisk is visible throughout the Chuckwalla Valley. A lighting study completed for the proposed Eagle Mountain Landfill concluded that the increase in light compared to natural or ambient background levels is relatively low, and would only be perceptible in the immediate vicinity of the Project, up to a distance of approximately 2 miles (CH_2M Hill, 1996). The proposed Project may increase lighting over ambient levels temporarily during construction. After construction, lighting of facilities will be kept to a minimum and to facilities necessary for security and safety reasons.

3.7.3.3.2 *Transmission Construction*

Construction of the Project's transmission line will create short-term visual impacts associated with construction including: visibility of Project construction equipment, materials, personnel, and construction staging areas. Because the Project's transmission line would be constructed over a relatively short period (12 months) and would directly affect only the transmission line corridor and immediately surrounding area, this impact would be *less than significant*.

3.7.3.3.3 *Transmission Line Operation*

Project Site to MWD Eagle Mountain Pump Station. The proposed double-circuit 500 kilovolt (kV) transmission line will utilize lattice tower structures that are approximately 175 to 220 feet in height. North of the MWD Eagle Mountain Pump Station, the proposed route will cross and parallel existing wood pole transmission lines, introducing a new element that is only incremental in its visual impact on existing conditions. Visibility of this route segment is limited primarily to travelers on north Kaiser Road. The transmission line may be visible to hikers within the JTNP and Wilderness Area. However, the structures would be viewed from middleground distance zones and their visual contrast will be relatively low due to distance, landscape background, and existing transmission lines and MWD facilities. Visibility of this segment of the transmission line from I-10 is in the background and is further limited by intervening landforms as exemplified by the viewshed summary presented in Figure 3.7-10. The proposed transmission line would meet the VRM Class III and IV management objectives in this area.

Although the 500 kV transmission line would not reflect the basic elements of the existing natural features in the landscape, it would reflect the characteristics of the existing transmission lines and MWD facilities and not dominate the view of the casual observer. Therefore, the low level of visual change that would be created by this portion of the transmission line would create only incremental visual impacts, and would be consistent with the applicable VRM Class III and IV management objectives.

MWD Eagle Mountain Pump Station to Eagle Mountain Road Turnoff. South of the MWD Eagle Mountain Pump Station the transmission line parallels the existing Eagle Mountain Road for approximately 4 miles before turning southeast to the interconnection site. The transmission line will introduce a new feature to the landscape and create a visual contrast that varies in its degree of strength, depending on view location and view distance. The line segment paralleling Eagle Mountain Road will present a mild to moderate visual contrast from key viewpoints (Desert Center, I-10) since viewing distance is beyond middleground distance zones. Additionally, tower structures will not be skylined and will “blend” with the surrounding mottled landscape of the desert basin at these distance zones due to the higher elevations of the view locations. Similarly, visual contrast will be relatively mild from middleground view locations within the JTNP and Wilderness Area. While the new line would not reflect the basic elements of the existing natural features in the landscape, it would reflect the characteristics of the existing MWD transmission line that lies within far foreground views of the JTNP. Consequently, visual impacts in this location are expected to be less than significant and would be consistent with VRM Class III management objectives.

Construction of the transmission line segment east of the MWD Eagle Mountain Pump Station near the existing railroad to the point where it turns away from the Eagle Mountain Road (5.7 miles) will create a new utility feature and right-of-way (ROW). Viewing opportunities of concern include middleground view opportunities from the JTNP and Wilderness areas, and to a lesser extent, background views from I-10 and Desert Center. While the new line would not repeat the basic elements of the existing natural features in the landscape, it would repeat the characteristics of the existing MWD transmission line that lies within foreground views of the JTNP. Visual contrast from background views of I-10 and Desert Center would be weak to moderate and should not dominate the view of the casual observer.

Eagle Mountain Road Turnoff to Interconnection Substation. Visual contrasts created by construction of access and spur roads and towers will become greater as the route leaves the Eagle Mountain Road and travels to the Interconnection Substation site. Here, the line enters middleground and foreground viewsheds of key viewpoints, notably I-10 and Desert Center residences. Visual contrast will be high due to increased visibility of structure details and conductors, and as a result of a new utility feature being introduced into the natural landscape. Although views from I-10 are of short duration, they sweep across this location due to the bend in the road alignment providing panoramic views of the Chuckwalla Valley. Consequently, construction of this transmission line segment would not be compatible with VRM Class III management objectives.

VRM Class III areas require that the level of change to the characteristic landscape be "moderate or less" and that the Project should not dominate the view of the casual observer. While such visual impacts for viewers traveling at 70 miles per hour will be brief, the addition of a new 500 kV transmission line and substation into foreground views would create visual changes exceeding moderate levels that would dominate the view for a brief period. Similar conclusions were drawn for the Southern California Edison (SCE) Devers-PaloVerde No. 2 (DPV2) Transmission Line north alternative segment that is proposed to route across the same vicinity (*see* SCE, DPV2 Transmission Line Project, Draft EIR/EIS, May 2006). The new DPV2 Transmission Line proposed to route through this area would reduce the visual contrast of the Project Transmission Line to some degree, but not sufficiently to meet VRM Class III management objectives in foreground and middleground view zones.

The proposed Interconnection Substation site will lie within foreground views of I-10 and Desert Center. While the substation may be constructed in proximity to the new DPV2 transmission line and therefore, not be the only utility element in the foreground, the station's size, discordant structures, lines and features within the foreground views from I-10 and Desert Center will create a strong visual contrast that would not be consistent with VRM Class III management objectives.

Of the nine KOPs established, two (I-10 and Desert Center) would be exposed to significant, unmitigable visual changes. Although the new structures would be similar in design and height to the new DPV2 line segment proposed to cross within the I-10 foreground (*see* Figures 3.7-7 through 3.7-10 for locations of existing and proposed transmission lines), the new structures would additionally block panoramic views of the Chuckwalla Valley and surrounding mountains. The new line and new ROW would also increase the structural complexity and industrial character, which would become more pronounced the closer the viewer is to the structures. Viewers traveling eastbound on I-10 would be most affected by the new transmission line since unobstructed views of it would become apparent as viewers come within the foreground/ middleground view zones. The new structures will be apparent to westbound travelers as well, but potentially "filtered" due to the proposed DPV2 line. The moderate-to-high level of visual change that would be caused by this segment of the Project would be inconsistent with the applicable VRM Class III management objectives. Based upon the analysis above, the Project will result in a significant adverse visual impact on the existing visual character of the Project vicinity.

3.7.3.3.4 *Water Pipeline Construction and Operation*

The proposed water pipeline crosses lands visually dominated by undeveloped open desert areas, abandoned agricultural areas, road and utility ROWs. The pipeline, extending from wells that will provide make up water, will be buried, creating only short-term visual impacts during construction. Temporary visual impacts from construction will be noticeable to travelers on SR 177 where the pipeline will cross. Overall, the pipeline will create a short-term visual impact due to creation of higher, but temporary visual contrast. Construction and operation of the pipeline will meet VRM Class III and IV management objectives identified for this area. Table 3.7-3 summarizes the results of the impact assessment presented above.

Table 3.7-3. Project Visual Resource Impact Summary

Project Feature	Visual Impact			Mitigation Program	Remarks
	Pot. Signif. Impact	Less Than Signif. With Mit.	Less Than Signif. Impact		
Project Site		X		MM AES-1, PDF AES-1	Project development within a previously disturbed setting
Transmission Line	2.5 miles	5.7 miles	5.3 miles	PDF-AES 1, MM AES-3 MM AES-4	Significant impact due to introduction of a new line into a landscape lacking similar built structures within foreground and middleground view zones of KOPs. Moderate impacts due to introduction of line within landscape lacking similar structures but sufficiently away from view zones to cause weak to moderate contrast. Less-than-significant impacts due to construction in seldom seen areas or adjacent to existing structures.
Interconnection Substation	X			MM AES-1 MM AES-3	Significant impacts due to strong visual contrast within fg view zones.
Water Pipeline		X		MM AES-2	Temporary, short term, less-than-significant impacts due to construction activity.
High Impact - Strong visual contrast in fg/mg view zones from a number of KOPs. Mitigation unlikely to reduce impact significance. Inconsistent with VRM Class designations.					
Moderate Impact - Visual contrast noticeable but not dominant as viewed from KOPs. Mitigation can reduce impacts to less than significant levels. Consistent with VRM Class designations.					
Low Impact - Weak visual contrast and/or adjacency to existing built structures and development. Mostly within background or seldom seen view zones. Consistent with VRM Class designation. Mitigation not necessary.					

Environmental Impact Assessment Summary:

(a) *Would the project have a substantial adverse effect on a scenic vista?* No. Scenic vistas will not be affected by construction or operation of the proposed Project.

(b) *Would the project substantially damage scenic resources, including but not limited to trees, rock outcroppings and historic buildings within a state scenic highway?* No. The Project will not damage scenic resources within a State scenic highway.

(c) *Would the project substantially degrade the existing visual character or quality of the site and its surroundings?* Yes. Of the nine KOPs established, two (I-10 and Desert Center) would be exposed to significant adverse visual impacts. The moderate to high level of visual change is inconsistent with the applicable VRM Class III management objectives. These impacts would be significant and would remain significant with mitigation. Therefore, these impacts would be *significant and unavoidable*.

(d) *Would the project create a new source of substantial light and/or glare that would adversely affect day or nighttime views in the area?* The Project will include night lighting. Mitigation (MM AES-1) is proposed to reduce this impact *below the level of significance*.

Impact 3.7-1 Central Project Area. This impact is *potentially significant and subject to the mitigation program* (MM AES-1). Visual impacts associated with the development of the Project's central facility are largely short-term due to construction activity and have a low potential to impact scenic vistas within the vicinity of the Project area. Visual impacts from the Central Project Area would be less than significant and no mitigation measures would be required.

Impact 3.7-2 Transmission Line Construction. This impact is considered *potentially significant and subject to the mitigation program* (PDF AES-1 and MM AES-4). The Project's transmission line will create short-term visual impacts associated with construction including: visibility of Project construction equipment, materials, personnel, and construction staging areas. This impact would be significant at I-10 and Desert Center, deemed to be a significant, unmitigable visual change. The new line and new ROW would also increase the structural complexity and industrial character, which would become more pronounced the closer the viewer is to the structures. The moderate-to-high level of visual change that would be caused by this segment of the Project would be inconsistent with the applicable VRM Class III management objectives.

Impact 3.7-3 Operation of Transmission Line from the Project Site to MWD Eagle Mountain Pump Station. Visual impacts would be *less than significant* for this line segment.

Impact 3.7-4 Operation of Transmission Line from the MWD Eagle Mountain Pump Station to Eagle Mountain Road Turnoff. Visual impacts resulting from construction of this segment of the transmission line are *potentially significant and subject to the mitigation program* (MM AES-3 and MM AES-4). The project would be designed consistent with VRM Class III management objectives (regulatory LORS).

Impact 3.7-5 Operation of Transmission Line from the Eagle Mountain Road Turnoff to the Interconnection Substation. The transmission line segment from the Eagle Mountain Road turnoff to the interconnection substation (2.5 miles) would constitute a new utility feature within the landscape, creating high visual contrast within foreground view zones, resulting in a *significant and unavoidable* impact (MM AES-3 and MM AES-4).

Impact 3.7-6 Construction and Operation of the Water Pipeline. Short-term construction impacts would be *potentially significant and subject to the mitigation program* (MM AES-2) due to the water pipeline's low profile and proximity to existing access roads, SR 177 and transmission utilities.

3.7.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs). Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts to less than significant, where applicable. As appropriate, performance standards have been built into the mitigation measures.

As mentioned under Regulatory Settings, local, State, or Federal regulations or laws are frequently required independent of California Environmental Quality Act review, yet these requirements offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

PDF AES-1. **Staging Areas.** Staging areas and areas needed for equipment operation, material storage and assembly shall be combined with construction lands to the extent feasible, and organized to minimize the total footprint needed. Staging, storage, and temporary construction areas shall be reclaimed as soon as the use of each such area is completed.

MM AES-1. **Lighting.** To minimize lighting effects and potential light pollution, the final engineering design shall incorporate directional lighting, light hoods, low pressure sodium bulbs or LED lighting, and operational devices to allow surface night-lighting in the central site to be turned on as-needed for safety. The Project operator shall fund night sky monitoring to be conducted in collaboration with the National Park Service (NPS) during the post-licensing design period (to represent baseline conditions) and during construction and the initial operational period.

Implementation Timing: Final engineering/pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Contractor/ Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB/FERC

MM AES-2. **Water Pipeline**. For construction of the water pipeline, reduce side cast disposal of soils from open cut construction (by replacing disturbed soil within the trench and limiting the width of the construction disturbance) to reduce color contrast and disturbance with surrounding landscape. The area disturbed during pipeline construction shall be backfilled and revegetated with native vegetation immediately following completion of pipeline construction.

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Contractor/Environmental Coordinator

Responsible Agency for verification and enforcement: SWRCB/FERC

MM AES-3. **Road Crossings.** For design of the transmission line, road crossings shall be aligned perpendicular to the road to minimize views up and down ROW corridors, and towers should be placed at the maximum distance from the road ROW. Steel lattice structures with a dull, galvanized steel finish shall be utilized to reduce visual contrast. Conductors shall be selected to reduce glare and visual contrast. The corridor should be collocated with the existing MWD transmission corridor, and tower spacing at Victory Pass designed so that as few towers as possible are skylighted on the ridgeline. These considerations will be balanced with engineering constraints and concerns for minimizing impacts to other resources such a desert tortoise and cultural resources. Final design will be approved by FERC.

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB/FERC

MM AES-4. **Transmission Line.** For construction of the transmission line, existing access roads and construction laydown areas shall be used to the extent feasible. The transmission line disturbed zones that will not be required for long term maintenance access will be revegetated with native vegetation immediately following completion of transmission line construction, consistent with the recommendations in the Biological Resources Revegetation Plan (*see* Section 12.14).

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Contractor/ Environmental Coordinator

Responsible Agency for verification and enforcement: SWRCB/ FERC

3.7.5 Level of Significance after Implementation of Mitigation Program

Impact 3.7-1 Central Project Area. The Central Project Area is already highly disturbed. Most Project features are underground. Above ground facilities are generally blocked from view by intervening landforms. MM AES-1 will ensure that visual impacts from Project lighting *are less than significant.*

Impact 3.7-2 Transmission Line Construction. Due to the Project's relative short duration of transmission line construction, these impacts are short term and would be *less than significant* PDF AES-1 and MM AES-4 will further reduce construction-related visual impacts.

Impact 3.7-3 Operation of Transmission Line from the Project Site to MWD Eagle Mountain Pump Station. The transmission line is consistent with applicable VRM Class III and IV management objectives, therefore this impact is *less than significant* and no mitigation measures are required.

Impact 3.7-4 Operation of the Transmission Line from the MWD Eagle Mountain Pump Station to Eagle Mountain Road Turnoff. Impacts are *less than significant*. MM AES-3 and MM AES-4 would further reduce visual effects of this Project component.

Impact 3.7-5 Operation of the Transmission Line from Eagle Mountain Road to Interconnection Substation. While project design features are included in the design, this portion of the Project would result in significant impacts. Mitigation measures (MM AES-3, MM AES-4) would reduce these impacts; however, none of the mitigation measures would reduce this visual impact to less than significant. Therefore, this impact would be *significant and unavoidable*.

Impact 3.7-6 Construction and Operation of the Water Pipeline. Short-term impacts from construction of the water pipeline would be significant. However, with incorporation of MM AES-2, these impacts will be reduced to *less than significant*.

Residual aesthetics impacts from the operation of the transmission line from Eagle Mountain Road to interconnection substation would occur with implementation of the proposed Project.

3.8 Cultural Resources

This section of the Draft Environmental Impact Report describes the existing cultural resources setting within the Eagle Mountain Pumped Storage Hydroelectric Project (Project) site and surrounding vicinity, and evaluates potential impacts to cultural resources that could occur from Project implementation. The Project site does not contain any structures, buildings, or other features that could constitute historic or prehistoric resources. The impact analysis is based upon field reconnaissance, consultation with the Bureau of Land Management (BLM), State Historic Preservation Office (SHPO), and Native American Heritage Commission, and review of pertinent documents as discussed within this section.

3.8.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of cultural resources. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Section 106 of the National Historic Preservation Act (NHPA) requires that every Federal agency "take into account" how each of its undertakings could affect historic properties. *See* 16 U.S.C. § 470 (2000) *et.seq.* Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (NRHP).

The Federal Energy Regulatory Commission (FERC) designated Eagle Crest Energy Company (ECE) as a non-federal representative for the purposes of conducting section 106 Consultation under the NHPA on September 18, 2008. Pursuant to Section 106, and as the Commission's designated non-federal representative, ECE consulted with the SHPO and affected Indian Tribes to locate, determine National Register eligibility, and assess potential adverse effects to historic properties associated with the Project.

The Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Federal Register 44738-39) specifies the qualifications for archeologists tasked with assessing the impacts to cultural resources. ECE has contracted with Dr. Jerry Schaefer, Ph.D., RPA of ASM Affiliates, Inc. (ASM), who has the required qualifications, to prepare the cultural resources analysis of the proposed Project.

A Historic Properties Management Plan (HPMP) was prepared, informed by the *Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects* (FERC May 20, 2002). ECE's Plan and Procedures for Addressing Unanticipated Discoveries of Cultural Resources and Human Remains (HPMP Appendix A) is consistent with the Advisory Council on Historic Preservation's Policy Statement Regarding Treatment of Human Remains and Grave Goods (September 27, 1988, Gallup, N.M.), California laws regarding the discovery of human remains (Health and Safety Code Section 7050.5: Disturbance of Human Remains;

8010-8011: California Native American Graves and Protection Act 8010-8011; Public Resources Code Sections 5097.94, 5097.98 and 5097.99), and the National Native American Graves and Protection Act of 1990 (25 U.S.C. 3001 et seq; 43 CFR 10). This HPMP is also consistent with Federal procedures for obtaining required permits for archaeological excavation (Archaeological Resources Protection Act of 1979) (16 U.S.C. 470aa-470mm; Public Law 96-95).

3.8.2 Existing Conditions

The Project traverses the north-central margin of the Colorado Desert, centering on the Chuckwalla Valley and north-eastern Eagle Mountains. This region has a long cultural history extending back more than 10,000 years. The affiliation of a particular Native American group with the Chuckwalla Valley is somewhat uncertain (Heizer, 1978); ethnographic and historic evidence suggests possible links with three distinct groups: the Halchidhoma, Desert Cahuilla, and Chemehuevi. Since the Euro-American occupation of the region, the cultural landscape has been altered by a variety of land uses relating to travel, settlement, mining, water reclamation, and military preparedness. A thorough description of the environmental and cultural context is presented in Section 12.11.

3.8.2.1 Results of Inventories

A search of cultural resource records at the Eastern Information Center (EIC) was performed on March 9, 2009, supplemented by previous similar reports available at ASM Affiliates. The search identified 26 previous reports that had addressed portions of the study corridor, of which nine are mapped as including a portion of the Project area proper and therefore within the Project Area of Potential Effects (APE) boundary. A total of 31 cultural resources had been recorded within the study corridor; of these only two in part fall within the Project APE boundary: an underground portion of site P-33-011265, the Colorado River Aqueduct (CRA), will be crossed by both the transmission line and water pipeline. The transmission line also crosses the Eagle Mountain Railroad. The Central Project Area, where the major elements of the Project (reservoirs, powerhouse, switchyard, etc.) occur, is within the Eagle Mountain Mine area, recorded as P-33-006913.

3.8.2.1.1 *Previous Reports*

As noted, 26 reports addressing portions of the study corridor have been identified (Table 3.8-1). Of these, just 35 percent addressed the Project APE proper. The study corridor (including the 1 mile buffer around the Project area proper) amounts to approximately 49,833 acres. Because many of the previous reports have addressed small linear corridors or irregularly shaped areas, it is not possible to estimate precisely how much of either the Project area proper or the larger study corridor has previously been systematically inventoried for cultural resources. Based upon inspection of the coverage maps, it appears that the portion of the actual Project area that has been systematically inventoried previous to this project-specific Class I and III investigation is unlikely to have exceeded 10 percent, with the smallest portions being the linear elements of the transmission line and water line. Larger contiguous areas within and around the Eagle Mountain Mine (4,656 acres) and townsite (404 acres) near the northern terminus of the transmission line and the reservoir sites (central and eastern mine pits) have been surveyed (Bull et al., 1991; Schmidt, 1995). A much smaller portion of the larger study corridor has been investigated.

Previous studies likely to have addressed significant portions of the area within the Project boundary include Cowan and Wallof (1977; RI-00220), Wallof and Cowan (1977; RI-00222), Carrico et al. (1982; RI-00221), Bull et al. (1991; RI-03321), Love (1994; RI-03949), and Schaefer (2003):

- Cowan and Wallof (1977) and Wallof and Cowan (1977) reported a 1976 archaeological survey of 200 linear miles for the earliest alternative routes of the Southern California Edison Devers-Palo Verde No. 1 (DPV1) 500 kilovolt (kV) Transmission Line, both north and south of Interstate 10 (I-10). The northern route bisects both the transmission and water line routes although no sites were recorded at the Information Center within the Project area proper. The 1976 survey corridor was 400 feet wide and was surveyed intensively, in 12-meter (m) interval transects. However, standards for recording sites were relatively restrictive: resources classified as isolates included lithic scatters with less than 15 items per 10 m^2; ceramic scatters with less than 5 items per 10 m^2; prehistoric trails, rock rings, and other isolated features; and historic remains except for pre-1950 scatters with more than 10 items per 10 m^2, structures, military encampments, and mine buildings. Most of these would be classified as sites under today's standards. These "isolates" were not recorded by Cowan and Wallof at the EIC and only appear as tabular listings in their report. Some may have been recorded during subsequent surveys along the same corridor.
- Carrico et al. (1982) reported a 1980 survey of the same alignment as the 1976 DPV1 500 kV Transmission Line survey. The 1980 survey also included a corridor that was 400 feet wide and was surveyed at 12-meter intervals. Criteria for distinguishing sites from isolates were less restrictive than in the 1976 study: isolates were defined as five or fewer prehistoric or historic artifacts within a distance of 25 meters. Most of the recorded sites were south of I-10 and outside the Project area. This route was ultimately built but the sites were evaluated in the field prior to construction and as a result, these sites no longer exist.
- Schaefer (2003) reported a Class I and II study for 527 linear miles of alternative routes for the Desert-Southwest transmission line, including 16.5 miles of new surveys. The alignments addressed were generally the same as those previously addressed in the reports by Cowan and Wallof (1977), Wallof and Cowan (1977), and Carrico et al. (1982). Additional fieldwork in 2002 consisted of surveying 16.5 miles of generally 1-mile long, 150-meter (500-foot) wide sample units with transects at 20-meters (65-feet) intervals. The survey corroborated the Carrico et al. survey results and identified the Alligator Rock NRHP site complex as the only known sensitive zone near the current Project area.

- Bull, et al. (1991) reported a 1990 survey of 4,659 acres for the previously proposed solid waste landfill project. This survey overlaps much of the northern extent of the proposed transmission line and portions of the site plan at the former Eagle Mountain Mine, including the Eagle Mountain Railroad route. This area is generally characterized by relatively rugged terrain, and the 1990 survey coverage in this area was not systematic, but was focused on ridgelines, saddles, and drainages. Scatters of more than three items within a 25-meter radius were classified as sites although none were recorded in the current Project area. Their conclusion was that the area possessed low sensitivity for archaeological sites. The Bull et al. investigations included ethnographic interviews by subconsultant Cultural Systems Research, Inc. (CSRI), under the direction of Lowell J. Bean, Sylvia Brakke Vane, and Jackson Young. These ethnographic investigations included field visits and interviews with one Cahuilla, one Chemehuevi, and two Mohave consultants, as well as phone interviews with other groups and an ethnohistoric literature review. Both the Chemehuevi and Cahuilla Elders recounted knowledge of hunting activities in the Eagle Mountains but no groups attributed sacred sites or special spiritual or cultural significance to the area. Opposition to the solid waste landfill project was noted, however, for environmental reasons. CSRI's conclusion was that the Project posed no impacts to traditional cultural or sacred values.
- Love conducted Class I literature reviews and reconnaissance level surveys for a similar (in part) transmission line route (1993) and water pipeline (1994) as the present project for the previous proposal for the Eagle Mountain Pumped Storage Project. The study area was visually inspected by driving on existing roads and doing on-foot spot checks. Unlike the present proposed transmission line corridor, the earlier proposed route paralleled the eastern side of Eagle Mountain Road and veered northeast at the Metropolitan Water District of Southern California (MWD), Eagle Mountain Pump Station holding pond. The literature reviews included inspection of 1850s Government Land Office (GLO) maps and surveyor notes and Riverside County Historical Division archives that informed the present study. The only identifiable resource on the 1857 GLO maps within the current Project is "Brown's (Wagon) Road" which crosses the southern portion of Eagle Mountain Road. Love also conducted in-field visits with Cahuilla elder and former tribal historian, Anthony Andreas, Jr. He specifically identified the east-west trail segments as particularly important evidence of the cultural interaction between the Cahuilla and the Mohave (Love, 1993:11). Otherwise, Love predicted that both the general areas of the current transmission line and water line routes would possess low sensitivity for cultural resources.

The field portion of a Class III Inventory of all Project elements outside the privately owned Kaiser property has recently been completed under a BLM Fieldwork Authorization.

Table 3.8-1. Previous Cultural Resource Studies in or near the Eagle Mountain Pumped Storage Project Transmission Line Project Area

Note: Asterisks indicate reports that are mapped as specifically addressing portions of the present Project area proper.

Report No. RI-	Title	Author(s)	Year	Survey (acres)
RI-00099	Archaeological Survey Of Proposed County Dump 4 1/2 Miles North Of Desert Center.	McWilliams, S.R.	1973	160
RI-00220*	Interim Report-Fieldwork and Data Analysis: Cultural Resource Survey Of The Proposed Southern California Edison Palo Verde-Devers 500 Kv Power Transmission Line	Cowan, Richard; Kurt Wallof	1977	0
RI-00221	Cultural Resource Inventory And National Register Assessment Of The Southern California Edison Palo Verde To Devers Transmission Line Corridor (California Portion)	Carrico, R.; D. Quillen, D. Gallegos	1982	6120
RI-00222	Final Report: Cultural Resource Survey Of The Proposed Southern California Edison Palo Verde-Devers 500kv Power Transmission Line	Wallof, Kurt; Richard Cowan	1977	0
RI-00498*	An Archaeological Assessment Of A Portion Of The Se 1/4 Of Section 36, T3s, R14e, SBBM, Near Eagle Mountain, Riverside County, California	Swenson, James	1978	150
RI-00672	Addendum Phase I Archaeological Survey Report For Proposed Berm And Channel West Of Desert Center, Riverside County, California, 11-RIV-10, PM 104.7	McManus, James	1980	0.4
RI-00673	Historic Property Survey Report: 11-RIV-10, 104.7, 11209-192511 (Construct Berm And Channel)	Salazar, Lucian	1980	0.4
RI-00674	Archaeology Phase I Survey Report: Proposed Berm And Channel At 11-RIV-10, PM 104.7, Desert Center, 11209-192511	Oxendine, Joan	1979	3.7
RI-00813	Eastern Riverside County Geothermal Temperature Gradient Holes	Bureau of Land Management	1980	0
RI-00982	An Archaeological Survey Of Geothermal Drilling Sites In Riverside County	Crew, Harvey	1980	0
RI-01654	An Archaeological Assessment For TPM 18983, Parcel No. 808-083-004	Bowles, Larry	1983	915
RI-01855	Cultural Resources Literature Search, Records Check And Sample Field Survey For The California Portion Of The Celeron/ All American Pipeline Project	Weil, Edward; Jill Weisbord; E.Blakeley	1984	172.97
RI-02210	Preliminary Cultural Resources Survey Report For The US Telecom Fiber Optic Cable Project, From San Timoteo Canyon To Socorro, Texas: The California Segment	Underwood, J.; J. Cleland; C Woods; R. Apple	1986	0

Report No. RI-	Title	Author(s)	Year	Survey (acres)
RI-02285[*]	Letter Report: Proposed Land Exchange With The Nature Conservancy	Mitchell, Mike	1988	110
RI-03151	Letter Report: CA066-9NO-1, Hindley Mining Test Units, CAMC238008	Broeker, Gale	1991	14
RI-03321[*]	Cultural Resource Survey Of The Eagle Mountain Mine And The Kaiser Railroad, Cultural Resource Permit #CA881916	Bull, C.; S. Wade; M. Davis	1991	4659
RI-03648	Negative Archaeological Survey Report, Desert Center Maintenance Station	Laylander, Don	1993	2
RI-03914[*]	Cultural Resource Investigation Of Eagle Mountain townsite	Schmidt, James	1995	404
RI-03948[*]	Cultural Resources Reconnaissance: Eagle Mountain Pumped Storage Transmission Corridor, Riverside County, California	Love, Bruce	1993	0
RI-03949[*]	Addendum Cultural Resources Reconnaissance: Eagle Mountain Pumped Storage Transmission Corridor, Riverside County	Love, Bruce	1994	0
RI-04152	Letter Report: Archaeological Assessment For Pacific Bell Mobile Services Telecommunications Facility CM 826-02, 1083 Washington Street, City And County Of Riverside, California	McLean, Deborah	1998	0.25
RI-04452[*]	Cultural Resources Reconnaissance, Eagle Mountain Pumped Storage Transmission Corridor, Riverside County, California	Love, Bruce	1993	0
RI-04570	Cultural Resources Survey And Assessment Of A Cellular Phone Tower Site And Associated Access Road And The Results Of Test Excavations At Historic Archaeology Site CA-RIV-6513H In Desert Center, Riverside County, California	DeBarros, Philip	2000	0.25
RI-05245	Negative Archaeological Survey Report: Southern California Edison Company, Blythe-Eagle Mountain 161 kV Deteriorated Pole Replacement Project	Schmidt, James	2005	0
RI-05272[*]	Cultural Resources Survey And Assessment Of Approximately 40 Acres: Fraternal Order Of Eagles# 4455 Kaiser Road Project, North Of Desert Center, Riverside County, California	Robinson, Mark	2003	40
RI-06707	Cultural Resources Surveys Of Alternative Routes Within California For The Proposed Devers-Palo Verde 2 Transmission Project	McDougall, D; J. George; S. Goldberg	2006	1243
RI-07790	A Class II Cultural Resources Assessment For The Desert-Southwest Transmission Line, Colorado Desert, Riverside And Imperial Counties, California	Schaefer, Jerry	2003	600

3.8.2.1.2 *Previously Recorded Cultural Resources*

Records from EIC document the presence of 31 previously recorded cultural resources within the study corridor (Table 3.8-2). About 50 percent (*n* = 15) of the recorded resources in the study area are prehistoric, and 50 percent (*n* = 16) are historic in age. The majority of the recorded resources are comparatively minor. Some 18 percent (*n* = 5) are isolated finds, including three prehistoric lithics, one milling stone, and one historic ceramic mug. Many other sites consist of small prehistoric lithic scatters, a pot drop, possible rock rings and cleared circles, and bedrock milling. However, potentially more significant resources are also present in the surrounding study corridor, consisting of several portions of a major east-west trail network with associated features. Significant historic sites in the study region include two stick figure petroglyphs associated with an early wagon road and possibly a cenotaph (a monument erected in honor of a person whose remains are interred elsewhere) associated with “Desert Steve” Ragsdale, three historic sites associated with Camp Young/Desert Center and the World War II-era Desert Training Center/California-Arizona Maneuver Area (DTC/CAMA), a historic well, and the Eagle Mountain Mine and townsite, including the Eagle Mountain Mine Radio Control Tower, the CRA, and the MWD Eagle Mountain Pump Station. Less significant historic sites include remains of a blacktopped road and various historic post-World War II trash scatters. The vast majority of the sites is located either north or south of the I-10 corridor and outside the proposed Project boundary, and therefore will not be affected by the proposed Project.

Table 3.8-2. Previously Recorded Cultural Resources in or near the Eagle Mountain Pumped Storage Project Transmission Line Project Area

Site		Within APE	Description
P-33-	CA-RIV-		
000072	72	No	Prehistoric trail, 13 rock cairns, ceramics at one cairn, part of major e-w trail network recorded by Johnston and Johnston 1957
000187	187	No	Historic Gruendike Well, Cram Brothers cattle trough, scant residence, school, gas station remains, unconfirmed (prehistoric) camp site related to Johnston’s e-w trail
001173	1173	No	Historic petroglyphs of two anthropomorphs on north tip of Alligator Rock, associated with e-w trail, San Pasqual Well, and historic Frink’s Cutoff alternative to the Bradshaw Trail
002735	2735	No	Prehistoric rock circle, flake and milling stone scatter (temporary camp)
002736	2736	No	Prehistoric trail, bedrock milling
002737	2737	No	Prehistoric chipping station associated with Alligator Rock quarry
002738	2738	No	Prehistoric lithic core fragments associated with Alligator Rock quarry
003108	3108	No	Prehistoric chipping station associated with Alligator Rock quarry
003109	3109	No	Prehistoric flake scatter associated with Alligator Rock quarry
006836		No	Historic Desert Center Army Air Field
006418		No	Prehistoric isolated milling stone

Site		Within APE	Description
P-33-	CA-RIV-		
006913		Yes	Historic Eagle Mountain community and mine
006914		No	Historic Eagle Mountain Pumping Station of the Colorado River Aqueduct
008392	6123H	No	Historic 1920s surveyors camp from the Colorado River Aqueduct surveys including hearth and artifacts; later 1969 claim marker
011265	6726H	Yes	Historic Colorado River Aqueduct
012295	7019H	No	Historic mid-twentieth century trash pit, most removed during mechanical trenching
014207		No	Historic trash scatter, concrete cistern or well, dirt road, mid-nineteenth century
014181		No	Five (5) historic mine claim cairns and trash scatter
014182		No	Prehistoric isolated basalt flake
014194		No	Prehistoric isolated quartz flake
014195		No	Prehistoric isolated quartz flake
015097		No	Historic WWII-era DTC/CAMA tent pads, rock alignments and trash
015098		No	Prehistoric cleared circle or rock ring (problematic)
015100		No	Prehistoric cleared circle or rock ring (problematic)
015106		No	Prehistoric ceramic “pot drop” of 12 buff ware sherds
015970		No	Prehistoric rock ring
015971		No	Historic WWII-era DTC/CAMA mortared rock alignment and clearings (hospital?)
015972		No	Historic blacktopped paved road
015973		No	Historic refuse dump associated with old gas station location
016946		No	Historic Eagle Mountain Mine radio control tower and storage structure
017343		No	Historic isolated ceramic mug

3.8.2.1.3 *Prehistoric Cultural Resources*

Prehistoric resource types represented in the sample include two (2) different segments of the same east-west trail, one (1) temporary camp, four (4) lithic scatters or chipping stations, one (1) rock ring and two (2) cleared circle features, one (1) ceramic pot drop, and four (4) isolated finds (Table 3.8-3).

Table 3.8-3. Previously Recorded Prehistoric Sites[1], by Generalized Types (Primary Number P-33-)

Trail	Temporary Camp	Lithic Scatter/Chipping Station	Cleared Circle/Rock Ring	Ceramic Pot Drop	Isolates
000072	002735	002737	015098	015106	006418
002736		002738	015100		014182
		003108	015970		014194
		003108			014195

- Temporary camps are informally distinguished from artifact scatters by the greater diversity of artifact types, often with features. The one site of this type, P-33-002735, included a rock ring, lithics, and two portable milling slabs. Because temporary camps contain more complex patterns of prehistoric remains, they are more likely than simple scatters to be determined to constitute significant resources. This site is located in relative isolation to the south of I-10, but in the same general vicinity of the majority of prehistoric lithic scatters and isolates of materials derived from Alligator Rock. This southern location would also make it associated with the general east-west travel route through the Chuckwalla Valley.
- The two trails, P-33-000072 and P-33-002736, are the previously recorded segments of the major east-west transit route through the Chuckwalla Valley. Much of this route has been traced by Johnston and Johnston (1957), extending west through the San Gorgonio Pass and east to the Colorado River. Numerous pot drops were recorded along the route. A separate branch that goes south through the Coachella Valley and east through Salt Creek Pass is better known as the Cocomaricopa Trail but McCarthy (1982) identifies the route through the Chuckwalla Valley by the same name. Both routes, it seems, were major prehistoric and ethnohistoric transportation corridors, recognized by archaeologists and Native American consultants alike as a significant element in the regional cultural history. Depending on their integrity and further research, they are likely to be eligible for the NRHP. The trail network appears to be south of the Project area and thus the Project poses no impact to any preserved remains.
- Four lithic scatter sites are located south of I-10 and contain the types of plutonic aplite associated with the North Chuckwalla Mountain Quarry National Register of Historic Places District around Alligator Rock. They are outside of the district boundaries and represent peripheral sites to the main lithic procurement area. They are not likely to be NRHP-eligible but in any event are not within the Project area.
- One rock ring and two cleared circles are located in the study corridor but not within the Project area. The two cleared circles are problematic and may result from deflation of

[1] None of these resources are located within the APE.

natural ground rodent mounds rather than from cultural factors. If cultural, these type of features bear witness to temporary encampment.

- Prehistoric isolates consist of single artifacts in these cases. Three of the four isolates are stone flakes and one is a milling stone. None are located in the Project area but only within the study corridor. Normally, isolates are treated as categorically ineligible for the NRHP due to limited research values and do not require any further treatment or consideration.
- One ceramic pot drop, P-33-015106, is of the site type often associated with routes of travel. Although pot drops are generally considered not NRHP-eligible, recent advances in thermoluminescence dating and materials analysis suggest they have greater research value than previously thought. It is located near I-10 and therefore outside the Project area.

Except for the trail segments, the likelihood of special ethnic importance for contemporary Native Americans is not evident at any of the resources previously identified in the study corridor, and as suggested by previous Native American ethnographic work associated with the proposed Eagle Mountain solid waste landfill project (Bull et al., 1991). Ongoing consultation with local Native American groups is required as a part of the Section 106 process that will occur as development of the Project progresses.

3.8.2.1.4 *Historic Cultural Resources*

Historic-period cultural resources that have previously been identified in the study corridor include a well and cattle trough complex, the CRA, and the Eagle Mountain Pumping Station, a workers camp associated with the construction of the aqueduct, two sites with rock alignments and other features associated with the World War II DTC/CAMA, the Desert Center Army Air Base (now in part the formerly Riverside County-owned Desert Center Airport), the Eagle Mountain Mine and all facilities, the Eagle Mountain Mine Radio Control Tower, two mining sites associated with claims or prospectors camps, one paved road surface, three post-war trash deposits, and one isolate (Table 3.8-4). In large measure, evaluating the significance of such resources is likely to be based on archival background research used to determine whether the archaeological remains can be linked to interpretable historic contexts and whether they possess either significant research potential or historic preservation values. In some cases, surface collections or test excavations could be required if Project construction of operations activities will disturb or threaten the integrity of such sites.

Table 3.8-4. Previously Recorded Historic Sites, by Generalized Types (Primary Number P 33-)

Rock Art	Well, Cattle Trough, etc.	Colorado River Aqueduct	WWII Military	Mining	Road	Trash Deposit	Isolate
001173	000187	006914	006836	**006913**	015972	012295	017343
		008392	015097	014181		014207	
		011265	016971	016946		015973	

Note: Resources in bold are located at least partially within the APE.

- The Gruendike Well site, P-33-000187, is located on the U.S. Geological Survey (USGS) Corn Springs 7.5-minute map southeast of the Desert Center Airport and was recorded in 1978 based on an interview with the son of Steve Ragsdale who was the original resident in 1915. Remains of an old school, cattle trough, and gas station complex were said to exist but integrity was noted as very poor. These are all located outside the Project APE.
- One of the historic road segments, P-33-015972, is located south of the Project APE, parallel to I-10. The historic Brown's Wagon Road route crosses one transmission line alternative that was considered but rejected, but is not in the Project APE. It is only known from GLO maps and has not been officially recorded. An alternative to the Bradshaw Trail route known as Frink's Cutoff Alternative is associated with a historic petroglyph site at the northern tip of Alligator Ridge, P-33-000173. This is also located outside the Project APE.
- Military features and deposits in the study corridor relate to the World War II DTC/CAMA (P-33-015097 and P-33–016971). Most of the residential or cantonment facilities are concentrated around I-10 but are known to extend over a large area. Bischoff (2000) suggests that the rock-lined walkways on the east side of Eagle Mountain Road near the southern extent along a pipeline road may remain from the evacuation hospital and not Camp Desert Center proper. E Clampus Vitus and the BLM are about to recognize this general area as such. Some alignments and clearings have been previously recorded in 2007 as P-33-016971, extending across Eagle Mountain Road and may be specifically associated. In any case, the transmission line alignment will avoid this area. The Riverside County Historical Commission recognizes the Desert Training Center (DTC) in the vicinity of Desert Center as a Point of Historical Interest (Riv-022). Remains of the DTC Army Air Base were recorded in 1982 by a Riverside Historical Commission staffer as P-33-006836. The current airport utilizes the southern arm of what was a V-shaped landing strip, with the apex pointing east. Remains from World War II include concrete slabs from the link trainer building, headquarters building, flagpole stump, and officers' facilities. All of these are outside the Project APE.
- The proposed transmission line and water line will span a buried portion of the CRA, P-33-011265. This is the only previously recorded cultural resource that occurs directly

within the Project APE, except for the mine proper. An aqueduct feature, the MWD Eagle Mountain Pump Station (P-33-006914), is located 1 mile from the Project area proper and will not be subject to any direct impacts from the transmission line Project.

- The entire Eagle Mountain Mine and company town of Eagle Mountain was recorded by a Riverside Historical Commission staffer as P-33-006913 in 1982, shortly before the mine closed. A historical marker commemorates the early claims from the 1880s, L. S. Barnes' sale to the Southern Pacific Railroad in 1909, Kaiser Steel's acquisition in 1944, and the beginning of ore shipments to Fontana in 1948. Specific facilities that are mentioned include the iron ore mine with offices, mining equipment, railroad yard, residential community, stores, school, and playground that was constructed of discarded mining equipment. The site form, however, fails to identify the boundaries of the 57-acre site or specific feature locations, and neither does it constitute a full inventory that may be found in Schmidt (1995), although no site form updates were prepared. More recently, the radio control tower and storage structure was recorded in the central part of the mine (P-33-016946). Other mining-related sites, P-33-014181, are a group of late-dated mine claim cairns and associated trash. The Riverside County Historical Commission recognizes Eagle Mountain Iron Mine and the Desert Center Area as a Point of Historical Interest (Riv-041). The Project will avoid the townsite, and the transmission line will span the railroad.
- Three historic trash deposits have been recorded within the Project area proper (P-33-012295, P-33-014207, and P-33–015973). All of these deposits appear to date from the middle twentieth century and postdate the DTC/CAMA.
- One historic isolate, a ceramic mug, was recorded (P-33-017343). As is the case with prehistoric isolates, such resources are normally treated as categorically ineligible for the NRHP and do not require any further consideration or treatment.

3.8.2.1.5 *Newly Recorded Cultural Resources.*

The Class III intensive field survey documented only five historic sites (P-33-17643 through P-33-17647) and one historic isolate (P-33-17648) within the Project APE (*see* Section 12.12). All are located within the boundaries of the proposed Interconnection Collection Substation site. All of the historic sites are trash dumps containing, variously, domestic trash, tin cans, and building debris. Diagnostic tin can and other artifact attributes indicate all the sites date to the late 1940s, 1950s, and more recent decades, often with a mix of artifacts from several decades. These sites all appear to represent road-side trash deposition associated with the town of Desert Center. All post-date the World War II DTC/CAMA. The one historic isolate is a concrete post with an embossed "C." This type of monument was used to mark California highway rights-of-way margins during the period between 1914 and 1934. It is likely associated with Ragsdale Road or the precursors of I-10. All of these sites are evaluated as not eligible to the NRHP. Formal determinations of significance will be made by the BLM.

3.8.2.2 Native American Heritage Commission Results

On April 16, 2008, ASM mailed a Sacred Lands File records search request to the California Native American Heritage Commission (NAHC) and received a records search from the NAHC on April 30, 2009 stating search results were negative for sacred lands within the proposed Project area.

Twelve tribal groups or individuals were identified who may have knowledge of cultural resources in the Project area:

1. John A. James, Chairperson, Cabazon Band of Mission Indians (Cahuilla)
2. Joseph Hamilton, Chairman, Ramona Band of Cahuilla Mission Indians
3. Patricia Tuck, Tribal Historic Preservation Officer, Agua Caliente Band of Cahuilla Indians
4. Diana L. Chichuaha, Cultural Resources Coordinator, Torres-Martinez Band of Cahuilla Indians
5. Michael Contreras, Cultural Heritage Program Manager, Morongo Band of Cahuilla Indians (Cahuilla, Serrano)
6. Luther Salgado, Sr., Cahuilla Band of Indians
7. Ann Brierty, Policy/Cultural Resources Department, San Manuel Band of Mission Indians (Serrano)
8. Darrell Mike, Chairperson, Twenty-Nine Palms Band of Mission Indians (Chemehuevi)
9. Charles Wood, Chairperson, Chemehuevi Reservation
10. Joseph (Mike) R. Benitez (Chemehuevi)
11. Michael Tsosie, Cultural Contact, Colorado River Reservation (Mohave, Chemehuevi)
12. Linda Otero, Director, AhaMaKav Cultural Society, Fort Mojave Indian Tribe

3.8.2.3 Cultural Resources Consultation

The FERC authorized ASM to conduct government-to-government consultation in order to gather information on any traditional use areas and places of traditional or cultural significance that may be affected by the proposed Project. GEI Consultants, Inc. (GEI) also participated in initial consultation. This consultation was conducted under 18 CFR 380.12 and 18 CFR 380.14 of the National Environmental Policy Act as well as Executive Orders 13007 and 13175, and the FERC policy on consultation with Indian Tribes (Order No. 635). A following is a summary of the consultation results.

Contact with Native Americans that have traditional ties with the region in which the proposed Project is located began in September 2007 and will continue as needed throughout the duration of the proposed Project permitting and construction. On September 26, 2007, GEI mailed a Project notification letter to eight Tribes requesting input on the proposed Project Pre-Application Document (PAD) to:

1. Agua Caliente Band of Cahuilla Indians
2. Barona Band of Mission Indians

3. Cabazon Tribal Business Committee
4. Cahuilla Band of Mission Indians
5. Chemehuevi Tribal Council
6. Morongo Band of Mission Indians
7. Torres-Martinez Desert Cahuilla Indians
8. Twenty-Nine Palms Band of Mission Indians

Of these Tribes, one Tribe (Agua Caliente Band of Cahuilla Indians) requested a meeting to discuss the proposed Project, and one Tribe (Morongo Band of Mission Indians) confirmed an interest in the proposed Project area. On October 23, 2007, representatives from GEI and Ruettiger, Tonilli, and Associates met with Tribal Historic Preservation Officer (THPO) staff, Sean Milanovich, and tribal representative, Thomas Davis at the Agua Caliente Band tribal headquarters in Palm Springs, California to discuss the proposed Project and cultural resource concerns. At this meeting, Chairman Richard Milanovich requested that GEI hold a joint meeting and field visit with all Tribes contacted for the proposed Project. On March 7, 2008, GEI mailed a meeting and field visit invitation to the eight above-listed Tribes; however none of the Tribes responded to the invitation.

On June 16, 2008, GEI mailed a Notice of Draft License Application and request for comments to the eight above-listed Tribes. Of these Tribes, one Tribe (Agua Caliente Band of Cahuilla Indians) requested additional Project information. Mr. Sean Milanovich requested and received the Draft License Application Initial Statement Exhibits, A-G (Public Information); Draft License Application Exhibit E, Volume 2 (Privileged Information); and the Eagle Mountain Pumped Storage Project Class I Inventory Report and site records.

On August 29, 2008, Kurt Russo (Native American Land Conservancy) contacted GEI and requested to be placed on the consultation list for the proposed Project. On September 15, 2008, GEI mailed Mr. Russo the Draft License Application Initial Statement Exhibits, A-G (Public Information) and the Eagle Mountain Pumped Storage Project Class I Inventory Report, without the site records.

On July 1, 2009, Ann Miles (FERC) mailed a request for consultation on Licensing to two Tribes that initially indicated an interest in the proposed Project (Agua Caliente Band of Cahuilla Indians, Morongo Band of Mission Indians). ASM, on behalf of FERC, initiated government-to-government consultation with the following 10 Tribes:

1. Agua Caliente Band of Cahuilla Indians (Ms. Patricia Tuck, THPO)
2. Barona Band of Mission Indians
3. Cabazon Tribal Business Committee
4. Cahuilla Band of Mission Indians
5. Chemehuevi Tribal Council Morongo
6. Colorado River Indian Reservation
7. Fort Mojave Indian Tribe
8. Morongo Band of Mission Indians
9. Torres-Martinez Desert Cahuilla Indians

10. Twenty-Nine Palms Band of Mission Indians

All Tribes were mailed an initial consultation letter on September 10, 2009, and a copy of the proposed Project's HPMP on September 17, 2009. ASM contacted tribal representatives from all 10 Tribes by electronic mail and telephone calls to determine the need for further work. As of the date of this report, additional consultation concerning the proposed Eagle Mountain Pumped Storage Project has not been requested by any of the above listed Tribes; however the following requests have been documented, as shown below.

Based on a request for clarification from FERC another consultation letter was mailed on December 4, 2009 to the above listed Tribes with an updated map of the Project APE, including all elements within the Project boundaries. The letter also included a confidential map and discussion of recorded trail segments and projected trail routes in the Project vicinity, which was a response to one tribal member about the location of trails in the Project area. The letter demonstrated that the previously recorded trail is located to the south of, and outside of, the APE. The most significant preserved segment, documented as CA-RIV-72, is located 5 miles west of the Project APE. The letter was followed by a telephone call on December 13-16, 2009 to determine if there were any tribal concerns involving sites or Traditional Cultural Properties (TCPs) in the Project APE.

At present, no TCPs have been identified in the Project APE by any Native American Tribes. The Augustine Band of Cahuilla Mission Indians has recommended Native American monitors during construction activities. The Cabazon Band of Mission Indians has recommended archaeological monitors during construction activities.

3.8.2.4 Historic Properties Management Plan

ECE prepared a draft HPMP in September 2009, which was submitted to the SHPO for comment. The SHPO replied (in a letter dated October 26, 2009) that the determination that the Eagle Mountain Mine and townsite were not eligible for the National Register was primarily based on the fact that in 1996 they were not yet 50 years old and would have had to been exceptional to so qualify. Today, however, they are over 50 years old and would not have to meet this higher level of eligibility. The SHPO concluded that the HPMP, as it presently exists for what is currently known about the cultural resources within the APE, is reasonable for taking effects on historic properties by the undertaking into account.

The HPMP was revised in December 2009 to include plans to address any TCPs should any be identified. The HPMP also includes provision for a new inventory and evaluation after the Project has been approved and prior to any construction, concurrent with final engineering design. The SHPO was consulted regarding the revised HPMP, and in a letter dated December 22, 2009 stated that they did not object to how the APE was defined, that they look forward to having the opportunity to review and comment on the adequacy of ECE's efforts to identify historic properties once that information has been completely gathered and assembled, that they were pleased ECE provided for the National Register reevaluation of the Eagle Mountain Mine and townsite and they concur that such a study should consider whether the Mine and townsite constitutes an historic district eligible for the NRHP.

The SHPO also stated that they do not object to ECE assuming eligibility of the CRA for the National Register for the purposes of the undertaking, and that the HPMP appears to be reasonable given what is currently known about the potential for the undertaking to effect historic properties. Once identification and evaluation are complete and effects are fully known, amendment to the HPMP may be warranted. ECE will continue consultation with the SHPO throughout the development of the Project.

This HPMP provides Project background information, identifies previously recorded cultural resources in the APE, outlines Project management and preservation goals and priorities, presents the very limited foreseeable Project effects and mitigation/management measures, and provides a schedule for implementing the stipulated activities. The HPMP should be considered a dynamic and updatable document. The HPMP will be used by ECE staff to ensure that the management goals are achieved with regard to the preservation or appropriate treatment of historic resources. It gives explicit guidance to ECE staff on how to accomplish the goals. ECE's Project Environmental Coordinator is responsible for implementing the HPMP. The focus of the HPMP is on the discovery plan and worker environmental awareness training because no historic properties are identified within the APE except for a buried portion of the CRA that will be easily avoided.

3.8.3 Potential Environmental Impacts

3.8.3.1 Methodology

A Class I cultural resources inventory was conducted on the entire Project site. The report of this inventory is included in Section 12.11. The Class I study involved requesting information on previously identified cultural resources and studies on record at the EIC at University of California Riverside, and with the California NAHC in Sacramento. Two areas were considered: the provisional "project area proper" plotted by geographic information system (GIS) mapping as a route extending outward from the Project boundary, varying in width from about 400 to 800 feet; and a broader study corridor extending out 1 mile on each side of the project area proper. The Project boundary, as defined in ECE's Final License Application Exhibit G, constitutes the APE for the purposes of regulations for compliance with Section 106 of the National Historic Preservation Act (36 CFR 800).

The data were used to assess:

- The extent of previous studies of cultural resources completed within the project area proper and within the study corridor.
- The number and character of previously recorded cultural resources within the project area proper and within the study corridor.

- The likelihood of additional cultural resources being present in portions of the study corridor that have not yet been systematically inventoried, and the probable character of such unidentified resources.
- Any additional inventories, evaluation studies, and mitigation measures likely to be needed to treat cultural resources as the development of the Project advances.

A comprehensive Class III inventory of the APE, including the transmission line right-of way route, water pipeline route, three well locations, and interconnection collector substation were also conducted under a BLM Fieldwork Authorization and is included in Section 12.12. No significant cultural resources were identified within the Project boundaries during the surveys. However, it is the responsibility of the FERC to make authoritative significance determinations and findings of effect.

In that regard, these reports were prepared to provide FERC, BLM, other regulatory authorities with data for compliance with Section 106 of the National Historic Preservation Act (16 U.S.C.470(f); 16 CFR 4.41; 64 CFR 26618.380.14). The Eagle Mountain Mine lands which are also part of the APE were not surveyed due to access limitations, but are considered to have low probability of containing significant cultural resources because of the magnitude of disturbance from historic mining activities that are well documented The BLM, Agua Caliente Band of Cahuilla Indians, and the Morongo Band of Mission Indians made comments on cultural resources during the consultation process. These entities requested cultural resource surveys be conducted in the Project area. No special survey procedures were recommended, and survey procedures employed are standard methods for Class I and Class III surveys. The BLM advised ECE on the status of previous cultural resource surveys that have been done in the general area of the Project.

3.8.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on aesthetics and visual resources if it does any of the following:

(a) Cause a substantial adverse change in the significance of a historical resource defined in §15064.5

(b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5

(c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature

(d) Disturb any human remains, including those interred outside of formal cemeteries

3.8.3.3 Environmental Impact Assessment

The small number of cultural resources previously recorded within the study corridor indicates the low general archaeological sensitivity of the area and the unlikely presence of additional resources that may be eligible for the NRHP within the Project boundary. This conclusion has been confirmed by the results of the Class III survey of the Project transmission line, interconnection substation site, water line, and water wells. The reasons include lack of permanent or seasonal water sources or stable food sources to sustain either residential or temporary camps, lack of lithic resources on the spotty desert pavements within the Project area (with Alligator Rock to the south and well outside the Project APE being the main local lithic tool stone source), location of the Project to the north of the documented archaeological remains of the major east-west trail through the Chuckwalla Valley, deliberate efforts in Project planning to avoid known World War II training areas, and previous impacts to the integrity of old land surfaces from alluvial stream channels and historic era activities.

3.8.3.3.1 *Prehistoric Cultural Resources*

The major east-west trail through the Chuckwalla Valley is documented to occur around the southern periphery, but outside of, the Project APE. The trail was first documented by Johnston and Johnston (1957:24) in 1953 and recorded at the EIC by them as CA-RIV-72. It was described as a 1-mile long segment of trail located several miles west of Desert Center and a short distance north of U.S. Highway 60-70 (now Interstate-10). The most notable aspect of the trail was an alignment of 13 large rock cairns, each from 1 to 3 feet in height. Potsherds were also found along the trail, one of which was Tizon Brown Ware, indicating use of the trail by Native Americans whose travels probably brought them through upland mountainous areas. Johnston and Johnston could not trace the trail further east but hypothesized that it probably followed a course towards Gruendike Well (near the Desert Center Airport), and then on to Sidewinder Well further east.

They also surmised that this was a branch of the much larger trail, CA-RIV-53T, that extended for 150 miles all the way from the San Bernardino Valley through the San Gorgonio Pass, over to Thousand Palms, south to La Quinta, and then east to Pinkhan Well, Cottonwood Spring, along the north side of Hayfield Lake, and then past Desert Center through the Chuckwalla Valley to the Colorado River. A southern branch of this same trail system passed along the south side of Hayfield Lake to Aztec Well and Corn Spring and then north to Sidewinder Well. The Johnstons were able to record seven short segments of the entire trail and then projected the remainder. One such segment is CA-RIV-72.

Daniel McCarthy relocated CA-RIV-72 in 1981, establishing the location with greater certainty on a 15-foot USGS quadrangle and mapping the location of not 13 but 14 cairns. He remarked that beyond the portion he could map, the trail appears to be disturbed by tank tracks and active erosion and “seems to be heading toward the north flanks of the Chuckwalla Mountains near the intersection of I-10 and Eagle Mountain Road” (EIC, Department of Parks and Recreation [DPR] Form 1981). Two other recorded trail segments, CA-RIV-1173 and –2736, although historic, appear to support this course. Later, McCarthy (1982) proposed that this network was the famous Cocomaricopa Trail, although most scholars identify that trail as the precursor of the historic Bradshaw Trail which proceeded south of CA-RIV-53 at Whitewater to Palm Springs, then across the Coachella Valley to Dos Palmas Oasis and then east through the Salt Creek Pass. Such a route was preferred because the distances between water sources would have been shorter than a more direct easterly route through the Chuckwalla Valley. Nevertheless, enough scant evidence remains to posit another important Native American trail network through the Chuckwalla Valley, past Desert Center, and on to the Colorado River.

In their study of traditional cultural properties along the Devers-Palo Verde Transmission Line, based on ethnographic information and interviews with tribal elders, Bean and Vane (1995) do not specifically mention CA-RIV-72 but they list CA-RIV-53 as a resource requiring further research. They emphasize that many trails were integral to “both traditional and current Native American life” (Bean and Vane 1995: Chapter 7:13). The larger trails especially had not only utilitarian economic functions, but were used for war, peace parties, transfer of sacred goods, and shamanic purposes. Those most used trails, especially when associated with rock art, were thought to have sentient qualities like living things.

The documented portion of CA-RIV-72 with its numerous rock cairns may be included in this category; whereas such isolates are treated as categorically ineligible for the NRHP due to limited research values and do not require any further treatment or consideration. Therefore, its location almost 5 miles west of the Project area would ensure it will not be affected by the proposed Project.

3.8.3.3.2 *Historic Cultural Resources*

Based on the records search and a recent intensive pedestrian survey of the project APE, only one resource is likely eligible for listing in the NRHP (Table 3.8-5). That is the CRA (P-33-006726). It occurs as a deeply buried massive underground pipeline where the transmission line and waterlines cross the aqueduct route. It is virtually invisible on the surface except for a road and earthen berm.

Table 3.8-5. Recorded Cultural Resources within the Eagle Mountain Pumped Storage Project Boundary

Primary Number	Resource	Date	NRHP Eligibility Recommendation
P-33-006726	Colorado River Aqueduct	1931-present	Recommended eligible
P-33-006913	Eagle Mountain Mine and townsite	1947-1983	Determined not eligible
P-33-017643	Trash dump	1940s-1950s	Recommended not eligible
P-33-017644	Trash dump	1940s-1950s	Recommended not eligible
P-33-017645	Trash dump	1940s-1950s	Recommended not eligible
P-33-017646	Trash dump	1940s-1950s	Recommended not eligible
P-33-017647	Trash dump	1940s-1950s	Recommended not eligible
P-33-017648	Isolate highway marker	1914-1934	Recommended not eligible

Kaiser’s developments of Eagle Mountain Mine are located within the water reservoirs and pumping station. A small portion of the western margin of the Eagle Mountain townsite appears to be located within the Project APE, principally in the vicinity of the desalination area and pipeline. Both the Mine and townsite are recorded as P-33-006913. In a previous consultation, the BLM and SHPO concurred that they are not eligible for listing in the NRHP (Letter from Cherilyn Widell to Henri R. Bisson, District Manager, BLM California Desert District, Dec. 12, 1996). The bed of the Eagle Mountain Railroad through the Project area has not been officially recorded or evaluated but is part of the mine and townsite complex. Only the bed and ballast remain as the steel rails and ties have been removed. There are plans to reuse the rail bed and restore the rail line for the proposed Eagle Mountain Landfill Project.

Based upon consultation on the status of the Eagle Mountain Mine and townsite, SHPO requested that it be re-evaluated because at the time of the original 1996 determination and SHPO consultation, the site was less than 50 years old. SHPO explains “Today they are now 50 years old and would not have to meet this higher level of eligibility. The HPMP should provide for consideration of such an evaluation if these properties could be adversely affected by the undertaking” (Donaldson, 2009). Given that a portion of the townsite, Mine, and railroad are located within the Project APE but that the private property in question is not currently open to investigation, provisions are provided for a new inventory and evaluation after the Project has been approved, and prior to any construction, concurrent with final engineering design.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project cause a substantial adverse change in the significance of a historical resource defined in §15064.5?* No. Mitigation measures will minimize adverse changes in historical resources. Historic sites related to the World War II DTC/CAMA are more likely to occur within the study corridor (which extends out 1 mile on each side of the Project area proper). Although visible, based on the distance from the DTC/CAMA, the substation and transmission line route should not result in significant impacts to cultural resources related to the DTC/CAMA. The transmission and water pipelines cross over buried portions of the CRA, which is very likely eligible for the NRHP based on its historical and engineering significance. Impacts to materials, feeling, setting, and association are therefore expected to be potentially significant. However, implementation of mitigation measures would reduce these effects to less than significant levels. The Eagle Mountain Mine and townsite (and railroad) are over 50 years old and may be NRHP-eligible. Therefore mitigation measures would require inventory and evaluation of the site, and data recovery or alternative mitigation as appropriate.

(b) *Would the project cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?* No, the only substantial prehistoric and historic sites identified in either the Class I inventory or Class III survey within the study corridor are located outside of the Project boundaries or APE.

(c) *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?* No paleontological resources or unique geologic features have been identified in the Project APE.

(d) *Would the project disturb any human remains, including those interred outside of formal cemeteries?* No human remains are known to be present in the APE. In the event that any unknown human remains are discovered during Project construction, the on-site Project manager will notify the Riverside County Coroner's Bureau within 24 hours under State law (California Health and Safety Code § 7050.5) and all activities in the immediate area of the find shall cease until appropriate and lawful measures have been taken. If the Coroner determines that the remains are Native American, the NAHC shall also be contacted (California Public Resources Code § 5097.98). In accordance with Section 5097.98 of the *California Public Resources Code,* the NAHC shall designate a Most Likely Descendent, who may make recommendations concerning the disposition of the remains in consultation with Riverside County and the Project Archaeologist.

Impact 3.8-1 Transmission Line Route from the Crossing of the CRA to the Interconnector Substation. This impact is considered *potentially significant and subject to the mitigation program*. Construction of the substation and transmission lines will not result in significant impacts on cultural resources related to the World War II DTC/CAMA. Historic sites are more likely to occur within the study corridor (which extends out 1 mile on each side of the Project area proper). The most sensitive would be the remains of Camp Desert Center and the evacuation hospital at the southern end of Eagle Mountain Road. The transmission line route comes no closer than 0.25 miles north of the closest recorded DTC/CAMA site and the Interconnection Collector Substation is located two miles to the north and east, respectively, of the known DTC/CAMA features. Although visible, based on the distance from the DTC/CAMA, the substation and transmission line route should not result in significant impacts to cultural resources related to the DTC/CAMA with implementation of several mitigation measures which are intended to ensure potential impacts are minimized (MM CR-3 through MM CR-11).

Impact 3.8-2 Transmission Line and Water Pipeline Crossing of the CRA. This impact is considered *potentially significant and subject to the mitigation program*. The transmission and water pipelines cross over buried portions of the CRA, which is very likely eligible for the NRHP based on its historical and engineering significance. The CRA is not visible from the surface in this area, however, except for a road and flood control berm. Impacts to materials, feeling, setting, and association are therefore expected to be potentially significant. However, implementation of mitigation measures (MM CR-1, MM CR-3, MM CR-5, MM CR-6, MM CR-11) would reduce these effects to less than significant levels.

Impact 3.8-3 Transmission Line Crossing of the Eagle Mountain Railroad. This impact is considered *potentially significant and subject to the mitigation program*. The transmission line crosses over the Eagle Mountain Railroad in two places. A formal significance determination of the rail line remains to be undertaken by the BLM but there have been substantial previous impacts to its integrity and it is unlikely to be found NRHP-eligible. In relation to the proposed Eagle Mountain Landfill Project and its related EIR, BLM determined that the Eagle Mountain Mine and townsite are not NRHP-eligible and received SHPO concurrence. The railroad is likely to be similarly considered in that the landfill project includes reuse of the railroad. Therefore, the impact would be potentially significant; however, mitigation measures (MM CR-2 through MM CR-11) would reduce this impact to *less than significant* by requiring site inventory, worker education, implementation of an HPMP and other measures.

Impact 3.8-4 Central Project Site. This impact is *potentially significant and subject to the mitigation program.* Class III surveys have not been conducted on the Central Project Site because of a lack of access. Because of the large degree of disturbance on the site, it is unlikely that significant pre-historic cultural resources remaining on the site. However, there is the potential for historic resources. SHPO commented that the previous determination that the Eagle Mountain Mine and townsite were not eligible for the National Register was primarily based on the fact that in 1996, they were not yet 50 years old and would have had to been of exceptional historical value to qualify. Today, they are over 50 years old and would not have to meet this higher level of eligibility. Therefore, these impacts would be potentially significant and mitigation measures (MM CR-2 through MM CR-11) would require inventory and evaluation of the site, and data recovery or alternative mitigation as appropriate.

Impact 3.8-5 Unknown/ Buried Cultural Resources. This impact is *potentially significant and subject to the mitigation program* (MM CR-2 through MM CR-11). The only substantial prehistoric and historic sites identified in either the Class I inventory or Class III survey within the study corridor are located outside of the Project boundaries or APE. The Project involves grading and excavation for several Project features. In the event that any unknown (remaining) cultural resources, including paleontological or archeological resources, are encountered during Project construction, all earthwork shall cease and a qualified paleontologist/archeologist shall be contacted to evaluate the nature and significance of any such discoveries. In the event that any unknown human remains are discovered during Project construction, the on-site Project manager will notify the Riverside County Coroner's Bureau within 24 hours under State law (California Health and Safety Code § 7050.5) and all activities in the immediate area of the find shall cease until appropriate and lawful measures have been taken. If the Coroner determines that the remains are Native American, the NAHC shall also be contacted (California Public Resources Code § 5097.98). In accordance with Section 5097.98 of the *California Public Resources Code,* the NAHC shall designate a Most Likely Descendent, who may make recommendations concerning the disposition of the remains, in consultation with Riverside County and the Project Archaeologist.

3.8.4 Mitigation Program

Archaeological isolates or relatively small, simple sites make up the largest portion of the previously recorded cultural resources. Such resources as these will require minimal efforts to manage, in connection with the Project. Although several potentially more significant sites are present in the study corridor, none of similar type is expected in the project area proper based on the results of the Class I and Class III inventories. Some additional small sites may be identified when systematic inventory is undertaken in the Kaiser Mine property and when Native American consultation is completed. In that case, these resources will require further consideration.

The mitigation program includes project design features and mitigation measures (MMs). Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards built have been into mitigation measures.

As mentioned under Regulatory Setting, many protective measures are required by local, State, or Federal regulations or laws that are independent of California Environmental Quality Act (CEQA) review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local requirements.

MM CR-1. **Protect Known Historic Properties.** Of the cultural resources recorded within the Project boundaries (*see* Table 3.8.4), only the CRA (P-33-6726) is evaluated as potentially eligible for listing under Criterion "A" – broad patterns of history; and Criterion "C" – embodies distinctive characteristics of a type, period, region, or method of construction. No formal determination of eligibility has been made, but the CRA will be treated as potentially eligible.

Management Activity: Design transmission line and water pipes to avoid direct or indirect impacts to the buried portion of the CRA. Inspect once every 2 years to observe if conditions are stable or if any disturbance or deterioration has occurred.

ECE will design transmission tower locations, plan conductor installation procedures, and design water line placements to avoid impacts to this crucial element of southern California's water delivery infrastructure. Consultation with the MWD will occur for that purpose. The CRA is buried in the areas of the Project APE and no impacts to its integrity are anticipated.

- The inspections will be made by a ground surface level as appropriate.
- Digital photographs will be taken and compared with photographs from the previous inspections.
- The Project Environmental Coordinator or designee will summarize observations made during inspections every two years during construction. This summary will be included in the HPMP Implementation Summary Report (HPMP Implementation Report). ECE will provide a HPMP Implementation Report on a 6-year review cycle after construction, in coordination with California SHPO.
- Although none are presently identified, in the event that interested Indian Tribes identify TCPs in the future during the planning, construction, and/or operation of the Project within the APE, the Project Environmental Coordinator shall direct qualified individuals to conduct additional

consultation with the Indian Tribes, BLM, and SHPO to evaluate and document the properties in accordance with National Register Bulletin 38 (Parker and King, 1998). If the properties are determined to be eligible for listing in the NRHP, appropriate measures will be developed to mitigate adverse effects through consultation with the Indian Tribes, BLM, and SHPO. Priority will be given to preservation in place when possible, followed by data recovery, documentation, restoration or other measures as approved by the Tribes, BLM and SHPO.

Performance Standards:

- Inspect the CRA in the area of the APE every 2 years during construction.
- Provide a summary of observations on a 2-year cycle during the construction phase and a 6-year reporting cycle thereafter.
- If notable changes are observed in site conditions consult with SHPO to determine if further remedial actions are appropriate.
- Conduct appropriate consultation and treatment if TCP are identified in the future.

Implementation Timing: Engineering design/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Contractor

Responsible Agency for verification and enforcement: FERC

MM CR-2. Inventory and Evaluate Cultural Resources Within the Kaiser Mine Property. An inventory of this portion of the APE will be undertaken in compliance with Section 106 of the National Historic Preservation Act and according to regulatory procedures provide in 36 CFR 800. The inventory will also include other accessible portions of the APE within the Kaiser property. The entire townsite and associated portions of the railroad will be re-recorded, and the various elements will be considered as contributors to a National Register district.

Management Activity: A Work Plan will be developed and executed following issuance of the FERC license and upon gaining legal access to the subject lands. A phased approach will be taken in order to make prudent and well-informed decisions on Section 106 compliance within the Kaiser property. The first phase will be a scoping reconnaissance of the APE within the Kaiser property and the entirety of the Eagle Mountain townsite. Portions of the site have been re-used from 1988 until 2003 for a prison. A high school and residential community has occupied portions of the site until recent years. Today it exists as a mix of abandoned and re-occupied post-war minimal traditional style dwellings, Kaiser operations buildings, modern buildings, ruins, and foundations. Questions concerning what remains of the original townsite plan and integrity of the Eagle Mountain townsite will be assessed to determine whether a district is feasible or warranted and what the scope of a survey should include. This information will be applied to the development of a Work Plan for the recording and evaluation of the site.

- The Work Plan will include a draft historic context and historical information about the footprint and content of the original townsite and its development over time. The context will include a consideration of the Eagle Mountain as a late example of a company town in the American West. This information will be used to develop an approach to the documentation of the site and consideration of whether a potential district may exist. The draft Work Plan will be submitted to SHPO, BLM, and FERC for review, comment, and approval of the survey approach.

- Updates to DPR 523 forms will be developed for the townsite, mine, and railroad and will be used as the basis for formal evaluations of the townsite, mine, and railroad for listing in the NRHP will be made according to 36 CFR 800 and 36 CFR 60.4. Individual buildings or structures will be documented on DPRb forms. A District Record (DPR 523d) will be completed, if appropriate. Any other resources discovered during survey also will be documented and evaluated. The results will be provided in California Archaeological Resource Management Report format and to the Secretary of the Interior's standards for archaeological reporting.

Performance Measures:

- SHPO, BLM, and FERC concurrence will be obtained for the determination of NRHP-eligibility of the Eagle Mountain townsite, mine, railroad, and any other documented cultural resources within the Project APE, including consideration for the potential of any resources as contributing elements to a historic district, if evidence exists for one to be present.
- If any resources are determined to be historic properties, recommendations will be developed to avoid or mitigate impacts through appropriate treatments in accordance with the Secretary of the Interior's standards. These include in order of preference: project design to avoid direct impacts; moving of standing buildings or structures in the APE to other areas of the townsite or mine so that integrity of setting, feeling, and materials can be retained; or data recovery and documentation.

Implementation Timing: Pre-construction

Party responsible for implementation, monitoring and reporting: Environmental Coordinator

Responsible Agencies for verification and enforcement: SHPO/BLM/FERC

MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program.

Management Activity: Implement project-specific education program.

- A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff.
- The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view.
- The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities.
- The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues.
- Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-4. Offer Opportunities for Public Interpretation. Unlike other hydroelectric projects where public access and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped Storage Project boundaries.

Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park.

Management Activity: Develop informative signage that will be available to the public.

ECE will develop and install one weather-tolerant sign that will be placed outside the main gate of the facility. The sign will provide information about the prehistory and history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified.

The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within one year of completion of the boundary fence.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/ Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-5. Review Effectiveness of the Historic Properties Management Plan.

Management Activity: Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP.

Performance Standard: Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-6. Consult with California SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC.

Management Activity: Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will:

- Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.).
- Summarize observations made of historic properties.
- Include summaries of cultural resource treatments as an update to a HPMP implementation summary table.
- Report the status of ECE's public interpretation projects.
- Recommend modifications to the Project HPMP that will improve its implementation if appropriate.

Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter.

The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report with FERC.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-7. **Class I Investigation.** In the event that Project activities would extend beyond the areas previously surveyed, then background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of Class I literature review is the EIC at the University of California, Riverside.

Management Activity: compare proposed Project location with Cultural Resources Management Maps.

- Determine if the Project area is located within 100 feet of a potentially significant previously recorded archeological site.
- Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground utility line).
- Determine if the area has been previously surveyed for cultural resources.

Performance Standard: based on the results of the above-noted Management Activity.

- Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional archaeologist.
- Previous ground-disturbing activity may be documented or observed therefore no Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be distributed to the California SHPO, the BLM, Riverside County, interested Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-8. **Class III Cultural Resources Field Investigation.** Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III survey in compliance with Section 106 of the National Historic Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579).

<u>Management Activity</u>: Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside.

<u>Performance Standards</u>: Review results of the Class III Survey and the associated recommendations.

- If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO.
- If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may proceed. If SHPO does not concur, then the resource is treated as potentially significant.

- If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity, identifiable limits, structure, function, research potential, and cultural/historical context – *see* definition under 4.2.3 below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-9. **Testing Phase Cultural Resources Field Investigation.** Conduct limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the National Register eligibility of individual resources and an assessment of the Project effects on historic properties.

The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be avoided by a proposed action, qualifies as significant.

The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and:

- is associated with events that have made a significant contribution to the broad patterns of history
- is associated with the lives of persons significant in the past
- embodies the distinctive characteristics of a type, period or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction or
- has yielded, or may be likely to yield, information important in prehistory or history

Management Activity: Engage services of a qualified archaeologist to collect data sufficient to determine if a cultural resource qualifies as significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-

95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward this report to BLM for consultation with SHPO, interested Indian Tribes and FERC.

Performance Standards: Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO.

- If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may proceed following consultation with the California SHPO.
- If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment measure).

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-10. **Data Recovery or Alternative Mitigation.** ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE, SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes

Management Activity: ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with the California SHPO, the BLM, the Advisory Council on Historic

Preservation, and interested Indian Tribes, as appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties.

Performance Standard: Review results of the data recovery or other mitigation and consult with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed.

Implementation Timing: Pre-construction/construction/operation

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agencies for verification and enforcement: FERC/SHPO

MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains. As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation emergency.

Management Activities: Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP.

Performance Standards: ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted.

Implementation Timing: Grading/earthwork/construction

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agency for verification and enforcement: Project Archeologist/Riverside County Coroner, as required

3.8.5 Level of Significance after Implementation of Mitigation Program

Impact 3.8-1 Transmission Line Route from the Crossing of the CRA to the Interconnector Substation. This impact is considered *potentially significant and subject to mitigation*. Mitigation measures MM CR-3, MM CR-4, MM CR-5, MM CR-6, MM CR-7, MM CR-8, MM CR-9, MM CR-10, and MM CR-11 are intended to reduce the potential impact to less than significant.

Impact 3.8-2 Transmission Line and Water Pipeline Crossing of the CRA. This impact is considered *potentially significant and subject to mitigation*. Mitigation measures MM CR-1, MM CR-3, MM CR-5, MM CR-6, MM CR-11 will reduce the potential impact to *less than significant*.

Impact 3.8-3 Transmission Line Crossing of the Eagle Mountain Railroad. This impact is *potentially significant and subject to mitigation*. Mitigation measures MM CR-2, MM CR-3, MM CR-4, MM CR-5, MM CR-6, MM CR-7, MM CR-8, MM CR-9, MM CR-10, and MM CR-11 will reduce the impact to *less than significant*.

Impact 3.8-4 Central Project Site. This impact is *potentially significant and subject to mitigation.* Mitigation measures MM CR-2, MM CR-3, MM CR-4, MM CR-5, MM CR-6, MM CR-7, MM CR-8, MM CR-9, MM CR-10, and MM CR-11 will reduce the impact to *less than significant*.

Impact 3.8-5 Unknown/ Buried Cultural Resources. This impact is *potentially significant and subject to mitigation.* Mitigation measures MM CR-2, MM CR-3, MM CR-5, MM CR-6, MM CR-7, MM CR-8, MM CR-9, MM CR-10, and MM CR-11 will reduce the impact to *less than significant*.

No residual impacts to cultural resources would occur with Project implementation.

3.9 Land Use / Public Services

This section of the Draft Environmental Impact Report evaluates the consistency of the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) with applicable plans and policies that govern land use in and around the Project area. The discussion focuses on the proposed Project's compatibility with existing and planned land uses, both on-site and off-site, as well as public services. Project compatibility with the proposed Eagle Mountain Landfill is examined in depth as an issue that was raised in scoping. In consultation with the Bureau of Land Management (BLM), the potential need for a plan amendment to the California Desert Conservation Area Plan (CDCA) is emphasized and analyzed, as well.

3.9.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to land uses and public services. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the BLM and therefore subject to the LORS of the agency. Land jurisdiction refers to Federal, State, and local government administrative authority as well as land ownership. Landownership for the Project boundary and surrounding area is shown on Figure 3.9-1.

In addition, the following is a summary of relevant land use plans, policies, and projects identified that may influence the final design, construction, operation, and management of the Project.

3.9.1.1 Federal

Bureau of Land Management, Federal Land Policy and Management Act (FLPMA) 1976 The California Desert Conservation Area (CDCA) Plan 1980 as amended directs the management of the public lands of the United States. In Section 601, Congress required the preparation of a comprehensive long-range Plan for the CDCA. The purpose of this Plan was to establish guidance for the management of the public lands by the California Desert administered by the BLM.

The proposed Project is located within the CDCA, a planning area under the management jurisdiction of the BLM; whereas, the public lands surrounding the Project site and crossed by the transmission line and water pipeline are managed by the BLM. The Project site and surrounding area is located within the 25 million acre CDCA, of which approximately 12 million acres are public lands. Pursuant to the FLPMA, the BLM is directed to prepare Land Use Plans to provide guidance, with public input, on how the public lands are to be managed. The CDCA Plan (CDCAP, 1980) provides Land Use Plan guidance for the CDCA.

The Central Project Area is included within one of six concurrent CDCA plan amendments – the NECO Public lands west of the Kaiser lands are managed as MUC-Limited public lands east of the Kaiser Specific Plan boundary are managed according to MUC-Moderate guidelines (Figure 3.9-4).

The CDCA Plan identifies designated utility corridors targeted for transmission lines, pipelines, and related structures such as substations and compression stations. If segments of the final alignment of the transmission line fall outside this corridor, an amendment to the CDCA Plan may be necessary. Routes within the defined corridor and on BLM-managed lands require authorization of a right-of-way (ROW) Grant from the BLM. Figure 3.9-4 identifies the current BLM MUCs relative to the Project and the BLM utility corridor. Figure 3.9-4 maps the BLM utility corridor at a width of two miles, however, the actual width may be as wide as five miles.

Joshua Tree National Park (JTNP) and Wilderness Area was established first as a national monument in 1936 and later changed to a National Park in 1994. Also at this time, an additional 234,000 acres of land were added as the Eagle Mountain Wilderness Area. The Wilderness Area designation allows only non-motorized, non-mechanized activities to occur within its boundaries, with minimal trail creation and maintenance. The JTNP and Wilderness Area encompasses nearly 792,000 acres of land of which approximately 700,000 acres have been designated Wilderness.

The part of the JTNP located within approximately 1.5 to 3 miles of the proposed Project area (Central Project Area) is designated by the National Park Service (NPS) as a Natural Environment and Wilderness Subzone. Lands within this Natural Environment Subzone are managed to maintain the natural resources and processes that are unaltered by human activity except for approved developments essential for use and appreciation such as park roads, picnic areas, and backcountry parking areas. The majority of this area is designated as a Wilderness Subzone and no development is allowed (NPS, 1986). The proposed Project will not directly or indirectly impact park or wilderness lands.

Areas of Critical Environmental Concern (ACEC) are designated to protect specific natural, historic, and cultural resources and are managed by the BLM. Alligator Rock ACEC is located south of Desert Center and south of Interstate 10 (I-10). Neither the proposed transmission line route nor Project activity will affect the Alligator Rock ACEC.

The Chuckwalla Desert Wildlife Management Area (DWMA) is a special management area prescribed as part of the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO), principally for the protection of the desert tortoise. A segment of the Project's proposed transmission line will route through the DWMA, as shown in Figure 3.9-2.

3.9.1.2 State

State Lands held or managed by the State of California in the Project study area include mineral interest lands where the underlying mineral interest is held by the California State Lands Commission, but the surface ownership is privately held.

3.9.1.3 Local

Riverside County General Plan – Eastern Riverside County Land Use Plan. The Project site and surrounding area are located within Riverside County's Desert Center Planning Area, a part of Riverside County's overall General Plan. Within the Desert Center Planning Area, Riverside County has established the Eagle Mountain Policy Area. The Policy Area encompasses the Kaiser mine and townsites described in Specific Plans #305 and #306 respectively, and includes land uses specific to the town development and proposed landfill.

Local government jurisdiction of non-federal lands includes Riverside County, which has plans and controls land uses within their jurisdictional boundaries through the development of land use planning and zoning ordinances. The Project study area lies within Riverside County's Desert Center Land Use Planning Area. The vast majority of the planning area is classified as Rural Open Space and zoned as Natural Assets.

Within the Desert Center Land Use Planning Area, Riverside County has established two specific Policy Areas. Policy Areas are specific geographic districts that contain unique characteristics that merit detailed attention and focused policies. The Eagle Mountain Policy Area encompasses the Project site, proposed landfill, and the Eagle Mountain Townsite. Outside this specific policy area boundary, "Rural Open Space" dominates the Riverside County land use designation, with the exception of an area of "Rural Open Space-Mineral Resources" to the north/northwest of the Central Project Area.

Local land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation. When an application for a license (or a preliminary permit) is first filed, pursuant to Section 24 of the Federal Power Act (FPA), any lands included in the Project power site are "reserved from entry, location, or other disposal under the laws of the United States until otherwise directed by the Commission or by Congress." (*See* 16 U.S.C. §818.) When the Commission issues a license for the Project, the authority to create or enforce a zoning ordinance cannot be exercised in a way by a local government agency (in this case County of Riverside) that could conflict with the Federal determination made under the FPA that the development of the Project – subject to the terms and conditions of the License – is in the public interest (s*ee First Iowa Hydro Elec. Coop. v. Federal Power Commission*, 328 U.S. 152 (1946)).

3.9.1.4 Private Lands

The Desert Center Policy Area encompasses currently undeveloped land located adjacent to and north of the small, unincorporated community of Desert Center. The terminus of the proposed transmission line and substation are included within this Policy Area.

Private lands in the study area consist of a few residential/undeveloped parcels, some commercial area near Desert Center, scattered agricultural areas, and property owned by the Metropolitan Water District of Southern California (MWD) and Kaiser Eagle Mountain, LLC (Kaiser). The transmission line and water pipeline routes will cross some of these private land holdings.

3.9.1.5 Other Projects within the Project Vicinity

Renewable Energy and Transmission Line Projects. Several solar energy projects are being proposed in the vicinity of the Project area. One in particular, proposed by First Solar, Inc., abuts the Project area to the east, and would encompass approximately 7,000 acres of land.

The Blythe Energy Project Transmission Line has been recently completed and was energized in May 2010. Other transmission line projects are proposed and/or have been approved, but are not yet built, including Southern California Edison's (SCE) Devers-Palo Verde No. 2 (DPV2) Project, and the Desert Southwest Transmission Line Project, both of which will extend from the City of Blythe to the Devers substation near Palm Springs roughly paralleling the I-10 corridor.

Landfill Project – Riverside County Eagle Mountain Policy Area. Pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA) and Riverside County Ordinance 555, Reclamation Plan No. 107 was approved by Riverside County for reclamation of the Eagle Mountain Mine. The East Pit and its adjacent overburden dumps were developed to their current limits prior to 1976 and are therefore largely exempted from reclamation. In conjunction with Specific Plan No. 252 for the proposed landfill (later repealed and updated with Specific Plan #305), Kaiser submitted an amendment to Reclamation Plan No. 107 that proposes some reclamation activity to occur concurrently with the landfill development (Kaiser Eagle Mountain, LLC, 1990). The amended Reclamation Plan will not be in effect until the land exchange between the BLM and Kaiser is effectuated. At this time of this writing (June 2010), the land exchange between the BLM and Kaiser is in litigation, and has not been effectuated, therefore, it appears that the 1976 Reclamation Plan No. 107 is still in effect.

3.9.2 Existing Conditions

Town of Eagle Mountain. Eagle Mountain is a 460-acre townsite owned by Kaiser. It is located in the vicinity of the Project site, but is not proposed to be part of the Project. The town was developed by Kaiser Steel Corporation to house mine workers and consists of 250 single-family dwellings, a store, café, two churches, a school, a post office, and other related features. After the mine closed, the town became largely vacant. A State-run correctional facility once utilized some of the features, but has since been relocated. The townsite is fenced with controlled access and is currently vacant except for a few dwellings still reportedly occupied by Kaiser Ventures employees. The townsite is serviced by public utilities, and a wastewater treatment plant is located southeast of the town.

The proposed Project consists of three principal components: (1) Central Project Area, (2) Water Pipeline Corridor, and (3) Transmission Line Corridor. The following sections discuss land use issues as they relate to these three Project components. While the majority of surrounding lands are publicly owned, undeveloped and managed by the BLM, a number of specific land uses do exist. These are described below and shown on Figure 3.9-2.

Central Project Area. The Central Project Area is defined by the Applicant's proposed hydroelectric features (Figure 3.9-3), including the reservoirs, connecting tunnels and underground powerhouse, electrical switchyard, water treatment plant, and ancillary facilities. The area consists of mountainous, rocky terrain that has been disturbed extensively as a result of past mining activity. Inactive open pits, tailings piles, and remnant tailings ponds exist on-site. Remnants of the structures associated with the previous mining, including railhead, haul roads, and ore processing/refining facilities still exist within the Central Project Area, though most of the ore processing and refining facilities have been removed.

As part of the iron ore mining process, four principal areas were excavated between 1948 and 1982. The four excavated open pits are named the East Pit, Central Deposit, Black Eagle-North Pit, and the Black Eagle-South Pit. Each pit extends approximately 1 to 2 miles in length and is aligned in an east-west orientation (Kaiser and MRC, 1991). During the mining operation significant amounts of overburden were removed, much of which can be seen adjacent to the pits.

The Central Project Area occupies only a portion of the acreage encompassing the Eagle Mountain Mine area. Kaiser has proposed to develop much of the area between the two quarries proposed as upper and lower reservoirs for this Project, as a landfill. Additionally, approximately 3,500 acres of public land within this area are proposed to be exchanged for off-site private lands to support the landfill project in the mine area. The Project boundary will include nearly 1,059 acres of Federal land managed by the BLM. (If the proposed BLM land exchange with Kaiser is executed, 676 acres of the Project features will be on Federal lands.) Recent (2002) Management Plan amendments changed the BLM Land Management Classifications governing public lands west of the landfill from "Moderate" guidelines to "Limited." The BLM reports that this was done in order to protect and better manage habitat for the desert tortoise (M. Bennett, BLM, personal communication with Rick Suttle, 2008).

The Central Project Area also contains land where the State of California holds a 100 percent mineral interest on 467 acres managed by the State Lands Commission. These lands are located in portions of Section 36, Township 3 South, Range 14 East, SB B&M (Figure 3.9-3).

Water Pipeline Corridor. Water for the proposed Project will originate from three wells located in the Chuckwalla Valley approximately 11 miles from the Project site. Water from the wells will be conveyed to the lower reservoir via pipeline extending alongside existing roads and MWD transmission line corridor within a new 60-foot pipeline ROW.

Land uses adjacent to the corridor consist primarily of undeveloped desert land. The southern third of the route crosses several private parcels with inactive agricultural fields that appear to be remnant jojoba fields. The remainder of the route consists of undeveloped Federal land managed by the BLM. As the route approaches the Eagle Mountain area, it crosses the Colorado River Aqueduct (CRA) before entering the Project boundary. The pipeline will be constructed using an open-cut method, except for the crossings of the CRA and State Route (SR) 177, where it will be tunneled (Figure 3.9-2).

Transmission Line Corridor. The Project's proposed double circuit 500 kilovolt (kV) transmission line route will be located almost entirely on public lands managed by the BLM. Exceptions include private lands within the Project boundary owned by Kaiser, and a small crossing of land owned by MWD as the route crosses the existing CRA and transmission lines. The transmission line will require a 200-foot wide corridor for construction, operation and maintenance. The route extends approximately 13.5 miles from the Project switchyard south-southeast to a new interconnection substation that will interconnect with the DPV2 Transmission Line located outside the Desert Center community.

The transmission line exits the Project switchyard, and extends south to a point on the west side of the sweeping approach curve of the Eagle Mountain Rail Line. At this point, the route turns southeast, and continues in a southeasterly direction to a location adjacent to existing SCE 161kV wood pole transmission lines. Here, the line turns southeast to parallel the existing transmission lines and access road, crossing the MWD metal tower structures and passing to the east of the MWD Eagle Mountain Pumping Station. Most of this route segment from the mine to the pumping station is located on public land managed by the BLM, except for a small parcel of land around the CRA and Aqueduct Road owned by MWD. This segment is undeveloped except for a number of unpaved access roads, the paved Aqueduct Road, and existing transmission lines.

East of the MWD pumping station the transmission line route crosses over a pass in the small hills near the Eagle Mountain Rail Line. At this point it turns southwest for a short distance before turning south to parallel the existing Eagle Mountain Road. The route continues to parallel Eagle Mountain Road for approximately 3 miles, then turns southeast and continues for another 2.5 miles to the proposed substation.

Land use in the location of the new substation is undeveloped desert; (rural open space as designated in Riverside County's General Plan, 2003). South of the site low density residential exists as a part of the Desert Center community. The proposed substation site will be developed adjacent to the planned DPV2 Transmission Line. Both facilities lie within the designated Utility Corridor identified by the BLM (Figure 3.9-4).

Lake Tamarisk and Desert Center Communities. The small communities of Lake Tamarisk and Desert Center are located approximately 9 and 10 miles southeast of the Central Project Area along the Kaiser Road. Lake Tamarisk consists of approximately 70 single family dwellings, an executive golf course, a recreational vehicle park, undeveloped lots (150), a staffed county fire station, and two small lakes.

Desert Center is located at the junction of I-10 and SR 177. Desert Center consists of a few small single-family dwellings, a mini market, café, and bar. The community included gas stations at one time, but those are now closed. Public facilities include a county fire station, branch library, post office, and several churches.

Both communities, as well as the Eagle Mountain townsite, are accessed by Kaiser Road, and SR 177 which connects to I-10 at Desert Center.

Roads, Utilities, Airports, and Miscellaneous Facilities. The principal transportation network in the study area includes I-10 and SR 177. Local paved roads include the Kaiser and Eagle Mountain Roads, and the interstate frontage road (Ragsdale Road) that connects them. Kaiser Road provides direct access to the Project site and proposed landfill. Eagle Mountain Road is gated at the MWD pumping station, but is proposed by Kaiser to be opened and extended as part of the landfill project. North of the pumping station a small paved road follows the CRA and a paved frontage road connects Desert Center to the Eagle Mountain Road/I-10 interchange. Other transportation resources in the study area include unpaved roads and off-road-vehicle (ORV) trails. The Eagle Mountain Rail Line, which once serviced the Kaiser Iron Ore Mine operation, also runs through the area from I-10 north to the Project site. This facility is proposed to be reconstructed and re-opened as part of the proposed landfill project.

Several existing transmission lines cross through the study area. A 230 kilovolt (kV) electrical transmission line (MWD line) crosses the Coxcomb Mountains from the northeast and continues to the MWD pumping station and through the Eagle Mountains to the south. A 160 kV transmission line, owned by SCE, runs southeast from the Eagle Mountain townsite to the community of Blythe located approximately 50 miles to the east. South of I-10 the 500 kV DPV21 Transmission Line parallels the Interstate. Plans exist for additional transmission lines within the BLM-designated utility corridor that follows I-10. These include a second transmission line (the DPV2, approved but not yet built) and a 230kV transmission line from Blythe to the Julian Hinds substation located several miles west of the Desert Center community.

Two small airports exist in the vicinity. A single private landing strip is located to the south of the Eagle Mountain townsite and west of Kaiser Road. This airstrip is infrequently used and does not appear on the Airport/Facility Directory. The Project's proposed 500kV transmission line will route within 2 miles of this private landing strip. Desert Center Airport is a larger development located approximately 10 miles southeast of the Central Project Area, accessed from SR 177. The Desert Center Airport is a privately owned property located southeast of SR 177 (Desert Center-Rice Road) and north of I-10 in the Desert Center community, in unincorporated Riverside County. The owner has proposed to develop a 400-acre road racing facility that includes three race tracks (designed for automobile and other motor vehicle racing), and will ultimately include a two-story, 16,200 square foot clubhouse, an administration building, garages, a scoring/timing tower, pit lanes, fueling facilities, and open parking areas, including transporter truck parking areas, within the 1,100-acre property that includes Desert Center Airport. The facility is open to members and their guests. The Desert Center Airport is not a public-use airport, and activity levels are very low.

A small disposal site operated by Riverside County is located west of Kaiser Road between Desert Center and Eagle Mountain. This facility provides solid waste disposal for the small communities in the area.

The CRA lies about 1 mile south of the proposed lower reservoir. The CRA runs in a northeast-to-southwest direction and transitions from open channel to the north and east to underground tunnel from 1 mile north of Kaiser Road to the MWD pumping station approximately 2 miles south of Kaiser Road.

No natural surface water resources exist in the study area. Water for residential, commercial and agricultural use is obtained from local wells.

Some limited resource gravel extraction exists in the study area. Several small gravel pits are located between Eagle Mountain and Desert Center, and Kaiser Ventures, LLC (Kaiser) has stated that it still operates a limited rock products business from the Kaiser Mine.

Fire Protection. The site would be serviced by the Lake Tamarisk Fire Station Number 49, located in Lake Tamarisk, California. This is a unit of the Riverside County Fire Department.

Police Services. The Riverside County Sheriff's Department serves the unincorporated areas of Riverside County.

Schools/Parks. The closest school, the Eagle Mountain Elementary School, serves grades K-8 in the Desert Center Unified School District. Enrollment in the Eagle Mountain Elementary School has been declining in recent decades, since the mine closed in 1983 and again when the prison in Eagle Mountain closed in 2003 (Figure 3.9-5).

Public Services. Riverside County Service Area (CSA) 51 consists of the communities of Desert Center, Lake Tamarisk, and Eagle Mountain. CSA 51 provides water, sewer, and trash disposal to these communities.

Increased demand for these services from the proposed Project is expected to be small. No on-site work camp or housing will be used. Non-local construction workers will live offsite in existing units within several Project-region options as described in Section 3.11.

3.9.3 Potential Environmental Impacts

3.9.3.1 Methodology

The methodology used for impact analysis involved a comparison and assessment of the proposed Project to relevant land use objectives and policies, surrounding land uses, and site features including agricultural resources. The analysis was conducted through a combination of document review, field visits and communication with resource agency staff. Potential Project impacts to land use relate to the significance of the Project's construction activity, dust, noise, traffic, and visual quality. Long-term impacts may result if the Project's construction, operation and maintenance would preclude or conflict with existing land uses.

3.9.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on land use and/or public services if it does any of the following:

Land Use Planning

(a) Physically divide an established community

(b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect and/or

(c) Conflict with any applicable habitat conservation plan or natural community conservation plan

Public Services

(a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: fire protection; police protection; schools; parks; other public facilities.

3.9.3.3 Environmental Impact Assessment

Construction and Operation of the Transmission Line and Substation

Construction of the proposed transmission line and substation would not displace any existing developed land uses as the entire route and both terminal facilities are located on undeveloped desert land. The proposed transmission line has been located to take advantage of existing roads for construction access, and is almost entirely on public lands administered by the BLM.

The route crosses the BLM lands managed for 'Limited" and "Moderate" MUC designations as part of the NECO Plan, including crossing approximately six miles of NECO's Desert Wildlife Management Area. After exiting the Central Project Area, most of the route lies within two designated BLM utility corridors identified in the NECO plan, with the exception of an approximately 5-mile segment located between the two corridors (Figure 3.9-4). This segment was located to take advantage of existing road access, and to minimize additional construction impacts on wildlife resources and cultural resources (the historic Desert Training Center). Coordination with the BLM staff will be required to determine if a deviation from an established utility corridor may be granted after a review of environmental considerations. A ROW granted by the BLM would be required in order to use the proposed transmission line corridor. As discussed in detail below, an amendment to the CDCA Plan also may be required.

The proposed transmission line and substation will cause short-term impacts as a result of construction activity, noise, dust, and traffic. This will be most noticeable with the substation construction for nearby residences of Desert Center. As such, construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site, in addition public noticing stating hours of operation for construction near the Desert Center community and along SR 177 will commence two-weeks prior to construction activities.

The long-term land use-related impact associated with operation of the transmission line and substation will be the permanent change from undeveloped desert to lands reserved for utilities (Table 3.9-1). Except for the tower locations, land within the ROW will remain undeveloped after construction.

Approximately 25 acres would be required for the new interconnection substation. The site would not interfere with any existing development and is located on undeveloped desert public land managed by the BLM. A planned transmission line (DPV2) is expected to be constructed across this location, to which the substation will connect.

Construction and Operation of the Water Pipeline

The Project's pipeline construction will create short-term impacts related to construction activity, traffic, noise, and dust. Public noticing stating hours of operation for construction near the Desert Center community and along SR 177 will commence 2 weeks prior to construction activities. Further, potential impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.

Long-term land use-related impacts associated with the water pipeline corridor construction will be the permanent change from undeveloped desert to lands reserved for utilities.

The proposed water pipeline will cross undeveloped desert and some previously farmed lands. In spring 2009, inventories indicate that all affected farmed lands are not presently in active use for agriculture (Figure 3.4-2). The open-cut, sidecast construction method proposed for the pipeline would cause temporary impacts to any active cropland. After pipeline installation and settling of restored surface soils, farming activity can be resumed over the pipeline. Pipeline construction will follow BMPs identified in the Erosion Control Plan (*see* Section 12.2). Construction-related impacts to farmed lands have been minimized through placement of the route adjacent to the road and transmission line ROWs.

The pipeline will cross SR 177 and the CRA. Pipelines will be tunneled underneath the road and aqueduct. (Based upon final engineering design coordination with MWD, it is possible that the water pipeline will cross over the CRA rather than tunneling beneath it.) Coordination with the California Department of Transportation and the MWD will be required to secure encroachment permits and identify reinforcing requirements and other safety measures. Development and ROW permits will also be required from the BLM.

Table 3.9-1. Summary of Transmission and Water Pipeline Land Use Features

Item/Feature	Length (miles)	Number or Acres	Remarks
TRANSMISSION LINE			
Total Length	13.5		
Number of Towers		54-68	Steel Lattice Towers, 1,000’ - 1,200’ Spans*
ROW	200 feet		
Staging/Laydown Areas		2	Within Project Boundary and Substation Zone**
Substation/Switching Station		(25) acres	New Station to connect with SCE DPV2 Line
PIPELINE			
Total Length	15.3		Includes main route and spurs
ROW	60 feet***		Pipeline diameters = 12”, 18” & 24”
Construction Disturbance Width	25 feet +/-		
Abandoned Farmland Crossed	4	29	60’ ROW over 4-mile length
Active Farmland Crossed	0	0	

** - Exact quantities and placement of structures and facilities depends on final design.*
***- Laydown areas (2-3 acres each) included within proposed substation and Project boundary to avoid additional impact.*
****Long term ROW for water pipeline will likely be ~ 25’*

Local Land Use Policies

The proposed Project would not conflict with any land use plan of an agency having jurisdiction over the Project. Local land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation. However, as with all projects in Riverside County, the Applicant will be required to pay development impact fees. The payment of these fees will insure that acceptable response times and service ratios are maintained for public services.

CDCA Plan

Public lands under the BLM's jurisdiction within the CDCA have been designated geographically into four Multiple Use Classes (MUC). Public lands are assigned a MUC according to the allowable level of multiple uses. Class "C" (controlled use) designation is the most restrictive and is assigned to wilderness areas; Class "L" (limited use) lands are managed to provide lower-intensity, carefully controlled multiple uses while ensuring that sensitive resource values are not significantly diminished; Class "M" (moderate use) lands are managed to provide for a wider variety of uses such as mining, livestock grazing, recreation, utilities, and energy development, while conserving desert resources and mitigating damages that permitted uses may cause; and Class "I" (intensive use) provides for concentrated uses of lands and resources to meet human needs (BLM and CDFG, 2002). A complete description of the BLM's MUC designations can be found in the CDCA Plan.

The Project will occupy 2,364.0 acres of land in total (Table 3.9-2). Land ownership of the various features of the Project includes patented or privately owned lands (52 percent of the Project site) not directly under the BLM stewardship. The rest are lands managed by the BLM under the "Limited" Class "L" MUC designation or Class "M" moderate use MUC-designation.

Table 3.9-2 Summary of Land Ownership within the Project Boundary

Land Owner	Water Supply Line Acreage	Transmission Line Acreage	Central Project Area Acreage	Total Acreage	Percent
Bureau of Land Management	84.80	537.41	73.84	696.1	29.4%
Bureau of Land Management (Subject to Land Exchange)	22.00	35.68	379.01	436.7	18.5%
State	0.00	0.00	0.00	0.0	0.0%
Private – MWD	24.69	38.56	4.62	67.9	2.9%
Private – other ownership	120.78	0.16	1042.46	1163.4	49.2%
Total Project Acreage	252.3	611.8	1499.9	2364.0	100.0%

The Class M land use category may allow electrical generation plants in accordance with Federal, State, and local laws subject to approval of the BLM. The proposed Project may require BLM approval of an amendment to the CDCA Plan and issuance of a ROW grant for use of approximately 696 acres. The Applicant has submitted a SF-299 ROW application to the BLM. If the lands exchanged for the proposed landfill project return to Federal ownership, the Project will require a ROW on an additional approximate 437 acres. The BLM will determine what terms and conditions are required as a part of the FERC license to grant a ROW and, if needed, to amend the land use plan.

The CDCA Plan criteria guide terms of the plan amendment. The criteria ensure that the plan amendment is tailored to the identified issues and ensure that unnecessary data collection and analyses are avoided. The criteria focus on the decisions to be made in the plan amendment, and will achieve the following: "Sites associated with power generation or transmission not identified in the Plan will be considered through the plan amendment process."

The proposed Project facilities, including generation facilities, transmission line, water pipeline, and all ancillary facilities, are not currently specifically identified within the CDCA Plan. However, the designated utility corridor within the CDCA Plan encompasses most of the proposed interconnection route. There are three categories of plan amendments:

- Category 1, for proposed changes that will not result in significant environmental impacts or require analysis through an EIS
- Category 2, for proposed changes that would require a significant change in the location or extent of a multiple-use class designation and
- Category 3, to accommodate a request for a specific use or activity that will require analysis beyond the current plan amendment decision

Based on these criteria, approval of the proposed Project may require a Category 3 amendment. Procedures necessary to evaluate the proposed plan amendment, including environmental review of the ROW application, are addressed throughout the environmental review documents (this EIR and the pending FERC EIS) prepared for this Project, and the attendant public review and comment periods. In summary, in considering terms and conditions for amending or changing the Plan, if a change in the Plan is determined to be needed, the BLM District Manager, Desert District, will:

1. Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.

2. Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element.

3. Determine the environmental effects of granting and/or implementing the applicant's request.

4. Consider the economic and social impacts of granting and/or implementing the applicant's request.

5. Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from Federal, State, and local government agencies.

6. Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.

The Decision Criteria to be used in identifying terms and conditions of the FERC license for the proposed amendment may require that the following determinations be made by the BLM Desert District Manager:

1. The proposed amendment is in accordance with applicable laws and regulations and

2. The proposed amendment will provide for the immediate and future management, use, development, and protection of the public lands within the CDCA. (U.S. Bureau of Land Management and California Energy Commission, March 2010).

Decision Criteria for Evaluation of Application

In addition to defining the required analyses and Decision Criteria for plan amendments, if a plan amendment is determined to be needed, the Plan also defines the Decision Criteria to be used to evaluate future applications in the Energy Production and Utility Corridors Element of Chapter 3. These Decision Criteria include:

1. Minimize the number of separate ROWs by utilizing existing ROW as a basis for planning corridors
2. Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables
3. Provide alternative corridors to be considered during processing of applications
4. Avoid sensitive resources wherever possible
5. Conform to applicable local plans whenever possible
6. Consider wilderness values and be consistent with final wilderness recommendations
7. Complete the delivery systems network
8. Consider ongoing projects for which decisions have been made and
9. Consider corridor networks which take into account power needs and alternative fuel resources

Factors to be Considered

The Plan also states that, in the evaluation of proposed power plants, BLM will use the same factors affecting the public lands and their resources as those used by the FERC. These factors are the environmental information requirements defined in the California Code of Regulations (CCR) Title 20, Appendix B, and include:

- General (Project Overview)

- Cultural Resources
- Land Use
- Noise
- Traffic and Transportation
- Visual Resources
- Socioeconomics
- Air Quality
- Public Health
- Hazardous Materials Handling
- Worker Safety
- Waste Management
- Biological Resources
- Water Resources
- Soils
- Paleontological Resources
- Geological Hazards and Resources
- Transmission System Safety and Nuisance
- Facility Design
- Transmission System Design
- Reliability
- Efficiency

The BLM is a Federal agency and is subject to NEPA requirements, but is excluded from CEQA requirements or conformance. Therefore, the BLM will rely upon the FERC EIS as the mechanism for evaluating both the proposed Project application, and the CDCA plan amendment. The specific determinations required for the plan amendment evaluation, if a plan amendment is determined to be required, will be covered in the Federal process, and are presented below for informational purposes.

CDCA Plan Amendment (BLM) Required Determinations

1. *Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.* The applicant's request for a ROW was properly submitted, and the FERC DEIS will act as the mechanism for evaluating and disclosing environmental impacts associated with that application. No law or regulation prohibits granting the amendment.

2. *Determine if alternative locations within the CDCA are available which would meet the applicant's needs without requiring a change in the Plan's classification, or an amendment to any Plan element.* The CDCA Plan does not currently identify any sites as electrical power generating facilities. Therefore, there is no other location within the CDCA which could serve as an alternative location without requiring a plan amendment.

The proposed Project does not require a change in the Multiple-Use Class classification for any area within the CDCA.

3. *Determine the environmental effects of granting and/or implementing the applicant's request.* This EIR discloses the potential environmental effects of granting the ROW and CDCA amendment for CEQA purposes. The FERC DEIS will act as the mechanism for evaluating the environmental effects and determining appropriate terms and conditions to be imposed by the BLM for the ROW and the plan amendment.

4. *Consider the economic and social impacts of granting and/or implementing the applicant's request.* The FERC EIS will serve as the mechanism for evaluating the economic and social impacts of granting the ROW and the plan amendment.

5. *Provide opportunities for and consideration of public comment on the proposed amendment, including input from the public and from Federal, State, and local government agencies.* The FERC public and agency consultation process completed during the NEPA scoping period, and pending for review of the Draft EIS, satisfy this requirement.

6. *Issues to be resolved in the plan amendment*: The full range of environmental issues applicable to the proposed pumped-storage Project are addressed in this EIR, and will be addressed in the pending FERC EIS and BLM plan amendment review process for development of terms and conditions to be added to the FERC license for the Project.

7. *Issues to be resolved through policy or administrative action*: The full range of applicable environmental issues are addressed in this EIR, and will be addressed in the pending FERC EIS and BLM plan amendment review process for development of terms and conditions to be added to the FERC license for the Project.

8. *Issues beyond the scope of this plan amendment*: No issues outside the scope of a CDCA plan amendment have been identified.

9. *Evaluate the effect of the proposed amendment on BLM management's desert-wide obligation to achieve and maintain a balance between resource use and resource protection.* Title VI of the FLPMA, under CDCA, provides for the immediate and future protection and administration of the public lands in the California Desert within the framework of a program of multiple use and sustained yield, and maintenance of environmental quality. Multiple use includes electrical power generation, and through Title V of FLPMA, the BLM is authorized to grant ROWs for generation and transmission of electric energy. The acceptability of use of public lands within the CDCA for this purpose is recognized through the Plan's approval of generating facilities within

Multiple-Use Class L. The purpose of this EIR and the pending FERC EIS is to identify resources which may be adversely impacted by approval of the proposed Project, evaluate alternative actions which may accomplish the purpose and need with a lesser degree of resource impacts, and identify mitigation measures and best management practices (BMPs) which, when implemented, would reduce the extent and magnitude of the impacts and provide a greater degree of resource protection.

Conformance of ROW Application with Decision Criteria (BLM)

1. *Minimize the number of separate ROWs by utilizing existing ROWs as a basis for planning corridors*: The proposed Project assists in minimizing the number of separate ROWs by being largely collocated with existing transmission and road ROW. Electrical transmission associated with the proposed Project is proposed within and adjacent to these existing corridors and placement of the water pipeline route adjacent to these corridors minimizes the length of new corridors necessary for transmission and water conveyance.

2. *Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables*: Both the transmission and water pipeline corridors for the Project are proposed to lie within and adjacent to existing linear ROWs to maximize joint use of the corridors for water supply and electrical transmission.

3. *Provide alternative corridors to be considered during processing of applications*: This decision criterion is not applicable to the proposed Project. Placement of the proposed facility adjacent to existing corridors does not require designation of alternative corridors to support the proposed Project. Alternative transmission routes are examined to minimize encroachment on the Desert Wildlife Management Area (DWMA) and high quality habitat for desert tortoises, and were also selected to follow existing utility and roadway corridors.

4. *Avoid sensitive resources wherever possible*: The extent to which the proposed Project has been located and designed to avoid sensitive resources is documented throughout this EIR and the pending EIS. BLM and other Federal regulations that restrict the placement of proposed facilities, such as the presence of designated Wilderness Areas or DWMAs were considerations in the original siting process used by the applicant to identify potential Project locations. The Project location and configurations of the boundaries were selected to maximize use of previously mined lands that have been highly disturbed, and to minimize or avoid encroachment on sensitive lands. The alternatives analysis examines transmission routing to further minimize encroachment on sensitive habitat.

5. *Conform to applicable local plans whenever possible*: The extent to which the proposed Project conforms to applicable local plans is addressed within this chapter of the EIR, and

will also be addressed in the Land Use section of the DEIS. As noted in the Regulatory Setting above, local land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation.

6. *Consider wilderness values and be consistent with final wilderness recommendations*: The proposed Project is not located within a designated Wilderness Area or Wilderness Study Area.

7. *Complete the delivery systems network*: This decision criterion is not applicable to the proposed Project.

8. *Consider ongoing projects for which decisions have been made*: This decision criterion is not applicable to the proposed Project. Approval of the proposed Project would not affect any other projects for which decisions have been made.

9. *Consider corridor networks which take into account power needs and alternative fuel resources*: This decision criterion is not applicable to the proposed Project. The proposed Project does not involve modification of the corridor network, but will include interconnection to the existing power grid system. With regard to alternative fuel, the proposed pumped-storage Project is intended to support development and transmission grid operations for full integration of renewable energy generation throughout the Southern California region.

Based upon review of BLM's CDCA plan amendment criteria and required determinations, it appears that the Project is consistent with all criteria, and that a determination in favor of adopting a plan amendment can be made.

Existing and Proposed Land Uses in the Central Project Site

Implementation of the proposed Project will result in a change in the use of land within the Central Project Area from an inactive iron mine to a pumped storage hydroelectric facility. Additionally, this Project could be operating in conjunction with the proposed Eagle Mountain landfill. The key components of the proposed Project include the upper and lower reservoirs, water conveyance tunnels, the powerhouse, the access tunnel, the cable tunnel and shaft, brine pond, the switchyard, the transmission line, the water supply line, and several access roads.

The proposed Project layout has been modified to eliminate conflicts with existing and proposed land uses. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the

CRA to address concerns of the MWD regarding the proximity of the brine ponds to the CRA. As the Project progresses into the design phase, the Project layout will be designed to accommodate the landfill as configured.

BLM-administered lands surrounding the upper reservoir will largely be unaffected and serve as a buffer element. An access road to the upper reservoir that currently crosses public lands will be utilized by the proposed Project for construction and operation. Minor improvements to the access road will not conflict with the BLM's "Limited" MUC designation for the area.

The major change in land use that would occur with Project implementation is the inundation of a portion of the Central Pit and the East Pit to form the upper and lower reservoirs of the Project. These reservoirs are located in Sections 28, 29, 35, and 36, Township 3 south, Range 14 east, SB B&M, and encompass maximum surface areas of approximately 157 acres for the upper reservoir and 107 acres for the lower reservoir. Road access to both reservoirs will be fenced and gated to prevent unauthorized access. Recreational use of the reservoirs is infeasible due to rapid fluctuations in water levels. The reservoirs are outside the area planned to be used by the landfill project for waste disposal during Phases 1 - 4 of the landfill operation (Figure 3.2-1).

The Project's water conveyance tunnels and powerhouse will be located entirely underground. While these tunnels pass beneath the boundaries of the proposed landfill, the subsurface shafts will not interfere with the proposed landfill operations. The only exposed structure between the two reservoirs is a surge chamber with a restricted orifice entrance located above grade. The surge tower will not interfere with landfill operations.

Other project structures that will be located at surface level include the portal to the main access tunnel, and the Project switchyard. The switchyard is located on an area of 500 x 800 feet (9.2 acres) and will be surrounded by a security fence. A storage warehouse building and an administration building will be located near the main access tunnel portal (Figure 3.2-2). These structures are located outside of the active landfill area, and do not conflict with the function of the landfill.

Access roads in the Central Project Area consist of roads to reach the dams at the upper reservoir, both inlet/outlet structures, the upper surge chamber, and the access tunnel portal. The road to the access tunnel portal and the storage and administration area will be paved and originate from a junction with the existing Kaiser Road and extend south of the Eagle Mountain town site to the proposed administration area. The road is approximately three miles in length and has been aligned to prevent conflict with existing land uses in the Eagle Mountain townsite.

Operational Compatibility with the Eagle Mountain Landfill

Plans for the Eagle Mountain Landfill Project have been developed by Mine Reclamation Corporation and others to use portions of the previous Eagle Mountain Mine site for a municipal waste landfill serving Southern California urban areas. The proposed Eagle Mountain Pumped

Storage Project has been formulated with the assumption that the landfill will exist, as currently proposed by the landfill developers.

Land use compatibility issues considered in this EIR include potential interference with implementation of landfill mitigation measures, construction timing, landfill operations and permitting, potential impacts of reservoir seepage on the landfill lining system, conflicts with specific project features and related ancillary facilities, use of mine tailings, and conflicts with methane gas from the landfill.

Effects of the Proposed Project on Mitigation Measures for the Landfill Project

During the examination of proposed Project impacts to terrestrial biological resources and threatened and endangered species, the Biological Assessment (BA; RECON 1992) and Biological Opinion (BO; USFWS 1992) for the Eagle Mountain Landfill and Recycling Center were reviewed and considered. The Landfill BA discussed conservation measures to mitigate impacts to listed and other special-status biological resources. The Landfill BO discussed conservation measures for the federally listed desert tortoise and desert pupfish. Table 3.9-3 identifies conservation measures set forth as part of the landfill project for federally and State-listed species, as well as other candidate or other special-status species (Landfill BA: Pages 41-86; Landfill BO: Pages 3-26) and a discussion of the potential effects of the proposed Project on those measures.

Table 3.9-3. Project Compatibility - Mitigation and Compensation Measures Required for the Landfill Project and the Eagle Mountain Pumped Storage Project

Species	Landfill Mitigation / Compensation Measure		Potential for Conflicts as a Result of Pumped Storage Project
	Number	Summary of Measure	
Desert Pupfish	c.,BO – R&P 1 and 2, BO-T&C 33, 34, 35, 36, 37	Monitoring of rail line activities and pupfish populations at Salt Creek drainage; habitat compensation in the event of a rail accident in pupfish habitat ; construction- and maintenance-related protection measures to avoid impacts to desert pupfish	The referenced segment of the Salt Creek drainage is in Imperial County, approximately 40 miles south of any component of the pumped storage Project
Desert	BO-T&C 29,	Contingency plan for	Pertains to areas within the landfill that are

Species	Landfill Mitigation / Compensation Measure		Potential for Conflicts as a Result of Pumped Storage Project
	Number	Summary of Measure	
Pupfish	30, 31, 38, 39, 40	spills and other spill-related issues	outside the footprint of the pumped storage project
Desert Pupfish (and other species)	BO-T&C 32	Worker Environmental Awareness Program	This will be a requirement for both projects, and the WEAP for the pumped storage project will not affect the WEAP for the landfill project.
Desert Tortoise	BA – 1, BO – R&P 2, BO-T&C 15, 16 , 17 and 24	Raven monitoring and control activities	The pumped storage project also has a raven monitoring and control plan (MM TE-5), and will have no effect on the landfill's operations or implementation of its own plan. The projects may have opportunities to work cooperatively in concert to achieve raven control goals and, to this end, it is anticipated that data could be shared to maximize the effectiveness of the raven program. ECE's monitoring will account for other projects in the vicinity, including, but not limited to, the landfill project.
Desert Tortoise	BA-2, BO-T&C 4 and 18	Railway surveys and clearance	Pertains to the railroad line that will serve the landfill project, and that is not related to or affected by the pumped storage project.
Desert Tortoise	BA-2, BO – R&P 1 and 2, BO-T&C 3, 5, 6, 7, and 8	Train monitoring and construction of a potential barrier/culvert system on the railway to protect tortoises	Pertains to the railroad line that will serve the landfill project, and that is not related to or affected by the pumped storage project.
Desert Tortoise	BA–2, BO – R&P 2, BO-T&C 24	Monitoring tortoise and raven populations adjacent to the railroad for railroad effects	Only the northern portion of the railroad ROW overlaps the pumped storage project transmission line ROW. The latter will be constructed prior to the railroad upgrades and use. As such, any impacts from transmission line construction and operations activities will be part of the statistical baseline for the landfill railroad monitoring program.
Desert Tortoise	BA-3, BO-T&C 18	Pre-construction surveys on Eagle Mountain Road	Pertains to both projects and neither project's surveys will limit the others ability to comply with its survey requirements.

Species	Landfill Mitigation / Compensation Measure		Potential for Conflicts as a Result of Pumped Storage Project
	Number	Summary of Measure	
Desert Tortoise	BA-3, BO-T&C 1	Compensation for lost habitat	Pertains to both projects and neither project's habitat compensation will limit the others ability to comply with its compensation requirements.
Desert Tortoise	BA-3, BO – R&P 1, BO-T&C 8, 9, 10, 11, 12, 13, and 14	Construction of a potential barrier/culvert system on Eagle Mountain Road to protect tortoises.	This measure pertains to use of the Eagle Mountain Road for regular truck traffic to the site. Segment of this road will be used by the pumped storage project to access the transmission line corridor during construction, but all other traffic for the pumped storage project will utilize Kaiser Road rather that Eagle Mountain Road. For long term operations, the pumped storage project will not generate significant traffic, and for long term, this requirement would only pertain to the landfill.
Desert Tortoise	BA-3	Removal of tortoises from Eagle Mountain Road.	Pertains to both projects and neither project's tortoise monitoring and relocation (if needed) will limit the others ability to comply with its requirements.
Desert Tortoise	BA-3, BO-T&C 25 and 26	Worker Environmental Awareness Program (WEAP)	This will be a requirement for both projects, and the WEAP for the pumped storage project (see MM BIO-4) will not affect the WEAP for the landfill project.
Raven		Monitor the raven population along Eagle Mountain Road	The pumped storage project transmission line ROW will be constructed prior to the landfill upgrade and use of Eagle Mountain Road. As such, any impacts from transmission line construction and operations activities will be part of the statistical baseline for the landfill railroad monitoring program.
Multiple Species	BO-4	Tipping fee for each ton of non-hazardous waste deposited at the landfill	This measure applies to landfill operations and is completely unrelated to the pumped storage project which will not have any waste disposal function.
Desert Tortoise	BO- R&P 3; T&C 28 and	Establish a contingency plan in the event of a train derailment or spill;	The pumped storage project will not involve railroad operations.

Species	Landfill Mitigation / Compensation Measure		Potential for Conflicts as a Result of Pumped Storage Project
	Number	Summary of Measure	
	29	spill-related conditions	
Desert Tortoise	BO-T&C 19, 20, 21, 22, 23, 27	Construction-related protection measures, tortoise translocation; designation of an authorized biologist and field contact representative	This will be a requirement for both projects, and the tortoise monitoring and protection measures for the pumped storage project will not affect these measures for the landfill project.
Desert Tortoise	BO-R&P 2, T&C 24	Long-term desert tortoise monitoring program	This will be a requirement for both projects, and the long-term tortoise monitoring and protection measures for the pumped storage project will not affect these measures for the landfill project. There may be opportunities for the two projects to share survey data.
California Leaf-nosed Bat and Townsend's Big-eared Bat	C. 1. a. and b.	Monitor the population on and around the east pit adit; alter the mine adit of the east pit to maintain bat utilization of the mine adit.	The mine adits are located adjacent to the Central Project Area (APEIS: Page 3-29). The pumped storage project does not propose to use or otherwise disturb these features. In order to insure that the project does not impact bats, the pumped storage project intends to conduct pre-construction surveys for bats, and develop a mitigation plan to avoid roosting and foraging impacts (see MM BIO-15) if needed.
Foxtail Cactus	C. 2. a.	Salvage and transplant individual cactus plants	At the time when the BA was published, this species was FWS Category 2 species and a BLM sensitive species. It is now only a CNPS List 4 species and is no longer a BLM sensitive species. It is protected by the California Desert Native Plants Act. As such the pumped storage project will salvage all individuals that could be injured by construction (see PDF BIO-2). This is consistent with the landfill measure.
Orocopia Sage	C.2.b.	Avoid plants	All Orocopia sage are well south of the pumped storage project, near the Salton Sea and Coachella Canal, and this measure applies to the landfill railroad in areas far south of any component of the pumped

Species	Landfill Mitigation / Compensation Measure		Potential for Conflicts as a Result of Pumped Storage Project
	Number	Summary of Measure	
			storage project.
Nelson's Bighorn Sheep	D.	The landfill will remove water sources and 994 acres of native, bighorn sheep habitat. Mitigation will include the construction of new, permanent water sources away from the mine site, maintenance of 644 acres of native habitat around the periphery of the landfill, and an employee training program. Domestic sheep would be excluded from the site, firearms would only be permitted for approved individuals, and dogs would be restrained. Mitigation also included a baseline study to determine home ranges of ewes currently using the site (Divine and Douglas 1996)	The pumped storage project will also provide a water source for sheep. No pumped storage project facilities in the Central Project Area will occur in native habitat, so the pumped storage project will not affect the landfill's preservation of native habitat. The pumped storage project also has an employee environmental awareness program that excludes firearms and unrestrained dogs (see MM BIO-1, MM BIO-4, and MM BIO-16).

Landfill Construction Timing

The timing of construction of the proposed landfill project is not known at this time. Under present conditions, construction of the pumped storage Project is very likely to be completed before the start of the landfill project and construction of facilities required to support landfill operations. On the current schedule, construction of the pumped storage Project is scheduled to begin in 2012 and to be fully completed by about 2016. On the basis of the analysis below, it is concluded that the pumped storage Project is likely to be built and operational prior to initiation of landfill construction at Eagle Mountain, and that the construction periods for the two projects are not likely to overlap or create any conflicts.

If all approvals for the landfill were resolved in 2010, then construction of support facilities for the landfill could begin when designs were finalized, and commercial landfill operations could theoretically begin as early as 2014. However, this is an unlikely scenario based upon the recent Ninth Circuit Court decision remanding the legal dispute for further review, review of current and projected demand for landfill capacity in southern California, and the recent opening of the Mesquite Regional Landfill. Therefore, as discussed in greater depth below, it is highly unlikely that the landfill project and the pumped storage Project construction periods will overlap.

One component of the landfill proposal is an exchange of lands between Kaiser and the BLM. On September 25, 1997, BLM issued a Record of Decision approving the land exchange between itself and Kaiser, which was appealed to the IBLA. On September 20, 1999 the IBLA issued an order denying the appeal and affirming the land exchange. This decision was subsequently appealed to the District Court who decided that "The subject land exchange and grants of rights of way and reversionary interest are set aside and the Defendants are enjoined from engaging in any action that would change the character and use of the exchanged properties…" until they complied with the changes requested by the decision. (*Donna Charpied et al., v. United States Dept. of Interior et al.*, ED CV99-0454 RT (Mcx) (Sept. 20, 2005); *Nat'l Parks and Conservation Assoc., v. Bureau of Land Mgmt, et al.*, ED CV 00-0041 RT (Mcx) Sept. 20, 2005).

This case was appealed to the Ninth Circuit Court of Appeals, and oral argument was heard on December 6, 2007. A decision on the case was published November 10, 2009, and the case was remanded for further proceedings consistent with the Ninth Circuit opinion. It is not possible to predict the length of time needed for future proceedings.

Approval of the landfill is contingent upon Kaiser being the fee owner of the property (*See* Development Agreement No. 64 Section 2.2; California Integrated Waste Management Board resolution 1999-624 (revised); and California Integrated Waste Management Board, Board Meeting Summary December 14-15, 1999). Therefore, until the land exchange is effectuated, the landfill is not a formally approved operation. In addition, at least one of the permits previously issued for the landfill, the USACE Clean Water Act Section 404 permit, has expired.

In the event that the land exchange is confirmed and all the necessary landfill approvals are issued, construction of the landfill could commence. A timeline for the start of construction is unknown, but is unlikely to occur before 2011 under the most optimistic scenario. Based on the experience of the Mesquite Regional Landfill, construction could take 3 years before the landfill would be ready to accept waste. Therefore, landfill operations are unlikely to commence prior to 2014.

Construction and operation of the Eagle Mountain Landfill may be further delayed due to lack of demand for additional landfill capacity in southern California at this time. The Mesquite Regional Landfill (MRL) was ready to accept waste in 2009. The MRL has capacity for approximately 600 million tons of solid waste, and up to 100 years of operation at a maximum of

20,000 tons per day. In 2009, when the MRL became operational, the Los Angeles County Sanitation District's projections indicated there was between 10,000 and 16,000 tons per day of excess landfill capacity in Los Angeles County. Although this means there is no immediate need to export trash to the MRL, the Sanitation Districts are proposing to conduct a 300 tons per day operation at the MRL. The projections continue to show excess landfill capacity in Los Angeles County until late 2013, when the Puente Hills Landfill is scheduled to be closed. According to the projections, there may still be some excess capacity at other landfills in 2013. However, there could be an overall shortfall of 4,500 tons per day by 2013 (Sanitation Districts of Los Angeles County, http://www.mrlf.org/index.php?pid=101, accessed February 18, 2009).

If the entire 4,500 tons per day potential shortfall from Los Angeles County is transported to the MRL facility, there would still be capacity for an additional 15,500 tons per day from other sources at the MRL facility. Therefore, there is enough capacity at the MRL facility to serve southern California's waste disposal needs for decades to come.

Landfill Operations

In the event that the land exchange is confirmed and all the necessary landfill approvals are issued, construction of the landfill could commence. The landfill was initially designed to be constructed in phases over a period of many decades. Construction and operation of each phase of the landfill is designed to progress from west to east. During the first four phases, no overlap occurs between the landfill disposal areas and lands required for the proposed pumped storage Project except for use of the primary access road into the site. The pumped storage Project will use the Central and East Pits to store water, areas that are not proposed to be used during Phases 1-4 of the landfill. The powerhouse and water conveyance tunnels will be underground and will not affect landfill construction or operations.

A proposed Phase 5 of the landfill – projected to commence in about year 84 of operations – does include overlapping uses in the vicinity of the East Pit which would form the lower reservoir for the pumped storage Project (*see* Section 12.8). However, the landfill was approved by Riverside County for a 50-year operation, and Phase 5 is not a part of the County-approved landfill project.

Landfill Use of the East Pit

The Eagle Mountain Pumped Storage Project's use of the East Pit does not exclude the East Pit's use as a landfill in perpetuity. In the event that, at some future date many decades from now, decision-makers determine that the landfill use of the East Pit has greater social or economic value than the proposed Project's use of the East Pit, the water could be drained and the East Pit used as a component of the landfill.

The Solid Waste Facility Permit for the Eagle Mountain Landfill (Permit 33-AA-0228, issued January 14, 2000) specifically approved Phases 1 through 4 of the landfill, with 1,864 acres for disposal (Table 3.9-4 Landfill Project Phasing). Phase 5 of the landfill was not included in this permit.

Table 3.9-4 Landfill Project Phasing

Phase	Life Span (years)	Acres	Net Waste Volume (million tons)
1	23	319	83
2	11	312	71
3	31	703	195
4	19	534	121
Total (Phases 1 – 4)	**84**	**1868**	**470**
Phase 5	*39*	*239*	*238*

Sources: Eagle Mountain Landfill and Recycling Center EIS/EIR and California Integrated Waste Management Board, Board Meeting Summary December 14-15, 1999.

Riverside County approved Development Agreement No. 64 with Mine Reclamation Corporation, and others, for development of the Eagle Mountain Landfill. This development agreement states that, "in no event that the term of this Agreement be extended beyond November 30, 2088" (78 years from now). Therefore, the development agreement only allows for development of Phases 1 through 4. Phase 5 would not be scheduled to occur until year 84, at least 6 years after Development Agreement No. 64 expires.

Mine Reclamation's lease of the landfill site from Kaiser expires in 2088, prior to the time when Phase 5 would be scheduled for development. Therefore, landfill use of the East Pit is proposed only in a future, and speculative, phase.

Potential Impacts to the Landfill Liner

The Eagle Mountain Pumped Storage Project will involve storing water in the central and east mine pits and moving water between the two reservoirs through underground tunnels to generate power and to refill storage in the upper reservoir (East Pit).

Studies by GeoSyntec (1996) indicate that the natural groundwater flow is initially to the south from the area of the central pit. Those studies also indicated that because of fractures in the bedrock, seepage will occur, particularly if the reservoir is not treated to control the rate of seepage. Therefore, the proposed pumped storage operations may artificially raise groundwater levels in this local area. In the case of consistently high reservoir levels and efficient interconnectivity of bedrock fractures to the south, there is likelihood that this groundwater could exit on the hillside south of the upper reservoir rather than staying beneath the existing ground surface and the landfill. With the landfill proposed to be constructed south (down-gradient) of the upper reservoir, this groundwater could potentially encounter the lining of the landfill.

The potential and timing for groundwater to migrate to the southern slope is dependent on the local hydraulic conductivity of the rock and Project operations. Assuming a hydraulic conductivity of 650 feet per year, suggested by GeoSyntec's work, it appears that seepage could intersect the southern slope under long-term steady-state assumptions. The fact that the reservoir will be filled and drained on a weekly basis will have a dampening effect on the rate of seepage.

The following project design feature (PDF GW-1) will be undertaken to determine the actual potential for seepage and to control its rate from the upper reservoir:

- The upper reservoir (East Pit) will be thoroughly investigated during final design of the pumped storage Project to identify a program for seepage control. This investigation will include geologic mapping to identify the locations and extent of faults, cracks, fractures, and discontinuities in the rock formations and subsurface explorations to characterize the hydraulic conductivity of the rock formations. The mapping will identify locations that will tend to be the areas where seepage into the bedrock will be most pronounced. A seepage model will then be developed to characterize the flow patterns and potential seepage rates through the bedrock with the upper reservoir at its maximum normal pool (Elevation 2,485).

- Based on the above studies, a seepage mitigation program is proposed. This program includes:
    - Curtain grouting beneath the footprints of the two upper reservoir dams (foundation grouting typically is performed for dam safety reasons as a means of uplift control)
    - Grouting and/or shotcrete treatment of the surface features identified in the reservoir as likely locations for seepage to concentrate
    - Installation of monitoring wells and piezometers so that seepage amounts and flow patterns can be detected and understood
    - Installation of seepage recovery well(s) to capture seepage and prevent significant quantities of water from encountering the landfill liner
    - Other measures, such as impervious blanketing on portions of the reservoir bottom and sides, may also be used depending on results of detailed studies during design

The Eagle Mountain Pumped Storage Project Applicant has planned the Project with the assumption that the water conveyance tunnels for the Project will be concrete-lined throughout, except for the steel-lined penstock and draft-tube tunnels. This was assumed primarily for hydraulic efficiency reasons. However, these liners will effectively block seepage from occurring. Final tunnel design will need to carefully consider water pressures acting on the tunnels in both directions when the tunnels are fully pressurized for hydroelectric operations and when they are dewatered for inspection. The final designs for the tunnels and associated tunnel linings will assure that no potential will exist for water from the Project to cause uplift loads on the landfill liner system.

Compatibility of Specific Features and Ancillary Facilities Interferences

If both of the projects are constructed, there will be a number of potential compatibility or interference issues that will need to be addressed during the design and construction phases. A Technical Memorandum (*see* Section 12.8) has been prepared for the applicant and submitted to the Board, addressing the issues of compatibility with the landfill and describing the features of the pumped storage Project that have been adjusted in order to eliminate possible conflicts with the landfill. These measures are summarized in PDF LU-4. For assessment of these issues and development of mitigation measures, it is assumed that the pumped storage Project will be constructed before the landfill project and that these measures to maintain compatibility of the two projects will be implemented by the pumped storage Project rather than the landfill developer.

The truck marshalling and rail yard facilities for the landfill are located on the east end of the mine site, *see* Section 12.8. In the Draft License Application (DLA), the applicant had indicated that construction staging and lay-down areas would be located close to the truck marshalling and rail yard. These areas, which are required for pumped storage Project construction, have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill, *see* Section 12.8.

The DLA showed the low-voltage cable connection from the powerhouse to the Eagle Mountain switchyard as an above-ground line. The transmission lines connecting the transfer station and the switchyard were originally placed above ground through Phase 3 of the landfill project. The line would have extended from the top through a vertical cable shaft, above ground to the switchyard. ECE now intends to route the low-voltage cables from the underground powerhouse through the underground powerhouse access tunnel (*see* Section 12.8). The transmission cables would only be located above ground from the access tunnel portal near the lower reservoir, along the north rim of the reservoir and adjacent to the proposed water pipeline from the reverse osmosis treatment plant to the lower reservoir.

The water treatment facilities have also been relocated from the originally proposed location to address concerns raised by the MWD regarding proximity of the ponds to the CRA. The proposed Final License Application (FLA) pumped storage layout (*see* Section 12.8) aligns transmission lines within the access tunnel down to near the lower reservoir inlet structure. Here the lines will run up through a shaft to the ground surface and then continue on to the Eagle Mountain switchyard as overhead transmission lines (*see* Section 12.8).

Existing and proposed roads within the landfill can be utilized by both projects if construction were to occur simultaneously requiring close coordination and communications between the projects, but, as discussed below, it is very unlikely that both projects will be constructed on the same schedule.

Potential Conflicts with Other Landfill Facilities and Rock Resources

The landfill haul roads along the perimeter of the Project area could be used to move equipment for pumped storage construction and as construction access roads. The existing internal access road running through the northern portion of landfill Phases 2 and 3 may be used to access the pumped storage surge tank and shaft until the north perimeter maintenance road is completed.

The staging, storage, and office/administrative areas for the pumped storage Project construction are proposed to be located to the southwest of the lower reservoir, in close proximity to the landfill project's proposed administration buildings. South of this area, is the proposed desalination area. This area is an abandoned section of the Eagle Mountain townsite. The proposed water treatment plant and brine disposal area will be accessed using existing roads from the abandoned town and crossing over the Eagle Mountain Railroad track system will not be required.

Kaiser's uses rock resources within the area of section 36, T 14E, R3N. There are no proposed Project facilities planned to be located on or near this area.

There is an estimated nine-million cubic yards of fine tailings on the site. The Report of Waste Discharge (ROWD) for the landfill states that Kaiser needs 1.7 million cubic yards of that material for construction of the landfill liner.

According to the ROWD, other rock resources on site include 25 million cubic yards of overburden, 50 million cubic yards of coarse tailings, 500,000 cubic yards of alluvium (within the footprint of the landfill), and 28 million cubic yards of excavated bedrock, providing extensive quantities of rock material for daily cover.

For bottom lining of the reservoirs for seepage, the Applicant will use a portion of the fine tailings not utilized by the landfill, coupled with residual materials from tunnel boring, and other materials processed on-site that provide sufficiently low permeability, or combinations of all three.

Methane Gas from Eagle Mountain Landfill

The proposed landfill will have an active gas extraction system installed to collect landfill gases. The collection system is quite extensive, with 1,200 extraction wells located approximately 300 feet apart over the cover for active continuous gas removal. These extraction wells will penetrate the full extent of the waste layers in the landfill. Lateral pipelines will connect these wells and convey the collected gases to a blower building. With this type of system, it is highly unlikely that landfill/methane gas would escape from the landfill and cause any concern to the pumped storage Project.

The proposed Project's tunnels are at sufficient depth (between 100 feet and 1,500 feet below surface) and distance from the landfill waste, that there should be no significant risk of methane migration into these facilities. Methane is lighter than air, so it is highly unlikely that landfill gas would be forced to such depths given the extraction system proposed for the landfill.

<u>Environmental Impact Assessment Summary</u>:

Land Use and Planning

(a) *Would the Project physically divide an established community?* No. The Project will have no physical effect on any established community.

(b) *Would the Project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?* No. The Project will not conflict with any land use plan of an agency with jurisdiction over the Project. As noted in the Regulatory Setting section above, Riverside County land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation. Pursuant to Section 24 of the FPA, any lands included in the Project power site are "reserved from entry, location, or other disposal under the laws of the United States until otherwise directed by the Commission or by Congress." (*See* 16 U.S.C. §818.) If the Commission issues a license for the Project, the authority to create or enforce a zoning ordinance cannot be exercised in a way by a local government agency that could conflict with the Federal determination that development of the Project – subject to the terms and conditions of the License – is in the public interest.

(c) *Would the Project conflict with any applicable habitat conservation plan or natural community conservation plan?* No. Such plans do not exist for the Project area. A segment of the proposed transmission line will cross a Desert Wildlife Management Area, which, while not conflicting with a Habitat Conservation Plan / Natural Community Conservation Plan, is recognized as a potentially significant adverse impact that requires mitigation.

Public Services

(d) *Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: Fire protection? Police Protection? Schools? Parks? Other Public Facilities?* No. Because no new housing construction is anticipated, it is expected that existing regional public services (water, sewer, waste) will meet the Project-related workforce population. The Project will pay Development Impact Fees to insure that there are adequate public services.

Impact 3.9-1 Short-term Construction Impact from Transmission Line and Interconnection to Substation. The proposed transmission line and substation will cause short-term impacts as a result of construction activity, noise, dust, and traffic, this impact would be considered *potentially significant and subject to the mitigation program* (PDF LU-1 and PDF LU-2). This will be most noticeable with the substation construction for nearby residences of Desert Center. As such, construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. In addition public noticing stating hours of operation for construction near the Desert Center community and along SR 177 will commence two-weeks prior to construction activities.

Impact 3.9-2 Operational Impact from Transmission Line and Interconnection to Substation. This impact is considered *less than significant*. Long-term land use-related impacts associated with the transmission line/substation construction will be the permanent change from undeveloped desert to lands reserved for utilities. Except for the tower locations, land within the ROW will remain undeveloped after construction.

Impact 3.9-3 Short-term Construction Impacts from the Water Pipeline Corridor. Construction of the water pipeline will cause short-term impacts as a result of construction activity, noise, dust, and traffic, this impact would be considered *potentially significant and subject to the mitigation program* (PDF LU-1, PDF LU-2, and PDF LU-3).

Impact 3.9-4 Operational Impacts from the Water Pipeline Corridor. This impact is *less than significant*. Long-term land use-related impacts associated with the water pipeline corridor construction will be the permanent change from undeveloped desert to lands reserved for utilities.

Impact 3.9-5 Local Land Use Policies. The proposed Project would not conflict with any land use plan of an agency having jurisdiction over the Project. Local land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation. This impact is considered *less than significant*.

Impact 3.9-6 CDCA Plan Amendment for Utility Right-of-Way. Based upon review of BLM's CDCA plan amendment criteria and required determinations, it appears that the Project is consistent with all criteria, and that a determination in favor of adopting a plan amendment can be made, if a plan amendment is needed. Therefore, this potential impact is determined to be *less than significant*.

Impact 3.9-7 Existing and Proposed Land Uses in the Central Project Site. Implementation of the proposed Project will result in a change in the use of land within the Central Project Area from an inactive iron mine to a pumped storage hydroelectric facility. Additionally, this Project could be operating in conjunction with the proposed Eagle Mountain landfill. The Project layout has been modified to eliminate conflicts with existing and proposed land uses. This impact *is potentially significant and subject to the mitigation program* (PDF LU-4 and MM LU-2).

Impact 3.9-8 Landfill Construction Timing. The pumped storage Project is likely to be built and operational prior to initiation of landfill construction at Eagle Mountain. Construction periods for the two projects are not likely to overlap or create any conflicts. Therefore, this impact is determined to be *less than significant*.

Impact 3.9-9 Landfill Operations. The proposed Eagle Mountain Pumped Storage Project will use the Central and East Pits to store water, areas that are not proposed to be used during Phases 1-4 of the landfill. The powerhouse and water conveyance tunnels will be underground and will not affect landfill construction or operations. Therefore, this impact is determined to be *less than significant*.

Impact 3.9-10 Landfill Use of the East Pit. The Eagle Mountain Pumped Storage Project's use of the East Pit does not exclude the East Pit's use as a landfill in perpetuity. In the event that, at some future date many decades from now, decision-makers determine that the landfill use of the East Pit has greater social or economic value than the proposed Project's use of the East Pit, the water could be drained and the East Pit used as a component of the landfill. Therefore, this impact is determined to be *less than significant*.

Impact 3.9-11 Potential Impacts to the Landfill Liner. Seepage from the upper reservoir could potentially encounter the lining of the landfill. Therefore, this potential impact is determined to be *potentially significant and subject to the mitigation program*. Mitigation measures to address this impact are PDF GW-1 [Groundwater Seepage] and MM GW-5 [Seepage Recovery Wells], described in detail in Section 3.3 Groundwater.

Impact 3.9-12 Compatibility of Specific Features and Ancillary Facilities Interferences. On the basis of the analysis presented above, this impact is *potentially significant and subject to the mitigation program* (PDF LU-4). Design adjustments have been made to avoid interference with proposed landfill components, so that the proposed pumped storage Project does not conflict with construction or long-term operation of the proposed landfill project's specific features and ancillary facilities.

Impact 3.9-13 Potential Conflicts with Other Landfill Facilities and Rock Resources. On the basis of the analysis presented, it is concluded that the proposed pumped storage Project does not conflict with construction roads, other operational components, or use of rock and fine-tailings resources at the mine site. Therefore, this impact is determined to be *less than significant*.

Impact 3.9-14 Methane Gas from Eagle Mountain Landfill. Based upon the analysis set forth, it is concluded that methane gas produced by the proposed landfill will not be affected in any way by the proposed pumped storage Project. Therefore, this potential impact is determined to be *less than significant*.

Impact 3.9-15 Impact to Public Services. This impact is considered *potentially significant and subject to the mitigation program*. Because no new housing construction is anticipated, it is expected that existing regional public services will meet the Project-related demand for services. However, to insure that there is no impact to public services, the Project will pay Development Impact Fees. Payment of development impact fees is listed as in the mitigation program as MM LU-1. The payment of these fees will insure that acceptable response times and service ratios are maintained for public services.

3.9.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs). PDFs are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards built have been into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of CEQA review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

Implementation of the proposed hydroelectric facility within the Central Project Area will have no significant effect on existing or future land uses. If and when the proposed landfill project becomes a reality, coordination between owners will facilitate compatible final designs and operation.

Due to the proximity of the Project's substation to Desert Center and pipeline construction across private property, the following project design features will be included:

PDF LU-1. Construction Access. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points.

PDF LU-2. Construction Notice. Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal.

PDF LU-3. Pipeline Construction. Impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.

PDF LU-4. **Construction Staging Area**. The Project layout has been modified to eliminate conflicts with existing and proposed land uses. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the MWD regarding the proximity of the brine ponds to the CRA.

Mitigation Measure

MM LU-1. **Development Impact Fee.** Prior to the start of commercial operation the Applicant shall pay to Riverside County the required Development Impact Fee for the Project area in accordance with Riverside County Ordinance 659, as amended through 659.7 and Chapter 4.60 of the Riverside County Code (Development Impact Fees).

Implementation Timing: Prior to start of Commercial Operations

Party responsible for implementation, monitoring and reporting: Operator / Environmental Coordinator

Responsible agency for verification and enforcement: SWRCB and FERC

MM LU-2 **Coordinate with MWD.** Engineering designs of crossings of MWD facilities will be submitted to MWD for their review and approval.

Implementation Timing: Pre-construction

Party responsible for implementation, monitoring and reporting: Applicant

Responsible agency for verification and enforcement: MWD and FERC

3.9.5 Level of Significance after Implementation of Mitigation Program

Impact 3.9-1 Short-term Construction Impact from Transmission Line and Interconnection to Substation. The proposed transmission line and substation will cause short-term impacts as a result of construction activity, noise, dust, and traffic, and will be most noticeable with the substation construction for nearby residences of Desert Center. As such, construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site, in addition public noticing stating hours of operation for construction near the Desert Center community and along SR 177 will commence 2 weeks prior to construction activities. Implementation of PDF LU-1 and PDF LU-2 will result in a *less than significant impact*.

Impact 3.9-2 Operational Impact from Transmission Line and Interconnection to Substation. This impact is considered *less than significant* and no mitigation required

Impact 3.9-3 Short-term Construction Impacts from the Water Pipeline Corridor. The Project's pipeline construction will create short-term impacts related to construction activity, traffic, noise, and dust. These impacts would be considered *less than significant* with implementation of PDF LU-1, PDF LU-2, and PDF LU-3 which require construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site, in addition, public noticing stating hours of operation for construction near the Desert Center community and along SR 177 will commence 2 weeks prior to construction activities. Further, potential impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.

Impact 3.9-4 Operational Impacts from the Water Pipeline Corridor. This impact is considered *less than significant* and no mitigation required.

Impact 3.9-5 Local Land Use Policies. All development projects in Riverside County are subject to development fees. Adherence to this payment (listed within the mitigation program as MM LU-1) would not change the level of significance which is *less than significant*.

Impact 3.9-6 CDCA Plan Amendment for Utility Right-of-Way. This impact is considered *less than significant* and no mitigation required.

Impact 3.9-7 Existing and Proposed Land Use Conflicts in the Central Project Area. None of the facilities or structures of the Project are anticipated to have a significant adverse effect on existing land uses and land use impacts would be *less than significant* with incorporation of the mitigation program (PDF LU-4 and MM LU-2).

Impact 3.9-8 Landfill Construction Timing. This impact is considered *less than significant* and no mitigation required.

Impact 3.9-9 Landfill Operations. The pumped storage Project will use the Central and East Pits to store water, areas that are not proposed to be used during Phases 1 through 4 of the landfill. This impact is considered *less than significant* and no mitigation required.

Impact 3.9-10 Landfill Permitting. The Eagle Mountain Pumped Storage Project's use of the East Pit does not exclude the East Pit's use as a landfill in perpetuity. This impact is considered *less than significant* and no mitigation required.

Impact 3.9-11 Potential Impact to the Landfill Liner. Mitigation measures proposed to control and recover seepage from the pumped storage Project's reservoirs (PDF GW-1 and MM GW-5) would result in *less than significant* impact.

Impact 3.9-12 Compatibility of Specific Features and Ancillary Facilities Interferences. With adherence to PDF LU-4, potential impacts would be *less than significant*.

Impact 3.9-13 Potential Conflicts with Other Landfill Facilities and Rock Resources. This impact is determined to be *less than significant*, and no mitigation is required.

Impact 3.9-14 Methane Gas from Eagle Mountain Landfill. This impact is determined to be *less than significant*, and no mitigation is required.

Impact 3.9-15 Impact to Public Services. This impact is considered *less than significant* with the application of the mitigation program (MM LU-1). The payment of these fees will insure that acceptable response times and service ratios are maintained for public services.

No residual impacts to land use or public services would occur with Project implementation.

3.10 Recreation

This section of the Draft Environmental Impact Report presents a discussion of the recreational facilities within the proposed Eagle Mountain Pumped Storage Hydroelectric Project (Project) vicinity and an assessment of potential environmental impacts on these facilities.

3.10.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the recreational facilities or land uses. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land managed by the Bureau of Land Management (BLM) and therefore subject to the recreational LORS of the agency. No State regulatory standards pertaining to recreational land uses apply to the proposed Project.

Federal Land Policy Management Act, 1976 (FLPMA) directs the management of the public lands of the United States. In Section 601, Congress required the preparation of a comprehensive long-range plan for the California Desert Conservation Area (CDCA). The purpose of this plan was to establish guidance for the management of public lands in the California desert, administered by the BLM.

California Desert Conservation Area (CDCA) Plan 1980, as amended. BLM lands in the Project area are classified as Multiple-Use Class M (Moderate Use) and Multiple-Use Class L (Limited Use). More information about these land classes is provided in Section 3.9, Land Use, Public Services, Planning, and Utilities.

Wilderness Act and California Desert Protection Act 1994. The Project area is not within a designated wilderness area. In accordance with the Wilderness Act of 1964 and the California Desert Protection Act (CDPA) of 1994, the nearest designated wilderness area is the Joshua Tree National Park (JTNP) and Wilderness Area. This area was designated as wilderness by Congress in 1994 with passage of the CDPA.

3.10.2 Existing Conditions

The Project is located within the Little San Bernardino Mountains and Colorado Desert of California. Though temperatures can be extreme in the summer months, recreational resources within the region provide for a variety of activities that attract visitors.

With the exception of JTNP, few parks or developed recreational facilities exist within the Project area. The surrounding mountains and desert areas provide open space for a number of dispersed recreational activities. Activities within the region include hiking, camping, backpacking, hunting, nature appreciation, rock hounding, rock climbing, mountain biking, horseback riding, jeep tours, and off-highway vehicles (OHVs).

3.10.2.1 Existing Recreational Resources and Use in the Central Project Area

Extensive past mining activities of the Central Project Area have made the Project unattractive for most recreational activities. In addition, no public access is currently allowed on the Project site. It is currently undeveloped and highly disturbed, is not designated for active recreational use, and is not used as a recreational area.

3.10.2.2 Existing Recreational Resources and Use in the Project Vicinity

Access to area recreation opportunities is provided primarily from I-10. Table 3.10-1 summarizes the various recreational resources and facilities located within the Project vicinity. Private recreation adjacent to I-10 includes the Patton Museum at Chiriaco Summit. This facility borders a large historic area known as Camp Young, which was established by Patton as a desert tank warfare practice area. This area is predominantly public land, managed by the BLM.

Other public lands in the vicinity adjacent to I-10 include Ford Dry Lake and Palen Dry Lake, which are OHV-use areas managed by the BLM. No developed facilities exist at these locations.

Alligator Rock ACEC (Area of Critical Environmental Concern) is a resource area located near I-10, south of Desert Center. ACECs are managed by BLM, and are designated for the protection of wildlife and other resources. No developed facilities exist at this location.

The nearest BLM campground to the Project site is Corn Springs, located approximately 15 miles to the southeast. Overflow camping is also permitted by the BLM north of I-10 just outside the south entrance to JTNP. There are no developed facilities at this location and camping is not permitted within 300 feet of the roadway.

Another nearby public land use open to day-use activity is the Desert Lily Sanctuary located adjacent to State Route 177, approximately 8 miles southeast of the Project area. This area encompasses over 2,000 acres and is managed by the BLM. No developed facilities exist at this site other than signage and a graveled parking lot.

Lake Tamarisk is a small private community located off Kaiser Road that includes a nine-hole golf course and swimming pool. The community was originally developed for executives of the Kaiser Mine enterprise.

Chuckwalla Valley Raceway is located on the eastern portion of the Desert Center Airport. This 400-acre raceway is a members-only road course racing facility that provides a clubhouse with a restaurant and overnight camping.

Hiking and OHV use are the primary dispersed recreational activities in the Project area (Figures 3.10-1 and 3.10-2). The BLM maintains an inventory of trails, which indicates areas open or closed to OHV activity. The BLM also maintains several primitive campsites within the region, but keeps no records of visitor use. The BLM has noted as part of the review of the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan that this area receives little recreational or multiple use (USDI, FWS, Biological Opinion, 2004).

3.10.2.3 Joshua Tree National Park and Wilderness Area

The JTNP and Wilderness Area is the principal recreation attraction in the area (Figure 3.10-1). JTNP encompasses unique geology, flora, and fauna as a result of two ecosystems – the higher elevation Mojave Desert and the lower elevation and dryer Colorado Desert – meeting in a relatively short distance.

Access to the JTNP is from I-10 to the south and from California State Highway 62 to the north. JTNP includes a variety of dispersed recreational activities and camping. Because of its unique geology and rock formations, the area is internationally known as a prime rock climbing destination. JTNP is a popular destination for both local and non-local residents, and visitation has increased steadily over the past several years, such that it is now considered a year-round destination. Throughout the fall, winter, and spring, it is not uncommon for all of JTNP's campsites to be filled to capacity. In 2006, JTNP had over 1.2 million recreation visitors (USDI, JTNP, 2006).

Developed recreational facilities, including trails, camping, picnic, and day-use facilities, are more prevalent in the northwestern portion of JTNP, far from the proposed project site. Recreational activities nearest to the project area include a few back country roads and trails, which is consistent with the management prescriptions of the Wilderness Area designation. Cottonwood Visitors Center greets visitors at the southern access to JTNP, while the northern portion is accessible from the Oasis Visitor Center near Twenty-nine Palms, and the West Entrance Station south of the town of Joshua Tree. All but one of the nine campgrounds within JTNP are located in high desert in the western half of JTNP.

Backcountry hiking and camping are popular in JTNP. Trails and facilities are more limited in the eastern half of JTNP near the Project site due to the larger areas of designated Wilderness, which restricts certain uses and access. Specific trail-head use records were not available from JTNP staff, but 2006 records indicated 5,491 backcountry stays and 189,724 campground stays (USDI, JTNP, 2006).

3.10.2.3.1 *Recreational Use of the Eastern JTNP*

The NPS has no use data for dispersed or primitive campsites within its boundaries in the vicinity of the Project site and no backcountry trail-head boards for registration data in the Eagle Mountain area. Consequently, no data exist on the number of hikers that may access the ridge tops around the Project site (K. Messaros, personal communication, email to Rick Suttle, September 8, 2009). An approximation of the numbers of visitors and potential Project effects on those visitors was made based on information received from the NPS.

Prior to its inclusion into JTNP Wilderness Area system, the east side lands relied on 4-wheel drive access to many locations (USDI, JTNP, 2006). Four-wheel drive/ATV use is now prohibited within the Wilderness areas. Black Eagle Mine Road traverses a non-wilderness corridor in this eastern section of JTNP Wilderness Area, and continues off Park property to the Eagle Mountain Mine and proposed Project site. This road is very rugged and further limited by JTNP's restriction on ATVs. JTNP allows only road-licensed 4-wheel vehicles and keeps no day-use records; therefore, the actual numbers of users or vehicles on the road are not known. However, staff has estimated, based on their experience that the road may see about 1,000 day-use visits in a season (K. Messaros, personal communication, email to Rick Suttle, September 8, 2009). Written summaries on web sites by users rate the driving difficulty as moderate to difficult, and attest that it is very rough and not for the inexperienced. Approximately 3 miles east of the JTNP boundary, a large boulder has been placed across the road, effectively stopping vehicle passage (Figure 3.10-2).

Joshua Tree National Park's *Backcountry and Wilderness Management Plan* notes that only about 0.5 percent of visitors to JTNP spend the night in the backcountry (USDI, JTNP, 2006). According to Park Service personnel, miscellaneous backcountry use over the past five years has ranged between 3,900 to 5,900 user-nights annually. About 500 user-nights of this backcountry annual use are estimated to be attributed to the eastern region of JTNP (K. Messaros, email communication to Rick Suttle, September 8, 2009). However, this usage rate is only an estimate since JTNP has no backcountry registration boards in this region, which encompasses over 633 square miles (i.e., less than one backcountry user per square mile per year).

Table 3.10-1. Summary of Recreational Facilities in Project Vicinity

#	Site	Jurisdiction	Acreage	Facilities	Use	Distance From Project
1	Joshua Tree National Park & Wilderness Area	NPS	794,000	Campgrounds, Visitor Centers, Trails, Picnic Areas	1.26 million annual visits*	1-2 miles
2	Patton Museum	Private		Museum	unknown	22 miles
3	Desert Lily Preserve	BLM		Undeveloped	unknown	9 miles
4	Alligator Rock ACEC	BLM	7,726	Undeveloped	unknown	11 miles
5	Chuckwalla Valley Dune Thicket ACEC	BLM	2,273	Undeveloped	unknown	35 miles
6	Chuckwalla Mountains Wilderness Area	BLM	84,614	Undeveloped	unknown	12 miles
7	Orocopia Mountains Wilderness Area	BLM	45,927	Undeveloped	unknown	20 miles
8	Corn Springs ACEC & Campground	BLM		Primitive Campsites,	unknown	18 miles
9	Palen/McCoy Wilderness Area	BLM		Undeveloped	unknown	17 miles
10	Palen Dry Lake ACEC	BLM		Undeveloped	unknown	21 miles
11	Ford Dry Lake OHV Use Area	BLM		Undeveloped	unknown	26 miles
12	Lake Tamarisk Community	Private		Golf course, Community Center	unknown	8 miles
13	Chuckwalla Valley Raceway	Private	400	Member-only raceway, clubhouse and restaurant	Vehicle / motorcycle raceway	10 miles
*	2006 Park Data					

3.10.3 Potential Environmental Impacts

3.10.3.1 Methodology

Preparation of this section included a literature review and site visit. The area was reviewed to identify any designated recreational facilities that would be affected by the proposed Project.

3.10.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on recreational facilities if it does any of the following:

(a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated and/or

(b) Include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

3.10.3.3 Environmental Impact Assessment

3.10.3.3.1 *Recreation*

No developed recreation sites occur within the Project boundary or in the immediate vicinity. The entire Kaiser Eagle Mountain Iron Mine site is and will continue to be fenced and inaccessible to the general public. The highly disturbed property is unsuitable for public recreation. If the proposed landfill is developed, there would be safety and health concerns if the public were allowed access to the site. Therefore, the proposed Project does not propose to open the site for any recreational purposes.

No recreation issues or concerns were identified during the Project's scoping meeting. However, during informal consultation, the BLM suggested that an overlook/interpretive facility might be desirable. Because of the highly disturbed nature of the site, concerns about public safety with the adjacent landfill project, and concerns regarding intrusion into the JTNP and Wilderness Area, it was determined that no recreational facilities would be developed at the site.

The highly fluctuating water levels of the proposed pumped storage hydroelectric facility would not be suitable or safe for public recreation. Additionally, the existing disturbed, mined setting is not attractive for recreational use with the possible exception of OHV activity. However, OHV use would not be consistent with the proposed landfill project, and would raise concerns regarding wildlife resources and potential intrusion to off-site JTNP and Wilderness Areas.

One four-wheel drive/backcountry trail providing access to/from JTNP is located west of the proposed Project boundary. This route is very rugged and only utilized by the most adventurous visitor and is not a through road. Access to this trail is controlled by its location through the Kaiser property, which limits OHV activity. JTNP staff have indicated a desire to maintain the remote nature of this portion of JTNP and a desire not to provide new public access to JTNP through the Project area (K. Messaros, National Park Service [NPS], January 2009, email personal communication to Rick Suttle, RTA).

The number of JTNP/Wilderness Area visitors potentially affected by the Project would be very small. Two designated trails within JTNP boundaries that are closest to the Project include the Black Eagle Mine Road and the Big Wash Hiking Corridor (Figure 3.10-2). The road and trail are both located in the lower elevations of JTNP and are over 8 miles from the nearest Project feature (the upper reservoir dam) and are not visible to the Project (Figure 3.10-3).

Backcountry hikers who traverse the Black Eagle Mine Road past JTNP boundaries and into BLM and private lands could eventually view Project features. Hikers would require a considerable part of a day to hike the round trip from the boulder blocking the Black Eagle Mine Road to the nearest Project feature over 6 miles away. This assumes that the hikers have already driven the rough road section within JTNP boundaries, which is over 9 miles away.

For the few hikers that reach surrounding ridge top peaks, views of Project features and activities may be possible. Views of Project features from ridge tops however, would either be from adjacent ridges that are no longer within JTNP boundaries, or on higher ridge tops that are over 4 miles away. A viewshed analysis of the proposed Project's Upper Reservoir Dams indicates that potential views from ridge tops and slopes within JTNP are few (Figure 3.10-3). At these distances, few Project features would be indiscernible from the existing disturbed visual character resulting from past mining activities.

3.10.3.3.2 *Wilderness*

Noise and visual effects on recreational uses could occur. Project construction noise and lighting may be detectable at nearest designated wilderness lands. Upon completion of construction activities, Project facilities including the reservoirs and transmission line will be visible from limited higher elevations within the surrounding wilderness portions of JTNP (Figure 3.10-3). Access to these higher elevation ridge tops is difficult and most activity follows the lower elevations and existing trails. For the few that do traverse the distant ridge tops, the views from the wilderness may be affected. However, the existing mine site is already disturbed such that the incremental change with addition of the proposed facilities will be inconsequential.

Joshua Tree National Park representatives have expressed concern regarding light pollution during Project operation (C. Sauer, JTNP, letter to Kimberly D. Bose, Federal Energy Regulatory Commission, August 11, 2009). This issue is addressed in Section 3.7, Aesthetic Resources.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?* No. The unincorporated community of Desert Center is the closest community to the Project. Desert Center is approximately 10 miles west of the Project and has no community parks. There are no regional parks or open spaces operated by the Riverside County Regional Park and Open Space District in the Chuckwalla Valley. There are no California State public parks within the Chuckwalla Valley. The Project would not increase the use of existing neighborhood and regional parks or other recreational facilities resulting in a substantial physical deterioration or accelerate the deterioration of the facility. The few recreational users of the Project area would be dispersed over a large area. Therefore, this potential impact is less than significant and no mitigation measures are required.

(b) *Does the project include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment?* No. The Project consists of a pumped storage hydroelectric facility. No new recreation activities or facilities are proposed. As such, the Project does not involve any recreational components nor is it intended to serve as one. Therefore, this potential impact is less than significant and no mitigation measures are required.

Impact 3.10-1 Recreational Use. This impact is *less than significant*. The proposed transmission line and water pipeline corridors cross lands, in part, managed by the BLM, which are available for dispersed recreational use. Access to some OHV tracks may be impeded temporarily during construction of the linear facilities.

Access to the JTNP and recreational destinations will not be altered by Project construction or operation. The major southern access to the JTNP is from I-10 at the Cottonwood Road exit located several miles to the west of the Eagle Mountain and Desert Center exits, which will be used for Project access. Traffic will increase along Kaiser and Eagle Mountain Roads during construction. Additional traffic should not hinder access to recreational areas, or noticeably affect dispersed recreational activities, which is of relatively low intensity (USDI, FWS, Biological Opinion, January 8, 2004).

Impact 3.10-2 Wilderness Area. This impact is *less than significant*. The Project would not directly or indirectly disrupt activities in an established Federal, State, or local recreation and/or wilderness area. The Project area is not located in a designated Federal wilderness area.

Project construction and operation will not restrict recreation use in the nearby JTNP and Wilderness. The Project site is currently an existing open pit mine, and many Project features are planned to be underground. Therefore, proposed Project impacts to the visual character of the Project site will be insignificant. In addition, the proposed Project will be visible from very few locations from within the Wilderness Area.

3.10.4 Mitigation Program

Similar to existing conditions, public access, including OHV use, will be restricted during and after Project construction, as it is currently. There are no identified potential impacts to recreational facilities, and no mitigation is required.

3.10.5 Level of Significance after Implementation of the Mitigation Program

There are no identified potential impacts to recreational facilities, and no mitigation is required.

No residual impacts to recreation would occur with implementation of the Project.

3.11 Population and Housing

This section of the Draft Environmental Impact Report describes the existing population and housing conditions within the surrounding area of the Eagle Mountain Pumped Storage Hydroelectric Project (Project) area. It then characterizes the potential impacts of the proposed Project on population and housing. The impact analysis is based upon literature review of pertinent documents and Project area site visits. This analysis of population and housing, as well as socioeconomic effects, relies on Riverside County statistics, with analysis of local details as well.

3.11.1 Regulatory Setting

There are no Federal laws or regulations for population and housing that apply to the effects of an individual project on population growth or displacement of people and provision of replacement housing. California Government Code Sections 65580–65589.8 states that cities and counties have a responsibility to facilitate the improvement and development of housing and to adequately provide for the housing needs of all economic segments of the community. These sections also require cities and counties to prepare and implement housing elements addressing housing needs and provision.

3.11.2 Existing Conditions

Riverside County was formed in 1893 from parts of San Bernardino County and San Diego County, and is one of the largest counties in the United States. Riverside County, located in southern California, stretches from the Colorado River and Arizona border in the east to Orange County and within 14 miles of the Pacific Ocean to the west. Riverside County shares borders with Los Angeles, Imperial, Orange, San Diego, and San Bernardino counties. Riverside County encompasses approximately 7,300 square miles.

Riverside County has an estimated population of 2,088,322 people according to the California State Department of Finance (California DOF, 2008). The 2003 Riverside County General Plan (RCGP, 2003) provides a summary of existing and proposed land use patterns within Riverside County. Much of central and eastern Riverside County land is Federal land comprised of a complex mix of public open space and protected areas.

The Bureau of Land Management (BLM), Bureau of Indian Affairs, National Park Service, U.S. Forest Service, Department of Defense, and the California Department of Parks and Recreation are the principal stewards of these lands. They include a National Park (Joshua Tree), two National Forests (Cleveland and San Bernardino), a National Wildlife Refuge (Coachella Valley), a National Monument (Santa Rosa/San Jacinto Mountains), the California Desert Conservation Area, several State parks, and many Wilderness Areas and areas designated by the BLM as Areas of Critical Environmental Concern (ACEC). Property ownership patterns are complex and many private and public lands are contained within these “protected” areas.

Urban development is primarily concentrated in western and central Riverside County. Centrally located is the urban area of the Coachella Valley consisting of Bermuda Dunes, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage, as well as various unincorporated areas. The Project is east of this urban development. The only urban area east of the Project is the City of Blythe, located on the eastern edge of Riverside County along the Colorado River, with a population of 21,695 in 2008. The rest of Riverside County is mainly open space with small rural communities dispersed among the large open areas.

Riverside County has seen recent significant growth in land use for public utilities and renewable energy generation facilities. Many wind energy generation facilities are located in the San Gorgonio Pass and Coachella Valley and there is significant interest in development of solar power facilities in eastern Riverside County.

3.11.2.1 Identification of the Area Potentially Impacted by the Project

The Project region is defined as the unincorporated areas of eastern Riverside County (Eagle Mountain, Lake Tamarisk, and Desert Center) and cities within approximately 60 miles of the Project (Blythe, Coachella, Indio, Palm Desert, Cathedral City, and Palm Springs). Construction workers will likely commute from these areas. Some of the construction workers will likely move closer to the Project for extended periods. Thus, any population effects and the associated environmental impacts would occur in the cities and unincorporated areas nearest the Project. Although much of the population and housing analysis is based on county-wide data, this impact analysis is focused on areas around the proposed Project where population effects would be more apparent.

The population of Riverside County has increased at a fast pace, totaling 35 percent from 2000 to 2008 and reaching 2,088,322 people, according to the County of Riverside Economic Development Agency (EDA). The County ranks as the second fastest growing and has climbed from seventh in 1990 to fourth largest county in the state (California DOF, 2008). The demand from a fast increasing populace will help to generate strong expansion in the services, retail trade, government, and construction industries. The Riverside County employment analysis for 2006 is depicted in Table 3.11-1.

3.11.2.2 Employment in Riverside County

Agricultural Sector. Agricultural employment within the County was at 14,200 in 2006 and has steadily fallen from the high of 17,600 people in 2000 (California EDD, 2008). This represents a decrease in employment of 19.3 percent. The California Employment Development Department (California, EDD) projects that the Riverside and San Bernardino counties had a combined agricultural employment of 18,700 in 2004 and project 17,200 in 2014.

Mining Sector. Mining represents a very small percentage (1 percent) of the total nonagricultural employment within Riverside County. In 2006 the mining industry employed 600 people in Riverside County. The California EDD projects that the Riverside and San Bernardino counties had a combined mining employment of 1,200 in 2004 and project 1,600 in 2014.

Table 3.11-1. Riverside County Employment Analysis

Industry	Individuals	Percentage
Agriculture, forestry, fishing and hunting, and mining	13824	1.6%
Construction	112297	12.7%
Manufacturing	90885	10.3%
Wholesale trade	32279	3.7%
Retail trade	119795	13.6%
Transportation and warehousing, and utilities	40334	4.6%
Information	16973	1.9%
Finance, insurance, real estate, and rental and leasing	58680	6.7%
Professional, scientific, management, administrative	80500	9.1%
Educational, health and social services	147594	16.7%
Arts, entertainment, recreation and food services	90159	10.2%
Public Administration	35430	4.0%
Other Services	42553	4.8%
Total	881303	

Source: Bureau of the Census 2006

Construction Sector. The construction sector has shown increasing gains in employment since 1993 when 21,200 where employed to 2006 when 83,000 where employed. The California EDD projects that the Riverside and San Bernardino counties had a combined construction employment of 111,800 in 2004 and project 145,300 in 2014, a 30 percent increase. A possible slowdown in construction growth could be seen since 2006 as the housing market has slowed significantly. Riverside County had 30,350 single family and 4,023 multi-family building permits in 2005; only 9,587 single-family and 903 multi-family building permits in 2007; and 3,745 single-family and 1,798 multi-family building permits in 2008 (EDA, 2004).

Manufacturing Sector. The manufacturing sector has seen slow gains in employment since 1991 with a small decrease in 2001 and 2002. The manufacturing sector in Riverside County employed 56,100 people in 2006 and accounts for 9.2 percent of the nonagricultural employment. The California EDD projects that the Riverside and San Bernardino counties had a combined manufacturing employment of 120,100 in 2004 and project 129,000 in 2014, a 7.4 percent increase.

Trade, Transportation, and Public Utilities Sector. The trade, transportation, and public utilities sector has shown increasing gains in employment since 1994 when 63,700 were employed to 2006 when 123,800 were employed. The rapid population growth propelled the need for intra-city and county transportation. In addition, bus transportation should increase at a fast pace, reflecting the population growth trend. The California EDD projects that the Riverside and San Bernardino counties had a combined trade, transportation, and public utilities sector employment of 254,900 in 2004 and project 334,200 in 2014, a 31.1 percent increase.

Service Sector. By far the largest source of jobs is the services sector with 470,600 jobs in 2006. The service provider sector accounts for 77.1 percent of the nonagricultural employment. Major sources of new jobs have occurred at healthcare facilities, in hotels and lodging services, and business and other services such as social and membership services.

Government Sector. The government sector has seen steady gains in employment since 1990. The government sector in Riverside County employed 105,100 people in 2006 and accounts for 17.2 percent of the nonagricultural employment. This trend follows the increase in population as more services are required. The California EDD projects that the Riverside and San Bernardino counties had a combined manufacturing employment of 212,500 in 2004 and projected 256,600 in 2014 a 20.8 percent increase.

3.11.2.3 Existing Housing

Within Riverside County, approximately 773,331 housing units exist based on 2008 data from the California DOF. This compares to 584,674 units in 2000. Single family housing accounted for a majority of these units consisting of 559,169 units in 2008. Multiple family housing accounted for 127,740 in 2008.

The median home price for Riverside County stood at $234,105 in January 2009. Housing accommodations for cities in the Project region are depicted in Table 3.11-2.

In 2008, the vacancy rate for all housing units (single family, multiple family, and mobile homes) within Riverside County was 13 percent. Within the Project region, Palm Springs accounted for the highest vacancy rate at 33.4 percent or 11,192 units in 2008, while the City of Coachella experienced the lowest rate at 4.4 percent or 386 units. The combined total number of vacant housing units for the six cities within the Project region is 28,021 with 100,533 vacant units county-wide (California DOF, 2008). The Census 2005-2007 Community Survey shows 193,931 renter-occupied housing units and a rental vacancy rate of 6.2 percent with 12,818 vacant rental units.

Table 3.11-2. Housing Accommodations and Characteristics

	Median Home Price		Median Rental Price	Total Units		Vacancy Rate		Owner Occupied
Area	2000	2008	2000	2000	2008	2000	2008	2000
Blythe	$90,800	$187,000	$501	4,851	5,444	16.2%	16.1%	57%
Cathedral City	$125,500	$226,500	$695	17,813	21,561	21.7%	21.1%	65%
Coachella	$83,700	$215,500	$470	4,807	8,814	4.4%	4.4%	61%
Indio	$99,000	$272,500	$579	16,899	26,464	18.0%	18.0%	56%
Palm Desert	$189,100	$382,500	$744	28,071	34,120	31.5%	31.0%	67%
Palm Springs	$157,000	$295,000	$631	30,979	33,479	33.3%	33.4%	61%
Riverside County	$146,500	$275,000	$660	584,674	773,331	13.4%	13.0%	69%

Source: Bureau of the Census, Riverside County Economic Development Agency

3.11.2.4 Temporary Accommodations

Within the cities in the Project region, there are approximately 257 hotels/motels accounting for 11,599 rooms. Palm Springs has the highest number of hotels and motels with 187 and 6,400 rooms (EDA, 2004).

3.11.3 Potential Environmental Impacts

3.11.3.1 Methodology

Preparation of this section included review of Census and Riverside County statistics, and site visits. Projections for employment needs are based on Project design features for construction and operational activities. For purposes of this analysis, housing accommodations, current population counts, and employment statistics were reviewed considering the construction and operational needs of the Project.

3.11.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on aesthetics and visual resources if it does any of the following:

(a) Induce substantial population growth in an area, either directly or indirectly and/or

(b) Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere

3.11.3.3 Environmental Impact Assessment

3.11.3.3.1 *On-site Employment and Labor Income*

Construction of the proposed Project is expected to occur over a period of 4 years and generate an approximate 4,674 person-months of employment over the duration of construction. Table 3.11-3 contains a breakdown of the employment requirements for the Project summarized by task and duration. Table 3.11-4 provides a summary of the manpower requirements for the Project.

Table 3.11-3. Employment Projections by Year

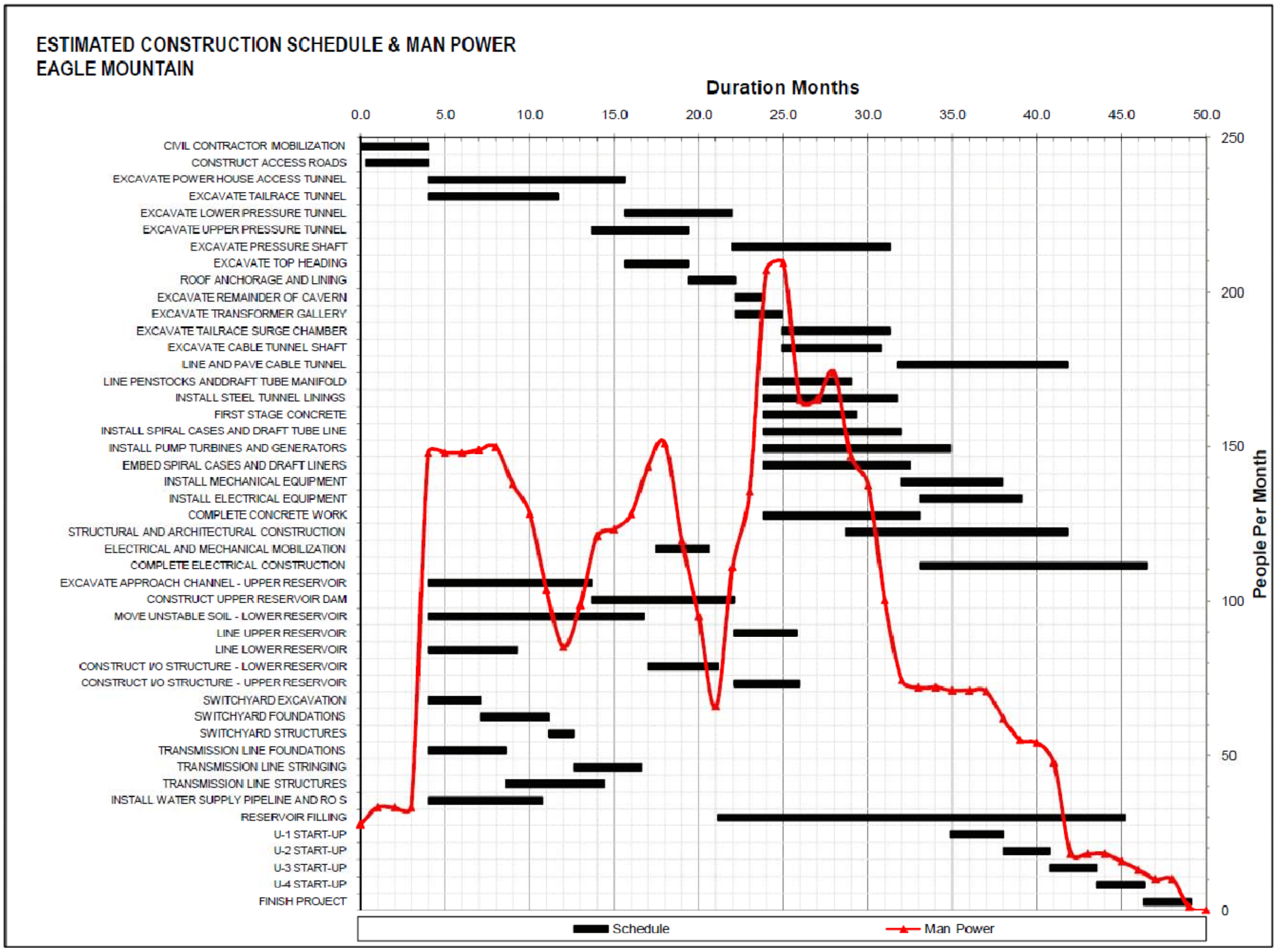
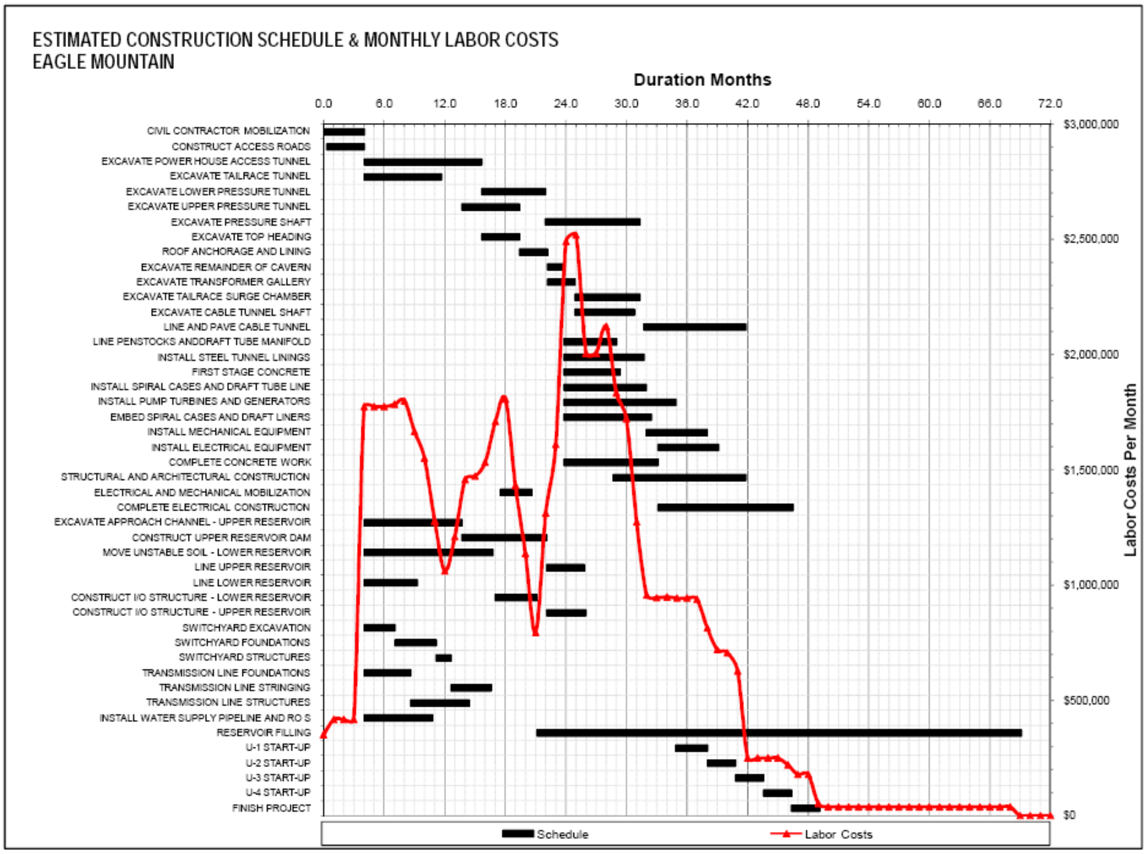


Table 3.11-4. Labor Cost Projections by Year



The majority of required manpower is needed during the timeframe approximately 2 years into the construction period with considerably less needed in the first and last year. Peak monthly employment occurs in Year 2 with a high of 209.

Most of the general labor required during construction would likely be available from the labor pool within Riverside County and the Project region. As much as 50 percent of the skilled trades and management and support personnel could also be provided by regional labor. However, there would be some immigration of non-local workers to meet the Project labor requirements. Many of these employees will utilize regional housing in the Indio/Palm Desert area, or in the City of Blythe. Significant vacant housing and rental units are available within Riverside County as well as large numbers of hotel/motel rooms.

Current estimates of peak construction work force and the expected percentage of non-local workers suggest that during the peak period approximately 105 workers will require short-term (2 years) housing accommodations.

Total construction workforce payroll costs for the Project are estimated at $58,000,000. Additionally the Project is estimated to spend $39,085,000 on design engineering; $48,856,200 on construction administration and engineering; and $2,931,400 on legal and administrative costs. The distribution of this payroll would fluctuate over time and would parallel the fluctuations in employment. Labor expenditures would be highest in Year 2.

3.11.3.3.2 *Community Infrastructure and Services*

The population of Eagle Mountain in 1980 was 1,890 with 914 dwelling units. Presently (2010), the privately owned town of Eagle Mountain is not used for housing. The Eagle Mountain Landfill and Recycling Center EIS/EIR (CH2M Hill, 1996) showed there were 410 housing sites with 347 detached single-family homes, 14 partial residential structures, and 49 residential foundations/slabs. The Eagle Mountain Landfill and Recycling Center is proposing to reopen the townsite for permanent housing, however, the Eagle Mountain Pumped Storage Project is not proposing to utilize the townsite for housing. Also, there are more than 25,000 vacant housing units and 12,000 vacant rental units within Riverside County (Census, 2005-2007). In addition, there are approximately 11,599 hotel/motel rooms within the communities of Blythe, Cathedral City, Palm Desert, Palm Springs and Indio (Riverside County, 2004). Thus, there exists sufficient housing potential to accommodate the non-local construction work force.

Medical facilities also appear to be adequate with one bed per approximately 645 people within Riverside County. In addition, Riverside County operates a full-time fire station in Lake Tamarisk. The development will be required to follow the Development Impact Fee Program as adopted by Riverside County to assess impact fees for the fire district. Because no new housing construction is anticipated, it is expected that existing regional public services (water, sewer, waste) will meet the Project-related workforce population.

3.11.3.3.3 *Costs*

Riverside County Service Area (CSA) 51 consists of the communities of Desert Center, Lake Tamarisk, and Eagle Mountain. CSA 51 provides water, sewer, and trash disposal to these communities.

Increased demand for these services from the proposed Project is expected to be small. No on-site work camp or housing will be used. Non-local construction workers will live offsite in existing units within several Project-region options as described above.

Because of the anticipated small impact on municipal services and infrastructure, the impact on local municipal costs during construction is expected to be insignificant; further, as described below, it will be enhanced by anticipated tax revenues.

3.11.3.3.4 *Revenues*

The Project will contribute to the revenues of Riverside County and local governments primarily through the collection of property tax and sales and use taxes. Construction of the Project would increase property tax revenues to Riverside County. The assessed valuation of the Project would rise on an annual basis, in proportion to the work completed. Property tax revenues would increase accordingly. Based upon the construction cost estimate and tax schedule, the property taxes are expected to rise to approximately $8,390,000 (2008 Dollars) per year at the time of Project completion.

The sales tax rate for Riverside County is 8.750 percent. Sales tax is imposed on the sale of tangible personal property and specified services. Much of the materials and equipment for the Project could fall into this category. Therefore, substantial sales tax revenues could be generated from the Project.

3.11.3.3.5 *Indirect and Induced Impacts of Project Construction*

In addition to the direct economic impact of the Project on employment, income, and government revenues, the Project would have secondary economic impacts. These include indirect impacts resulting from the construction and operation workforce and the purchase of materials and supplies. Measurements of this additional indirect impact are applied to employment and gross multipliers.

For construction activity of this type, gross output multipliers often range from 1.0 to 1.5. This means for every dollar spent on materials and supplies, the spin-off indirect impact accounts for an additional $1.00 to $1.50. To the extent purchases are made outside of the region, this multiplier may be lower.

Employment multipliers range from 1.0 to 1.5 for construction projects. This means for every construction job created, another 1.0 to 1.5 job(s) will be created in the retail, service, and non-basic employment sectors.

3.11.3.3.6 *Operations*

Socioeconomic benefits derived, particularly from the property taxes, will be significant to Riverside County and local municipalities. The following sections discuss the Project's impacts in terms of annual employment, labor income, purchase of materials, tax revenues, and public service costs over its operating life. The Project estimates an annual operating budget of $28.3 million (2009 Dollars).

There will be no displacement of residences or business establishments due to operation of the Project. An estimated 30 persons will manage, operate, and maintain the Project. Each day will be divided into two 15 person shifts. The total staff requirement per shift includes three management personnel, seven engineers, two power plant operators, one maintenance technician and two administrative staff. Estimated annual labor operations and maintenance (O&M) cost (operations staff + home office administration) is $2.3 million (2009 Dollars). Various employment and fiscal benefits will result. Although slight employment growth would occur, the Project’s operation will not significantly grow the local employment base.

Purchases of Materials. The annual O&M budget for plant supplies and parts is $2.5 million. Purchase of supplies and parts within the region will add annual local economic benefits.

Impacts on Local Government Finances. The Project will not have any significant ongoing impacts on local/County government costs. The relatively small labor force is unlikely to create any impacts on housing, schools, and other public services within the Project area.

Tax revenues from property tax will escalate relative to the value of the Project during construction. At completion, the Project will generate approximately $7.67 million per year in property tax revenue. Sales tax will decrease following completion. However, sales tax revenue will be generated from the operation and maintenance of the facility. Using the Riverside County sales tax of 7.75 percent, approximately $187,500 in annual sales tax revenue could be generated from the purchasing of plant supplies and parts.

3.11.3.3.7 *Indirect and Induced Effects on Ongoing Expenditures*

The ongoing expenditures for materials, services, and employment will generate indirect benefits within the region in the same manner as described under construction stage impacts. The implementation of the Project and present and future multipliers applicable to employment and expenditures on the operation of an energy storage project are likely to be quite different from those associated with expenditures and employment during construction. The operation phase will have a consistent workforce and yearly expenditures that differ significantly from the fluctuations of the larger construction workforce. The multiplier impacts are likely to be similar to those associated with the operation of other utilities in the region.

The typical multiplier for utilities operations is 1.5 for employment. Therefore, the operations workforce of 30 personnel may generate up to an additional 45 indirect or secondary jobs.

Indirect impacts of the Project include employment increases in retail, service, and other sectors and revenue increases as a result of the purchase of materials and supplies.

Environmental Impact Assessment Summary:

(a) *Would the project induce substantial population growth in an area, either directly or indirectly?* No. Peak employment during construction is estimated to be 209 persons. Most of the general labor required during construction would likely be available from the labor pool within Riverside County and the Project region. As much as 50 percent of the skilled trades and management and support personnel could also be provided by regional labor. The Project may import some non-regional workers; however, these workers would be temporary and would not add substantially to the population. Similarly, during Project operation, only about 30 persons will be employed, which would not substantially increase population growth either directly or indirectly. Therefore, this impact would be less than significant and no mitigation would be required.

(b) *Would the project displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?* No. Because the Project area consists of mining pits and is uninhabited, the Project would not displace any people or housing. Therefore no replacement housing, resulting in any physical changes elsewhere, would be needed. Therefore, this impact would be less than significant and no mitigation would be required.

Impact 3.11-1 Residential or Business Displacement during Construction. Implementation of the Project will not displace significant number of people, affect existing housing or business establishments, or require replacement housing elsewhere. Therefore, this impact is considered *less than significant* and no mitigation is required.

Impact 3.11-2 Impacts on Community Infrastructure and Services. Because of the available infrastructure capacity within the region, the Project would not require construction of significant additional infrastructure. Therefore, this impact is considered *less than significant* and no mitigation is required.

Impact 3.11-3 Impacts on Local Government Finances. This impact is *less than significant.* Payment of Riverside County Development Impact fees is required. In addition, purchase of construction materials and equipment required to construct the Project would increase local and regional tax bases. The substantial sales tax revenues would be considered beneficial impact as a direct result of Project implementation.

3.11.4 Mitigation Program

No significant population or housing impacts have been identified for the proposed Project, and therefore no mitigation is required. The Project is expected to generate incremental growth along with concomitant jobs, government revenue and commercial activity. There will be a spike in economic activity during construction that will diminish to low but sustained levels during operation.

3.11.5 Level of Impact after Implementation of the Mitigation Program

No significant population or housing impacts have been identified for the proposed Project, and therefore no mitigation is required.

No residual population or housing impacts would occur with implementation of the Proposed Project.

3.12 Transportation and Traffic

This section of the Draft Environmental Impact Report analyzes the existing transportation system in the area and addresses the potential transportation and circulation impacts resulting from development of the Eagle Mountain Pumped Storage Hydroelectric Project (Project).

3.12.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to transportation. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards.

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land which is managed by the Bureau of Land Management (BLM).

Title 49 Code of Federal Regulations Subtitle B, Parts 171-173, 177-178, 350-359, 397.9 and Appendices A-G addresses safety considerations for the transport of goods, materials, and substances and governs the transportation of hazardous materials including types of materials and marking of the transportation vehicles.

California Vehicle Code (VC) Sections 353; 2500-2505; 31303-31309; 32000-32053; 32100-32109; 31600-31620; California Health and Safety Code Section 25160 et seq. regulates the highway transport of hazardous materials.

VC Sections 13369; 15275 and 15278 addresses the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles; also requires certificates permitting operation of vehicles transporting hazardous materials.

VC Sections 35100 et seq.; 35250 et seq.; 35400 et seq. specifies limits for vehicle width, height, and length.

VC Section 35780 requires permits for any load exceeding Caltrans weight, length, or width standards on public roadways.

California Streets and Highways Code Section 117, 660-672 requires permits for any load exceeding Caltrans weight, length, or width standards on County roads.

California Streets and Highways Code Sections 117, 660-670, 1450, 1460 et seq., and 1480 et seq. regulates permits from Caltrans for any roadway encroachment from facilities that require construction, maintenance, or repairs on or across State highways and County roads.

Riverside County General Plan Circulation Element specifies long-term planning goals and procedures for transportation infrastructure system quality and specifies level of service standards used to assess the performance of a street or highway system and the capacity of a roadway.

Riverside County Municipal Code Title 10, Chapter 10.08, Sections 10.08.010-10.08.180 and 12.08.010-12.08.100 specifies limits and permit requirements for oversize loads and specifies requirements for encroachment permits.

3.12.2 Existing Conditions

The Riverside County and Project area are served by a variety of transportation systems. These include interstate and State highways, air service, rail service, and motor carriers.

3.12.2.1 Interstate and State Highways

Three interstate highways pass through Riverside County. Interstate 15 and Interstate 215 are the major north-south freeways. Interstate 10 (I-10) and State Highways 60 and 91 provide direct access to the metropolitan areas of Los Angeles and Orange Counties as well as joining the Interstate routes at the Arizona border.

The Project site is accessible via I-10 by Kaiser Road (County Road R-2) from State Route (SR) 177 at Desert Center, and Eagle Mountain Road both approximately 11 miles south of the Project site.

Eagle Mountain Road currently has very low traffic volume as it primarily only serves the Eagle Mountain Pump Station for the Metropolitan Water District of Southern California (MWD). The pavement is 32 feet edge to edge and 40 foot-wide within the I-10 underpass. Eagle Mountain Road is gated at the MWD pumping station. Kaiser proposes to improve the road and construct a new paved road extension to the townsite as part of the proposed landfill project. Ragsdale Road intersects Eagle Mountain Road from the east, just north of the I-10 ramps in a “T” intersection. The Eagle Mountain Landfill Environmental Impact Report (Landfill EIS/EIR) traffic study showed a daily traffic volume of 82 vehicles with only 32 continuing north of Ragsdale Road (Landfill EIS/EIR, 1996).

SR 177 (Desert Center Rice Road) has a full interchange with I-10 in Desert Center and is 40 feet wide under the overpass. SR 177 carried 2,514 vehicles per day between I-10 and Kaiser Road (Landfill EIS/EIR, 1996)

Kaiser Road runs from SR 177 just north of Desert Center to the Eagle Mountain Mine site. Kaiser Road primarily serves the residents of Lake Tamarisk, the school site at Eagle Mountain, and the mine site. Between SR 177 and Lake Tamarisk Drive, Kaiser Road carried 424 vehicles per day and north of Lake Tamarisk Drive carried 286 vehicles per day (Landfill EIS/EIR, 1996).

3.12.2.2 Air Service

There are numerous commercial and general aviation airports within Riverside County. Within the Project region, the closest commercial airport to the Project site is at Palm Springs International Airport located more than 60 miles west of the site.

Two small airports exist in the vicinity. A single private landing strip is located to the south of the Eagle Mountain Town and west of Kaiser Road. This airstrip is infrequently used and does not appear on the Airport/Facility Directory. Desert Center Airport is a larger development located approximately 10 miles southeast of the Central Project Site, accessed from SR 177. The Desert Center Airport is a privately owned property located southeast of SR177 (Desert Center-Rice Road) and north of I-10 in the community of Desert Center, in unincorporated Riverside County. The Desert Center Airport is not a public use airport, and activity levels are very low.

3.12.2.3 Rail and Motor Freight Service

Business and industry within Riverside County are served by major rail carriers including Atchison, Topeka, and Santa Fe; Southern Pacific; and Union Pacific (Riverside County Economic Development Agency, 2009).

The Eagle Mountain Rail Line is located within the Project site. The Project does not intent to utilize the Rail Line however the Kaiser proposes to rehabilitate the Eagle Mountain Rail Line to transport solid waste to the Eagle Mountain Landfill from southern California.

A variety of motor carriers serve the communities within Riverside County and the Project region.

3.12.2.4 Local Roadways

Existing average daily traffic from the Landfill EIR showed 424 vehicles per day on Kaiser Road from SR 177 to Lake Tamarisk drive and 286 vehicles per day north of Lake Tamarisk Drive in 1995. The traffic study showed both Eagle Mountain Road and Kaiser Road showing level of services rated as “A.” An “A” level of service provides a road that nearly all drivers find freedom of operation, there are very seldom times of more than one vehicle in a queue and average delay per vehicle ranges between 0 and 10 seconds. Eagle Mountain Road had a peak hour volume of six vehicles from 12:45-1:45 PM; Kaiser Road north of SR 177 had a peak of 41 vehicles from 8:45-9:45 AM and north of Lake Tamarisk Drive had 26 vehicles from 12:30-1:30 PM.

3.12.3 Potential Environmental Impacts

3.12.3.1 Methodology

This section analyzes the existing transportation system in the area and addresses the potential transportation and circulation impacts resulting from development of the proposed Eagle Mountain Pumped Storage Hydroelectric Project.

3.12.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on transportation and traffic if the Project does any of the following:

(a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit

(b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by Riverside County congestion management agency for designated roads or highways

(c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks

(d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

(e) Result in inadequate emergency access and/or

(f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities

3.12.3.3 Environmental Impact Assessment

3.12.3.3.1 *Construction Traffic*

Traffic generated from the movement of workers, materials, and equipment to the site will increase on local roads during the construction and to a lesser extent during operation. The primary route will be I-10 and Kaiser Road with a possible secondary route of Eagle Mountain Road when the landfill extends the road to the townsite. The peak construction work force is estimated at 209 lasting approximately 2 years of the entire 4-year construction schedule. Approximately 90 percent of the Project will have a construction workforce under 150 and approximately half the Project will have less than 100 workers.

The total off-site truck volume is estimated to be 925 semi-trailer trucks for the duration of the Project assuming that off-site trucks will be importing all the necessary construction materials such as steel linings, steel reinforcement, electrical components, etc. The peak off-site truck volume is estimated to be 75 trucks per month in Month 9. Over 80 percent of the Project construction schedule will produce less than 50 trucks per month with 27 months having less than 10 off-site trucks per month.

The peak daily on-site heavy truck construction traffic is estimated to be 258 trucks per day. Of the 258 peak on-site truck traffic, 80 percent (210) will be concrete round trips from an on-site concrete batch plant.

The Landfill EIR traffic study projected with the full operation of the landfill in 2010, Kaiser Road would handle 3,500 vehicles per day between SR 177 and Lake Tamarisk and 3,500 vehicles per day north of Lake Tamarisk and maintain a level of service of “B.” A “B” level of service provides a road where there is occasionally more than one vehicle in a queue, the average delay per vehicle is between 10 and 20 seconds and some drivers begin to consider the delay an inconvenience. The report also stated Kaiser Road could handle double the projected traffic from the landfill project

(Landfill EIS/EIR, 1996). Consequently, it is reasonably assumed that traffic generated by the proposed Eagle Mountain Pumped Storage Project, with a construction peak of 258 trucks per day, will not cause significant traffic congestion or even create much roadway inconvenience within the Project area. Implementation of the Transportation Management Plan (TMP) will assist to further reduce potential construction-related traffic impacts.

The construction workforce will be divided approximately into three shifts. However, much of the management and management support personnel would operate during the day shift. Therefore, construction workforce traffic will be significantly reduced, in contrast to one shift, as a result of being spread over three shifts. Due to the existing infrastructure and the work shifts, no significant transportation impacts are anticipated.

The primary impacts to adjacent or nearby landowners would occur as a result of construction-related traffic. The traffic noise, dust and traffic along the primary access routes using Kaiser Road may be an inconvenience to area property owners during the construction phase. However, the existing transportation infrastructure previously accommodated a population at the Eagle Mountain townsite of 1,859 in 1980 along with mining-related traffic (Census, 1990). The Project proposes to have three shifts working during the construction which will minimize traffic during the peak work months and the site will only have off-site truck traffic peaking at 89 trucks per month. Therefore, impacts resulting from construction-related traffic are expected to be minimal. If the proposed Eagle Mountain Landfill builds the extension to Eagle Mountain Road, this route could be used as an alternative to further reduce the low level effect on area residents.

3.12.3.3.2 *Operational Traffic*

Operation of the proposed pumped storage hydroelectric facility requires a labor force of about 30 employees to staff the facility 24 hours a day, 7 days a week. This translates to approximately 60 daily one-way trips, assuming that workers travel in their own individual vehicles. Because employees would arrive and depart at different times throughout the day, this would generate less than 20 daily peak hour trips, even if every employee commutes alone.

Operation of the facility would also generate minor truck traffic during activities such as delivery and off-site waste shipments. Project operation is anticipated to generate up to four truck trips per day, which would not affect the level of service on study roadways and intersections.

Environmental Impact Assessment Summary:

The primary impacts to adjacent or nearby landowners will occur as a result of Project-related construction traffic. Based on employment numbers, the operational phase of the Project will not cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system. Regional emergency service vehicles have access to the site directly from I-10 at Kaiser Road. In addition, the Project will not cause area roads to exceed, either individually or cumulatively, a level of service standard established by Riverside County Congestion Management Agency.

(a) *Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?* No. The Project will not conflict with any plan, ordinance, or policy regarding the performance of the circulation system.

(b) *Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?* No. The proposed Project will not conflict with any applicable congestion management program.

(c) *Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?* No. The proposed Project will not change air traffic patterns.

(d) *Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?* No. The proposed Project will not increase transportation hazards.

(e) *Would the project result in inadequate emergency access?* No. Access for emergency services will be unaffected.

(f) *Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?* No. Conflicts with public transit, bicycle or pedestrian facilities will occur.

Impact 3.12-1 Construction-related Traffic. The Project will cause an increase in traffic that is not substantial in relation to the existing traffic load and capacity of the street system. The Project will not decrease a level of service standard established by Riverside County. This impact is considered *potentially significant and subject to the mitigation program* (MM AQ-6, PDF LU-1, and PDF LU-2).

Air Quality mitigation measure (MM AQ-6) is proposed to reduce impacts to air quality, in addition, mitigation measure will also reduce impacts to traffic; whereas, MM AQ-6 requires the construction contractor to develop and implement a Transportation Management Plan for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The Transportation Management Plan will also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period. (*See* Section 3.15 Air Quality for further discussion).

In addition PDF LU-1 and PDF LU-2 will also reduce traffic impacts. These project design features specify that construction access to and from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. In addition, 2 weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the community of Desert Center and along SR 177. (*See* Section 3.9 Land Use and Public Services for further discussion).

Impact 3.12-2 Operational Traffic. This impact would be considered *less than significant*. Daily traffic, including service and delivery trucks, will be approximately 64 one-way trips.

3.12.4 Mitigation Program

The existing infrastructure to support the work force and anticipated activities is in place and will absorb the changes with no significant or lasting impacts. The Project is not anticipated to have a significant impact on traffic in the Project area as the proposed construction traffic will be dispersed through three shifts, and peak off-site trucks will total only 75 per month. The roads used for access are adequate to handle the traffic volume and provide an acceptable level of service.

MM AQ-6. **Transportation Management Plan**. The Construction Contractor shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

Due to the proximity of the Project's substation to Desert Center and pipeline construction across private property, the following project design features will be included:

PDF LU-1. **Construction Access.** Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site.

PDF LU-2. **Construction Monitoring.** Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177.

No additional mitigation has been identified or is required.

3.12.5 Level of Significance after Implementation of the Mitigation Program

Impact 3.12-1 Construction-related Traffic. The mitigation program includes the development and implementation a TMP (MM AQ-6) which will control construction traffic onto the site and within the Project vicinity. Further, PDF LU-1 and PDF LU-2 control site access and require public noticing. With adherence to MM AQ-6, PDF LU-1, and PDF LU-2, potential traffic impacts would be *less than significant*.

Impact 3.12-2 Operational Traffic. This impact is *less than significant*, and no mitigation is required.

No residual impacts to transportation would occur with Project implementation.

3.13 Air Quality

This section of the Draft Environmental Impact Report provides an overview of the existing air quality in the proposed Eagle Mountain Pump Storage Hydroelectric Project (Project) area, associated regulatory framework, and an analysis of potential air quality impacts that could result from the short-term construction and long-term operation of the proposed Project.

3.13.1 Regulatory Setting

Air quality issues associated with the proposed Project are under the jurisdiction of the United States Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD).

Regulation of air pollution is achieved through both Federal and State ambient air quality standards and emission limits for individual sources of air pollutants. An “ambient air quality standard” represents a level of an air pollutant in the outdoor (ambient) air that is deemed necessary to protect public health. The ambient standards do not apply to indoor environments.

3.13.1.1 Federal

The EPA has established National Ambient Air Quality Standards (NAAQS) for outdoor concentrations of the following “criteria” pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and particulate matter with aerodynamic diameters of 10 or 2.5 microns and less (PM_{10} and $PM_{2.5}$)

An ambient air quality standard establishes the concentration above which the pollutant is known to cause adverse health effects to sensitive groups within the population such as children and the elderly. The goal is for localized Project effects not to cause or contribute to an exceedance of the standards. Ambient air quality standards are classified as either “primary” or “secondary” standards. Primary standards define levels of air quality, including an adequate margin of safety, necessary to protect the public health. Secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Under the Federal Clean Air Act (CAA), each state must identify non-attainment areas that do not meet the NAAQS. For any non-attainment designation, a State Implementation Plan (SIP) is developed to define actions to be taken to achieve attainment of the applicable NAAQS. In summary:

- An attainment area is any area that meets the NAAQS.
- A non-attainment area is any area that does not meet the NAAQS.
- A maintenance area is any area previously designated non-attainment but is in transition back to attainment.

General Conformity is the Federal process used to ensure that the air quality effects of Federal actions not related to motor vehicle transportation plans are also considered in the air quality planning of nonattainment and maintenance areas. The criteria for determining the conformity of such actions to the Clean Air Act states that a conformity determination must be performed when:

- The emissions caused by a Federal action equal or exceed the de minimis levels.
- The emissions level is determined to be regionally significant, representing 10 percent or more of the applicable regional (or nonattainment area) emissions.

If emissions are below the de minimis levels and the emissions are not regionally significant the action is presumed to conform to the CAA. If emissions exceed the de minimis levels or are regionally significant, a General Conformity Determination must be prepared.

The area surrounding the proposed Project is currently designated as attainment/unclassified for all NAAQS including the eight-hour O_3 standard, PM_{10}, and $PM_{2.5}$, although it is nonattainment for the California AAQS for ozone and PM_{10}.[1] Thus, General Conformity is not applicable and a General Conformity Determination is not required for this proposed Project.

Section 111 of the California Ambient Air (CAA) Standards of Performance of New Stationary Sources requires the EPA to establish Federal emission standards for source categories that cause or contribute significantly to air pollution. These standards are intended to promote use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements.

Prevention of Significant Deterioration (PSD) regulations were first promulgated by the EPA (40 C.F.R. part 52) to prevent air quality degradation in those areas where criteria air pollutant concentrations are below the ambient standards (i.e. attainment areas). Exceedance of a PSD trigger level requires a demonstration by pollutant dispersion modeling that the emissions will not interfere with the attainment or maintenance of any NAAQS at the point of maximum impact and will not cause an exceedance of a PSD increment.

Title V of the 1990 CAA Amendments requires all major sources and some minor sources of air pollution to obtain an operating permit. A Title V permit grants a source permission to operate. The permit includes all air pollution requirements that apply to the source, including emissions limits and monitoring, record keeping, and reporting requirements. It also requires that the source report its compliance status with respect to permit conditions to the permitting authority. Under Title V of the CAA, any source that emits or has the potential to emit 100 tons per year or more of any criteria air pollutant is a major source and must obtain a Title V operating permit.

[1] California Area Designation Maps / State and Federal, http://www.arb.ca.gov/desig/adm/adm.htm

3.13.1.2 State

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional Air Pollution Control Districts and Air Quality Management Districts. CARB regulates local air quality indirectly by establishing State ambient air quality standards and vehicle emissions and fuel standards, and by conducting research, planning, and coordinating activities. California has adopted ambient standards (CAAQS) that are more stringent than the Federal standards for some criteria air pollutants.

3.13.1.3 Regional

The proposed Project is located in a portion of eastern Riverside County, which is within the Mojave Desert Air Basin (MDAB). The MDAB is comprised of four air districts, the Kern County Air Pollution Control District (APCD), the Antelope Valley Air Quality Management District (AQMD), the Mojave Desert AQMD, and the eastern portion of the South Coast AQMD. The Kern County APCD consists of the eastern portion of Kern County; the Antelope Valley AQMD consists of the northeastern portion of Los Angeles County; the Mojave Desert AQMD includes San Bernardino County and the most eastern portion of Riverside County; and the portion of the SCAQMD includes the eastern part of Riverside County.

The proposed Project (including the pipeline and transmission line elements) is located in a portion of eastern Riverside County that is within the SCAQMD jurisdiction. The SCAQMD also acts as the primary reviewing agency for environmental documents addressing potential air quality impacts, and develops regulations that must be consistent with, or more stringent than, Federal and State air quality policies.

The SCAQMD is responsible for developing attainment plans for the region for inclusion in California's SIP, as well as establishing and enforcing air pollution control rules and regulations. The attainment plans must demonstrate compliance with Federal and State ambient air quality standards, and must first be approved by CARB before inclusion into the SIP. The SCAQMD regulates, permits, and inspects stationary sources of air pollution, while the State is responsible for emission standards and controlling actual tailpipe emissions from motor vehicles. For this proposed Project, the relevant rules and regulations include:

- Rule 402 – requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site.
- Rule 403 – requires use of best available technologies to reduce the amount of particulate matter (dust) entrained in ambient air as a result of anthropogenic (human-made, e.g., construction) activities.

3.13.2 Existing Conditions

3.13.2.1 Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions are also important. Factors such as wind speed and direction, and air temperature gradients interacting with physical landscape features determine the movement and dispersal of criteria air pollutants.

The MDAB consists of an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are generally out of the west and southwest, due to the proximity of the MDAB to coastal and central regions and the interference of the Sierra Nevada Mountains to the north. Air masses pushed onshore in southern California by differential heating are channeled through the MDAB.

Eastern Riverside County’s climate is typical of an arid region, with hot, dry summers and mild, dry winters. Average maximum daily temperatures typically exceed 100 degrees Fahrenheit (°F) from June through September. Average annual precipitation varies from almost 0 to 9 inches per year, with a mean of approximately 3.94 inches. The MDAB is classified as a dry-hot desert climate (specifically: “tropical or subtropical desert: warm and arid (very dry) year-round”) with portions classified as dry-very hot desert, to indicate that at least three months have maximum average temperatures over 100 °F.

Wind patterns in the area of the Project site are presented from data collected at the Southern California Edison meteorological station located near the southwestern edge of Blythe (Figure 3.13-1). The wind rose is for the 5-year distribution of wind velocity. A bi-modal wind direction distribution is apparent for the summary with maxima from the northeast and southwest. This bi-modal circulation pattern is influenced primarily by the southwest-northeast orientation of the nearby Colorado River Valley. This pattern is highly variable seasonally.

Criteria Air Pollutants. The following provides a brief summary of the potential health and welfare effects and typical sources of each of the criteria air pollutants (*see* Table 3.13-1 Criteria Air Pollutants).

Ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NO_x). VOCs and NO_x are known as precursor compounds for ozone. Substantial ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of VOC and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional air subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds.

Carbon Monoxide. Carbon monoxide (CO) is a non–reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood–burning stoves and fireplaces. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground–level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces its oxygen–carrying capacity, resulting in reduced levels of oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Table 3.13-1. Criteria Air Pollutants

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	– 0.075 ppm	High concentrations can directly affect lungs, causing irritation. Long–term exposure may cause damage to lung tissue.	Formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. Major sources include on–road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline–powered motor vehicles.
Nitrogen Dioxide (NO_2)	1 Hour Annual	0.18 ppm 0.03 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish–brown.	Motor vehicles, petroleum–refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide (SO_2)	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM10)	24 Hour Annual	50 $\mu g/m^3$ 20 $\mu g/m^3$	150 $\mu g/m^3$ –	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume–producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind–raised dust and ocean sprays).
Fine Particulate Matter (PM2.5)	24 Hour Annual	– 12 $\mu g/m^3$	35 $\mu g/m^3$ 15 $\mu g/m^3$	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including nitrogen oxides, sulfur oxides, and organics.
Lead (Pb)	Month Quarter	1.5 $\mu g/m^3$ –	– 1.5 $\mu g/m^3$	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present sources: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

SOURCE: California Air Resource Board, February 2, 2007, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California, but in more recent years CO measurements and modeling are not a priority in most California air districts due to the retirement of older polluting vehicles, less emission from new vehicles, and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the CARB 2004 *Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas,* shown below:

> The dramatic reduction in CO levels across California is one of the biggest success stories in air pollution control. CARB requirements for cleaner vehicles, equipment, and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as nonattainment for the Federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the Federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard.

Nitrogen Oxides. When combustion temperatures are extremely high, as in aircraft, truck, and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO_2 can lead to respiratory illnesses such as bronchitis and pneumonia.

Particulate Matter. Particulate matter (PM_{10} and $PM_{2.5}$) consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects. Particulate matter in the atmosphere results from many kinds of dust– and fume–producing industrial and agricultural operations, fuel combustion, wood burning stoves and fireplaces, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition, construction activities and mining, are more local in nature, while others, such as vehicular traffic and wood burning stoves and fireplaces, have a more regional effect.

Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard. The remaining fractions, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the Federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope 2006). The CARB has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur–containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The maximum SO_2 concentrations recorded in the Project area are well below Federal and State standards; as a result the area is in attainment status with both Federal and State SO_2 standards.

Lead. Ambient lead concentrations meet both the Federal and State standards in the Project area. Lead has a range of adverse neurotoxin health effects, and was released into the atmosphere via leaded gasoline products. The phase–out of leaded gasoline in California has resulted in dramatically decreased levels of atmospheric lead.

3.13.2.2 Existing Ambient Air Quality

The CARB, SCAQMD, and MDAQMD provide air quality monitoring networks with information on existing ambient concentrations of criteria air pollutants near the Project area. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources, the influence of topographical and meteorological factors, and determine attainment status. Table 3.13-2 Air Quality Data Summary presents a 5-year summary of air pollutant (concentration) data collected at the monitoring stations in the vicinity of the Project area. However, less monitoring data is available for the sparsely populated eastern Riverside County. For example, no PM_{10} and $PM_{2.5}$ monitors are located within the SCAQMD portion of the Mojave Desert Air Basin.

The pollutant concentrations are generally a conservative (overestimation) representation of background air pollutant concentrations at the Project area, because they are the highest 1-hour averages in many cases. However, background concentrations can vary among different locations within an area. Table 3.13-4 Annual Construction Emissions (below) compares these measured air pollutant concentrations with CAAQS and NAAQS. From the available data, some monitoring data does not meet applicable standards.

Table 3.13-2. Air Quality Data Summary (2004–2008)[1]

Pollutant	Monitoring Data by Year					
	CAAQS/ NAAQS[2]	2004	2005	2006	2007	2008
Ozone						
Highest 1 Hour Average (ppm)[3]	0.09/-	0.078	0.084	0.078	0.092	0.074
Days of Exceedance		0	0	0	0	0
Highest 8 Hour Average (ppm)[3]	0.07/0.075	0.068	**0.072**	0.059	**0.076**	**0.071**
Days of Exceedance		0	1	0	1	1
Particulate Matter (PM10)						
Highest 24 Hour Average (µg/m^3)[3]	50/150	41	**53**	**53**	**88**	**72**
Days of Exceedance		0	5.8	na	24.5	Na
Annual Average (µg/m^3)[3]	20/-	**28.4**	**25.8**	**27.6**	**29.3**	**25.1**
Particulate Matter (PM2.5)						
Highest 24 Hour Average (µg/m^3)[3]	-/35	34	27	22	28	13
Days of Exceedance		0	0	0	0	0
Annual Average (µg/m^3)[3]	12/15	**10.8**	**9.6**	**10.3**	**9.7**	**Na**
Carbon Monoxide (CO)						
Highest 1 Hour Average (ppm)[3]	20/35	2.1	2.1	2.3	1.5	1.0
Highest 8 Hour Average (ppm)[3]	9/9	0.8	0.8	0.9	0.8	0.5
Nitrogen Dioxide (NO2)						
Highest 1 Hour Average (ppm)[3]	0.18/-	0.089	0.073	0.107	0.079	0.065
Annual Average (ppm)[3]	0.03/0.053	0.017	0.016	0.016	0.016	0.013

SOURCE: EPA (http://www.epa.gov/air/data/), 2004–2008 and CARB Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html , 2004–2008.

NOTE: Values in **bold** are in excess of applicable standard.

[1] Ambient monitoring station for ozone at 445 West Murphy Street, Blythe, for PM10 at Olive Street, Hesperia, and for PM2.5 at 14306 Park Avenue, Victorville, for NOx at 220 South Hathaway Street, Banning, and for CO at 590 Racquet Club Ave at Palms Springs.

[2] California Ambient Air Quality Standards are not to be exceeded and National Ambient Air Quality Standards are not to be exceeded more than once per year.

[3] ppm = parts per million; µg/m3 = micrograms per cubic meter.

Sensitive Receptors. For the purposes of air quality analyses, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations with Project construction and/or operation. These receptors generally include schools, day care centers, libraries, hospitals, residential care centers, parks, and churches. Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre–existing health problems, proximity to emissions sources, or duration of exposure to air pollutants.

Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than is the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The mostly vacated town of Eagle Mountain is a 460-acre townsite, fenced with controlled access. The townsite is accessed by Kaiser Road, a two-lane county maintained roadway that will also provide access to the proposed Project. Numerous dirt roads intersect Kaiser Road, leading to scattered residences and agricultural fields.

The two small communities of Lake Tamarisk and Desert Center are located approximately 9 and 10 miles southeast of the Central Project Area. Lake Tamarisk consists of approximately 70 single family dwellings, an executive (9-hole) golf course, a recreational vehicle park, 150 undeveloped lots, and two small lakes.

Desert Center is located at the junction of Interstate 10 and State Route 177. Desert Center consists of a few small single-family dwellings, a mini-market, café, and bar. The community included gas stations at one time, but those are now closed. Public facilities include a county fire station, branch library, post office, and several churches.

The Project site is 1 and 1.5 miles from the southeastern boundary of Joshua Tree National Park (JTNP) at its nearest point and about 30 miles from the more developed sections of the JTNP. National Parks are designated as a Class I areas, and afforded protection through the Federal PSD Program. Visibility and air concentrations due to fugitive dust emissions during construction are the main issue for air quality.

3.13.3 Potential Environmental Impacts

3.13.3.1 Methodology

The air quality analysis was conducted in accordance with published guidance, including the SCAQMD's *California Environmental Quality Act (CEQA) Air Quality Handbook*, BLM *NEPA Handbook H-1790-1*, FERC guidance: *Preparing Environmental Documents (Sept 2008)*, and *NEPA Procedures in FERC Hydroelectric Licensing (May 2000).*

Emissions associated with construction activities are temporary and variable depending on Project location, duration and level of activity. These emissions occur predominantly from the exhaust generated from the operation of construction equipment, but can also be attributed to fugitive dust ($PM_{2.5}$ and PM_{10}) produced from materials staging, demolition and earthworks activities, as well as concrete processing operations.

Construction equipment utilized in the proposed Project involve both on-road and non-road equipment. The former category of vehicles are used for the transport and delivery of supplies, materials and equipment to and from the site, and also include employee vehicles; the latter category of vehicles are operated exclusively on-site for the completion of activities such as paving, utility installation, site clearing and fill operations, earth moving, earth loading and unloading, installation of structures, and tunnel boring.

Activity levels and vehicle assignments for non-road and on-road construction vehicles were developed based on requirements and schedules outlined below. Non-road exhaust emissions factors were calculated using the current version of the CARB OFFROAD2007 model[2], while on-road emissions factors were computed using county-specific data processed by the CARB EMFAC2007 model[3]. A detailed list of construction equipment assignments, projects, assumptions, usage schedules and emissions factors are compiled in Section 12.10 of this document.

Emissions factors used to estimate fugitive dust PM emissions from soil disturbance, wind erosion of stockpiles, traffic on unpaved surfaces, blasting, and demolition were obtained from the SCAQMD's CEQA Air Quality Handbook, EPA's *Compilation of Air Pollution Emissions Factors* (i.e., AP-42), and other accepted guidance, assuming a 75 percent control efficiency through implementation of mitigation techniques pertaining to fugitive dust and combustion emissions.

3.13.3.2 Thresholds of Significance

The proposed Project is located in the State of California, and therefore the significance of potential impacts to air quality is determined based on CEQA guidelines (CCR §§ 15000-15387, Appendix G), SCAQMD thresholds for criteria pollutants and other relevant considerations. These guidelines identify certain thresholds that may be pertinent in determining whether an impact is significant. Using these thresholds, the proposed Project would be considered to have significant air quality impacts if it were to:

(a) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable Federal or State AAQS (including releasing emissions which exceed quantitative thresholds for ozone precursors).

(b) Expose sensitive receptors to substantial pollutant concentrations.

(c) Create objectionable odors affecting a substantial number of people.

With respect to criteria pollutants, SCAQMD provides quantitative guidance regarding significance thresholds for both construction and operational activities. These significance

[2] CARB OFFROAD2007 Emissions Model http://www.arb.ca.gov/msei/offroad/offroad.htm

[3] CARB EMFAC2007 Emissions Model, http://www.arb.ca.gov/msei/onroad/latest_version.htm

thresholds, listed in pounds per day (lb/day), are presented in Table 3.13-3 SCAQMD Significance Thresholds for construction and operations.

Table 3.13-3. SCAQMD Significance Thresholds (pounds per day)

Source	ROG	NOx	CO	PM10	PM2.5	SOx
Construction	75	100	550	150	55	150
Operation	55	55	550	150	55	150

Source: South Coast Air Quality Management District, *SCAQMD Air Quality Significance Thresholds*, October 2006, http://www.aqmd.gov/ceqa/hdbk.html

3.13.3.3 Environmental Impact Assessment

3.13.3.3.1 *Annual Emissions during Construction*

Construction-related annual emissions associated with the proposed Project are presented, segregated by Project year and pollutant type, in Table 3.13-4 Annual Construction Emissions. Annual emissions related to construction activities are highest in 2013 or 2104 (depending on pollutant) and are estimated to be 60.2 tons per year (tpy) for CO, 7.86 tpy for VOC, 56.7 tpy for NOx, 0.09 tpy for SO_2, 13.9 tpy for PM_{10} and 5.17 tpy for $PM_{2.5}$. The proposed Project represents less than a tenth of one percent (0.07 percent) of the forecasted annual NOx emissions within the Mojave Desert Air Basin.

Table 3.13-4. Annual Construction Emissions (tons)

Year	CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2	CO_2	N_2O	CH_4
2012	59.0	7.46	54.2	13.8	5.08	0.08	7,998	0.05	0.68
2013	57.7	7.86	56.7	13.9	5.17	0.09	9,021	0.05	0.71
2014	60.2	7.67	50.9	13.8	5.02	0.09	9,296	0.07	0.71
2015	15.8	1.66	9.61	11.6	3.08	0.02	1,931	0.02	0.15
Maximum	60.2	7.86	56.7	13.9	5.17	0.09	9,296	0.07	0.71
Percent of Mojave Desert Air Basin	0.04%	0.02%	0.07%	0.02%	0.03%	0.004%			

Source: Prepared by KB Environmental Sciences, Inc., 2009 (see Air Quality Appendix).

3.13.3.3.2 *Daily Emissions during Construction*

Construction-related daily emissions associated with the proposed Project are presented, segregated by Project year and pollutant type, in Table 3.13-5 Daily Construction Emissions. Typical daily emissions related to construction activities are highest in 2013 or 2014 (depending on pollutant) and are estimated to be less than: 463 pounds per day (ppd) for CO; 60.5 ppd for VOC; 436 ppd for NO_x; 0.73 ppd for SO_2; 107 ppd for PM_{10}; and 39.8 ppd for $PM_{2.5}$.

Table 3.13-5. Daily Construction Emissions (pounds)

Year	CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2
2012	454	57.4	417	106	39.0	0.62
2013	444	60.5	436	107	39.8	0.70
2014	463	59.0	392	106	38.6	0.73
2015	122	12.8	74.0	89.3	23.7	0.16
Maximum	463	60.5	436	107	39.8	0.73
CEQA Threshold	550	75	100	150	55	150
Exceed CEQA	No	No	Yes	No	No	No

Source: KB Environmental Sciences, Inc., 2009.

Daily emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd.

3.13.3.3.3 *Emissions during Operation*

Operation-related annual emissions associated with the proposed Project are presented in Table 3.13-6.

Table 3.13-6. Annual Operational Emissions (tons)

CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2	CO_2	N_2O	CH_4
1.85	0.05	0.16	0.03	0.02	0.00	332	0.01	0.02

Source: Prepared by KB Environmental Sciences, Inc., 2009.

Air pollutant emissions associated with O&M activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operations.

3.13.3.3.4 *Reduction of Off-site Emissions*

One of the unique factors of pumped storage is flexibility of the timing to generate electricity and refill the upper reservoir. In addition to financial advantages that can be achieved by the timing, there are also environmental benefits related to the reduced emission profile of the power generated during off-peak periods. Table 3.13-7 Annual Offset Electrical Generation Air Emissions shows that even though it takes more pump-back power than the power that is generated by the facility, the overall emissions of criteria pollutants will be reduced by the overall system operation. Due to the nature of the grid, it is not know which power plants would be used for pump-back power or which power plants would be displaced by generation from the Eagle Mountain Pumped Storage Project. Table 3.13-7 looks at two scenarios for maximum and minimum displacement scenarios. The emissions from simple cycle power plants are assumed to be displaced in both the maximum and minimum displacement scenarios. The difference in the scenarios is that pump-back power is assumed to be generated by renewable sources (generating no air pollutants) in the maximum scenarios and combined cycle power plants are assumed to be displaced in the minimum displacement scenarios.

In most cases, the pump-back power would probably include a mix of power from the combined cycle power plants and the renewable sources so the actual emissions displaced would fall between the maximum and minimum displaced amounts shown. As shown in Table 3.13-7, the proposed Project would be expected to have a net benefit for the State with regard to the generation of air pollutant emissions. The proposed Project power generation would reduce reliance on simple cycle power plants (displacing their air pollutant emissions) during peak periods of electricity demand and rely on cleaner power plants for pump-back power during periods of low electricity demand.

During peak periods, approximately 1,300 megawatts (MW) would be available for use. In this manner, the proposed Project would eliminate the need for the regional transmission operator (California ISO) to dispatch up to 1,300 MW of fossil-fueled peaking plants (or increase capacity from baseline plants typically powered by natural gas) during peak periods, and thus eliminate the criteria air pollutant and greenhouse gas emissions associated with the fossil-fueled facilities.

Of important note, there are beneficial synergies between a pumped storage development and non-firm energy from wind and, potentially, solar projects. More than 2,000 MW of wind power have been built in California, and more capacity is planned. The San Gorgonio Pass area of central Riverside County has 359 MW of wind generation capacity. This area is less than 100 miles from the Project. There are also eight solar projects now planned for the Chuckwalla Valley, one within 5 miles of the Project, with over 1000 MW estimated total capacity proposed.

Wind power is only generated when the wind is blowing, and that does not always correspond to times of power demand. “Control power” is needed for times of high wind when the electrical grid cannot absorb the excessive power, and energy should be stored for times of insufficient wind.

Pumped hydropower stores energy by using surplus power for pumping water from a lower level to a higher level. Thus, the proposed Project can serve as a “battery” for energy generation. In addition, energy generation from pumped storage can be rapidly adjusted to match demand, enhancing the overall reliability of the transmission system. These benefits result in a substantial benefit towards air quality impacts and climate change.

The proposed Project would displace the need for up to 1,300 MW of fossil-fueled peaking plants during peak periods.

Table 3.13-7 Annual Offset Electrical Generation Air Emissions (tons)

	Power Source		NOx	VOC	CO	PM10	SOx
Pump-back Power Used	Renewable Sources [A]	GWh/Year (20% annual hours)	2,883	2,883	2,883	2,883	2,883
		Emission Factor (lbs/GWh))	0	0	0	0	0
		Annual Pollutants (tons)	0	0	0	0	0
	Combined Cycle [B]	GWh/Year (20% annual hours)	2,883	2,883	2,883	2,883	2,883
		Emission Factor (lbs/GWh))	70	21	24	37	5
		Annual Pollutants (tons)	101	30	35	53	7
Generation Displaced	Simple Cycle [C]	GWh/Year (20% annual hours)	2,278	2,278	2,278	2,278	2,278
		Emission Factor (lbs/GWh))	279	54	368	134	13
		Annual Pollutants (tons)	318	61	419	153	15
Summary of Displaced Emissions							
		Maximum Displaced Net Emissions Rows [C] - [A] (tons)	318	61	419	153	15
		Minimum Displaced Net Emissions Rows [C] - [B] (tons)	217	31	384	99	8

Notes: These emissions have been calculated using emissions factors from *Comparative Costs of California Central Station Electricity Generation* (CEC, 2010) for conventional simple cycle and combined cycle power plants. The analysis assumes 2,278 GWh of annual generation for the project (1.3 MW for 20% of the annual hours). Different amounts of annual generation would have directly proportional benefits of displacing the air emissions shown in this table.

Environmental Impact Summary:

(a) *Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State AAQS (including releasing emissions which exceed quantitative thresholds for ozone precursors)?* Yes. The proposed Project alone would result in a *significant construction-related impact* from NOx in construction years 2012 through 2014. If a project would individually have a significant air quality impact, the Project would also be considered to have a *significant cumulative air quality impact.*

(b) *Would the project expose sensitive receptors to substantial pollutant concentrations?* No. The Project does not have the potential to emit substantial pollutants. In addition, the closest sensitive receptors [Lake Tamarisk and Desert Center communities] are located approximately 9 and 10 miles southeast of the Central Project Area, and approximately 1 to 1.5 miles from the southeastern boundary of JTNP at its nearest point and about 30 miles from the more developed sections of the JTNP.

(c) *Would the project create objectionable odors affecting a substantial number of people?* No. (*See* response (b) above).

Impact 3.13-1 Annual Emissions during Construction. The proposed Project represents less than 0.07 percent of the forecasted annual NOx emissions within the Mojave Desert Air Basin. This impact is *less than significant*.

Impact 3.13-2 Daily Emissions during Construction. These emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd; therefore, the NO_x impact is *potentially significant and subject to the mitigation program* (MM AQ-1 through MM AQ-13).

Impact 3.13-3 Emissions during Operation. Air pollutant emissions associated with O&M activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operation. This impact is *less than significant*.

3.13.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs), where applicable. Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards built have been into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of CEQA review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

To construct necessary features of the Project there will be fugitive dust sources from grading, trenching, wind erosion and truck filling/dumping at the site. Applicable mitigation measures of AQ-1 through AQ-5, derived from SCAQMD Rule 403 and Rule 402, to reduce fugitive dust impacts are identified.

MM AQ-1. **Fugitive Dust.** Periodic watering or application of suitable surfactant will be conducted for short-term stabilization of disturbed surface areas and storage piles as needed to minimize visible fugitive dust emissions. For dirt roads, watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is done for the day.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-2. **Trackout.** To prevent Project-related trackout onto paved surfaces, the following measures will be undertaken through the construction period:

- Prevention and clean up of Project-related trackout or spills on publicly maintained paved surfaces within 24 hours.
- Covering loaded haul vehicles operating on public paved roads.
- Material transported off-site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust.
- Paving, gravel covering, or chemically stabilizing on-site roads as soon as feasible.
- Limiting onsite vehicle speeds on unpaved surfaces to 25 mph.
- Operating a wash rack for drivers to wet down material before leaving the facility.
- Operate a wheel washer (or equivalent) to remove soil from vehicle tires as needed.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-3. **Grading.** Graded site surfaces will be stabilized upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-4. **Surface Disturbance.** Areas of active surface disturbance (such as grading) will be limited to no more than 15 acres per day.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-5. **Earth-moving Activities.** Non-essential earth-moving activities will be reduced during windy conditions; i.e., when visible dusting occurs from moist and dry surfaces due to wind erosion. Clearing, grading, earth-moving, or excavation activities will cease if winds exceed 25 mph averaged over 1-hour duration.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

In addition, compliance with the following mitigation measures AQ-6 through AQ-12 would further reduce impacts from engine exhaust and NOx and other criteria pollutant emissions.

MM AQ-6. **Transportation Management Plan**. The Construction Contractor shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-7. **Diesel Trucks.** All diesel truck operators shall strictly abide by the applicable State law requirements for idling, as described in the airborne toxic control measure (CCR, Title 13, section 2485), which limits vehicles with gross vehicular weight ratings of more than 10,000 pounds to no more than 5 minutes in a 60-minute period of idling of the primary engine or the diesel-fueled auxiliary power system at any location.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-8. **Equipment.** Use electrical drops in place of temporary electrical generators, and substitute low- and zero emitting construction equipment and/or alternative fueled or catalyst equipped diesel construction equipment wherever economically feasible.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-9. **Generators.** Electrical generators must be properly permitted with the SCAQMD.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-10. **Heavy-duty Diesel Trucks.** Heavy-duty diesel trucks shall be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-11. **Construction Equipment.** At least 50 percent diesel fleet hours will utilize 2002 or later year diesel construction equipment, where feasible.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-12. **Off-road Construction Equipment.** Older off-road construction equipment shall be retrofitted with appropriate emission control devices prior to onsite use, where feasible.

Implementation Timing: Construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

MM AQ-13. **Air Quality Study Design.** The Project applicant/owner (Eagle Crest Energy Company [ECE]) shall work collaboratively with the National Park Service (NPS) to establish an air quality study design for two years of ozone monitoring to be conducted upon completion of construction and Project operations beginning. ECE will fund the annual expenses as a cost-share with the NPS and other transmission operators. The funding contribution for this study will be based on a percentage of total miles of transmission line. If the proposed Project is found to have a significant impact on ozone levels within Joshua Tree National Park, the Project owner will develop a transmission management plan to reduce ozone emissions.

Implementation Timing: Final design/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator

Responsible Agencies for verification and enforcement: SWRCB and FERC

3.13.5 Level of Significance after Implementation of Mitigation Program

The proposed Project will result in a significant construction-related impact from NO_x in construction years 2012 through 2014. Other air quality parameters will not exceed the threshold of significance.

3.14 Noise

This section provides an overview of the existing noise environment in the proposed Eagle Mountain Pumped Storage Project (Project) area, a discussion of the applicable regulatory framework, and an analysis of potential noise impacts that could result from the short-term construction and long-term operation of the proposed Project. The noise analysis was conducted in accordance with published technical guidance, including Riverside County noise regulations and ordinances and the Federal Transit Administration.

3.14.1 Regulatory Setting

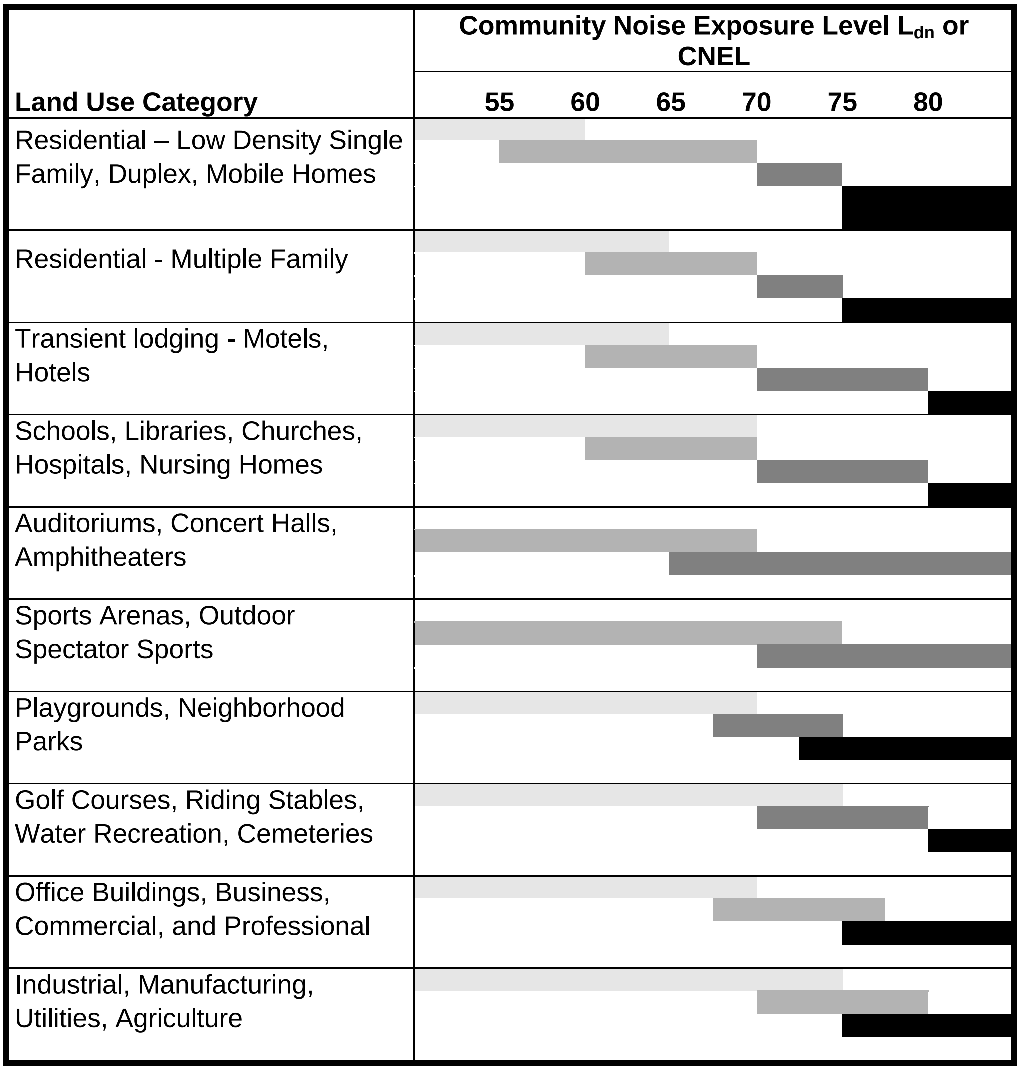
The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS). The following LORS apply to noise exposure standards.

Portions of the Project site are located on private lands which are not subject to Federal or State land management requirements. Other portions of the Project site are located on Federal land managed by the Bureau of Land Management (BLM) and therefore subject to the LORS of the agency. No Federal or State regulatory settings pertaining to noise regulations apply to the proposed Project.

Most local jurisdictions have noise exposure standards designed to ensure that noise does not excessively impact the quality of life of its citizens. Regulation of noise in the proposed Project area is implemented through general plan policies and noise ordinances. The Riverside County General Plan (RCGP, 2003) identifies policies and standards intended to direct planning effects associated with new developments, while Riverside County's noise ordinances establish standards and procedures for addressing specific noise sources.

Riverside County General Plan. The Riverside County Noise Element identifies land use compatibility noise levels to ensure acceptable noise environments for each land use within unincorporated Riverside County (Table 3.14-1). The noise element also identities the following noise compatibility, noise mitigation strategy, stationary noise, and temporary construction policies that may be applicable to the proposed Project.

Table 3.14-1. Riverside County Land Use Compatibility for Community Noise Exposure



3.14.1.1 Compatibility Categories

Normally Acceptable: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable: New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

3.14.1.2 Noise Compatibility Policies

Policy N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or blockwalls shall be used.

Policy N 1.2: Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports.

Policy N 1.3: Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools
- Hospitals
- Rest Homes
- Long-Term Care Facilities
- Mental Care Facilities
- Residential Uses
- Libraries
- Passive Recreation Uses
- Places of Worship

According to the State of California Governor’s Office of Planning and Research General Plan Guidelines, an acoustical study may be required in cases where these noise-sensitive land uses are located in an area of 60 CNEL or greater. Any land use that is exposed to levels higher than 65 CNEL will require noise attenuation measures. Areas around airports may have different noise standards than those cited above.

Policy N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys.

Policy N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

Policy N 1.6 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise sensitive uses.

Policy N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

Policy N 1.8 Limit the maximum permitted noise levels that cross property lines and impact adjacent land uses, except when dealing with noise emissions from wind turbines.

3.14.1.3 Noise Mitigation Strategy Policies

Policy N 2.3 Mitigate exterior and interior noises to the levels listed in the table below (Table 3.14-2.) to the extent feasible, for stationary sources.

Table 3.14-2. Riverside County Stationary Source Noise Standards at Residential Uses

Time Period	Interior Standards	Exterior Standards
10:00 p.m. to 7:00 a.m.	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L_{eq} (10 minute)	65 L_{eq} (10 minute)

3.14.1.4 Stationary Noise Policies

Policy N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:

(a) 45 decibel scale (dBA)1-10-minute Equivalent Sound Level (Leq)2 between 10:00 p.m. and 7:00 a.m.

(b) 65 dBA-10-minute Leq between 7:00 a.m. and 10:00 p.m.

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[1] A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level commonly referred to as “sound level” measured in dB. An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels.

[2] The Equivalent Sound Level (L_{eq}) is a single value of a constant sound level for the same measurement period duration, which has sound energy equal to the time–varying sound energy in the measurement period.

Policy N 4.4 Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources.

Policy N 4.5 Encourage major stationary noise-generating sources throughout Riverside County to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of Conditional Use Permits or business licenses or prior to the approval and/or issuance of new Conditional Use Permits for said facilities.

Policy N 4.7 Evaluate noise producers for the possibility of pure-tone producing noises. Mitigate any pure tones that may be emitted from a noise source.

3.14.1.5 Temporary Construction Policies

Policy N 12.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices.

Policy N 12.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

Policy N 12.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

3.14.1.6 Riverside County Noise Ordinance

Riverside County Ordinance 847, Regulating Noise, identifies general noise level standards that are not to be exceeded within Riverside County (2009). For example, the maximum noise level standards that would be applicable to sensitive receptor locations in the vicinity of the proposed Project area (i.e., rural residences and the school in the Eagle Mountain Townsite) are 55 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m.

Pursuant to Ordinance 847, Section 6, part b., no person shall operate any power tools or equipment between the hours of 10:00 p.m. and 8:00 a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than 100 feet from the power tools or equipment.

Noise levels from the following sources are exempt from the provisions of Ordinance 847:

a. Private construction projects located one-quarter of a mile or more from an inhabited dwelling.

b. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September.

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

c. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems

3.14.2 Existing Conditions

The general Project vicinity is located approximately 10 miles north-northwest of Desert Center in Riverside County, California. The study area is remote with noise levels that are relatively low, estimated to average between 35 and 45 dBA. The main noise source in the area is vehicle noise on nearby roads, including Interstate 10 (I-10), Eagle Mountain Road, and Kaiser Road. Vehicle noises can range up to 80 dBA, depending on the distance from the source.

Ambient Leq noise measurement data were last collected in the Project area for the review for the proposed Eagle Mountain Landfill Project (Riverside County and BLM, 1996). Although these data are more than 13 years old, the ambient conditions in the study area are largely the same, with the exception that at the time of the measurements, a State-run correctional facility utilized some of the buildings at the Eagle Mountain Townsite. That State-run correctional facility has since relocated from the site. Ambient Leq noise levels at the Eagle Mountain Townsite were measured to be between 38 and 63 dBA, depending on the distance of the measurement locations to Kaiser Road. Now that the correctional facility is not located at the site, it is anticipated that existing average ambient noise levels are closer to the lower level of the measured range. Ambient Leq noise levels in the vicinity of the communities of Lake Tamarisk and Desert Center were measured to be moderately higher than those in the immediate Project area, ranging between 54 and 60 dBA and 66 and 70 dBA, respectively. The ambient Leq noise level near I-10 at Kaiser Road was measured to be 73 dBA.

3.14.2.1 Sensitive Receptors

For the purposes of noise analyses, sensitive receptors are generally defined as land uses that are sensitive to noise, such as residential areas, schools, convalescent and acute care hospitals, some parks and recreational areas, and churches and other religious facilities.

The 460-acre remnants of the Eagle Mountain Townsite are fenced with public access prohibited. The mostly vacated Townsite is located adjacent to Kaiser Road, a two-lane county roadway which is the access road leading to the core Project area (reservoirs, powerhouse and switchyard). A school is still operated within the Townsite. In the surrounding area, numerous unpaved roads intersect Kaiser Road, leading to rural residences.

Two other small communities in the area are Lake Tamarisk and Desert Center, located approximately 9 and 10 miles southeast of the general Project vicinity. Lake Tamarisk consists of approximately 70 single family dwellings, an executive golf course, and a recreational vehicle park. Desert Center is located at the junction of I-10 and State Route (SR) 177. Desert Center consists of a few small single-family dwellings and a few commercial buildings. Both communities, as well as the Eagle Mountain Townsite, are accessed by Kaiser Road, which connects to I-10 at Desert Center.

The closest sensitive receptors to the general Project vicinity are the Eagle Mountain Townsite school, and residences approximately 4 miles to the south-southeast and southeast of the site, along Eagle Mountain Road/Phone Line Road and Kaiser Road, respectively. However, a few of these sensitive receptors are within approximately 200 feet of the proposed electric transmission line route along Eagle Mountain Road and the water supply line route that would parallel a segment of Kaiser Road.

In addition to the sensitive receptors described above, the general Project vicinity is located south and east of the Joshua Tree National Park (JTNP), which encompasses approximately 558,000 acres of land and is a popular location for recreational activities such as hiking and camping in solitude. The Project site is located approximately 1.5 miles from the closest JTNP boundary.

3.14.3 Potential Environmental Impact

3.14.3.1 Methodology

To describe noise environments and to assess impacts on noise–sensitive areas, a frequency weighting measure which simulates human perception is commonly used. It has been found that A-weighting of sound levels best reflects the human ear's reduced sensitivity to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted dBA is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to those that the human ear is most sensitive. Table 3.14-3 identifies dBA levels of typical noise environments.

Several time–averaged scales represent noise environments and consequences of human activities. The most commonly used noise descriptors are the equivalent A–weighted sound level over a given time period (Leq); average day–night 24–hour average sound level (Ldn)[3] with a nighttime increase of 10 dBA to account for sensitivity to noise during the nighttime; and

[3] Ldn is the day–night average sound level that is equal to the 24–hour A–weighted equivalent sound level obtained by addition of ten decibels to the sound levels in the night between 10:00 p.m. and 7:00 a.m.

community noise equivalent level (CNEL)[4], also a 24–hour average that includes both evening and nighttime weighting factors.

Table 3.14-3. A-Weighted (dBA) Sound Levels of Typical Noise Environments

A-Weighted	***Overall Level***	Noise Environment
120	Uncomfortably Loud (32 times as loud as 70 dBA)	Military jet takeoff at 50 feet
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet; diesel truck 40 mph at 50 feet
70	Moderately loud	Freeway at 50 feet from pavement edge; vacuum cleaner (indoor)
60	Relatively quiet (1/2 as loud as 70 dBA)	Air conditioning unit at 10 feet; dishwasher at 10 feet (indoor)
50	Quiet (1/4 as loud as 70 dBA)	Large transformers; small private office (indoor)
40	Very quiet (1/8 as loud as 70 dBA)	Bird calls; lowest limit of urban ambient sound
10	Extremely quiet (1/64 as loud as 70 dBA)	Just audible
0	Threshold of hearing	

3.14.3.2 Thresholds of Significance

The State Water Resources Control Board (SWRCB) concludes that the Project may have significant noise impacts if it does any of the following:

(a) Expose persons or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standard of other agencies;
(b) Expose persons or generate excessive ground-borne vibrations or ground borne noise levels;
(c) Substantially and permanently increase ambient noise levels in the Project vicinity above baseline levels;
(d) Result in a significant increase in noise levels at sensitive receptors in the area;
(e) Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above baseline levels;

[4] CNEL is the average A–weighted noise level during a 24–hour day, obtained by addition of five decibels to sound levels in the evening from 7:00 to 10:00 p.m., and addition of ten decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.

(f) Be located within an airport land use plan or, where such plan has been adopted, within two miles of a public airport and therefore expose people residing or working in the Project areas to excess noise levels; and/or

(g) Be located within the vicinity of a private airstrip and therefore expose people residing or working in the Project area to excessive noise levels.

3.14.3.3 Environmental Impact Assessment

3.14.3.3.1 *Construction Noise, Central Project Site*

Construction traffic will utilize Kaiser Road to access the core Project site, and will pass by the school at the Eagle Mountain Townsite. The core Project area in which construction will take place (upper and lower reservoir sites, the proposed pressure and tailrace tunnel locations, and the proposed powerhouse, switchyard, and reverse osmosis treatment sites) lies within the mined lands in which there are no sensitive land uses, such as residences, schools/churches, or parks. These sites are in or beneath mountainous terrain and mine tailings, approximately 1.5 to 4 miles from the nearest sensitive receptors (i.e., the school and rural residences along Kaiser Road and Eagle Mountain Road) and approximately 1.5 miles to the closest boundary of the JTNP. As noted above, sensitive receptors would be within approximately 200 feet of the preferred locations of the electric transmission line along Eagle Mountain Road and the water supply line that would parallel a segment of Kaiser Road.

Construction of the proposed components in the vicinity of the upper and lower reservoir sites would result in an increase of noise levels that could be audible in the JTNP. During construction of proposed components, including the electric transmission line and water supply line, the highest noise generating activities are expected to be earth moving, including excavation, grading, and filling. For purposes of this noise analysis, it is anticipated that the majority of construction equipment that would be used to construct the Project would be mobile off-road equipment, including dozers, backhoes, graders, dump trucks, etc., which generate maximum noise levels of up to 88 dBA at 50 feet (FTA, 2006). The loudest piece of construction equipment is anticipated to be a stationary rock drill, which would generate maximum noise levels of 98 dBA at 50 feet.

Based on the assumed noise levels at 50 feet from the construction equipment, a standard acoustical equation that calculates the noise attenuation rate of approximately 7.5 dBA per doubling of distance to account for the absorption of noise waves due to ground surfaces such as soft dirt and bushes (Caltrans, 1998) was used to estimate the attenuation of noise based on the distance from the construction site to the nearest JTNP boundary and the nearest sensitive receptors.

Table 3.14-4 presents the estimated construction noise levels that would affect people at the nearest sensitive land uses to the reservoir sites (the general Project vicinity) and the preferred pipeline/transmission line routes. It should be noted that the estimated noise levels shown in Table 3.14-4 represent the worst-case scenario because the estimates do not account for noise attenuation due to the presence of natural sound barriers. Noise levels associated with construction activities at the reservoir sites would be expected to be at least 5 to 10 dBA lower at the nearest sensitive receptors due to the fact that most of the work would be completed at the bottom of the proposed reservoir sites where the line of sight between the construction activities and the receptors would be blocked.

Table 3.14-4. Minimum Distances (in feet) and L_{max} Noise Levels (in dBA) at Sensitive Land Uses

Project Component	Closest Distance to the Sensitive Land Use	L_{max} at 50 feet (Rock Drill/Dump Truck)	L_{max} at School and Closest Residence (Rock Drill/Dump Truck)
Reservoir Sites	1 - 4 miles (residences)	98/88	32/22
Reservoir Sites	1.5 miles (JTNP)	98/88	43/33
Pipeline/ Transmission Line	200 feet (residences)	98/88	83/73

As indicated in Table 3.14-4, maximum construction noise from the vicinity of the reservoir sites at the nearest residences are estimated to be 32 dBA during rock drilling and 22 dBA associated with other construction activities. These noise levels would likely not be audible at the nearby residences. The same construction activities would generate noise levels at the boundary of JTNP that would be up to 43 dBA. However, it should be noted that rock drilling, if necessary, would only generate loud noises during early stages of the construction and would be attenuated to undetectable levels when the excavation would proceed deep into the ground. Rock drilling activities may be audible at the boundary of JTNP; however, noise levels would be temporary, resulting in less than significant impacts.

3.14.3.3.2 *Construction Noise, Near Features*

Maximum construction noise at the nearest sensitive receptors attributed to the transmission line and water pipeline would be adverse; however, it is anticipated that construction of the facilities would proceed in a linear fashion and construction noise impacts at any one location along the pipeline or transmission line route would only last for up to several weeks.

Construction of the Project would also create increased traffic on local roads. Increased traffic would be generated from the movement of workers, materials, and equipment to the site. The primary routes used to access the Project site would be I-10 and Kaiser Road. Workers coming to the site would utilize these routes. Given the existing low volumes of traffic levels along Kaiser Road, construction traffic would result in an increase in noise levels at residences along the road, which would result in adverse temporary impacts. Based upon aerial photographs, about 20 residences would be affected by the increased traffic along Kaiser Road.

Standard compliance with the applicable County of Riverside noise ordinance codes during construction should minimize the effects of noise levels during construction (LORS). In addition, MM N-1 will reduce the effects of construction on noise levels include equipping all construction equipment with properly operating and maintained noise mufflers and intake silencers, consistent with manufacturers' standards.

3.14.3.3.3 *Operational Noise*

The long-term operation of the proposed Project would result in a minimal increase in road traffic and would not substantially increase ambient noise levels along Kaiser Road. The proposed powerhouse would be located underground and would not affect noise levels aboveground.

Under wet weather conditions, high-tension transmission lines may generate audible noises known as corona discharge. The audible noise emitted from high-voltage lines is caused by the discharge of energy that occurs when the electrical field strength on the conductor surface is greater than the "breakdown strength" (the field intensity necessary to start a flow of electric current) of the air surrounding the conductor. The degree or intensity of the corona discharge and the resulting audible noise are affected by humidity, air density, wind, and water in the form of rain, drizzle, and fog. Water increases the conductivity of the air and therefore increases the intensity of the discharge. Also, irregularities on the conductor surface such as nicks or sharp points and airborne contaminants can increase the corona activity. Aging or weathering of the conductor surface generally increases the significance of these factors.

The higher voltages at which modern transmission lines operate have increased the noise problem to the point to which they have become a concern to the power industry. Consequently, these lines are now designed, constructed, and maintained so that during dry conditions they would operate below the corona-inception voltage, meaning that the line would generate a minimal amount of corona-related noise. In foul weather conditions, however, corona discharges can be produced by water droplets, fog, and snow.

Based on a review of other high voltage power lines that have been proposed in California, corona noise at the edge of the right-of-way (i.e., 100 feet from the centerline of the transmission line) of a 500 kilovolt (kV) transmission line would range from 45 to 50 dBA. At 200 feet from the transmission line, this would equate to a noise level range of approximately 37 to 43 dBA. This low level hissing or crackling would only be noticeable in wet weather conditions in close proximity to the line and is considered to be less than significant, particularly in this desert environment in which wet weather is a rare exception.

<u>Environmental Impact Summary:</u>

(a) *Would the project expose persons or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standard of other agencies?* No

(b) *Would the project expose persons or generate excessive ground-borne vibrations or ground borne noise levels?* No, the Project will not generate excessive ground-borne vibrations or noise.

(c) *Would the project substantially and permanently increase ambient noise levels in the project vicinity above baseline levels?* No, noise will be generated primarily during construction.

(d) *Would the project result in a significant increase in noise levels at sensitive receptors in the area?* There will be an increase in noise levels during construction, but this impact will be less than significant.

(e) *Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above baseline levels?* There will be a temporary increase in noise levels during construction, which will decline to near baseline conditions during Project operation.

(f) *Would the project be located within an airport land use plan or, where such plan has been adopted, within two miles of a public airport and therefore expose people residing or working in the project areas to excess noise levels?* No.

(g) *Would the project be located within the vicinity of a private airstrip and therefore expose people residing or working in the project area to excessive noise levels?* No.

Construction noise represents a temporary effect on ambient noise levels. The dominant source of noise from most construction equipment is engine noise. In a few cases, such as rock drilling or pavement breaking, noise generated by the process dominates (FTA, 2006).

Impact 3.14-1 Construction Noise, Central Project Site. The maximum construction noise coming from the Central Project Site would likely not be audible at the school or nearby residences. The same construction activities would generate noise levels at the boundary of JTNP that would be up to 43 dBA temporarily, resulting in a *less than significant* impact.

Impact 3.14-2 Construction Noise, Linear Features. The maximum construction noise at the nearest sensitive receptors attributed to the transmission line and water pipeline would be adverse for up to several weeks during construction, but due to the nature of linear facilities, only for several days at any one location. About 20 residences would be affected by noise from increased traffic along Kaiser Road during construction. This impact is *potentially significant impact and subject to the mitigation program* (MM N-1).

Impact 3.14-3 Operational Noise. The operation of the proposed Project would result in a minimal increase in road traffic and would not substantially increase ambient noise levels along Kaiser Road. This impact is *less than significant*. The proposed powerhouse would be located underground and would not affect noise levels aboveground. Noise from operation of the transmission line (low level hissing or crackling), could be adverse but would only be noticeable in wet weather conditions in close proximity to the line, and is a *less than significant* effect in this desert environment.

3.14.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs). PDFs are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards have been built into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of the California Environmental Quality Act (CEQA) review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

MM N-1: The Contractor shall utilize construction equipment with properly operating and maintained noise mufflers and intake silencers, consistent with manufacturers' standards in order to reduce or avoid construction noise levels.

> *Implementation Timing:* Construction
>
> *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator
>
> *Responsible Agency for verification and enforcement*: SWRCB

3.14.5 Level of Impact after Implementation of Mitigation Program

Impact 3.14-1 Construction Noise, Central Project Site. MM N-1 has been designed to reduce construction noise impacts. However, during construction there will be a temporary increase in noise along Kaiser Road. This temporary traffic noise increase will not exceed Riverside County standards, and is deemed to be a less than significant impact.

Impact 3.14-2 Construction Noise, Linear Features. This impact is less than significant and no mitigation is required.

Impact 3.14-3 Operational Noise. This impact is less than significant and no mitigation is required.

No residual impacts to noise would occur with Project implementation.

3.15 Greenhouse Gas Emissions

The impact of all projects on climate change and the effect of climate change on projects are of growing concern. A major concern is that increases in greenhouse gases (GHGs) are causing global climate change. The accumulation of GHGs in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of GHGs in the atmosphere, and have contributed to an increase in the temperature of the earth's atmosphere. GHGs include all of the following gases; carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, nitrogen trifluroide (NF_3), and sulfur hexafluoride (California Health and Safety Code section 38505(g)). To account for the warming potential of different GHGs, GHG emissions are quantified and reported as CO_2 equivalents (CO_2e)[1]. The effects of GHG emission sources (i.e., individual projects) are reported in metric tons/year of CO_2e. This allows for convenient comparisons between projects that have different percentages of the seven GHGs.

3.15.1 Regulatory Setting

In 2005, in recognition of California's vulnerability to the potential effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of GHG would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80 percent below 1990 levels

3.15.1.1 Assembly Bill 32 (AB 32)

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions will be reduced to 1990 levels by 2020.

[1] CO_2e determinations are based on the Global warming potential (GWP) of the greenhouse gases. GWP is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide (whose GWP is by convention equal to 1). A GWP is calculated over a specific time interval and the value of this must be stated whenever a GWP is quoted or else the value is meaningless.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of CO_2 equivalents (CO_2e) of GHGs. The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2E, or approximately 30 percent, from the state's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual).

AB 32 required development of a mandatory reporting rule for major sources of GHGs. The CARB reporting rule (California Code of Regulations Title 17, Subchapter 10, Article 2, §95100 to 95133) became effective in January 2009. The rule requires reporting of GHG emission for:

- Cement plants
- Petroleum refineries ($\geq$ 25,000 metric tons of CO2 in any calendar year)
- Hydrogen plants ($\geq$ 25,000 metric tons of CO2 in any calendar year)
- Electric generating facilities and cogeneration facilities (> 1 MW capacity and > 2,500 metric tons of CO2 in any year)
- Electricity retail providers and marketers
- Other facilities that emit >25,000 metric tons of CO2, for stationary combustion sources, in any calendar year

Cement plants, oil refineries, fossil-fueled electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2e, make up 94 percent of the point source CO_2e emissions in California.

In June, 2008, CARB published its *Climate Change Draft Scoping Plan* that was approved and adopted by the CARB Board on December 11, 2008 as the *Climate Change Scoping Plan*. The *Climate Change Scoping Plan* reported that CARB met the first milestones set by AB 32 in 2007 by: (1) developing a list of early actions to begin sharply reducing GHG emissions; (2) assembling an inventory of historic emissions; and (3) establishing the 2020 emissions limit. Key elements of the *Climate Change Scoping Plan* include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets

- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation

The *Climate Change Scoping Plan* notes that "after Board approval of this plan, the measures in it will be developed and adopted through the normal rulemaking process, with public input."

The *Climate Change Scoping Plan* acknowledges that local governments are "essential partners" in the effort to reduce GHG emissions. Local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The *Climate Change Scoping Plan* encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020.

The *Climate Change Scoping Plan* also includes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures, shown in Table 3.15-1 by sector, also put the State on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels.

Table 3.15-1. List of Recommended Actions by Sector

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO2e)
Transportation		
T-1	Pavley I and II – Light Duty Vehicle Greenhouse Gas Standards	31.7
T-2	Low Carbon Fuel Standard (Discrete Early Action)	15
T-3[1]	Regional Transportation-Related Greenhouse Gas Targets	5
T-4	Vehicle Efficiency Measures	4.5
T-5	Ship Electrification at Ports (Discrete Early Action)	0.2
T-6	Goods Movement Efficiency Measures. • Ship Electrification at Ports	3.5

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO2e)
	• System-Wide Efficiency Improvements	
T-7	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)	0.93
T-8	Medium- and Heavy-Duty Vehicle Hybridization	0.5
T-9	High Speed Rail	1
Electricity and Natural Gas		
E-1	Energy Efficiency (32,000 GWh of Reduced Demand) • Increased Utility Energy Efficiency Programs • More Stringent Building & Appliance Standards Additional Efficiency and Conservation Programs	15.2
E-2	Increase Combined Heat and Power Use by 30,000 GWh (Net reductions include avoided transmission line loss)	6.7
E-3	Renewable Portfolio Standard (33% by 2020)	21.3
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities) • Target of 3000 MW Total Installation by 2020	2.1
CR-1	Energy Efficiency (800 Million Therms Reduced Consumptions) • Utility Energy Efficiency Programs • Building and Appliance Standards • Additional Efficiency and Conservation Programs	4.3
CR-2	Solar Water Heating (AB 1470 goal)	0.1
Green Buildings		
GB-1	Green Buildings	26
Water		
W-1	Water Use Efficiency	1.4†
W-2	Water Recycling	0.3†
W-3	Water System Energy Efficiency	2.0†
W-4	Reuse Urban Runoff	0.2†
W-5	Increase Renewable Energy Production	0.9†
W-6	Public Goods Charge (Water)	TBD†
Industry		
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	TBD
I-2	Oil and Gas Extraction GHG Emission Reduction	0.2
I-3	GHG Leak Reduction from Oil and Gas Transmission	0.9

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO2e)
I-4	Refinery Flare Recovery Process Improvements	0.3
I-5	Removal of Methane Exemption from Existing Refinery Regulations	0.01
Recycling and Water Management		
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane • Increase the Efficiency of Landfill Methane Capture	TBD†
RW-3	High Recycling/Zero Water • Commercial Recycling • Increase Production and Markets for Compost • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	9†
Forests		
F-1	Sustainable Forest Target	5
High Global Warming Potential (GWP) Gases		
H-1	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Services (Discrete Early Action)	0.26
H-2	SF_6 Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	0.3
H-3	Reduction of Perfluorocarbons in Semiconductor Manufacturing (Discrete Early Action)	0.15
H-4	Limit High GWP Use in Consumer Products Discrete Early Action (Adopted June 2008)	0.25
H-5	High GWP Reductions from Mobile Sources • Low GWP Refrigerants for New Motor Vehicle Air Conditioning Systems • Air Conditioner Refrigerant Leak Test During Vehicle Smog Check • Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers • Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems	3.3
H-6	High GWP Reductions from Stationary Sources • High GWP Stationary Equipment Refrigerant Management Program: o Refrigerant Tracking/Reporting/Repair Deposit Program	10.9

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO2e)
	o Specifications for Commercial and Industrial Refrigeration Systems • Foam Recovery and Destruction Program • SF Leak Reduction and Recycling in Electrical Applications • Alternative Suppressants in Fire Protection Systems • Residential Refrigeration Early Retirement Program	
H-7	Mitigation Fee on High GWP Gases	5
Agriculture		
A-1	Methane Capture at Large Dairies	1.0†

[1] This is not the SB 375 regional target. CARB will establish regional targets for each MPO region following the input of the regional targets advisory committee and a consultation process with MPO's and other stakeholders per SB 375.

† GHG emission reduction estimates are not included in calculating the total reductions needed to meet the 2020 target.

The total reduction for the recommended measures is 174 million metric tons/year of CO_2e, slightly exceeding the 169 million metric tons/year of CO_2e of reductions estimated to be needed. The measures in the *Climate Change Scoping Plan* will be developed and be in place by 2012.

3.15.1.2 Senate Bill 97

The provisions of Senate Bill 97, enacted in August 2007 as part of the State Budget negotiations, directed the Office of Planning and Research (OPR) to propose California Environmental Quality Act (CEQA) Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions." SB 97 directed OPR to develop such guidelines by July 2009, and directed the Natural Resources Agency, the agency charged with adopting the CEQA Guidelines, to certify and adopt such guidelines by January 2010.

3.15.1.3 Office of Planning and Research Amendments to the CEQA Guidelines

The Legislature directed the OPR to develop CEQA Guidelines pertaining to GHG emissions by July 1, 2009 and to adopt the guidelines by January 1, 2010. OPR submitted recommended Amendments to the CEQA Guidelines for GHG emissions to the Natural Resources Agency on April 13, 2009. On July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code Section 21083.05. The Natural Resources Agency transmitted the adopted Amendments and the entire rulemaking file to the Office of Administrative Law (OAL) on December 31, 2009.

On February 16, 2010, the OAL approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010 (OPR, 2010). The amendments provide relatively modest changes to various portions of the existing CEQA Guidelines. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis.

The amendments include a new section (15064.4) to assist lead agencies in determining the significance of the GHG impacts. This section urges lead agencies to quantify, where possible, the GHG emissions of proposed projects. In addition to quantification, this section recommends consideration of several other qualitative factors that may be used in determination of significance, including: (1) the extent to which the Project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the GHG emissions exceed a threshold of significance that the lead agency determines applies to the Project; and (3) the extent to which the Project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The amendments include a new subdivision (15064.7(c)) to clarify that in developing thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

In addition, the amendments add a new set of environmental checklist questions to the CEQA Guidelines Appendix G. The new set includes the following two questions for GHG emissions, which are the basis for the impact level of significance thresholds in this Draft Environmental Impact Report:

Would the project:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG?

3.15.2 Existing Conditions

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun and re-radiated from the Earth's surface as it is reflected back into the atmosphere, roughly analogous to the retention of heat energy in a greenhouse. The accumulation of GHGs has been implicated as a driving force for global climate change.

Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the Earth's climate caused by natural fluctuations and the impact of human activities that alter the composition of the global atmosphere. Both natural processes and human activities emit GHGs.

Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. Although there is disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, the majority of the scientific community now agrees that there is a direct link between increased emission of GHGs due to human activity and long term global temperature. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

The accumulation of GHGs in the atmosphere regulates the Earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of GHGs in the atmosphere.

3.15.3 Potential Environmental Impacts

3.15.3.1 Methodology

Four types of assessments are used to determining whether the Project could be in conflict with the State goals for reducing GHG emissions. The assessments are shown below:

A. Identify any potential conflicts with the CARB's 39 recommended actions.

B. Evaluate the relative size of the Project. The Project's GHG emissions will be compared to the size of major facilities that are required to report GHG emissions ($\geq$25,000 metric tons/year of CO_2e)[2] to the State; and the Project size will be compared to the State goal of reducing 169 million metric tons per year of projected CO_2e emissions in 2020. As noted above the 25,000 metric ton annual limit identifies the large stationary point sources in California that make up approximately 94 percent of the stationary emissions. If the Project's total emissions are below this limit, its total emissions are equivalent in size to the smaller projects in California that as a group only make up 6 percent of all stationary emissions. It is assumed that the activities of these smaller projects generally would not conflict with State's ability to reach AB 32 overall goals. In reaching its goals the CARB will focus upon the largest emitters of GHG emissions.

[2] The State of California has not provided guidance as to quantitative significance thresholds for assessing the impact of greenhouse gas emissions on climate change concerns. Nothing in the CEQA Guidelines directly addresses this issue.

C. Evaluate the basic energy efficiency parameters of a project to determine whether its design is inherently energy efficient.

D. Identify any potential conflicts with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

3.15.3.2 Thresholds of Significance

CEQA Checklist Appendix G regarding GHG emissions reflects OPR's recommended guidelines for analysis of GHG emissions in CEQA documents. For this Project, the Project would be considered to have a significant impact if the Project:

(a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

(b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

3.15.3.3 Environmental Impact Assessment

With regard to Assessment Item A (potential conflicts with the CARB's 39 recommended actions), the proposed Project does not pose any apparent conflict with the CARB recommended actions (*see* Table 3.15-1). The project would support Measure E-3, the State of California's Renewables Portfolio Standard (RPS) by providing an effective means for full integration of renewable energy generated in periods of low electrical demand.

With regard to Assessment Item B (evaluate the relative size of the Project), Project construction GHG emissions during the maximum year would be approximately 8,467 metric tons/year of CO_2e and Project operations (i.e., employee trips) would be a maximum of approximately 303 metric tons/year of CO_2e. The Project would not be classified as a major source of GHG emissions.

In addition, Project operations would generate electricity during peak demand periods and as needed to support transmission grid operations. This electrical generation from the Project would offset electrical generation from fossil fueled plants. Typically, peaking power is provided by simple cycle natural gas generating plants (also known as "peaker plants"). Assuming the proposed Project generates 2,278 Gwh/year, the Project would offset emissions from fossil fuel generation by as much as 1,115,000 metric tons/year of CO_2e.

Table 3.15-2 shows overall emissions of CO_2 comparing power generation and pump-back power. The pump-back power required is greater than the power that is generated by the facility, however, due to the timing and source of power from which pump-back power (generally from plants with low air emissions) is derived, and the displacement of other peak power sources (generally peaker plants with higher emissions), overall emissions of CO_2 would be reduced by the overall system operation. Table 3.15-2 compares two scenarios for maximum and minimum displacement scenarios. Proposed Project generation is assumed to displace emissions from simple cycle power plants (natural gas-fired peaker plants). The difference in the scenarios is that pump-back power is assumed to be generated by renewable sources (generating no air pollutants) in the maximum displacement scenarios and by combined cycle power plants[3] in the minimum displacement scenarios.

In most cases, the pump-back power would probably include a mix of power from the combined cycle power plants and the renewable sources so the actual emissions displaced would fall between the maximum and minimum displaced amounts shown. As shown in Table 3.15-2, the proposed Project would be expected to have a net benefit for the State with regard to the generation of CO_2 pollutant emissions. The proposed Project power generation would reduce reliance on simple cycle power plants (displacing their CO_2 pollutant emissions) during peak periods of electricity demand and rely on cleaner power plants (including renewable power projects) for pump-back power during periods of low electricity demand.

Table 3.15-2. Annual Electrical Generation Greenhouse Gas Emissions (metric tons)

	Power Source		**CO_2**
Pump-back Power Used	Renewable Sources	GWh/Year	2,883
		Emission Factor (lbs/GWh)	0
	[A]	Annual Pollutants (metric tons)	0
	Combined Cycle	GWh/Year	2,883
		Emission Factor (lbs/GWh)	815,000
	[B]	Annual Pollutants (metric tons)	1,065,796
Generation Displaced	Simple Cycle	GWh/Year	2,278
		Emission Factor (lbs/GWh)	1,080,000
	[C]	Annual Pollutants (metric tons)	1,115,751
Summary of Displaced Emissions			
		Maximum Displaced Net Emissions Rows [C] - [A] (metric tons)	1,115,751
		Minimum Displaced Net Emissions	

[3] In a combined cycle power plant a gas turbine generator generates electricity and the waste heat is used to make steam to generate additional electricity via a steam turbine; this last step enhances the efficiency of electricity generation. These types of plants are expensive to build and are generally used a base load plants, generating power during both peak and off-peak time periods.

Rows [C] - [B] (metric tons)	49,955

Notes: These emissions have been calculated using emissions factors from *Comparative Costs of California Central Station Electricity Generation* (CEC, 2010) for conventional simple cycle and combined cycle power plants. The analysis assumes 2,278 GWh of annual generation for the proposed Project (1.3 MW for 20% of the annual hours). The pump-back efficiency is 79%, resulting in more GWh/year required for the pump-back power requirements than are generated annually. Different amounts of annual generation would have directly proportional benefits of displacing CO_2 emissions.

In addition, by providing energy storage and ancillary services for transmission grid operations, the proposed Project would allow successful integration of reliable wind and solar power to meet the State's RPS of 33 percent of 2020. The proposed Project as an energy storage facility would leverage the increased use of alternative renewable sources of power such as wind and solar to displace generation of fossil-fueled power plants by firming the energy made from renewables. Storage of energy at Eagle Mountain would increase the value of renewable energy sources, especially wind but also solar, to the equivalent reliable capacity of fossil fuels because of the proposed Projects' ability to store and dispatch that energy when needed and not just when the wind blows or the sun is shining. Essential benefits for efficiently operating the transmission grid with large scale (33 percent) integration of intermittent generation sources (wind and solar power), including voltage regulation, spinning reserves, and load following, would also be realized.

With regard to Assessment Item C (evaluate the basic energy efficiency parameters of a project), the proposed Project would assist in the State's ability to meet the AB 32 goals and overall State reduction goal of approximately 169 million metric tons/year of CO_2e, and achieving the statewide renewable energy mix of 33 percent.

With regard to Assessment Item D (identify any potential conflicts with any applicable plan, policy, or regulation), the proposed Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

The review of Assessment Items A, B, C, and D indicate that the proposed Project would not conflict with the State goals in AB 32 and therefore this potential impact would *be less than significant*.

<u>Environmental Impact Summary</u>:

(a) *Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment*? No. The proposed Project would offset CO_2e production and enhance integration of reliable of wind and solar power.

(b) *Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?* No. The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Impact 3.15-1 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. This impact is *less than significant*. The proposed Project would offset CO_2e production and enhance integration of reliable of wind and solar power to meet the State's RPS, thus having a beneficial impact on GHG production.

Impact 3.15-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts would be *less than significant.* The State Water Resources Control Board currently does not have an adopted climate action plan or general plan policies related to GHG emissions. In addition, the proposed Project would not conflict with the State's ability to reach the overall goals of AB 32. Therefore, the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

3.15.4 Mitigation Program

In addition to not conflicting with State Goals in AB 32 or 97, the proposed environmental measures associated with Section 3.12 Air Quality would also reduce the GHG emissions from the proposed Project.

3.15.5 Level of Impact after Implementation of Mitigation Program

Based upon the foregoing analysis, it is concluded that the proposed Project would not contribute to an increase in GHG emissions, and no mitigation for greenhouse gas emissions is required. This conclusion is based upon the analyses in Table 3.15-2. The most likely future scenario would be that power generation from the proposed Project would displace simple cycle power plants (natural gas-fired peaker plants) and that pump-back power would result in the dispatch of power from natural gas-fired combined cycle power plants. Under this scenario there would be a beneficial effect from each cycle of water through the proposed Project. Table 3.15-2 uses CO_2 emission factors for simple cycle and combined cycle power plants recommended by the CEC (CEC, 2010).

This analysis is based upon existing generation sources and conditions in California, and does not assume that cleaner generation sources would be available for the proposed project's pump-back power in the future. Although it is not possible to accurately predict the energy generation mix in California over the next 50 years, it can be reasonably assumed that sources of generation will become cleaner (i.e., lower greenhouse gas emissions) over decades to come, and the total emissions associated with pump-back power would likely decrease over the proposed 50-year life of the proposed Project, potentially resulting in a greater level of emissions offset than the amounts presented in Table 3.15.2.

3.16 Hazards and Hazardous Material

This section of the Draft Environmental Impact Report discusses the existing conditions at the Eagle Mountain Pumped Storage Hydroelectric Project (Project) site, and the potential public health and environmental issues related to hazards and the use of hazardous materials associated with construction and operations proposed for the Project area. This section also describes potential wildland fire hazards. Section 3.1 Geology and Soils provides details on potential seismic and geologic hazards; Section 3.2 Surface Water contains a discussion of potential flood hazards; and Sections 3.13 Air Quality and 3.15 Greenhouse Gas Emissions provide details about air emissions.

3.16.1 Regulatory Setting

The following Federal, State, and local laws and policies apply to the protection of public health and hazardous materials management. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local laws, ordinances, regulations, and standards (LORS).

3.16.1.1 Federal

U.S. Environmental Protection Agency (EPA) is responsible for the implementation and enforcement of Federal laws and regulations governing hazardous materials. The legislation includes the Resource Conservation and Recovery Act of 1986, which creates a framework for the management of hazardous wastes. The Superfund Amendment and Reauthorization Act of 1986 (SARA), Title III, the Comprehensive Environmental Response, Compensation, and Liability act of 1980, and the Clean Air Act of 1990. SARA, codified in 40 Code of Federal Regulations (CRF), Section 68.110 et seq., requires states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials are stored or handled at a facility. The EPA is actively involved in the oversight and process for site investigations and remediation projects. The EPA has also established restrictions and treatment standards for the disposal of hazardous materials.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and the Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The SARA (codified in 40 CFR, §68.110 et seq.) requires states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California Health and Safety Code, Section 25531 et seq.

3.16.1.2 State

California Department of Toxic Substances Control (DTSC) coordinates with the EPA to ensure implementation and enforcement of applicable laws and regulations pertaining to hazardous materials and waste disposal methods. The Hazardous Waste Control Act and

Hazardous Substance Account Act can be found under Title 22 of the California Code of Regulations (CCR).

California Health and Safety Code Section 25534 directs facility owners, storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the EPA, and the designated local Administering Agency for review and approval. The RMP must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material.

California Health and Safety Code Section 41700 requires that "No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Title 8, California Code of Regulations Section 5189 requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

California Government Code Section 65850.2 restricts the issuance of an occupancy permit to any new facility involving the handling of acutely hazardous materials until the facility has submitted an RMP to the administering agency with jurisdiction over the facility.

3.16.1.3 Local

Riverside County Ordinance 457. This Ordinance adopts specific building, mechanical, plumbing, and electrical codes from sources such as the California Building Standards Commission with county-specific modifications.

Riverside County Ordinance 787 adopts the 2007 edition of the California Fire Code and portions of the 2007 edition of the California Building Code with county specific modifications.

Riverside County Ordinance 615 establishes requirements for the use, generation, storage and disposal of hazardous materials within Riverside County.

Riverside County Department of Environmental Health, Hazardous Materials Releases adopts State requirements and guidelines to govern hazardous materials release response plans and inventories.

National Fire Protection Association Standards 850, 58, 15, and 54 address the storage of and safety measures for Liquefied Petroleum gases.

3.16.2 Existing Conditions

3.16.2.1 Hazardous Materials

The term hazardous substance refers to both hazardous materials and hazardous wastes. A material is defined as hazardous if it appears on a Substances Control list of hazardous materials prepared by a Federal, State or local regulatory agency, or if it has characteristics defined as hazardous by such an agency. The California Environmental Protection Agency, Department of Toxic Substances Control (Cal/EPA, DTSC) defines hazardous waste, as found in the California Health and Safety Code Section 25141(b), as follows:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed. *(CCR, Title 22, Section 66260.10).*

Hazardous materials include liquids, solids, and gases which, by themselves or when placed in contact with other materials, can result in contamination of soil or water, poisonous vapors, fires, or explosions. An inadvertent release of hazardous materials can enter the environment via air, soil transport, or surface runoff. When improperly stored or disposed, hazardous materials can contaminate soil and groundwater or surface water and pose a general health hazard to the population via poisonous vapors, fumes, or explosions. Hazardous materials are used and created by industry every day, and are commonly found in household items such as insecticides, waste motor oil, and cleaning fluids.

Public health is potentially at risk whenever hazardous materials are, or will be used. It is necessary to differentiate between the “hazard” of these materials and the acceptability of the “risk” they pose to human health and the environment. A hazard is any situation that has the potential to cause damage to human health and the environment. The risk to health and public safety is determined by the probability of exposure, in addition to the inherent toxicity of a material. Factors that can influence the health effects of exposure to hazardous materials include: the dose the person is exposed to, the frequency of exposure, the duration of exposure, the exposure pathway (route by which the hazardous material enters a person’s body), and the individual’s unique biological susceptibility.

The Cal/EPA, DTSC maintains a list of hazardous waste substance sites, also known as the “Cortese list.” The list receives information from the CalSites database of hazardous waste sites, Leaking Underground Storage Tanks database, and the California Integrated Waste Management Board database of sanitary landfill sites with evidence of groundwater contamination. The most current list had one site located within the Project vicinity. The nearest site is over 10 miles away (EnviroStor Database, accessed April 2010).

The potential human and ecological health concerns related to hazards and the use of hazardous materials within the proposed Project include, but are not limited to: fire hazards, exposure to toxic air emissions, and exposure to petroleum products, during both construction and operations.

3.16.2.2 Background and Site Conditions

3.16.2.2.1 *Existing Hazards Materials*

The Project area was an open pit iron mine, until the mine closed in 1983. Appendix P of the Eagle Mountain Landfill Specific Plan # 305 and 306 included a summary of all of the contaminant surveys conducted on the proposed landfill site. All of the surveys concluded that there was no evidence of hazardous substances or obvious signs of any effects of contamination. Upon completion of the Level I surveys, the Bureau of Land Management recommended that no subsequent, more detailed surveys need be conducted to assess for potential contamination (CH2MHill 1997).

3.16.2.2.2 *Worker Safety*

The Central Project Area has been used for military training in recent years (Kaiser Eagle Mountain, LLC and Mine Reclamation, LLC, Protest and Motion to Intervene, Project Number 13123, filed with FERC, March 10, 2010). As a result, the Project site may contain unexploded ordinance (UXO). In addition, the Project site is in the vicinity of General George Patton’s training camps, used during World War II. Live fire training occurred throughout this desert region at that time. Therefore, there is also the potential for UXO in the portion of the Project area where the linear features (transmission line and water pipeline) will be located.

3.16.2.2.3 *Fire Hazards*

During construction and operation of the Project, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, hydraulic fluid, mineral oil, insulating fluid at the powerplant switchyard or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to develop at powerplants. Compliance with all LORS would be adequate to assure protection from all fire hazards.

The Project will rely on both on-site fire protection systems and local fire protection services. The on-site fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the Riverside County Fire Department.

During construction, the permanent fire protection systems proposed for the pumped storage hydroelectric facility would be installed as soon as practical; until then portable fire extinguishers would be placed throughout the site at appropriate intervals and periodically maintained. Safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Plan.

3.16.3 Potential Environmental Impact

3.16.3.1 Methodology

The environmental impact analysis focused on the hazardous materials potentially present on the site, worker safety, and fire hazards at the Project site. The reservoirs and powerhouse are not located within ¼-mile of an existing or proposed school nor are they within a 2-mile radius of an existing public airport. The proposed Project would comply with Riverside County regulations regarding adequate emergency access for emergency evacuation or response.

3.16.3.2 Thresholds of Significance

The State Water Resources Control Board concludes that the Project may have significant impacts on hazards and hazardous materials if any of the following would occur:

(a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials

(b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

(c) Emits hazardous emissions or handles hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school

(d) Is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment, (the Cortese list is compiled pursuant to Government Code Section 65962.5) and/or

(e) Exposes people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas

3.16.3.3 Environmental Impact Assessment

Historical use of the site included General George Patton’s Desert Training Camps during World War II. Live-fire training occurred throughout the area. In addition, military training has been conducted on Kaiser lands in the Central Project Area. Therefore, there is the potential for unexploded ordinance to be encountered during Project construction.

During the construction phase of the Project, hazardous materials proposed for use include paint, solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases. No acutely toxic hazardous materials will be used on site during construction, and none of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards even in larger quantities.

During operations, hazardous chemicals such as cleaning agents, water treatment chemicals, welding gasses, oils, activated carbon, and other various chemicals would be used and stored in relatively small amounts and represent limited off-site hazards because of their small quantities, low volatility, and/or low toxicity.

The findings of impact are based on an assessment of the changes attributable to implementation of the Project relative to the thresholds of significance listed above.

<u>Environmental Impact Assessment Summary</u>:

(a) *Would the project create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?* No. Transport of such materials is subject to regulatory controls.

(b) *Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?* No. The use, storage, and disposal of such materials are subject to regulatory controls.

(c) *Would the project emit hazardous emissions or handles hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?* No. The closest school is located more than one mile away.

(d) *Is the project site located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?* No. The site is not located on this list.

(e) *Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas?* No. The Project is a pumped storage facility whereby the not posing any significant risk to wildfires.

Impact 3.16-1 Hazardous Materials during Construction. Due to the proximity of the transmission line to the World War II-era camps, and the recent history of military training on the Central Project site, any unexploded ordnance (UXO) found on-site could be hazardous to workers on-site. This impact is considered *potentially significant and subject to the mitigation program* (MM HM-1). The Project Contractor and Environmental Coordinator will implement a UXO Identification, Training and Reporting Plan (UXO Plan) to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance.

Hazardous materials transported, stored and/or used onsite during proposed Project construction and operation (i.e., petroleum products, lubricants, solvents) could potentially be spilled or released into the atmosphere if improperly stored and/ or handled. However, the Project will comply with Federal, State, and local hazardous material LORS to insure that construction products will not be improperly stored or handled.

Impact 3.16-2 Hazardous Materials during Operation. Hazardous material usage in the vicinity would mainly be limited to the Project site. The Project site is not located within ¼ mile of a school. This impact is therefore considered to be *less than significant.*

Impact 3.16-3 Located on a Hazardous Materials Site per Government Code Section 65962.5. The site is not on a list of hazardous materials sites pursuant to Government Code Section 65962.5. This impact is therefore found to be *less than significant.*

3.16.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs). Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards have been built into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, State, or Federal regulations or laws that are frequently required independent of the California Environmental Quality Act review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable Federal, State, and local LORS.

MM HM-1. **UXO Plan.** The Contractor, in consultation with the Project owner's Environmental Coordinator, shall implement a UXO Identification, Training and Reporting Plan (UXO Plan) to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance. Implementation shall include: (1) a description of the training program outline and materials, and the qualifications of the trainers; (2) identification of available trained experts that will respond to notification of discovery of any ordnance (unexploded or not); (3) a work plan to recover and remove discovered ordnance; and (4) work stoppage until site is determined clear by the Environmental Coordinator.

Verification: The UXO Plan shall be implemented no less than 60 days prior to the initiation of construction activities at the site.

Implementation Timing: Final engineering/pre-construction/construction

Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor

Responsible Agency for verification and enforcement: SWRCB/FERC

3.16.5 Level of Significance after Implementation of Mitigation Program

Impact 3.16-1 Hazardous Materials during Construction. Hazardous materials will be transported, stored and/or used onsite during proposed Project construction and operation in compliance with Federal, State, and local LORS making the potential impacts less than significant. Risks to workers from UXO will be reduced to *less than significant* through the implementation of mitigation measure HM-1.

Impact 3.16-2 Hazardous Materials during Operation. This impact is considered to be *less than significant* and no mitigation required.

Impact 3.16-3 Located on a Hazardous Materials Site per Government Code Section 65962.5. This impact is considered to be *less than significant* and no mitigation required.

No residual impacts to hazards or hazardous materials would occur with Project implementation.

4 Alternatives Analysis

4.1 Introduction

The California Environmental Quality Act (CEQA) and State CEQA Guidelines §15126.6 require consideration and discussion of alternatives of a Proposed Project in an EIR. The purpose of the alternatives analysis is to identify ways to mitigate or avoid the potentially significant adverse effects that may result from implementation of the Proposed Project. This chapter identifies and considers alternatives to the Eagle Mountain Pumped Storage Project (Proposed Project) in comparison to the Proposed Project.

CEQA provides the following guidelines for discussing alternatives to a Proposed Project:

- The EIR must describe a reasonable range of alternatives to the project that would *"…feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives."* [State CEQA Guidelines §15126.6(a)];

- The EIR must identify ways to mitigate or avoid significant effects of the project on the environment: *"…the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly."* [State CEQA Guidelines §15126.6(b)];

- The range of potential alternatives to the Proposed Project shall include those that could feasibly accomplish most of the basic objectives of the project and those that could avoid or substantially lessen one or more of the significant adverse effects. If there is a specific Proposed Project or a preferred alternative, the EIR must explain why other alternatives considered in developing the Proposed Project were rejected in favor of the proposal. "*The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination."* [State CEQA Guidelines § 15126.6(c)];

- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project. "*If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."* [State CEQA Guidelines §15126.6(d)];

- The specific alternative of "no project" *"shall be evaluated along with its impact."* The purpose of describing and analyzing a no project alternative is to allow *"decision-makers to compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project."* The CEQA Guidelines also stipulate that the "no project" analysis *"shall discuss the existing conditions at the time the (EIR) Notice of Preparation is published...as well as what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans..."* [State CEQA Guidelines §15126.6(e)];

- The State CEQA Guidelines also instruct that *"If the environmentally superior alternative is the No Project Alternative, the EIR shall also identify the environmentally superior alternative among the other alternatives."* [CEQA Guidelines §15126.6(e)(2)]; and

- Under the State CEQA Guidelines §15126.6(f), the range of alternatives required in an EIR is governed by a "rule of reason" that requires an EIR to set forth only those alternatives necessary to permit a reasoned choice. *"The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making."*

4.2 Overview of the Alternative Selection Process

The alternative selection process involved the following sequence of steps:

(1) Identification of Proposed Project goals and objectives
(2) Identification of potentially significant impacts to the Proposed Project
(3) Development of evaluation criteria
(4) Review of a range of alternatives
(5) Identification of those alternatives that meet the criteria and explanation of why alternatives were rejected as infeasible
(6) Evaluation of alternatives based upon comparative environmental impact assessment

4.3 Summary of Goals and Objectives for the Proposed Project

Goals and objectives for the proposed Project can be summarized as follows (see also Project Description, Section 2.1.2 of this EIR):

GOAL AND OBJECTIVE #1 – Support California's Energy Policy

The State's energy policy is described in the California Energy Commission's, *2009 Integrated Energy Policy Report*. This report states that the driving force for California's energy policy is maintaining a reliable, efficient, and affordable energy system that minimizes the environmental impacts of energy production and use. The Policy Report also calls for projects that provide affordable peak power generation and storage of energy to support renewable energy production, (CEC 2009).

The CEC recognizes that although the recent economic downturn has reduced growth in energy demand in the short-term, demand is expected to grow over time as the economy recovers. The CEC states that “it is essential that the state’s energy sectors be flexible enough to respond to future fluctuations in the economy and that the state continue to develop and adopt the “green” technologies that are critical for long-term reliability and economic growth” (CEC 2009).

GOAL AND OBJECTIVE #2 – Provide Generation to Meet Part of California’s Peak Power Requirements

An additional goal of the project is to provide hydroelectric generation to meet part of California’s power requirements, resource diversity, and capacity needs. Peak demand is forecast to increase in California by 1.3 percent per year between 2010 and 2018 (Kavalek and Gorin, 2009). Additional generation will be needed to continue to meet peak power demands.

GOAL AND OBJECTIVE #3 – Provide Energy Storage for Integration of Renewable Energy Generation. Energy storage allows integration of intermittent renewable energy generation (primarily wind and solar power) for attainment of California’s Renewable Portfolio Standards (RPS) and Greenhouse gas (GHG) reduction goals.

GOAL AND OBJECTIVE #4 – Provide Ancillary Services for Management of the Transmission Grid

Ancillary services – including spinning reserves, voltage regulation, load following, Black Start, and protection against over-generation – ensure reliability and support the transmission of energy from generation sites to customer loads.**GOAL AND OBJECTIVE #5 - Provide for Flexible Transmission Grid Operations**

On-demand peak power generation provides operational improvements in the electrical grid to substantially improve transmission efficiency, reliability, and affordability, while fully incorporating renewable and traditional energy sources and reducing carbon emissions.

GOAL AND OBJECTIVE # 6 - Reduce Greenhouse Gas Emissions

California Assembly Bill 32, the Global Warming Solutions Act of 2006, established the goal of reducing greenhouse gas emissions to 1990 levels by 2020. Operating a “smarter” transmission grid reduces waste, thus reducing GHG emissions. Integrating renewable energy generation sources that do not produce GHG emissions, and providing GHG-free peak power generation, will displace traditional fossil-fueled GHG-producing peak power generation, thus contributing to GHG emissions reductions within the State and southwestern region.

GOAL AND OBJECTIVE # 7- Re-Use Existing Industrial Sites

The environmental impacts of energy generation can be minimized by siting facilities on previously disturbed industrial sites such as the Eagle Mountain Mine ("brownfield" sites) rather than natural lands and habitats that have not been previously developed for intensive human uses ("greenfield" sites).

GOAL AND OBJECTIVE # 8 - Locate Energy Generation Adjacent to the Transmission Grid

By locating energy generation facilities in close proximity to the transmission grid, the environmental impacts of the construction and operation of transmission interconnection is minimized. In addition, shorter transmission interconnection results in reduced project costs, ultimately benefiting California rate payers. The Eagle Mountain Project is within approximately 15 miles of a major transmission corridor (including the 500 kV Palo-Verde Devers 1 Transmission Line and the pending 500 kV Palo-Verde Devers 2 line), serving southern California energy markets.

GOAL AND OBJECTIVE # 9 - Generate Hydropower Without Causing Impacts to Surface Waters and Aquatic Ecosystems

By developing the Eagle Mountain Pumped-Storage Project in existing mining pits and utilizing groundwater for its working fluid (initial fill and annual make-up water), impacts to streams, fisheries resources, wetlands, aquatic ecosystems, and associated recreational resources that are normally associated with hydropower generation are completely avoided.

GOAL AND OBJECTIVE # 10 - Redevelopment of the Eagle Mountain Mines – Central and Eastern Pits

The Central Pit of the Eagle Mountain Mine will be utilized for the Upper Reservoir. The East Pit of the Eagle Mountain Mine will form the lower reservoir for the Project. The mining pits are empty and have not been actively mined for decades. The Project reservoirs will be formed by filling the existing mining pits with water. There is an elevation difference between the reservoirs that will provide an average net head of 1,410 feet. Redevelopment of these mining pits provides necessary project components without the need for massive earthwork.

4.4 Potentially Significant Impacts of the Proposed Project

Impacts that have been determined to be significant, adverse and unavoidable with implementation of the proposed Pumped Storage Project include visual impacts of a segment of the required transmission line that can be seen from the I-10 corridor, cumulative effects of groundwater use of this Proposed Project combined with a proposed landfill project and multiple solar energy projects, and emissions of NOx from heavy equipment during construction which exceed air basin thresholds.

Mitigation is identified to reduce each of these effects, but it has been determined that these potential impacts cannot be fully mitigated, summarized as follows:

Impact 3.7-5 Aesthetic Impact of the Transmission Line from the Eagle Mountain Road to Interconnection Substation. While PDFs are included in the design element and mitigation measures are proposed (MM AES-3, MM AES-4), there is no mitigation available to reduce the potentially significant visual impact to a level that would be less than significant. It is therefore concluded that project implementation would result in *unavoidable and adverse significant impacts* to aesthetic resources.

The primary mitigation for the visual effects of transmission line segment parallel to I-10 corridor from Eagle Mountain Road to new substation south of Desert Center is a single taller transmission corridor, with lines hung on lattice towers in gray or brown color to blend with background landscape.

Impact 3.12-2 Daily Emissions during Construction. Emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x, where the threshold is 100 ppd. Mitigation (MM AQ-1 through MM AQ-13) for air quality during construction includes specific standards for construction equipment emissions controls, operations and construction. However, even with the implementation of mitigation, the proposed Project will result in a significant construction-related impact from NO_x in construction years 2012 through 2014. Therefore the NO_x impact is *significant*. Other air quality parameters will not exceed the threshold of significance

Cumulative Impact to Groundwater Supply: While potential impacts to the groundwater basin are determined to be less than significant on an individual project basis, in conjunction with water use for the proposed solar projects and Eagle Mountain Landfill, the project would contribute to cumulative overdraft of the regional aquifer over the 50-year operational period. Mitigation for water use, water quality, and protecting the CRA includes:

- A groundwater level monitoring network will be developed to confirm that Project pumping is maintained at levels in the range of historic pumping **(**MM GW-1);

- Wells on neighboring properties whose water production may be impaired by Project groundwater pumping will be monitored during the initial fill pumping period. If it is determined that Project pumping is lower water levels in those wells by 5 feet or more, the Project will either replace or lower the pumps, deepen the existing well, construct a new well, and/or compensate the well owner for increased pumping costs to maintain water supply to those neighboring properties (MM GW-2).

- Seepage will be limited from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the brine disposal ponds that will be part of the water quality management system for the Project. Seepage control from the Project reservoirs will be accomplished using systematic procedures (PDF GW-1).

- Two extensiometers shall be constructed to measure potential inelastic subsidence that could affect operation of the CRA; one in the upper Chuckwalla Valley near OW-3 and the other in the Orocopia Valley near OW15 (MM GW-3).

- Seepage from the Lower Reservoir will be extracted through seepage recovery wells to prevent a significant rise in water levels beneath the CRA (MM GW-4).

- Seepage from the Upper Reservoir will be controlled through a separate set of seepage recovery wells, to maintain local groundwater levels below the bottom elevation of the landfill liner (MM GW-4).

- In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels (PDF GW-2).

- Water quality sampling will be done at the source wells, and within the reservoirs, and in Monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and other potential contaminants as needed to maintain groundwater effects at less than significant levels (MM GW-6).

- Existing wells within the central and eastern mining pits to be developed as Project reservoirs will be replaced at locations outside of the reservoirs (MM GW-7).

All other potential impacts are deemed to be mitigated to less than significant levels through implementation of the mitigation program (PDFS, regulatory compliance, and project-specific mitigation measures) identified throughout this DEIR as recommended conditions of approval.

4.5 Alternatives Evaluation Criteria

Once identified, the alternatives were evaluated based on the following criterion. An alternative had to meet all criteria to be considered for further analysis in the DEIR.

- **Criterion 1:** The alternative must feasibly attain most of the Proposed Project's objectives. This criterion focuses on identifying which alternatives were capable of achieving the same results as the Proposed Project (i.e., meeting the goals and objectives of the Proposed Project) in a feasible manner. "*Feasible*" is defined in the CEQA Guidelines §15364 as: "*capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.*";

- **Criterion 2:** Section 15126.6 of the CEQA Guidelines requires examination of a reasonable range of alternatives to the proposal. As part of the EIR certification process and action on the proposed project, the lead agency determines whether or not the alternatives are feasible; and

- **Criterion 3:** The alternative must avoid or substantially lessen an identified significant adverse environmental impact of the Proposed Project.

4.6 Alternatives Considered and Incorporated as Project Design Features

This alternatives analysis is constrained in part due to the fact that numerous alternative design elements and configurations have already been incorporated by the project applicant as a result of input received during the scoping and planning processes for the proposed project, with a goal to limit environmental impacts of the project. Changes were made in response to comments received by public agencies, the landfill project's sponsors, and concerned citizens. Additional alternatives were identified based upon findings and recommendations of technical studies. The alternatives initially considered [and summarized below] have been incorporated into the Proposed Project as design feature adjustments to the original proposal.

- Transmission route and footprint reduced from about 52 miles to about 14 miles.

- Transmission route alignment selected to follow existing transmission corridor and road corridor to the extent reasonably feasible, and the interconnection substation was relocated to avoid a sensitive historic site at I-10 and Eagle Mountain Road.

- Transmission was reconfigured from two parallel 500-kV corridors to a single double circuit 500-kV corridor on a taller single lattice tower to reduce the transmission footprint, visual intrusion, and related impacts on desert habitat and designated critical habitat areas by half.

- Well field location and well spacing was established to minimize potential interference with other area wells, and the water line corridor is collocated with existing roads and utility corridors to minimize new habitat disturbance.

- The locations, layout and footprint for the switchyard, administrative offices, RO ponds, and a segment of the transmission line have been revised to avoid conflicts with the proposed future Eagle Mountain landfill project.

In addition, the following project design features have been included by the applicant as a part of the proposed project:

PDF GW-1. Groundwater Seepage. The Owner will limit seepage from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the brine disposal ponds that will be part of the water quality management system for the Project. Final design for seepage control will be approved by FERC prior to construction. Seepage control from the Project reservoirs will be accomplished using systematic procedures such as design and construction control measures that will include the following:

- During final engineering design, a detailed reconnaissance of the reservoir basins and pond areas will be conducted to identify zones where leakage and seepage would be expected to occur. These areas will include faults, fissures and cracks in the bedrock, and zones that may have direct connection to the alluvial deposits of the Chuckwalla Valley. During the reconnaissance, the effectiveness of various methods for seepage and leakage control to mitigate the effects of these particular features will be evaluated, including grouting, seepage blankets, and RCC or soil cement treatments, and other methods if needed.
- Methods for seepage and leakage control will include curtain grouting of the foundation beneath the dam footprint and around the reservoir rim, as needed; backfill concrete placement and/or slush grouting of faults, fissures, and cracks detected in the field reconnaissance; placement of low permeability materials over zones too large to be grouted and over areas of alluvium within the lower reservoir; seepage and leakage collection systems positioned based upon the results of the hydrogeologic analyses; and clay or membrane lining of the brine ponds associated with the Project's water quality management system. The collection systems would recycle water into the Project reservoirs or the reverse osmosis system.
- Design and construction of a Comprehensive Monitoring Program, consisting of observation wells and piezometers that will be used to assess the effectiveness of the seepage and leakage control measures.

Based on monitoring results, additional actions may be taken to further control leakage and seepage from the reservoirs and ponds. Such measures may include curtain grouting and the expansion of seepage and leakage collection systems.

Other measures, such as use of stepped RCC or soil cement overlay on the eastern portion of the lower reservoir may also be used depending on results of final engineering design analyses.

In addition, portions of the tunnels and shaft of the Project will experience very high water pressures; whereas, current plans are based on lining of the tunnels with concrete, and in some locations steel liners will be installed. These liners will also effectively block seepage from occurring.

PDF GW-2: Water Treatment. Groundwater mitigation measures proposed by the applicant consist of engineered structural features associated with Project facilities. This consists primarily of an Reverse Osmosis desalination facility and brine disposal lagoon to remove salts and metals from reservoir water and maintain TDS concentrations at the level of the source water.

PDF BIO-1: Pre-Construction Special Species and Habitat Survey. Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2.

PDF BIO-2: Pre-construction Plant Survey. Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 , 2009 and 2010 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least three feet high, and no more than 10 feet apart. Each stake will be flagged with red and white, candy-striped flagging or other obvious barrier tape.

Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approved in the Re-Vegetation Plan. Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).

PDF BIO-3: Pre-construction Mammals Surveys. Prior to construction, surveys will be conducted for all burrows that might host a badger or kit fox. (These surveys can be simultaneous with those for desert tortoise burrows.) Active burrows and all fox natal dens will be avoided, where possible. The perimeters of all avoidance areas will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white, candy-striped flagging or other obvious barrier tape.

Where avoidance is infeasible, occupancy of burrows will be determined through fiberoptics and/or night vision equipment. All occupants will be encouraged to leave their burrows using one-way doors, burrow excavation in the late afternoon/early evening (to encourage escape at night), or other approved methods. All burrows from which badgers or foxes have been removed will be fully excavated and collapsed to ensure that animals cannot return prior to or during construction.

PDF BIO-4: Raptor Protection of Transmission Line. THE APPLICANT will design and construct raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation. The design plan (filed for Commission approval) will include adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.

PDF GEO-1: Geotechnical Investigations. Detailed investigations to support final engineering will be conducted in two stages, as detailed in Section 12.1. These generally include:

- **Stage 1 Subsurface Investigations**: Based on available information and the current project configuration, conduct a limited field program designed to confirm that basic project feature locations are appropriate and to provide basic design parameters for the final layout of the project features. Phase 1 Subsurface investigations will be initiated within 60 days of licensing and receipt of site access, field work will be completed within four months of the start of field investigations, and results filed with the Commission six months after the start of field investigations.

- **Stage 2 Subsurface Investigations:** Using the results of the Stage 1 work, and based on any design refinements developed during pre-design engineering, conduct additional explorations that will support final design of the project features and bids for construction of the project.

The Stage 1 subsurface site investigation program for the Eagle Mountain Pumped Storage Project will commence as soon as site access is obtained. The Stage 1 program will provide the information needed to finalize project features and to plan a second-stage program to support final design of the project.

The detailed scope of the Stage 1 program is discussed in a technical memorandum found in Section 12.1.

PDF GEO-2: Slope Stabilization. During site investigations, geologic mapping will be performed by project engineers to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining. The stability of the cut slopes and benches will be assessed at this time.

During construction, areas within the pits that exhibit unstable slopes because of adverse fracture sets exposed in the pit walls will be scaled of loose rock and unstable blocks. Material scaled from the side slopes will be removed and disposed of outside the pit, or pushed down slope and buried in the bottom of the pit. Rock slopes within the East and Central Pits that lie below an elevation of 5 feet above the maximum water level will be scaled of loose and unstable rock during construction. Existing cut slopes that lie above these elevations will not be modified unless there is evidence of potential failure areas that could impact project facilities.

PDF AES-1: Minimize Construction Staging Areas. Staging areas and areas needed for equipment operation, material storage and assembly shall be combined with construction lands to the extent feasible, and organized to minimize total footprint needed. Staging, storage, and temporary construction areas shall be reclaimed as soon as the use of each such area is completed.

PDF LU-1: Reduce Construction Impacts. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points.

PDF LU-2: Provide Notice of Construction. Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal.

PDF LU-3: Minimize Impacts of Water Pipeline Construction. Permanent impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.

PDF LU – 4: Eliminate Conflicts With Other Existing and Proposed Projects. The Project layout has been modified to eliminate conflicts with existing and proposed land uses, including the proposed Eagle Mountain Landfill. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the Metropolitan Water District of Southern California regarding the proximity of the brine ponds to the CRA. As the Project progresses into the design phase, the Project layout will be designed to accommodate the landfill as configured.

4.7 Alternatives Considered but Eliminated from Further Analysis

A number of alternative project components were considered that were ultimately judged not to be reasonable under the circumstances of this project. Based upon this determination, the components were eliminated from detailed study.

4.7.1 Pumped Storage Location Alternatives

The proposed project is located at the site of the former Kaiser Iron Mine, an open-pit operation that ceased iron ore production in the 1980s. The site is located near the Town of Eagle Mountain in Riverside County, CA, approximately 30 miles east of Indio, CA and 13 miles north of I-10 and the town of Desert Center.

The site was selected for pumped storage for the following reasons:

- Two existing, mine pits are located within 14,000 feet of each other, with an elevation difference between the pits of approximately 1,500 feet. The pits can be used for water storage, with the Central Pit serving as the upper reservoir and the East Pit serving as the lower reservoir for a hydroelectric pumped storage development. The storage space available in the two mine pits is about 28,000 acre-feet in total. Construction of dams to create this amount of storage could cost up to $190 million at sites with similar topography that would require major dams. Thus this site offers a rare opportunity to minimize costs of developing reservoir storage.

- The site has been previously disturbed by mining, thus reducing potential environmental impacts.

- The geology of the project area is dominated by rock formations comprised of good quality materials for construction of the dams, water conveyance tunnels, and underground chambers associated with a pumped storage project.

- The site is within about 13 miles of a National Interest Electric Transmission Corridor, which includes the Palo Verde to Devers corridor, which extends from the Palo Verde Nuclear Plant in Arizona to the Devers Substation near Palm Springs. The project proposes to interconnect to the planned Devers-Palo Verde No. 2 transmission line, 13.5 miles from the project site.

- The site is located close to an adequate source of water, the Chuckwalla Valley Aquifer (groundwater) to initially fill the reservoirs and to provide makeup water for evaporation and seepage.

- The site has potential to firm the energy produced by a growing regional portfolio of solar and wind power projects making them even more valuable to meet California's energy needs. California's renewable portfolio standards (RPS) call for 33 percent of electrical generation to come from renewable sources by 2020.

- The site is located near existing and proposed renewable energy generation, including the San Gorgonio Pass wind farm west of the community of Palm Springs. Major large scale solar projects, totaling more than 2000 MW, are proposed for the Chuckwalla Valley, Palo Verde Mesa, and surrounding desert areas.

- The site has no surface water or fisheries and has no potential to detrimentally affect aquatic ecosystems.

  There are no other alternative sites for pumped storage development with the above-noted attributes. Therefore, no other sites have been considered by the SWRCB for developing the proposed pumped storage project.

4.7.2 Water Treatment Alternatives

The Project proposes to use reverse osmosis water treatment to maintain water quality in the reservoirs at the same quality as the source groundwater. Other alternative methods of water treatment were considered. The alternatives considered include:

Thermal Processes (e.g. Multistage Flash Distillation). This type of water treatment is used in applications such as desalination in the Middle East, where power generation is needed as well as very large capacity (25 to 100 mgd) water treatment. With these systems, the power cycle is designed to provide waste heat which is used for thermal distillation. These types of water treatment plants are very costly and require a heat source. This option is not feasible for the Eagle Mountain Project, where there is no heat source and the water treatment needs are at a smaller scale.

Conventional Demineralization Using IX Resin (DI): These types of water treatment are only economical when the TDS of the water is low (less than a few hundred mg/l). In addition, these systems utilize large quantities of acid and caustic materials to regenerate the resin. This would create an additional waste stream (spent regeneration solution) which would need to be neutralized and for which there is no easy disposal option. For these reasons, this alternative was dismissed from further consideration for the Eagle Mountain Project.

Electrically Driven DI: These systems (sold as EDI (electrical demineralization) or sometimes called CDI), do not use chemicals (except to clean the resin), but applies an electrical field driving the ions to the resin. Some of these types of systems can only operate on softened water as the hardness can foul the resin. Operating costs for this technology are high and increase with increasing TDS. These systems are generally used as polishing technology after RO to produce boiler feed water, or high purity water for semiconductors. They are not used, as a general rule, as a primary treatment step.

After review of the available water treatment options, it was concluded that reverse osmosis is the most practical and cost efficient means of maintaining water quality in the reservoirs.

4.7.3 Alternative Power Sources

The purpose of the Project is to provide hydroelectric generation to meet part of California's peak power requirements, resource diversity, and capacity needs. Other forms of energy generation, particularly natural gas fueled power plants, can provide peaking power. However, only pumped storage hydropower provides peaking power *and* energy storage, needed to enable the growth of wind and solar power in the region. Pumped storage hydroelectric generation is the only energy storage technology to have been proven on a large scale.

In addition, pumped storage hydropower provides ancillary services to the transmission grid: spinning reserves, voltage regulation, load following, black start, and possibly protection against over-generation.

Pumped storage hydropower can provide these critical energy benefits without producing greenhouse gas emissions. Pumped storage can reduce greenhouse gas emissions by enhancing the efficiency of renewable energy and reducing reliance on fossil fuel generation for peak power generation. No other form of energy generation provides this combination of benefits.

4.8 Transmission Alternatives

The proposed Project interconnection route generally parallels Eagle Mountain Road and terminates at an Interconnection Collector Substation at Desert Center, which will be adjacent to the proposed Devers-Palo Verde No. 2 (DPV2) line to be developed and owned by Southern California Edison (SCE). The Collector substation could serve the proposed solar projects in the Chuckwalla Valley as well. The approximate length of the interconnection line is 13.5 miles. The proposed Devers-Palo Verde No. 2 is a 500-kV line that will be under the operational control of the California Independent Systems Operator (CAISO) as part of the restructured California electrical utility industry. The proposed routing from the Project was selected as the one that would most economically supply power to, and receive power from, the southwestern grid.

The applicant evaluated several potential points of interconnection to the transmission grid. In the initial planning stages (in 2007), the applicant considered an interconnection request to connect at the Devers Substation, near Palm Springs. This would have required an interconnection line of 83 miles, through an already crowded transmission corridor. Obstacles to this alternative include cost for construction; difficulty of obtaining rights-of-way, particularly in the communities of Indio and Cathedral City; potentially significant impacts to the natural and human environment; and cultural resource concerns of the Aqua Caliente Band of Cahuilla Indians.

As an alternative, in 2008 the applicant proposed to interconnect at SCE's proposed Midpoint Substation (also known as the Colorado River Substation). This proposal was presented in the Pre-application Document (filed with FERC January 2008), and the Draft License Application (filed with FERC in June 2008). This proposed route was 50.5 miles from the project site to the point of interconnection. The proposed route crossed the Chuckwalla Valley Dune Thicket Area of Critical Environmental Concern (ACEC), and required a crossing of the I-10 Interstate Highway.

The project requires a double circuit 500 kV line, which will require construction of new transmission towers to support and route to the interconnection substation. A comment from the USFWS at the scoping meeting suggested that the applicant consider installing its transmission lines on existing transmission towers owned by MWD. This is not a feasible alternative given the size of the towers, the size and weight of the new lines, and alignments of existing transmission lines in the area.

A substation site located at the I-10 and Eagle Mountain Road junction was considered but dismissed due to cultural resource concerns related to the historic (World War II) Desert Training Center hospital site. In addition, this location may have conflicted with an existing high pressure gas line.

While the transmission alternatives of interconnecting at the Devers Substation and the Colorado River Substation have been considered and dismissed, the Applicant has continued to evaluate other interconnection alternatives. Two additional substation alternative locations (east and west of the unincorporated community of Desert Center) have been studied in detail, as described in Section 4.9 below.

4.8.1 Water Supply Alternatives

The water supply alternative selected was groundwater. The applicant has acquired land to develop groundwater in the Chuckwalla Basin for the initial fill and annual make-up water for the reservoirs. Three wells will be utilized to provide initial reservoir fill. Water to replace losses due to seepage and evaporation will be obtained from the same source via a single well, with an additional well maintained as backup. The applicant will connect new wells to a central collection pipeline corridor (Figure 2.2-2).

Alternatives for supply of the initial filling and for water to make up for evaporation and seepage are limited. The Project is not located on a natural stream nor would the small drainage area that would flow into either or both of the reservoirs provide nearly enough water to offset seepage losses and evaporation. Therefore, the water supply must come from either local groundwater, or through the Metropolitan Water District's (MWD) Colorado River Aqueduct (CRA).

The applicant investigated the alternative of purchasing water from a third party and having the water delivered to MWD. In exchange, MWD could provide the same amount of water at the Colorado River Aqueduct. Potential sources of water supply for the exchange would most likely come from the purchase of surplus treated water from the San Joaquin Valley. The CRA could also be the source of make-up water supplies; however, it would require long-term contracts for exchange water and for wheeling through existing facilities.

This alternative was rejected for several reasons. Several potential vendors were approached regarding the purchase of surplus water. While it is possible to make an arrangement of this type, it is difficult to find willing sellers during drought years. In addition, the costs and environmental permitting requirements are a significant barrier. The potential for an arrangement of this type was discussed with MWD staff, but the MWD Board would need to approve of any such wheeling or exchange agreement, and MWD has legal limitations on the use of its Colorado River outside of its service territory. As MWD has stated in their comment letters on the project, they have not agreed to provide water to the project through the CRA. Perhaps most important, water supplies in the CRA contain quagga mussels. The introduction of quagga mussels into the project reservoirs would be undesirable. Finally, pumping of local groundwater would use less energy than surface water alternatives involving water transfers.

4.8.2 Facility Design Configuration Alternatives

4.8.2.1 Powerhouse Location

The choice between a surface and underground powerhouse was studied early in Project development. The required depth of unit setting below minimum lower reservoir pool and the limited ground cover, which would result in a long length of steel-lined power tunnel, indicated that a surface powerhouse would be more costly in comparison with an underground powerhouse. An underground powerhouse could be constructed closer to the lower reservoir; however, this arrangement would involve a longer high-head tunnel posing greater concerns about hydraulic transients and surge control.

The underground powerhouse could be located anywhere between the two reservoirs where suitable geologic conditions exist, at a depth that satisfies the unit submergence requirements. The proposed location was selected because of the expected existence of sound granitic rock away from fractured and diverse conditions associated with ore zones, determined by evaluation of existing geologic mapping, a route for the power waterways that is near to a direct connection between the upper and lower reservoirs, a minimum length of steel lining of the power waterways, proximity to a suitable location for surge shafts and chambers, and a reasonable length of access tunnel at an acceptable grade from the surface to the powerhouse.

There are no other alternative sites for pumped storage development with the above-noted attributes. Therefore, no other sites have been considered for developing the proposed pumped storage project.

4.8.2.2 Storage Capacity

The storage capacity of the reservoirs is directly related to the amount of energy storage provided by the Project. The amount of storage proposed for the Project will support continuous rated capacity generation for a period of 10 hours during each day while pumping back for a period of 12 to 14 hours during off-peak periods. (Off-peak periods are from 10:00 PM to 6:00 AM weeknights and all day on weekends). Significant wind energy is produced at night as well. A working volume of 17,700 acre-feet will be provided, which corresponds to 18.5 hours of reservoir storage at full plant discharge (11,600 cfs). The maximum weekly energy production is approximately 91,000 MWh. Alternate generating periods and variable pump-back periods to accommodate off-peak wind and solar power generation can also be accommodated. The 10-hour generating period was selected because it provides flexibility in Project operations.

4.8.2.3 Upper Reservoir

Some flexibility exists in the selection of the minimum and maximum operating levels of the upper reservoir. The respective levels of El. 2485 and El. 2343 were selected based on the required submergence for the intake structure at the upper reservoir and the energy storage required to support the intended weekly operating cycle. Also, the range of levels was checked to ensure that the maximum and minimum operating heads will remain within the range that is acceptable for reversible pump/turbines.

The foundation conditions at the upper reservoir are judged to be suitable for either a concrete-faced, rockfill dam or a roller-compacted concrete (RCC) gravity dam. Selection of the type of dam will be made during final design and following intensive subsurface explorations and materials testing. The layouts presented in this application are based on constructing an RCC dam, using on-site mine tailings that would be processed and/or using materials generated from tunnel and underground structure excavations.

4.8.2.4 Lower Reservoir

The capacity of the East Pit, with the low point of its rim at El. 1,100 feet, is about 23,000 acre-feet, which exceeds the needed storage capacity for a 1,300 MW project (total of 21,900 acre-feet, including dead storage). Therefore, no dam structures are needed at the lower reservoir. With the invert of the I/O structure at El. 925 feet, there is approximately 4,200 acre-feet of inactive storage. The operating levels of the lower reservoir, between El. 925 and El. 1092, will maintain the operating head of the pump/turbines in an acceptable range.

4.8.2.5 Water Conductors, Penstocks, Tailrace, and I/O Alternatives

The main water conductor connecting the upper reservoir to the powerhouse would be bored with a tunnel boring machine (TBM) or drilled and blasted into and through the Eagle Mountain, with a finished diameter of 29 feet. The choice of below-grade water conductors would minimize surface area disturbance and eliminate the potential for penstock rupture that could produce surface discharge of water transported by those underground high-pressure pipelines between the upper reservoir and the powerhouse. In general, the water conductor and penstock alignments will seek to follow the most direct route between the upper reservoir and the powerhouse, taking into consideration areas topography and subsurface geotechnical conditions.

Below the powerhouse, the tailrace tunnel will also be bored with a TBM or drilled and blasted into and through the Eagle Mountains, with a finished diameter of 33 feet. Again, this would minimize surface area disturbance. Generally, the draft tubes and tailrace tunnel alignments follow the most direct route between the powerhouse and the lower reservoir, taking into consideration area topography and subsurface geotechnical conditions.

Generally there are two types of reservoir intake structures for hydro-power projects, horizontal intakes and vertical drop intakes. The advantage of the vertical drop intakes ("morning glory" type) are that near maximum capacity is attained at relatively low heads. However, the disadvantage is that this type of inlet is ungated so that discharges from the upper reservoir cannot be stopped at the inlet in the event of an emergency. Horizontal intakes typically are gated by means of radial gates, slide gates, or an emergency bulkhead that can shut off water flow from the upper reservoir in the event of an emergency. For these reasons the intakes for the upper and lower reservoirs will be constructed horizontally.

The inlet/outlet structure at the upper reservoir will be located near the east end of the reservoir and will be constructed horizontally in the sloping bank of the pit. The inlet/outlet structure will use an approach channel and slope down to the tunnel invert. A fixed-wheel gate will be provided in the structure for emergency closure and for tunnel inspection. The inlet/outlet structure at the lower reservoir will be located near the west end of the reservoir and will be constructed horizontally in the sloping bank of the pit. The inlet/outlet structure will use an approach channel and slope down to the tailrace invert. A fixed-wheel gate will be provided in the structure for emergency closure and for tailrace inspection.

4.8.2.6 Unit Type Selection and General Arrangement

For many existing projects in the United States, and most recently proposed projects worldwide in the head range and project size at Eagle Mountain, the use of reversible, single-stage Francis units has been preferred over the use of separate pumps and turbines. Variable speed units are becoming more common because of their importance to realizing the ancillary benefits of pumped storage and their ability to pump over wide load variations. The generating head range of 1560 to 1251 feet at Eagle Mountain is well within the range of these types of units. Similarly, the nominal unit size of 325 MW is within the size range having a demonstrated history of reliable operating experience in the U.S. and overseas. For example, the reversible units at the Bath County Project in Virginia (operational since 1985) are rated at 350 MW. At the Rocky Mountain Project in Georgia (operational since 1995) the units are rated at 283 MW and at the Raccoon Mountain in Tennessee Project (operational since 1978) the units are rated at 383 MW.

The powerhouse arrangement is based on vertical-shaft units, with the turbine inlet valves and the draft tube gates located within the main powerhouse cavern. A separate cavern downstream of the main powerhouse cavern would house the power transformers, which increase voltage from 18 kV to 500 kV. A lay-down and erection area is provided at one end of the unit bays with direct access to the access tunnel. A service and controls bay is provided adjacent to the erection area.

4.8.2.7 Powerhouse Access

Access to the site is planned via Kaiser Road and from there to branch access roads, which lead to the various project features. The normal access to the powerhouse will be through the main access tunnel. Its portal will be located at the ground surface on the northeast rim of the East Pit at El. 1100 from which it will extend 6,600 feet to the powerhouse floor at El. 837. The alternative of access by a shaft directly above the powerhouse was considered. However, the powerhouse will be directly below the proposed landfill, which will, if constructed, ultimately place over 200 feet of fill depth over the ground surface above the powerhouse. The potential disruption of the landfill operations as well as access to the powerhouse ruled out the shaft access option. Secondary and emergency personnel access to and from the powerhouse will be from a shaft and short tunnel segment, with the shaft day-lighting in an area that is outside of the landfill to the north and west of the powerhouse location.

4.9 Alternatives Considered and Evaluated

Based upon the criteria listed above, the five alternatives evaluated in detail are as follows:

4.9.1 Proposed Project Alternative

This alternative includes incorporation of all alternative features (identified in Section 4.6 above) and implementation of the mitigation measures identified throughout the resource analyses in this DEIR.

This is the proposed action evaluated throughout this DEIR, recognizing all of the environmentally superior alternatives that have already been incorporated throughout the planning, consultation and evaluation stages. The focus of these alternative elements has been to protect surface and groundwater quality, minimize effects on habitat, establish compatibility with the future landfill operations at Eagle Mountain; ensure that the structural integrity, hydraulic function, and water quality of the Colorado River Aqueduct are not affected; ensure that other water users in the Chuckwalla Valley are not impacted, and to minimize the length, footprint, and habitat encroachment of the water and transmission line corridors.

This alternative also assumes that all of the mitigation measures identified throughout the DEIR are adopted as conditions of approval for the SWRCB to issue the Water Quality Certification, and are fully implemented at all appropriate stages of project development, including pre-construction, construction, and operations for the life of the project. As examined in detail in each of the resource analyses, potentially significant impacts to all resources will be reduced to less than significant levels for all resources except air quality, visual resources, and the project's contribution to the cumulative effect of groundwater overdraft.

Under this alternative, the two project-specific impacts that cannot be mitigated below threshold values for determining significance include short term air quality impacts during construction (NOx emissions from heavy equipment), and long term impacts on visual resources in the area north of Interstate 10 where the transmission line parallels the highway to reach the substation for interconnection to the southwestern grid. Alternative actions that could address these two impacts are described below.

4.9.2 Extended Construction Period Alternative

The only alternative action that could reduce the NO_x emissions to below the significance threshold would be to limit the number of pieces of equipment that could operate on any single day to keep NO_x emissions below the 100 lbs/day standard, thus extending the construction period.

Construction-related daily emissions associated with the Proposed Project are presented, segregated by project year and pollutant type, in Table 4-1. Typical daily emissions related to construction activities are highest in 2013 or 2014 (depending on pollutant) and are estimated to be less than: 463 pounds per day (ppd) for CO, 60.5 ppd for VOC, 436 ppd for NO_x, 0.73 ppd for SO_2, 107 ppd for PM_{10} and 39.8 ppd for $PM_{2.5}$. These emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd.

Table 4-1. Daily Construction Emissions (pounds)

Year	CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2
2012	454	57.4	417	106	39.0	0.62
2013	444	60.5	436	107	39.8	0.70
2014	463	59.0	392	106	38.6	0.73
2015	122	12.8	74.0	89.3	23.7	0.16
Maximum	463	60.5	436	107	39.8	0.73
CEQA Threshold	550	75	100	150	55	150
Exceed threshold?	No	No	**Yes**	No	No	No

Source: KB Environmental Sciences, Inc., 2009.

Air pollutant emissions associated with long term operations and maintenance (O&M) activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operation. Operation-related annual emissions associated with the Proposed Project are presented in Table 4-2 below.

Table 4-2. Annual Operational Emissions (tons)

CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2	CO_2	N_2O	CH_4
1.85	0.05	0.16	0.03	0.02	0.00	332	0.01	0.02

Source: KB Environmental Sciences, Inc., 2009.

Therefore, the Proposed Project will result in a significant construction-related impact from NO_x in construction years 2012, 2013, and 2014. This is attributable to the number of heavy construction vehicles and machines that will be required to construct the core project works (reservoirs, dams, tunnels, powerhouse and switchyard), and the linear components (water line and transmission line).

A variety of mitigation measures are prescribed for reducing air emissions overall, but these measures cannot reduce the NO_x emissions below the threshold level, and therefore this impact is deemed to be significant and unavoidable. (This impact is common to all large projects in the SCAQMD.)

The only alternative action that could reduce the NO_x emissions to below the significance threshold would be to limit the number of pieces of equipment that could operate on any single day to keep NO_x emissions below the 100 lbs/day standard. With NO_x emissions at approximately four times this threshold value, this implies that construction would need to be extended over a much longer period of time, and instead of 3 to 4 years for completion of project works, construction would extend over 10 to 12 years or more.

This Alternative does eliminate the short-term construction related air quality impact, however, it may increase other impacts by extending the duration of habitat disturbance, and project traffic and noise. This alternative would also substantially constrain attainment of project goals by substantially extending the time to full project operations, and it very likely would undermine the project's ability to be financed, thereby fundamentally affecting feasibility of the Project.

4.9.3 Eastern Red Bluff Substation Alternative

The BLM, SCE, and CAISO are considering two alternative substation sites, both south of the I-10. One is known as the eastern Red Bluff substation site (east of the community of Desert Center, California), the other the western substation site (west of Desert Center, just south of the Eagle Mountain Road interchange on the I-10. Interconnection to either of these two alternative substation locations will require coordination with California Department of Transportation for construction and operation of a 500 kV transmission line which crosses an interstate highway.

One of the substation sites that the BLM, SCE, and the California Independent System Operator (CAISO) are considering is known as the Eastern Red Bluff Substation site. This site is east of the community of Desert Center, south of the Interstate 10 (I-10) (Figures 4-1 and 4-2).

In order to interconnect at the Eastern Red Bluff Substation, the proposed Project's transmission interconnection would follow one of two paths. One route would go east from the Central Project Site to Kaiser Road, then parallel (and west of) Kaiser Road to south of the town of Lake Tamarisk, then east (to the south of the Chuckwalla Sun Peak Solar Project), then south to the substation site. This alternative is displayed on Figures 4-1 and 4-2 as Interconnection Alternative Route #2. The other route to the Eastern Red Bluff Substation would parallel the existing SCE transmission line going southwest to a point just north of the proposed substation, then go south to the substation. This alternative is displayed on Figures 4-1 and 4-2 as Interconnection Alternative Routes #1A and #1B.

Under the Eastern Substation Alternative, significant visual impacts would be decreased in comparison to the proposed Project, principally due to relocation of the substation out of the panoramic viewshed of the Chuckwalla Valley.

Impacts to desert tortoise habitat would also be decreased in comparison to the proposed Project by this alternative. Interconnection Alternative Route #1A and #1B are entirely outside of the Desert Wildlife Management Area (DWMA). The Eastern Red Bluff Substation site is within the DWMA, but in a location with a lower density of desert tortoises than the Western Red Bluff Substation.

Interconnection Alternative Route #2 would be within the DWMA, and would disturb slightly fewer acres of the DWMA than the proposed Project transmission line. However, Interconnection Alternative Route #2 would be along the edge of the road right-of-way (ROW) at the boundary of the DWMA and would not bisect the DWMA as the proposed Project transmission line alignment and Interconnection Alternative Route #3 do.

4.9.3.1 Detailed field surveys of cultural resources, sensitive species, visual resources, and land use for this alternative were conducted in the spring of 2010. A summary of the results of those field surveys follows. A letter report describing the results of the cultural resources field surveys is found in Section 12.16.Land Use

4.9.3.1.1 *Interconnection Alternative Routes #1A and 1B: East Route to Eastern Red Bluff Substation Alternative*

Nearly 86% of Interconnection Alternative Route #1A and #1B's 12.5 mile length would be located adjacent to an existing 160kV wood H-frame transmission line owned by SCE (Figure 4-4). This alternative would pass near several residences that reside near the existing SCE line north of the Kaiser Road crossing. East of the Kaiser Road crossing the remainder of the route is relatively remote from existing residences. Interconnection Alternative Route #1A crosses the greatest amount of private land (4.9 miles *vs.*0.4 miles for the proposed Project route), and has

0.1 miles within the region's DWMA (0.1 miles *vs.*5.9 miles for with the proposed route). Three road crossings would be required including Kaiser Road, SR 177, and I-10 (Table 4-4).

Interconnection Alternative Route #1A would pass within ¾ miles of the Desert Center Airport. The Desert Center Airport was sold by Riverside County several years ago to private individuals and is no longer a public airport. Interconnection Alternative Route #1B would provide greater distance from the airport.

Several abandoned agricultural fields would be crossed by this alternative where it parallels the existing H-frame ROW between Kaiser Road and several miles south of SR 177. Near the Desert Center Airport, the line may cross an active agricultural field if Interconnection Alternative Route #1B is selected. However, this crossing would be at the northeast corner of the field where tower placement would likely be able to span the field thereby avoiding direct impacts.

Interconnection Alternative Routes #1A and #1B would be consistent with applicable land use plans and policies of the Federal, State and local governments with jurisdiction over the land in the Project area. This alternative will require additional coordination and permitting with the California Department of Transportation regarding the crossing of I-10.

Although Interconnection Alternative Routes #1A and #1B are approximately 3 miles longer than the proposed Project route, land use impacts associated with construction and operation would be similar or possibly less due to ROW sharing with the existing transmission line. Overall, land use impacts of the Eastern Red Bluff Substation and Interconnection Alternative Route #1A and #1B would be less than the proposed Project, largely due to the consolidation of lines, which meets desirable objectives to minimize the duplication or proliferation of multiple facilities in different locations, and to reduced encroachment on desert tortoise habitat.

4.9.3.1.2 *Interconnection Alternative Route #2: Kaiser Route to Eastern Red Bluff Substation Alternative*

Interconnection Alternative Route #2 would be located within undeveloped lands paralleling Kaiser Road to the west for approximately 5.3 miles of its total 14.8 miles – the longest of all the alternatives and proposed Project route. Prior to following Kaiser Road, the route would parallel the existing SCE 160 kV transmission line for approximately 3.3 miles before turning south at Kaiser Road. This alternative would pass within close proximity (less than a ¼ mile) to several existing residences located off Kaiser Road, including the entrance to the Lake Tamarisk residential community, as well as residences north of Desert Center.

At Desert Center, Interconnection Alternative Route #2 turns east, crossing Kaiser Road and SR 177. A total of three road crossings, including I-10, would be required by the alternative; one more than the Project's proposed route. However, this Interconnection Alternative Route #2 would not require a pipeline crossing as with Interconnection Alternative Route #3. Near SR 177 Alternative Route #2 would pass through abandoned agricultural fields (orchard and jojoba). Interconnection Alternative Route #2 would require a new ROW and a new access road east of SR 177 (total of 6.3 miles new ROW *vs.* to 5.3 miles for the proposed Project).

Approximately 86% of Interconnection Alternative Route #2 lies within Federal lands managed by the BLM, including the East Red Bluff Substation location. Interconnection Alternative Route #2 has slightly less length of transmission line passing through the region's DWMA (5.4 miles compared to 5.9 for the proposed Project).

Interconnection Alternative Route #2 would have short-term impacts associated with construction similar to the other alternatives and the proposed Project. While over 8.5 miles of this alternative's transmission line would follow developed road and utility ROWs, there would be over 6 miles of new ROW, a higher amount than the proposed Project or other alternatives.

Interconnection Alternative Route #2 would be consistent with applicable land use plans and policies of the Federal, State and local governments. This however is the same situation for the proposed Project and the other alternatives. This alternative would require additional coordination and a highway crossing permit from State and Federal Highway Commissions for the I-10 crossing, which the proposed Project route does not require. Overall, land use impacts of the Interconnection Alternative Route #2 route would be slightly greater than the proposed Project.

4.9.3.2 Visual

The Eastern Red Bluff Substation is located entirely on BLM-managed lands and the BLM's Visual Resource Management (VRM) Class III designation (Figure 4-3).

The Eastern Red Bluff Substation alternative relocates the substation to the south of I-10 and out of the panoramic viewshed of the Chuckwalla Valley away from travelers on I-10. The Eastern Red Bluff Substation location avoids impacting the panoramic views of the Chuckwalla Valley that are prevalent along this stretch of the I-10 corridor. While an improvement over the proposed Project's current substation location, the substation's size, and discordant mass of equipment at varying heights, would create a strong contrast to the surrounding natural features that would dominate views from I-10 due to its location within foreground distance zones. Such views, however, would be brief; the substation becomes most visually apparent approximately 2 miles out, which at 70 mph would be visible for 2 minutes or less. The Eastern Red Bluff Substation would be noticeable from longer distances to west bound travelers due to the likelihood that several of the taller features would be skylined, as are the existing transmission line towers that draw the viewer's attention (KOP SI-1). Planting of desert vegetation at strategic locations and treatment of features (color, nonspecular material, etc.) would reduce visual contrast but not sufficiently within foreground view zones to avoid skylining or to meet VRM Class III designations.

There are three potential interconnection routes that were reviewed for the Eastern Red Bluff Substation alternative: Interconnection Alternative Routes #1A, #1B and #2.

Interconnection Alternative Routes #1A and #1B connects with the proposed Project transmission line route north of the Metropolitan Water District of Southern California's

Pumping Station, then parallels the existing 160kV wood H-frame transmission line owned by SCE on either its north or south side. These alternative routes would continue to parallel the existing line southeast, before turning south and leaving the existing H-frame line to cross I-10 to the Eastern Red Bluff Substation site.

Interconnection Alternative Routes #1A and #1B are approximately 12.5 miles in length (measured from the point of divergence from the proposed Project transmission route) (Table 4-3). Over 60% of the routes crosses through BLM managed lands and VRM Class III designations. The remainder of the routes cross VRM Class IV designations. The substation lies within VRM Class III lands.

Interconnection Alternative Routes #1A and #1B are located adjacent to an existing transmission line ROW for most of its entire length (10 of its 12.5 miles). Consequently, visual impacts are incremental to an existing infrastructure impact. The vertical forms of the lattice towers would be visible, but difficult to discern in middle-and background view distances as a result of the scale and mottled texture of the valley landscape. The routes would impact foreground views of travelers on State Route (SR) 177, but these are mitigated by the existing crossing of the SCE 160kV line and vegetation along the road sides. With the exception of the I-10 crossing, alternatives #1A and #1B would create an incremental increase of the visual impact caused by the existing transmission line and would not dominate the view of the casual observer. The level of change created by this alternative would be moderate and would meet VRM Class III and IV designations (Table 4-3). The portion of this interconnection alternative that parallels the existing SCE transmission line has visual impacts which would be less than significant (KOP SI-2).

Approximately 2 miles from I-10, Interconnection Alternative Routes #1A and #1B turns south and leaves the existing transmission line ROW. The vertical form and lines of the lattice towers would become more visible as the route approaches the foreground view zone of I-10 (KOP SI-6). The route’s perpendicular alignment and crossing of I-10 minimizes the extent and time the line would be visible from I-10 travelers, but the overall change in the foreground view zone caused by the towers and the proposed east substation would be high, creating a potentially significant impact.

Though Interconnection Alternative Routes #1A and #1B have potential visual impacts that would be potentially significant, overall significance of the visual impacts would be lower than the proposed Project alignment, due to relocation of the substation out of the panoramic viewshed of the Chuckwalla Valley and its co-location with an existing transmission line ROW. The Eastern Red Bluff Substation creates high visual contrast with its surroundings, but visibility is limited to a few minutes within foreground view zones due to the high rates of speed, with viewer interest typically focused away from the sites due to expansive valley views to the north.

Interconnection Alternative Route #2 is approximately 14.8 miles in length (measured from the point of divergence from the proposed Project transmission line), the majority of which (12.8 miles) passes through Federal land managed by the BLM. The majority of this alternative route crosses VRM Class III designations. A small amount (2.3 miles) crosses Class IV designations located in the northern end of the route (Figure 4-3).

Interconnection Alternative Route #2 includes relocation of the substation to the Eastern Red Bluff Substation site, significantly reducing the proposed Project's adverse visual impact. However, it is offset by the placement of over 6 miles of the 500 kV double-circuit transmission line parallel to and within the foreground view zone of I-10 (KOP SI-3). In addition to crossing I-10, this alternative crosses SR 177 and Kaiser Road within a ½ mile of their intersection north of the Desert Center community. Farther north, the transmission line would pass within the foreground zone and entrance to the Lake Tamarisk community. Due to the increased visibility at the road crossings, proximity to communities, and the extent of transmission line within foreground views of the Chuckwalla Valley viewshed, this alternative would have substantially greater visual impacts than the proposed Project route alignment. Therefore visual impacts of the Interconnection Alternative Route #2 would be significant (Table 4-3).

Operation of the new substation may result in a new source of light and glare from night lighting. This may be reduced by use of non-reflective materials and designs that minimize light glare, such as shielding.

Table 4-3. Interconnection Alternatives -Visual Resource Impact Summary

Project Feature	Visual Impact*			Mitigation	Remarks
	High	Moderate	Low		
Transmission Lines					High impact due to introduction of a new line into a landscape lacking similar built structures within fg/mg view zones of KOPs. Moderate Impact due to introduction of line within landscape lacking similar structures but sufficiently away from view zones to cause weak to moderate contrast. Low impacts due to construction in seldom seen areas or adjacent to existing structures.
Proposed Project Route	2.5 miles	5.7 miles	1.4 miles	AES-2,4,5	
Alternative #1	1.7 miles	1.5 miles	9.3 miles		
Alternative #2	7 miles	4 miles	3.8 miles		
Alternative #3	2.1 miles	5.7 miles	1.4 miles		
Project Substation	X			AES-1,4	High impact due to strong visual contrast within fg view zone of Chuckwalla Valley
West Red Bluff Substation	X			AES-1,4	High impact due to strong visual contrast within fg view zone; moderated somewhat by placement out of Chuckwalla Valley viewshed and near base of foothill mountains. View durations are short.
East Red Bluff Substation	X			AES-1,4	High impact due to strong visual contrast within fg view zone; moderated somewhat by placement out of Chuckwalla Valley viewshed. Possible skyline potential to westbound I-10 viewers.
High Impact - Strong visual contrast in fg/mg view zones from a number of KOPs. Mitigation unlikely to reduce impact significance. Inconsistent with VRM Class designations.					
Moderate Impact - Visual contrast noticeable but not dominant as viewed from KOPs. Mitigation can reduce impacts to less than significant levels. Consistent with VRM Class designations.					
Low Impact - Weak visual contrast and/or adjacency to existing built structures and development. Mostly within background or seldom seen view zones. Consistent with VRM Class designation. Mitigation not necessary.					

* - *Line route miles reflect total lengths for alternative routes starting from a common starting point as indicated on Figure 4-3.*

4.9.3.3 Biology

Surveys in spring 2010 found that desert tortoises are present but uncommon at the Eastern Red Bluff Substation alternative site. The substation is within a DWMA and designated critical habitat (Figure 4-2), but the habitat quality on-site and adjacent is much lower quality than the Western Red Bluff Substation alternative. It is also lower quality habitat than the proposed Project substation location. Therefore, the Eastern Red Bluff Substation location would have the least impact on desert tortoises of the three substation locations being considered for the proposed Project.

Interconnection Alternative Route #2, the route along Kaiser Road, passes along the outer edge of the DWMA. This area has relatively good habitat for biological resources. When the route turns east, the section that parallels the I-10 has lower habitat value and is not within a DWMA until it crosses the I-10 to reach the substation.

Interconnection Alternative Routes #1A and #1B have fewer biological resources overall than Interconnection Alternative Route #2.

4.9.3.4 Cultural Resources

A records search at the Eastern Information Center of an area extending 1 mile from Interconnection Alternative Routes #1A, #1B, #2 and #3 and Area of Potential Effect (APE) indicate that 30 cultural resources studies have been previously conducted, of which 18 bisect the APE. This record search does not include a recent survey conducted by ECORP Consulting, Inc. This survey covered much of the interconnection alternative routes and both alternative substation sites. Six of the previous studies provide overviews of cultural resources in the general area. Only two previous studies substantially cover elements of the alternatives. An archaeological assessment for TPM 18983 by Bowles (1983) covered most of the substation area and surrounding area. No sites were recorded during that survey, which may not have been a full Class III intensive survey and was conducted too long ago to meet current best professional practices.

Two prehistoric sites were recorded as being part of the APE located along Interconnection Alternative Route #2. The sites include a cleared circle and rock ring with distant quartz lithic assay-reduction (chipping) station and another prehistoric quartz chipping station.

Site P-33-015091. This prehistoric site consists of a cleared circle and poorly defined rock ring. Approximately 82 feet to the south is a quartz chipping station described as an assay/reduction station of 25-30 pieces of lithic debitage. This site and the one described below and were recorded by Applied Earthworks for an alternative alignment of the Devers-Palo Verde 2 Transmission Line Project.

Site P-33-015093. This prehistoric site consists of more than 50 pieces of quartz debris from a chipping station described as an assay/reduction station.

ECORP recently conducted a Class III inventory encompassing Interconnection Alternative Route #1A, #1B, the proposed Western Red Bluff Substation, Eastern Red Bluff Substation, and portions of Interconnection Alternative Routes #2 and #3. ASM Affiliates (ASM), under contract to ECE, surveyed the remainder of Interconnection Alternative Routes #2 and #3. ASM did not resurvey alternatives #1A and #1B or the substation alternatives. ASM relocated all of the sites recorded by ECORP within Interconnection Alternative Routes #2 and #3 and concurs with the character and content of the recordation, and to the best professional practices that characterize their survey and site records. ASM applied ECORP's survey results to the proposed Project alternatives where appropriate.

Three historic sites, DS-326, DS-327, and DS-330 are recorded in within the Eastern Red Bluff Substation alternative. Based on preliminary significance evaluations, none of these sites are potentially eligible for listing in the National Register of Historical Places (NRHP).

Cultural Resources: Interconnection Alternative Route #1A and #1B

Three sites are recorded in Interconnection Alternative Route #1B: DS-316, DS-494, and DS-495. Preliminary eligibility assessments suggest that none of these sites represent significant resources. DS-316 consists of a historic trash scatter that is unlikely to produce significant research value worthy of consideration for listing in the NRHP. One of the ECORP sites, DS-495, straddles the center line delineating Interconnection Alternative Routes #1A and #1B may extend within both of these alignments, with the majority of the site concentrated in Alternative #1B. Both DS-494 and DS-495 consist of historic refuse deposits possibly associated with military operations conducted during World War II as part of the Desert Training Center/California-Arizona Maneuver Area (DTC/CAMA). Although the sites are potentially associated with this historically significant military undertaking, the lack of features and character of the artifacts make it unlikely that the sites are eligible for the NRHP. The date range and low quantity of military rations suggest these may be trash deposits that are more associated with the town of Desert Center than with the DTC/CAMA.

Cultural Resources: Interconnection Alternative Route #2

A total of 21 archaeological sites are recorded within Interconnection Alternative Route #2. Recorded sites include 13 historic refuse deposits, four prehistoric lithic scatters, three historic mining sites, and one prehistoric habitation site. Only one of these resources, DS-240, is potentially eligible for listing in the NRHP. DS-240 consists of a prehistoric habitation site containing lithic artifacts, ceramics, and fire affected rock (FAR). Although the site components are relatively sparse, further investigation of the site could provide information relevant to the poorly understood prehistoric utilization of the Chuckwalla Valley. Site DS-240 is discrete in size and can be avoided through Project design to mitigate effects.

4.9.4 Western Red Bluff Substation Alternative

The Western Red Bluff Substation is west of the town of Desert Center and south of the I-10. Interconnection Alternative Route #3 would provide interconnection to the Western Red Bluff Substation. The new substation would occupy approximately 80 acres, and would include electrical facilities and supporting infrastructure. The tallest structures in the substation would be dead-end structures, bus and transformers, ranging in height from 85 feet to 135 feet. A chain-link fence would surround the substation.

In order to interconnect at the Western Red Bluff Substation, Interconnection Alternative Route #3 would follow the same alignment south as the proposed Project except for the last 2.5 miles. At this location, the alternative would continue south, paralleling Eagle Mountain Road, crossing I-10 to the substation located at the terminus of Eagle Mountain Road south of I-10. Alternative #3 includes approximately 9.2 miles of a double-circuit, 500 kV transmission line, 2.5 miles of which is different from the proposed Project route, as noted. This alternative is displayed on Figures 4-1 and 4-2 as Interconnection Alternative Route #3.

Under this alternative, significant visual impacts would be decreased in comparison to the proposed Project, principally due to relocation of the substation out of the panoramic viewshed of the Chuckwalla Valley.

However, desert tortoise impacts would be increased by this alternative. The substation site is located in an area with a higher density of desert tortoises, and desert tortoise habitat, than the proposed Project substation. In addition, the transmission line would need to cross the area of the Desert Training Center historic hospital site, an area of historical importance.

Detailed field surveys of this alternative were conducted in the spring of 2010. A summary of the results of those field surveys follows.

4.9.4.1 Land Use

Interconnection Alternative Route #3 will have land use effects similar to the proposed route since it follows the same alignment south as the proposed Project, except for the last few miles. The route would follow the Eagle Mountain Road ROW for 6.6 of its 9.2 mile length (Table 4-4). Over 96% of the route (8.8 miles) would be on Federal lands managed by the BLM. Like the proposed Project transmission line, construction of the route would introduce a new transmission line into a relatively undeveloped area. This alternative however, would reduce the amount of new ROW across undeveloped, non-roaded area compared to the proposed Project transmission line by over half (2.6 miles compared to 5.3 miles of “new” ROW for the proposed Project).

No agricultural areas would be affected by the Alternative #3 route, similar to the proposed Project (Figure 4-4). Recreational access to surrounding Federal and nonfederal lands may be temporarily affected during construction, similar to those described for the proposed Project.

Interconnection Alternative Route #3 would require two road crossings, Eagle Mountain Road in the north, and a crossing of I-10, which the proposed Project avoids. This alternative would also require the crossing of and coordination with existing pipelines that parallel I-10 on the north. The new substation location lies on private land in comparison to Federal land for the proposed Project’s substation location. Additionally, this alternative results in less development within the area’s DWMA (4.7 miles), compared to the proposed Project (5.9 miles). Temporary impacts due to construction activity and traffic would be similar in scope and significance to the proposed Project, with the exception of a temporary increase in traffic around the Eagle Mountain Road/I-10 interchange during the transmission line and substation construction period.

The Western Red Bluff Substation and Interconnection Alternative Route #3 would be consistent with applicable land use plans and policies of the Federal, State and local governments with jurisdiction over the land in the Project area. This alternative will require additional coordination and permitting with the California Department of Transportation regarding the crossing of I-10.

Overall, land use impacts of the Western Red Bluff Substation and Interconnection Alternative Route #3 would be slightly less than the proposed Project.

4.9.4.2 Visual

Interconnection Alternative Route #3 crosses entirely through VRM Class III designations, except for a small area designated as VRM Class II, located immediately south of the Eagle Mountain Road/I-10 intersection (Figure 4-3). The VRM Class II designation is part of BLM's existing VRM process, completed from earlier studies. The Western Red Bluff Substation site, which is located on private land, resides within VRM Class III, based on application of the BLM methodology to private lands for this study.

Interconnection Alternative Route #3 reduces the visual impact compared to the proposed Project by crossing the interstate perpendicular, thus lessening the extent and time the line would be visible by travelers on I-10, as compared to the longer, angled alignment created by the proposed Project route, even though it does not cross I-10 (KOP SI-4).

Relocating the substation to the south of I-10 and out of the panoramic viewshed of the Chuckwalla Valley from I-10 travelers, significantly reduces the proposed Project's adverse visual impact. However, the Western Red Bluff Substation's location will intrude on views of Alligator Rock from east-bound travelers on I-10, but only for a short time as intervening topography and the road's vertical alignment screen views until travelers are within 2 miles of the site (KOP SI-5). The Western Red Bluff Substation's location near a mountain backdrop and lack of skylining further reduces its visual contrast. However, its mass of complex, angular structures with varying heights within foreground views from I-10 would dominate views, and intrude upon scenic views of Alligator Rock, albeit briefly due to the high rates of speed on I-10.

Operation of the new substation may result in a new source of light and glare from night lighting. This may be reduced by use of non-reflective materials and designs that minimize light glare, such as shielding. Most of the transmission line would be within middleground and background view zones. The tower's lattice structure and avoidance of skylining reduces visual contrast to less than significant in these locations. However, the double circuit lattice towers would begin to dominate views within foreground distance zones (0 - ¾ mile). The visual change here would be high and would not meet BLM VRM Class II or III designations (Table 4-3).

Overall, visual impacts for the transmission features and the substation located within foreground distance zones for the Interconnection Alternative Route #3 alignment would be potentially significant. Even so, this alternative is considered to have a lower overall significance of visual impact than the proposed Project alignment, due to the relocation of the substation out of, and less transmission line length within the, panoramic viewshed of the Chuckwalla Valley. While the Western Red Bluff Substation would intrude on partial views of the scenic Alligator Rock for eastbound travelers, only the upper portion of Alligator Rock is visible, and from distances of over 2.5 miles. Travelers would be past the substation location before having clear, unobstructed views of Alligator Rock.

4.9.4.3 Biology

The Western Red Bluff Substation Alternative site hosts abundant desert tortoise sign and is high-quality desert tortoise habitat. Four tortoises, two burrows, and numerous scat were observed during Spring 2010 surveys. In addition, numerous tortoise sign were observed in the surrounding area and the site is connected to high-quality desert tortoise conservation areas (Chuckwalla DWMA) and designated critical habitat. In addition to desert tortoises, the site hosts several large populations of *California ditaxis,* a CNPS List 4 and Northern and Eastern Colorado Desert Plan (NECO) special-status species. Several State-jurisdictional drainages also cross this substation alternative.

4.9.4.4 Cultural Resources

The records search found two historic World War II Desert Training Center/Arizona-California Maneuver Area (DTC/CAMA) sites recorded within the APE of Alternative #3 along Eagle Mountain Road.

Site P-33-015921. This site is an approximately 148-foot long rock alignment marking the edge of a tent associated with the 36th Evacuation Hospital. The hospital was stationed here from May to December, 1943 as part of the DTC/CAMA. The site was recorded by SCE for the North Alligator Rock Alternative of the Devers-Palo Verde 2 Transmission Line Project. To the south of the archaeological complex, of which this site is a part, is a plaque and monument recognizing the historical significance of the 36th Evacuation Hospital, dedicated May 2, 2009 by the BLM and Bill Holcomb Chapter of E Clampus Vitus.

Site P-33-017642 (CA-RIV-9139). This site consists of three rock-lined tent bases and a flag pole base that appears to be associated with the 36th Evacuation Hospital. A contemporary World War II era artifact scatter is associated with the site. The site is located near Eagle Mountain Road.

Field surveys conducted in 2010 found a total of nine sites are recorded in the area of the Western Red Bluff Substation. These resources include three sites associated with historic mining, three prehistoric lithic scatters, one historic telephone/telegraph line, one historic refuse deposit, and a possibly historic fire ring. None of the resources recorded in the Western Red Bluff Substation are recommended as potentially eligible for listing in the NRHP based on preliminary evaluations.

Field surveys found three sites that were recorded within Interconnection Alternative Route #3. Two of these sites, P-33-17642 and P-33-15971 are potentially eligible for the NRHP. Both sites consist of historic features related to the DTC/CAMA, and are both potentially associated with 36th Evacuation Hospital. The third site, DS-203, represents the remains of a possible historic road, and is not likely eligible for listing in the NRHP.

Interconnection Alternative Route #3 has the potential to cause direct and indirect impacts to physical remains of the 36th Evacuation Hospital site and other associated remains from the

World War II era DTC/CAMA. The hospital complex was located between Camp Young to the west and Camp Desert Center to the east. Much of the main hospital complex road alignment and archaeological remains extent north of the I-10 and extend on both sides of Eagle Mountain Road.

Additional remains extend further north for several miles. The potential exists for a NRHP District or Multiple Resources to be located on a substantial area on either side of the Eagle Mountain Road. The site would also be eligible for listing in the California Register of Historic Resources (CRHR). Direct impacts and visual impacts to the complex are to be anticipated from the construction of a transmission line. Existing and on-going records of the main 36th Evacuation Hospital site, P-33-17542, confirm that Interconnection Alternative Route #3 is likely to have the greatest direct and indirect impacts to a historic property and its setting of any of the interconnection alternatives.

Table 4-4. Comparison of Interconnection Alternative Routes[1].

	Proposed Plan	ALT 1A and 1B East	ALT 2- Kaiser Rd	ALT 3 - West
Total Length (miles)*	9.6	12.5	14.8	9.2
Visual Sensitivity (miles)				
Low	-	2.1	1.8	-
Medium	-	3.3	2.2	-
High	9.6	7.1	10.8	9.2
Scenic Quality (miles)				
A	-	-	-	-
B	1.4	0.3	0.3	1.4
C	8.2	12.2	14.5	7.8
VRM Class (miles)				
I	-	-	-	-
II	-	-	-	0.2
III	8.7	7.9	12.5	8.2
IV	0.9	4.6	2.3	0.8
DWMA (miles)[2]				
Chuckwalla	5.9	0.1	5.4	4.7
Outside	3.7	12.4	9.4	4.5
Ownership (miles)				
BLM	9.2	7.6	12.8	8.8

[1] All distances measured from a common divergence point, south of the Central Project Site.

[2] Acreage of surface disturbance for the proposed Project and for each transmission alternative, measured from the Project switchyard, is calculated in the Revised Draft Biological Assessment (July 2010).

	Proposed Plan	ALT 1A and 1B East	ALT 2- Kaiser Rd	ALT 3 - West
Private	0.4	4.9	2.0	0.4
Road Crossings	2	3	3	2
	Eagle Mtn	Kaiser Rd	Kaiser Rd	Eagle Mtn
	Eagle Mtn	Route 177	Route 177	I-10
		I-10	I-10	
ROW (miles)				
Adjacent to Existing Road	4.3	-	5.3	6.6
Adjacent to Utility ROW	-	10.8	3.3	-
New ROW	5.3	1.7	6.2	2.6
Residential w/in 1/4 mile	-	1 area	2 areas	-
Airport w/in 1 mile	-	Yes[3]	-	-
Substations	**Ownership**	**DWMA**	**Desert Tortoise Critical Habitat**	
Proposed Project	BLM	No	No	
Western Red Bluff	Private	No[4]	Yes	
Eastern Red Bluff A-1	BLM	Yes[5]	Yes	

* - Distances noted are from a common "diverge" point, located south of Central Project Site.

4.9.5 No Project Alternative

Under the No Project Alternative, the SWRCB would deny water quality certification for the Eagle Mountain Pumped Storage Project. The project would not be built, and no change to the existing environment would occur. All potentially significant environmental effects would be eliminated, and unavoidable impacts related to air emissions and visual quality along the I-10 corridor would not occur, and the project would not contribute to a potential cumulative overdraft of the groundwater basin.

The No Project scenario may affect the long-term reliability of the transmission system. According to the California Energy Commission, the California Public Utilities Commission, and the California Independent System Operator, California needs large scale energy storage systems in the near future as an essential component of integrating renewable energy sources. At 1,300 megawatts generating capacity, this proposed project is the largest energy storage project proposed in the State, and the only proven technology for large scale energy storage. Under the No Project scenario, it is recognized that attainment of the State's Renewable Portfolio Standard

[3] Desert Center Airport, privately owned
[4] However, field surveys indicate desert tortoises are present at this site
[5] Field surveys indicate low abundance of desert tortoises at this site

will be more difficult to achieve, with consequences for attainment of greenhouse gas emissions reduction as well.

4.10 Determination of the Environmentally Superior Alternative

Based upon the elimination of project impacts to aesthetics, groundwater, and air quality, the environmentally superior alternative would be the No Project Alternative. However, while addressing project-specific impacts, the No Project alternative would eliminate a major utility-scale energy storage project from development, with the likely effect of impeding State goals for successful integration of renewable energy generation sources by year 2020. This outcome would have related consequences for attainment of greenhouse gas reduction goals by year 2020 as well. With this perspective, the conclusion that the No Project alternative is environmentally superior is questionable.

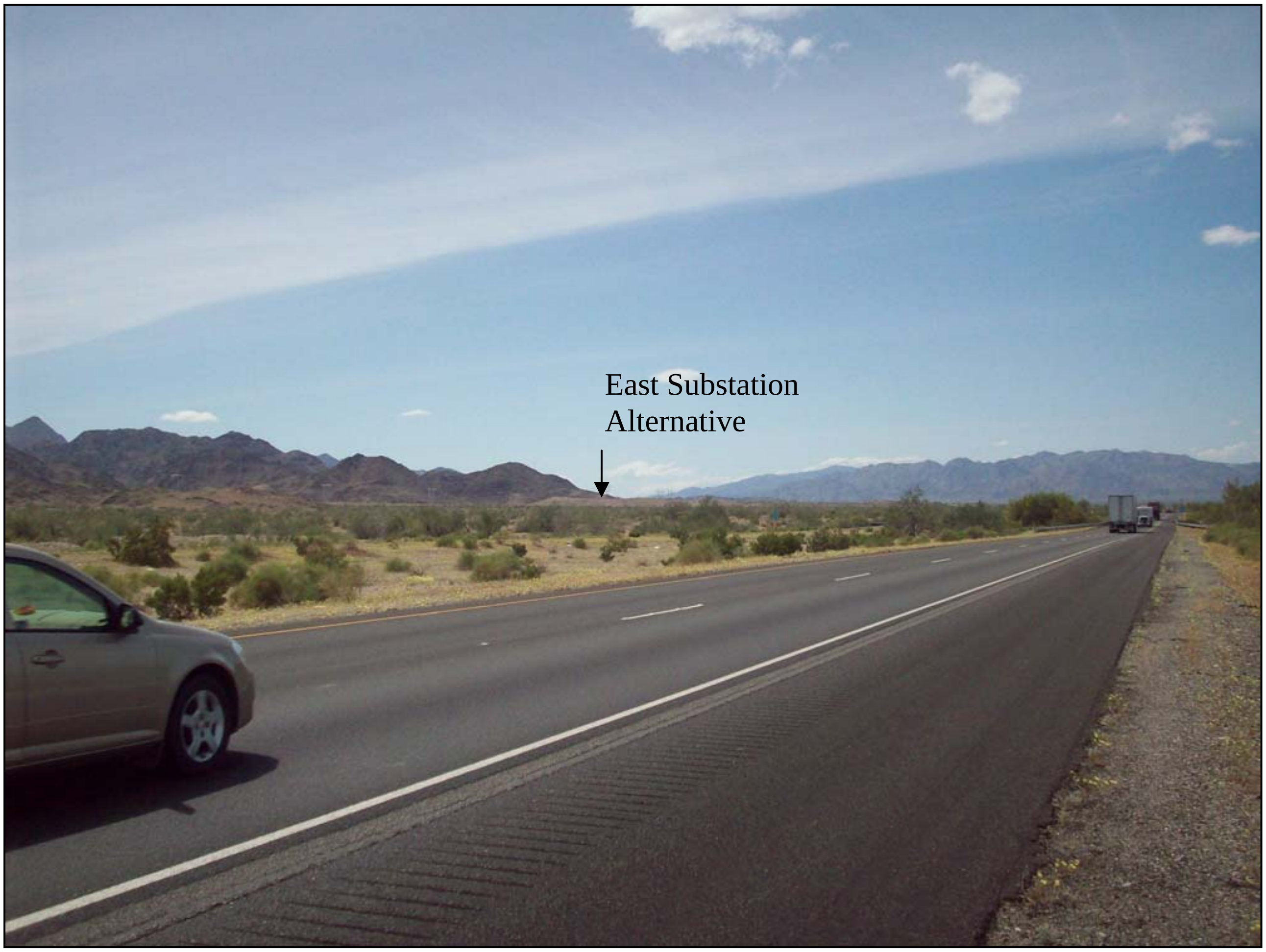
CEQA directs that in the case where the No Project Alternative is identified as the environmentally superior alternative, the EIR shall also identify the environmentally superior *development* alternative (Guidelines §15126.6(e)). As documented in Section 4.7 above, numerous development alternatives were examined and rejected as either infeasible, or having greater potential environmental consequences. These included alternative locations, water supply and water treatment, powerhouse location, and reservoir capacities.

The Proposed Project Alternative has evolved substantially over a period of years to include a variety of features (described in Section 4.6 above) intended to specifically address and minimize potential environmental effects. This alternative also includes incorporation of a comprehensive mitigation program intended to avoid or minimize environmental effects to the extent feasible, while still permitting attainment of basic project goals and objectives. Impacts to groundwater, air quality during construction, and aesthetics remain significant with the application of the mitigation program. It is concluded that *Alternative 1, the Proposed Project with incorporation of all identified Project Design Features and all identified mitigation measures, is the environmentally superior development alternative.*

Two alternative substation locations, and three alternative interconnection routes were examined. Both of the alternative substation locations have less visual impact than the proposed project. However, the western substation location has greater impacts to desert tortoise and cultural resources than either the proposed project or the eastern substation location.
Therefore, *the eastern substation site is the environmentally preferred substation location*.

Two alternative interconnection routes were examined to interconnect to the eastern substation location. Interconnection Alternative #1A and #1B have less impact to desert tortoise, land use, and visual resources than Interconnection Alternative 2, with Alternative #1A having slightly fewer impacts to biological resources than Alternative #1B. Therefore, *Interconnection Alternative #1A is the environmentally superior interconnection alternative*.

Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-1



Location: *East Red Bluff Substation Alternative Site*
Description: *Existing Condition: View west-southwest from I-10 toward location of Alternative Red Bluff Substation site.*
View Distance to Nearest Project Feature: *MG-FG, ¾ mile*
Visible Project Features: *Transmission Line, Substation*
VRM Class: *III (SQ = C, VS = High).*
Remarks: *Transmission line alternatives #s 1 and 2 would cross I-10 to substation location. Perpendicular crossings of I-10 will minimize view duration of the lines, but will not meet BLM VRM management objectives for Class III designations within the FG view zone, brief as it will be (less than a minute at typical interstate travel speeds). Substation features will be screened from east-bound views for some distance due to intervening topography. West bound views will be more pronounced with visual contrast due to potential for taller features to be skylined. Location of substation out of Valley viewshed (to right) reduces visual impact, but strong visual contrast in FG views will not meet BLM VRM Class III management objectives.*

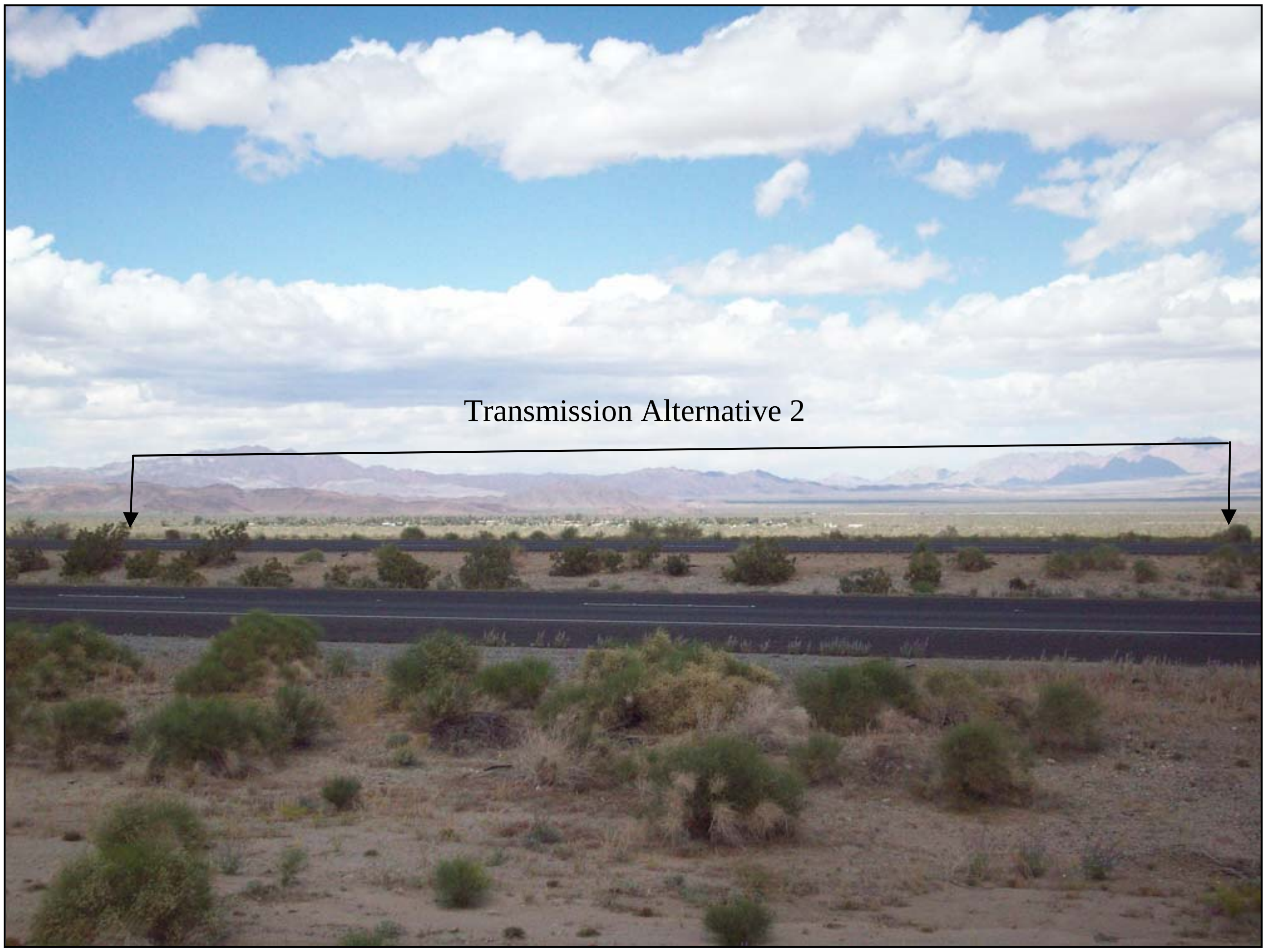
(*See Figure SI-3 for KOP Locations*)

Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-2

Location: *I-10 View North- Northwest*
Description: *Existing Condition: View north-northwest toward location of Alternative Transmission Line Route #1.*
View Distance to Nearest Project Feature: *MG- 1+ miles*
Visible Project Features: *Transmission Line*
VRM Class: *III (SQ = C, VS = High).*
Remarks: *Transmission line would parallel existing H-frame transmission line shown in distance before turning to cross I-10 approximately one mile to west (left side photograph). Perpendicular crossing of I-10 will minimize view duration of the line, but will not meet BLM VRM management objectives for Class III designations within the FG view zone, brief as it will be (less than a minute at typical interstate travel speeds).*

(*See Figure SI-3 for KOP Locations*)

Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-3



Location: *I-10 View North*
Description: *Existing Condition: View north toward location of Alternative Transmission Line Route #2.*
View Distance to Nearest Project Feature: *FG- ¼ mile to ¾ miles*
Visible Project Features: *Transmission Line*
VRM Class: *III (SQ = C, VS = High).*
Remarks: *Transmission line would parallel I-10 crossing (left-to-right) in FG view zone. Location of features, as noted, in FG view zones will not meet BLM VRM management objectives for Class III designations.*

(*See Figure SI-3 for KOP Locations*)

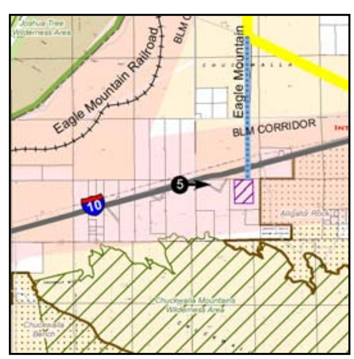
Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-4

Location: *West Red Bluff Substation Alternative Site*
Description: *Existing Condition: View north from substation site toward Alternative #3 transmission line crossing. I-10 in FG/MG view zone. Eagle Mtn Road in MG/BG view zone. Alternative #3 transmission line would parallel Eagle Mtn Road to substation.*
View Distance to Nearest Project Feature: *FG - substation, transmission line crossing I-10.*
Visible Project Features: *Transmission Line, Substation.*
VRM Class: *II (ACEC influence), III (SQ = C, VS = High).*
Remarks: *Perpendicular crossing of I-10 will minimize view duration of transmission line as much as possible. Substation location against mountain backdrop and out of valley viewshed minimizes impact. Location of features, as noted, in FG viewzones will not meet BLM VRM management objectives for Class II and Class III designations.*

(*See Figure SI-3 for KOP Locations*)

Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-5

Location: *I-10 View East*
Description: *Existing Condition: View east toward West Red Bluff Substation site approximately ¾ mile in distance, south (right) of I-10.*
View Distance to Nearest Project Feature: *FG/MG edge - point at which substation starts to become apparent to motorists.*
Visible Project Features: *Transmission Line, Substation.*
VRM Class: *II (ACEC influence), III (SQ = C, VS = High).*
Remarks: *Perpendicular crossing of I-10 will minimize view duration of transmission line as much as possible. Substation location against mountain backdrop and out of valley viewshed minimizes impact. Substation features will begin to intrude on views of Alligator Rock. Location of features, as noted, in FG viewzones will not meet BLM VRM management objectives for Class II and Class III designations.*



(*See Figure SI-3 for KOP Locations*)

Eagle Mountain Pumped Storage Project-Interconnection Alternatives
Visual Resource- Key Observation Point #SI-6

Location: *I-10 View west-northwest, Alternative #1/#2 Crossing*
Description: *Existing Condition: View north-northwest toward location of Alternative Transmission Line Route #1 and Route #2 crossing.*
View Distance to Nearest Project Feature: *FG/MG- ½ mile, +*
Visible Project Features: *Transmission Line*
VRM Class: *III (SQ = C, VS = High).*
Remarks: *Transmission lines would cross I-10 roughly at curve in road approximately ½ mile from view point. Alternative #1 would continue approximately 1.7 miles to northeast in distance before turning to parallel existing H-frame structures (see KOP-SI-2). Alternative #2 would continue to north for ¾ mile, then turn west (see KOP-SI-3). Perpendicular crossing of I-10 will minimize view duration of the line, but will not meet BLM VRM management objectives for Class III designations within the FG view zone, brief as it will be (less than a minute at typical interstate travel speeds).*

(*See Figure SI-3 for KOP Locations*)

5.0 CEQA Mandated Analyses

The California Environmental Quality Act (CEQA) requires consideration and discussion of a range of issues extending beyond analysis of project-specific impacts to individual resource areas. This section of the Eagle Mountain Pumped Storage Hydroelectric Project (Project) Draft Environmental Impact Report (EIR) contains analysis of additional CEQA-mandated analyses listed below, as well the required analysis for Energy Conservation as stated within the CEQA Guidelines, Appendix F. The mandated analyses are as follows:

- Unavoidable Adverse Impacts – CEQA Guidelines §15126.2(b)
- Growth Inducing Effects – CEQA Guidelines §15126.2(d)
- Significant Irreversible Environmental Changes – CEQA Guidelines §15126.2(c) and
- Cumulative Impacts – CEQA Guidelines §15130

5.1 Significant and Unavoidable Impacts

Public Resources Code Section 21100(b)(2)(A) requires an EIR to include a detailed statement setting forth any significant effects on the environment that cannot be avoided if a project is implemented. CEQA Guidelines §15126.2(b) states that such impacts include those which can be mitigated but not reduced to a level of less than significance. Where there are impacts that cannot be alleviated without selecting an alternative design, the implications and the reasons why a project is being proposed, notwithstanding its effect, must be described in a statement of overriding considerations. Significant and unavoidable impacts identified for the proposed Project relate to aesthetics, air quality, and groundwater.

5.1.1 Aesthetics

The transmission line segment from the Eagle Mountain Road turnoff to the interconnection substation (~2.5 miles) would introduce a new utility feature to the landscape, creating high visual contrast within foreground view zones. Of the 10 Key Observation Points established, two (Interstate 10 [I-10] and Desert Center) would be exposed to significant, visual changes that cannot be entirely mitigated to less than significant. Although the proposed Project's transmission line would be similar in design and height to the Southern California Edison, Devers-Palo Verde 2 (DPV2) Transmission line segment proposed to cross I-10 in the foreground (*see* various figures within this EIR for locations of existing and proposed transmission lines), the new structures would cause additional view blockage in the foreground of the panoramic views of the Chuckwalla Valley and surrounding mountains. The new transmission line and new right-of-way (ROW) would also increase the structural complexity and industrial character, which would be more pronounced as the viewer gets closer to the structures. Viewers traveling eastbound on I-10 would be most affected by the Project transmission line whereas unobstructed views of the line would be apparent in the foreground/middle-ground view zones. The new structures will be apparent to westbound travelers as well, but potentially “filtered” due to the proposed DPV2 line. The moderate-to-high level of visual change that would result from this component of the Project would be inconsistent with the applicable United States Bureau of Land Management’s (BLM) Visual Resource Management (VRM) Class III management objectives, resulting in a *significant and unavoidable impact*.

5.1.2 Air Quality

The proposed Project will result in a significant [short-term] construction-related impact from nitrogen oxide (NO_x) in construction years 2012 through 2014; resulting in a *significant and unavoidable impact*. Other air quality parameters will not exceed the thresholds of significance. No significant operational air quality impacts were identified.

5.1.3 Groundwater

Pumping will exceed recharge for approximately 4 years of the 50-year project life. During the remaining years, recharge will exceed pumping. By 2065, at the end of the 50-year Federal Energy Regulatory Commission (FERC) Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet. This will not result in depletion of groundwater supplies, and this potential impact is *less than significant*.

However, in combination with pumping for all reasonably foreseeable projects, Basin overdraft of about 9 feet is likely to occur over the life of the project, in which case, this project would contribute to a *significant adverse cumulative effect*.

5.2 Growth-Inducing Impacts

Public Resources Code Section 21100(a)(5) requires that the growth-inducing impacts of a project be addressed in the EIR. A project may be growth-inducing if it directly or indirectly fosters economic or population growth or the construction of additional housing, removes obstacles to growth, taxes community service facilities, or encourages or facilitates other activities that cause significant environmental effects. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment (CEQA Guidelines §15126.2[d]).

The Project proposes to establish industrial activities. Industrial activities are typically associated with economic growth and stimulated population growth. However, the Project’s operation does not require a large number of employees that would typically be required for other industrial operations, such as a landfill or mining pit. At Project buildout, the pumped storage facility would be expected to operate with a staff totaling 30 persons based on three work-shifts within a given 24-hour period.

The majority of required manpower is needed during construction, particularly in the time frame approximately 2 years into the construction period, with considerably less needed in the first and last years. Peak monthly employment would occur in Year 2 with a high of 209 employees.

It is expected that most of the general labor required during construction would be available from the labor pool within Riverside County and the Project region. As much as 50 percent of the skilled trades and management and support personnel could also be provided by regional labor. There would be some immigration of non-local workers to meet Project manpower requirements. It is expected that many of these employees will utilize local housing. Significant vacant housing and rental units are available within Riverside County as well as large numbers of hotel/motel rooms. Long-term employment during Project operation may generate additional demand for housing in the Desert Center area, but the number of employees will be small (approximately 30 employees) and the existing housing stock will likely accommodate these employees.

Estimates of peak construction work force and the expected percentage of non-local workers suggest that during the peak period, approximately 105 workers will require short-term (two years) housing accommodations. Therefore, the relatively small number of employees would likely be derived from the area's resident population and significant numbers of employees from outside the area would not be needed long-term. The proposed Project would have no indirect growth-inducing impacts. The Project does not have the ability to remove a barrier to growth. Based on this analysis, the growth inducing impact based on implementation of the proposed Project would be considered *less than significant.*

5.3 Significant Irreversible Environmental Changes

Public Resources Code Section 21100(b)(2)(B) requires an EIR to include a detailed statement setting forth any significant effects on the environment that would be irreversible if a project were implemented. Pursuant to CEQA Guidelines §15126.2(c), the uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely; whereas irreversible damage and irretrievable commitments of resources may result in significant impacts.

The site's use as a pumped storage facility may limit the capacity to recover further iron ore; however, as stated in Section 3.1 Geology and Soils, the property's owner intends to convert the site to a landfill. The remaining deposits contain low average iron content, and no ore processing facilities remain on the site. Furthermore, using rail to transport material would require substantial reconstruction for reoperation. Therefore, future iron mining is unlikely to occur within the proposed Project boundary.

The proposed Project would use part of the fine tailings stored onsite to create a reservoir liner or construction of a low-permeability central core in the embankments proposed for the upper reservoir site. Recycling of the large volumes of mine tailings around the site would be a significant benefit over the long term. None of these changes are irreversible, but resources will be committed for the life of the proposed Project.

The proposed Project will convert disturbed land to industrial use with reservoirs, transmission structures, and other related components; however, these changes would only occur over the life of the Project. This impact could be reversed if the reservoirs were reclaimed [drained] and transmission line is dismantled at the end of the Project. The Project duration is estimated at 30 to 50 years based in part on FERC licensing, California State Water Resources Control Board (SWRCB) permitting, market conditions, and various other components which are unknown at this time. In summary, the proposed Project would have *no significant irreversible environmental changes*.

5.4 Cumulative Projects

A cumulative project refers to land development projects that are in various phases of entitlement, planning and/or construction and that may affect the same resources and geographic area as the proposed Project. CEQA defines cumulative impacts as:

> Two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. (CEQA Guidelines §15355).

Pursuant to CEQA Guidelines §15130, "An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(a)(3)…" And further, "cumulatively considerable" is defined by the incremental effects of an individual project which are significant when taking into consideration with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CEQA Guidelines §15065 (a)(3)).

When an incremental effect is not "cumulatively considerable", the Lead Agency (the SWRCB) need not consider that that effect significant, but shall briefly describe its basis for conclusion that the incremental effect is not cumulatively significant (CEQA Guidelines §15130(a). CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, "…*but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative* *impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.*" (CEQA Guidelines §15130(b)).

As defined under CEQA Guideline §15130(b), the following elements are necessary to provide an adequate discussion of potential cumulative impacts.

1. Either:
   (a) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or

   (b) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.
2. When utilizing a list, factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project, and its type;
3. Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limits used;
4. A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and,
5. A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

This EIR utilized the list approach to define the past, present, and probable future projects (*see* below: Table 5-2 Existing Projects along the I-10 Corridor and Table 5-3 Future Foreseeable Projects along the I-10 Corridor).

The geographic area of cumulative effect varies by resource. For example, air quality impacts tend to disperse over a large area, while traffic impacts are typically more localized. For this reason, the geographic scope for the analysis of cumulative impacts must be identified for each resource area (*see* Table 5-1 Geographic Scope of Cumulative Effects Analysis). The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on topography and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects often extends beyond the scope of the direct effects, but not beyond the scope of the direct and indirect effects of the proposed action and alternatives. The geographic area encompassed by the listed projects covers an approximate 15 to 20 mile radius around the Project site.

Table 5-1. Geographic Scope of Cumulative Effects Analysis

Resource Area	Geographic Scope of Cumulative Effects Analysis
Geology & Soils	Chuckwalla Valley
Surface Water	Chuckwalla Valley
Groundwater	Chuckwalla Aquifer and surrounding hydrologically interconnected aquifers.
Agricultural Resources	Chuckwalla Valley
Biological Resources	Chuckwalla Valley and surrounding mountains (~ 10 mile radius from Project) with consideration for the range of individual species and populations.
Threatened & Endangered Species	Chuckwalla Valley and surrounding mountains with consideration for the range of individual species and populations.
Aesthetics	Chuckwalla Valley, including I-10 corridor in the area of Desert Center, CA
Cultural Resources	Chuckwalla Valley
Land Use / Public Services	Eastern Riverside County
Recreation	Chuckwalla Valley
Population/Housing	Riverside County, with focus on eastern Riverside County within commuting distance to the site.
Transportation	I-10 corridor in eastern Riverside County, and the Chuckwalla Valley.
Air Quality	South Coast Air Quality Management District
Noise	Chuckwalla Valley
Greenhouse Gas Emissions	Global
Hazards and Hazardous Materials	Chuckwalla Valley
Environmental Justice	Chuckwalla Valley, including Desert Center and Lake Tamarisk

The cumulative projects in the immediate Project vicinity include those along the I-10 corridor in eastern Riverside County (*see* Table 5.2 Existing Projects along the I-10 Corridor and Table 5.3 Future Foreseeable Projects along the I-10 Corridor). Both tables indicate project name, type, ownership, general location, acreage, and status. This information was compiled by the BLM for use in the cumulative environmental impact analysis for the proposed solar energy projects and was provided to the SWRCB (Lead Agency) in March 2010 (Ysmael Wariner, BLM staff, personal communication, March 2010). Several projects in the Chuckwalla Valley are in the planning and permitting stage. They include various proposed solar energy projects, the proposed Eagle Mountain Landfill project, and other relevant probable future projects.

5.4.1 Past and Present Projects

Based on the data provided by the BLM, past projects within the Project vicinity include roadway projects, prison projects, transmission line and energy facilities, recreational activities and mining. *See* Table 5-2 Existing Projects along the I-10 Corridor (Eastern Riverside County) for a complete list.

5.4.2 Probable Future Projects

Based on the data provided by the BLM, probable foreseeable projects within the Project vicinity include several proposed transmission line and energy facilities, the proposed Eagle Mountain Landfill, and recreational activities. *See* Table 5-3 Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County) for a complete list.

5.4.2.1 Proposed Solar Energy Projects

In 2006 under Senate Bill 107, California's Renewables Portfolio Standard (RPS) was created and codified a goal of increasing the percentage of renewable energy in the State's electricity mix to 20 percent by 2010. It is one of the most ambitious renewable energy standards in the United States. The RPS program requires electric utilities and providers to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, requiring that California utilities reach a renewables goal of 33 percent by 2020.

Solar power is one of the forms of eligible renewable energy that is being encouraged by the California RPS. According to the California Energy Commission (CEC), there is tremendous potential for utility-scale solar facilities in California. The CEC and the BLM have signed a Memorandum of Understanding to facilitate permitting of these facilities. As of January 2010, there were 244 renewable projects proposed in California in various stages of the environmental review process or under construction. Projects representing more than 30,000 megawatts of solar power have initiated discussion with the regulatory agencies.

In the Desert Center area, five large scale solar projects have been proposed. In the broader Palm Springs area there are at least 17 solar projects proposed. There is a limited amount of publically available information about these projects at this time. This Draft EIR addresses the cumulative impacts of the Eagle Mountain Pumped Storage Project and the proposed solar projects to the extent possible, with the information available at this time. It is assumed that these projects will start construction at the end of 2010, in order to qualify for funding under American Recovery and Reinvestment Act (ARRA).

The large renewable projects now described in applications to the BLM and on private land are competing for utility Power Purchase Agreements, which will allow utilities to meet State-required Renewable Portfolio Standards (RPS). However, it can be reasonably assumed that not all of the proposed solar projects will complete the environmental review, and not all projects will be funded and constructed. It is unlikely that all of these projects will be constructed for a number of reasons including the detailed Federal and State licensing and permitting process, mitigation requirements, technological limitations, endangered species habitat issues, and/or financial constraints.

5.4.2.2 Section 368 Energy Corridor

Section 368 of the Energy Policy Act of 2005, Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the secretaries of Agriculture, Commerce, Defense, Energy, and the Interior (the Agencies) to designate under their respective authorities corridors on Federal land in 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming) for oil, gas, and hydrogen pipelines, electricity transmission and distribution facilities (energy corridors).

The BLM and the United States Forest Service issued a Record of Decision in January 2009 designating more than 6,000 miles of Section 368 energy corridors. The evaluation of future project-related environmental impacts must await site-specific proposals and the required site-specific environmental review. A quantifiable and accurate evaluation of impacts at the local project level can be made only in response to an actual proposed energy project, when a proposal for an action with specific environmental consequences exists.

One of the corridors identified in the decision is a proposed Section 368 Energy Corridor which parallels I-10 and includes the existing Federal utility corridor designated in the California Desert Conservation Area Plan. The non default corridor width shown for the Chuckwalla Valley segment of the Section 368 corridor is 10,560 feet (U.S. DOI, 2009).

5.4.2.3 United States Department of Energy and BLM Solar Energy Study Areas in California

The United States Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy and the BLM, in response to direction from Congress under Title II, Section 211 of the Energy Policy Act of 2005, as well as Executive Order 13212, Actions to Expedite Energy-Related Projects (May 18, 2001), are currently preparing a Programmatic Environmental Impact Statement to evaluate utility-scale solar energy development, to develop and implement Agency-specific programs that would establish environmental policies and mitigation strategies for solar energy projects, and to amend relevant BLM land use plans with the consideration of establishing a new BLM solar energy development program (SED PEIS IC, 2010).

On March 11, 2009, Secretary of Interior Salazar announced Secretarial Order No. 3285, a policy goal of identifying and prioritizing specific locations best suited for large-scale production of solar energy on tracts of BLM administered land. The BLM identified a 202,295 acre area in eastern Riverside County identified as “Riverside East.” Riverside East includes the Chuckwalla Valley, the north side of I-10, and west of the city of Blythe.

5.4.2.4 The Proposed Eagle Mountain Landfill

Plans for the proposed Eagle Mountain Landfill Project have been developed by Mine Reclamation Corporation and others to use portions of the previous Eagle Mountain mine site for a regional landfill serving the Southern California urban areas. The EIR/EIS was approved in 1999; however, the project remains in litigation at the time of this writing (June 2010). Because of the ongoing litigation, and the current lack of demand for additional landfill capacity in southern California, it is assumed that construction of the landfill will not begin until after the proposed Project is completed. For a more thorough discussion of the timing of proposed landfill construction, *see* Section 3.9, Land Use.

The proposed Project has been formulated with the assumption that the proposed landfill will be constructed as currently proposed by the landfill developers. Details of an assessment of compatibility of the Eagle Mountain Pumped Storage Project with the Eagle Mountain Landfill Project are found in a technical memorandum in Section 12.5 Eagle Mountain Pumped Storage Project/Landfill Compatibility and in Section 3.9 Land Use.

Table 5-2. Existing Projects along the I-10 Corridor (Eastern Riverside County)

Project Name / Agency ID	Location	Ownership	Status	Acres	Project Description
Interstate 10	Linear project extending from Santa Monica to Blythe, CA	California Department of Transportation	Existing.	N/A	Interstate 10 (I-10) is a major east-west route for trucks delivering goods to and from California. I-10 is a four lane divided highway in the Blythe region.
Chuckwalla Valley State Prison	19025 Wiley's Well Road Blythe, CA	California Department of Corrections & Rehabilitation	Existing.	1,080	State prison providing long-term housing and services for male felons classified as medium and low-medium custody inmates. The prison is jointly located on 1,720 acres of State-owned property APN 879040006,008, 012, 027, 028, 029, 030.
Ironwood State Prison	19005 Wiley's Well Road Blythe, CA	California Department of Corrections & Rehabilitation	Existing.	640	ISP jointly occupies (with Chuckwalla Valley State Prison) 1,720 acres of State-owned property, of which ISP encompasses 640 acres. The prison complex occupies approximately 350 acres with the remaining acreage used for erosion control, drainage ditches, and catch basins. (APN 879040001, 004, 009, 010, 011, 015, 016, 017, 018, 019, 020)
Devers-Palo Verde Transmission Line	From the Midpoint Substation to Devers Substation	Southern California Edison	Existing.	N/A	Existing 500 kV transmission line parallel to I-10 from Midpoint Substation from approximately 10 miles southwest of Blytheto the SCE Devers Substation near Palm Springs.
Blythe Energy Project Transmission Line	From the Blythe Energy Project (Blythe, CA) to Devers Substation	Blythe Energy, LLC	Under construction.	N/A	Transmission Line Modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation and SCE's DPV 500 kV transmission line.

Project Name / Agency ID	Location	Ownership	Status	Acres	Project Description
West-wide Section 368 Energy Corridors	Riverside County, parallel to DPV corridor	Bureau of Land Management, Department of Energy, U.S. Forest Service	Approved by BLM and U.S. Forest Service.	N/A	Designation of corridors on Federal land in the 11 western states, including California, for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). One of the corridors runs along the southern portion of Riverside County.
Blythe Energy Project	City of Blythe, north of I-10, 7 miles west of the CA/AZ border	Blythe Energy, LLC	Existing.	76	520 MW combined-cycle natural gas-fired electric-generating facility. Project is connected to the Buck Substation owned by the Western Area Power Administration.
Eagle Mountain Pumping Plant	Eagle Mountain Road, west of Desert Center	Metropolitan Water District of Southern California	Existing.	--	144 ft. pumping plant owned by the Metropolitan Water District of Southern California. (APNs 807150007, 807150009, 807150010)
Recreational Opportunities	Eastern Riverside County	Bureau of Land Management	Existing.	N/A	BLM has numerous recreational opportunities on lands in eastern Riverside County along the I-10 corridor including the Wiley's Well Campground, Coon Hollow Campground, and Midland Long-Term Visitor Area.
Chuckwalla Valley Raceway	Desert Center Airport	Developer Matt Johnson	Under construction.	400	Proposed race track located on 400 acres of land that used to belong to Riverside County and was used as the Desert Center airport. (APN 811142016, 811142006)
Kaiser Mine	Eagle Mountain, north of Desert Center, CA	Kaiser Ventures, Inc.	Mining activities stopped in 1983.	--	Kaiser Steel mined iron ore at Kaiser Mine in Eagle Mountain, providing much of the Pacific coast's steel in the 1950s. The mine included the Eagle Mountain Railroad, 51 miles long. Imported steel captured market share in the 1960s and 1970s and primary steelmaking closed in the 1980s.

Table 5-3 Future Foreseeable Projects along the I-10 Corridor (Eastern Riverside County)

Project Name / Agency ID	Location	Ownership	Status	Acres	Proposed Project Description
Devers-Palo Verde 2 Transmission Line Project	From the Midpoint Substation to Devers Substation.	Southern California Edison	Project was approved by CPUC 11/2009.	N/A	New 500 kV transmission line parallel to the existing Devers-Palo Verde Transmission Line from Midpoint Substation, approximately 10 miles southwest of Blythe, to the SCE Devers Substation near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to the existing DPV ROW and would require an additional 130 feet of ROW on Federal and State land and at least 130 feet of ROW on private land and Indian Reservation land.
Desert Southwest Transmission Line	118 miles primarily parallel to DPV.	Imperial Irrigation District	Final EIR prepared 2005. Approved by the BLM in 2006.	N/A	New, approximately 118-mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs, California.
Green Energy Express Transmission Line Project	70-mile transmission line from the Eagle Mountain Substation to southern CA.	Green Energy Express LLC	September 9, 2009, Green Energy Express LLC filed a Petition for Declaratory Order requesting that FERC approve certain rate incentives for the project.	N/A	70-mile double-circuit 500 kV transmission line and new 500/230 kV substation from near the Eagle Mountain Substation (eastern Riverside County) to Southern California
Blythe Energy Project II	Blythe, CA. Near the Blythe Airport and I-10.	Blythe Energy, LLC.	Approved December 2005.	30	520 MW combined-cycle power plant located entirely within the Blythe Energy Project site boundary. Blythe Energy Project II will interconnect with the Buck Substation constructed by WAPA as part of the Blythe Energy Project. Project is designed on 30 acres of a 76-acre site.

Project Name / Agency ID	Location	Ownership	Status	Acres	Proposed Project Description
Palen Solar Power Project	North of I-10, 10 miles east of Desert Center	Solar Millennium, LLC and Chevron Energy	Undergoing environmental review. Construction expected to begin in late 2010 with one unit online in 2012 and one unit online in 2013.	5,200	500 MW solar trough project on 5,200 acres. Facility would consist of two 250 MW plants.
Blythe Solar Power Project	North of I-10, immediately north of the Blythe Airport	Solar Millennium, LLC and Chevron Energy	Undergoing environmental review.	9,400	1,000 MW solar trough facility on 9,400 acres.
NextEra (FPL) McCoy	Northwest of Blythe, CA, immediately north of Blythe Solar Power Project	NextEra (FPL)	Plan of Development submitted to the Palm Springs BLM.	20,608	250 MW solar trough project. ROW in process for monitoring water well drilling.
McCoy Soleil Project	10 miles northwest of Blythe	enXco	Plan of Development submitted to the Palm Springs BLM.	1,959	300 MW solar power tower project located on 1,959 acres. Project would require a 14 mile transmission line to proposed SCE Colorado Substation south of I-10.
Genesis Solar Energy Project	North of I-10, 25 miles west of Blythe and 27 miles east of Desert Center	NextEra (FPL)	Undergoing environmental review. Construction to begin late 2010.	4,640	250 MW solar trough project located on 4,640 acres north of the Ford Dry Lake. Project includes six mile natural gas pipeline and a 5.5 mile gen-tie line to the Blythe Energy Center to Julian Hinds Transmission Line, east on shared transmission poles to the Colorado River Substation.

Project Name / Agency ID	Location	Ownership	Status	Acres	Proposed Project Description
Big Maria Vista Solar Project	North of I-10, approx.12 miles NW of Blythe	Bullfrog Green Energy	Plan of Development submitted to BLM.	2,684	500 MW solar photovoltaic project on 2,684 acres. Project would be built in three phases and would require 6,000 gallons of water monthly.
Chuckwalla Solar	1 mile north of Desert Center	Chuckwalla Solar I, LLC	Plan of Development submitted to BLM.	4,083	200 MW solar photovoltaic project on 4,083 acres. Project would be developed in several phases and would tap into an existing SCE 161-kV transmission line crossing the site.
Rice Solar Energy Project	Rice Valley, Eastern Riverside County	Rice Solar Energy, LLC (SolarReserve, LLC)	Undergoing environmental review. Construction to begin in 2011.	1,410	150 MW solar power tower project with liquid salt storage. Project is located on approximately 1,410 acres and includes a power tower approximately 650 feet tall and a 10-mile long interconnection with the WAPA Parker-Blythe transmission line.
Blythe Airport Solar I Project	Blythe Airport	U.S. Solar	Application has been submitted to City of Blythe. Approved in November, 2009.	640	100 MW solar photovoltaic project located on 640 acres at the Blythe airport.
Blythe PV Project	Blythe	First Solar	CPUC approved power purchase agreement for 7.5 MW. Under construction in fourth quarter 2009.	200	7.5 MW solar photovoltaic project located on 200 acres. Project was constructed by First Solar and sold to NRG Energy.
Desert Quartzite	South of I-10, 8 miles southwest of Blythe	First Solar	POD in to BLM.	7,724	600 MW solar photovoltaic project located on 7,724 acres. Adjacent to DPV transmission line and SCE Colorado Substation.

Project Name / Agency ID	Location	Ownership	Status	Acres	Proposed Project Description
Desert Sunlight	North of Desert Center	First Solar	POD in to BLM.	5,000-6,000	250 MW solar photovoltaic project located on 5,000-6,000 acres.
EnXco	North of Wileys Well Road, east of Genesis Solar Energy Project	enXco	POD in to BLM.		300 MW solar photovoltaic project.
Desert Lily Soleil Project	6 miles north of Desert Center	enXco	Unknown.	1,216	100 MW photovoltaic plant on BLM land.
Red Bluff Substation	Unknown at this time; near Desert Center	SCE	Unknown.	N/A	Proposed 230/500 kV Substation near Desert Center. Planned to interconnect renewable projects near Desert Center with the DPV transmission line.
Eagle Mountain Landfill Project	Eagle Mountain, North of Desert Center	Mine Reclamation Corporation and Kaiser Eagle Mountain, Inc.	In litigation.	~3,500	Class III nonhazardous municipal solid waste landfill on a portion of the Kaiser Eagle Mountain Mine in Riverside County, California. The project would renovate and repopulate the Eagle Mountain Townsite. The landfill would accept up to 20,000 tons of non-hazardous solid waste per day for 50 years.

Project Name / Agency ID	Location	Ownership	Status	Acres	Proposed Project Description
Wileys Well Communication Tower (part of the Public Safety Enterprise Communication System)	East of Wileys Well Road, just south of I-10	Riverside County	Final EIR for the Public Safety Enterprise Communication System published in August 2008.	N/A	The Public Safety Enterprise Communication project is the expansion of the County of Riverside's fire and law enforcement agencies approximately 20 communication sites to provide voice and data transmission capabilities to assigned personnel in the field.
Mule Mountain Solar Project	South of I-10, approx. 4 miles west of Blythe	Bullfrog Green Energy	Plan of Development in to Palm Springs BLM.	2,684	500 MW solar concentrating photovoltaic project located on 2,684 acres.
BLM Renewable Energy Study Areas	Along the I-10 corridor between Desert Center and Blythe	BLM	Proposed.	--	The DOE and BLM identified 24 tracts of land as Solar Energy Study Areas in the BLM and DOE Solar PEIS. These areas have been identified for in-depth evaluation for solar development and may be found appropriate for designation as solar energy zones in the future.
Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve	Federal	In December 2009, Senator Feinstein introduced bill S.2921 that would designate two new national monuments including the Mojave Trails National Monument.	941,000	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of Federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.

5.5 Cumulative Impacts

5.5.1 Geology and Soils

The proposed Project would expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: rupture of an earthquake fault, strong seismic ground shaking, seismic-related ground failure, liquefaction or landslides. On-site faults have been evaluated and found to be inactive and the risk of surface rupture, liquefaction-induced settlement and other seismic effects at the site caused by faulting is very low (GeoSyntec, 1993, 1996) and *less than significant*. Other projects in the area would experience similar risk. No cumulative impacts associated with geological resources have been identified related to the solar projects proposed for development in the Chuckwalla Valley. Therefore, any cumulative impact would be *less than significant* and the proposed Project's incremental contribution *less than significant*.

Similarly, the proposed Project is not located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. The Project is not located on expansive soils. Because the risk of these effects is low in the region, any cumulative impact would be less than significant and the Project's incremental contribution *less than significant*.

The proposed Project would not affect soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are unavailable for the disposal of waste water. The waste disposal system will be permitted, engineered, and constructed and will not rely upon natural soils. Therefore, the proposed Project would have *no impact and would not contribute to a cumulative impact*.

The proposed Project's impact on soil erosion and loss of topsoil would be *less than significant*. Other cumulative projects in areas where soil is vulnerable to erosion could result in loss of topsoil and a cumulative. However, the impact of soil erosion is minimized by all projects to the extent possible by limiting surface disturbance to only those areas necessary for construction. Storm water and dust control best management practices (BMPs) will be employed to minimize erosion, sedimentation and fugitive dust. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, stabilized, and used during site restoration. State and Federal laws require soil stabilization BMPs for soil stabilization during construction as part of storm water regulations, which require preparation and implementation of a Storm Water Pollution Prevention Plan. Erosion control measures are outlined in MM GEO-1, which will reduce the Project's contribution to any cumulative soil erosion impacts to a *less than cumulatively considerable.*

No cumulative impacts associated with the geological resource area have been identified.

5.5.2 Surface Water

This section evaluates potential cumulative impacts on surface water; whereas, it does not evaluate cumulative effects to which the Project would have no contribution including substantial alteration of drainage patterns of a stream or river resulting in erosion or flooding, runoff contributions that would exceed the capacity of a storm drain system, placement of housing or other structures in a flood zone, redirection of flood flows, or inundation by catastrophic events (seiche, tsunami, or mudflow).

The Project owner and engineering team will collaborate with the Eagle Mountain Landfill project personnel on final design to insure that there is no interference with the landfill's water collection systems. The proposed Project may experience water quality issues within the reservoirs, such as elevated salt and metals. This issue would be addressed through water treatment processes. However, this is a project-specific issue not incremental as part of a cumulative impact.

None of the proposed solar projects in the vicinity of the proposed Project are anticipated to have an impact on surface water bodies. Therefore, there will be *no significant cumulative impacts* to surface waters.

5.5.3 Groundwater

The proposed Project would use groundwater to fill the Project reservoirs and for evaporation makeup water. As described in Section 3.3 Groundwater, this would have *a less than significant* impact on groundwater hydrology (drawdown elevation) after implementation of the mitigation program. Other cumulative projects in the planning and permitting stages are also within the Chuckwalla Valley Groundwater Basin include the proposed Eagle Mountain Landfill (held in litigation), solar generating facilities, and the existing Metropolitan Water District of Southern California (MWD) groundwater banking program in the Orocopia Valley.

The proposed Eagle Mountain Landfill would be located at the mine site and would likely use water from wells in the upper Chuckwalla Valley needing an average of 830 acre-feet per year (AFY). Solar generating facilities would have relatively low water demands for wash water, dust control, and (for thermal plants only) steam cycle make-up water. These projects are located at various locations in upper Chuckwalla Valley, Desert Center, and east of Desert Center. Their combined water demand is estimated to average about 4,000 AFY and may range up to 6,000 AFY during construction. The solar facilities were assumed to begin operation between 2012 and 2019. Over 70 percent of the solar water use will be east of Desert Center, in the lower Chuckwalla Valley.

The MWD stores water in the Orocopia Valley and plans to extract the water in the near future. Because the net effect on the groundwater is zero this evaluation of cumulative impacts does not include potential effects of MWD's conjunctive management.

Together, these and other projects could contribute to cumulative effects from the pumped storage project, agricultural users, the prisons, and local residences. Drawdown from existing projects, the proposed Project, and other sources of pumping was combined to assess the cumulative effects. Overall, pumping by the cumulative solar projects and the proposed landfill will add about 5 feet of additional drawdown to the areas of the basin where water is being pumped. Over the 50 year life of the Project, the resulting cumulative drawdown will exceed the maximum historic drawdown by 7 feet beneath the Colorado River Aqueduct (CRA) near the Project site, 6 feet in the Orocopia Valley, and 1 foot at the mouth of the Pinto Basin. The maximum historic drawdown would not be exceeded in the Desert Center area.

As discussed above in Section 5.1 Unavoidable Adverse Impacts, Project pumping will exceed recharge for approximately 4 years of the 50-year project life. During the remaining years, recharge will exceed pumping. By 2065, at the end of the 50-year FERC Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet. This will not result in depletion of groundwater supplies, and this potential impact *is less than significant.*

However, in combination with pumping for all reasonably foreseeable projects, Basin overdraft of about 9 feet is likely to occur over the life of the project, in which case, this project would contribute to a significant adverse cumulative effect.

Table 5-5 Chuckwalla Valley Groundwater Basin Water Balance Cumulative Effects on Groundwater Years 2008-2100 demonstrates the results of the groundwater balance and potential effects of groundwater pumping on groundwater storage over the life of the Project with the landfill and solar projects. Using 2008 as the start of the budget, recharge will exceed pumping until the start of the Project in 2014 at which time pumping will exceed recharge by about 6,500 to 10,700 AFY for 4 years. Throughout much of Project life the combination of pumping, including the cumulative solar projects and the proposed landfill will exceed recharge by about 2,600 to 3,200 AFY. By 2046 the aquifer storage (cumulative change) will have been reduced by about 95,300 acre-feet, equal to 1 percent of the total groundwater in storage in the Chuckwalla Valley Groundwater Basin for the conservative estimate of 9,100,000 acre-feet, and 0.6 percent for the more recent California Department of Water Resources (DWR) estimated volume of 15,000,000. As a comparison, the cumulative change in groundwater storage during agricultural pumping between 1981 and 1986 was over 36,000 acre-feet as shown in Table 3-11. Near the end of the Project life, in 2047, recharge is greater than the pumping. The basin will recover to pre-project levels by about 2094.

The cumulative effect on groundwater elevations will be a combined additional 5 feet of drawdown. Over the 50 year life of the Project, the resulting cumulative drawdown will exceed the maximum historic drawdown by 7 feet beneath the CRA near the Project site, 6 feet in the Orocopia Valley, and 1 foot at the mouth of the Pinto Basin. The maximum historic drawdown would not be exceeded in the Desert Center area.

Recharge will exceed pumping until the start of the Project, at which time pumping will exceed recharge by about 6,500 to 10,700 AFY for 4 years. Throughout much of Project life, the combined pumping, including cumulative solar projects and the proposed landfill, will exceed recharge by about 2,600 to 3,200 AFY. By 2046 the aquifer storage (cumulative change) will have been reduced by about 95,300 acre-feet, which is equal to 1 percent of the total groundwater in storage in the Chuckwalla Valley Groundwater Basin, based on a conservative estimate of 9,100,000 acre-feet groundwater in storage. Therefore, the cumulative impact would be 0.6 percent for the more recent DWR estimated volume of 15,000,000 acre-feet groundwater in storage. Near the end of the Project life, recharge is greater than the pumping. The basin will then recover to pre-Project levels by 2094.

Although the combination of existing water use, the proposed Project, and other proposed pumping will result in temporary overdraft, groundwater levels for the most part will remain within the range of past drawdown that has occurred in the past when little to no change in water quality occurred. For that reason, projected cumulative pumping will not adversely affect the water quality in the groundwater basin.

Table 5-5. Chuckwalla Valley Groundwater Basin Water Balance Cumulative Effects on Groundwater Years 2008-2100

Year	Subtotal Outflow	Subtotal Inflow	Inflow minus Outflow	Cumulative Change
2008	10,640	13,531	2,891	2,891
2009	10,640	13,531	2,891	5,781
2010	10,640	13,531	2,891	8,672
2011	10,040	13,531	3,491	12,163
2012	10,348	13,531	3,183	15,345
2013	10,348	13,531	3,183	18,528
2014	19,734	15,159	-4,575	13,953
2015	19,734	15,159	-4,575	9,377
2016	19,734	15,159	-4,575	4,802
2017	19,734	15,159	-4,575	226
2018	14,356	15,159	803	1,029
2019	13,435	15,159	1,724	2,753
2020	13,431	15,159	1,728	4,480
2021	13,431	15,159	1,728	6,208
2022	13,431	15,159	1,728	7,936
2023	13,431	15,159	1,728	9,663
2024	13,431	15,159	1,728	11,391
2025	13,431	15,159	1,728	13,119
2026	13,431	15,159	1,728	14,846
2027	13,431	15,159	1,728	16,574
2028	13,431	15,159	1,728	18,302
2029	13,431	15,159	1,728	20,029
2030	13,431	15,159	1,728	21,757
2031	13,431	15,159	1,728	23,484
2032	13,431	15,159	1,728	25,212
2033	13,431	15,159	1,728	26,940
2034	13,431	15,159	1,728	28,667
2035	13,431	15,159	1,728	30,395
2036	13,431	15,159	1,728	32,123
2037	13,431	15,159	1,728	33,850
2038	13,431	15,159	1,728	35,578
2039	13,431	15,159	1,728	37,306
2040	13,431	15,159	1,728	39,033
2041	13,431	15,159	1,728	40,761
2042	13,431	15,159	1,728	42,489
2043	13,431	15,159	1,728	44,216
2044	13,431	15,159	1,728	45,944
2045	13,431	15,159	1,728	47,671
2046	13,431	15,159	1,728	49,399
2047	13,431	15,159	1,728	51,127
2048	13,431	15,159	1,728	52,854
2049	13,431	15,159	1,728	54,582
2050	13,431	15,159	1,728	56,310
2051	13,431	15,159	1,728	58,037
2052	13,431	15,159	1,728	59,765
2053	13,431	15,159	1,728	61,493
2054	13,431	15,159	1,728	63,220
2055	13,431	15,159	1,728	64,948
2056	13,431	15,159	1,728	66,676
2057	13,431	15,159	1,728	68,403
2058	13,431	15,159	1,728	70,131
2059	13,431	15,159	1,728	71,858
2060	13,431	15,159	1,728	73,586
2061	10,040	13,531	3,491	77,077
2062	10,040	13,531	3,491	80,567

Year	Subtotal Outflow	Subtotal Inflow	Inflow minus Outflow	Cumulative Change
2063	10,040	13,531	3,491	84,058
2064	10,040	13,531	3,491	87,549
2065	10,040	13,531	3,491	91,039
2066	10,040	13,531	3,491	94,530
2067	10,040	13,531	3,491	98,021
2068	10,040	13,531	3,491	101,511
2069	10,040	13,531	3,491	105,002
2070	10,040	13,531	3,491	108,493
2071	10,040	13,531	3,491	111,983
2072	10,040	13,531	3,491	115,474
2073	10,040	13,531	3,491	118,964
2074	10,040	13,531	3,491	122,455
2075	10,040	13,531	3,491	125,946
2076	10,040	13,531	3,491	129,436
2077	10,040	13,531	3,491	132,927
2078	10,040	13,531	3,491	136,418
2079	10,040	13,531	3,491	139,908
2080	10,040	13,531	3,491	143,399
2081	10,040	13,531	3,491	146,890
2082	10,040	13,531	3,491	150,380
2083	10,040	13,531	3,491	153,871
2084	10,040	13,531	3,491	157,362
2085	10,040	13,531	3,491	160,852
2086	10,040	13,531	3,491	164,343
2087	10,040	13,531	3,491	167,833
2088	10,040	13,531	3,491	171,324
2089	10,040	13,531	3,491	174,815
2090	10,040	13,531	3,491	178,305
2091	10,040	13,531	3,491	181,796
2092	10,040	13,531	3,491	185,287
2093	10,040	13,531	3,491	188,777
2094	10,040	13,531	3,491	192,268
2095	10,040	13,531	3,491	195,759
2096	10,040	13,531	3,491	199,249
2097	10,040	13,531	3,491	202,740
2098	10,040	13,531	3,491	206,231
2099	10,040	13,531	3,491	209,721
2100	10,040	13,531	3,491	213,212

5.5.4 Agriculture

This section addresses potential cumulative impacts on agriculture. The proposed Project would have very short-term, temporary impacts on agricultural lands that would be *less than significant*. The proposed water pipeline will cross undeveloped desert and some previously farmed lands. Installation of the water pipeline would require excavation and side-casting of soil. However, surface soil conditions would be restored and farming could resume. Further, the construction contractor would use BMPs to conserve top soil and minimize erosion.

Cumulative projects may have similar minor impacts from utility installation. Larger solar power projects may result in loss of farmland, resulting in a significant cumulative impact. However, the impact of the proposed Project would be short-term (only during construction) and the incremental addition of the proposed Project with the cumulative projects will not be cumulatively considerable. Therefore, the Project's contribution to cumulative impacts on agricultural lands would be *less than cumulatively considerable*.

5.5.5 Biological Resources / Threatened & Endangered Species

This section addresses potential cumulative impacts on biological resources. It does not, however, analyze cumulative impacts on State or Federal wetlands, including riparian habitat, because the proposed Project would have no impacts on these resources. Therefore, the proposed Project *would not contribute to a cumulative impact*.

Effects of the Project on common and special plants, habitats, and wildlife have been analyzed and considered to be *less than significant* with implementation the mitigation program. The mitigation program has been designed to reduce, avoid, and/or offset potential biological impacts, where feasible. Thus, the incremental effects of the Project to other cumulative actions will be negligible to minor and fully mitigated. No synergistic effects between the Project and other cumulative actions are foreseeable. There are no foreseeable long-term impacts of the Project's mitigation program.

The proposed Project would have a direct effect on 83 acres of native desert tortoise habitat and could have a direct effect on desert tortoise individuals. The amount of desert tortoise habitat that will ultimately be affected by cumulative projects, including the proposed solar power developments is currently unknown, but much of the solar project acreage is desert tortoise habitat of variable quality. The acreage of native habitat affected by the proposed Project is less than 0.3 percent of the acreage of the solar projects. However, because the affected habitat supports desert tortoise and construction could have direct effects on this species, the Project's contribution to this cumulative impact would be cumulatively considerable prior to implementation of the mitigation program. Specifically, the mitigation measures and project design features include implementation of pre-construction special species and habitat surveys, preconstruction surveys and clearance surveys, construction monitoring, biological reporting program and monthly reports during construction, annual comprehensive reports, and special-incident reports, exclusion fencing, translocation or removal plans, hiring of an approved Project Biologist, worker environmental awareness program, and habitat compensation (MM TE-1 through MM TE-4, MM TE-6, MM BIO-1 through MM BIO-4, MM BIO 18, and MM BIO-22). Adherence to the mitigation program would result in a *less than significant impact*; and therefore is not cumulatively considerable.

The evaporation ponds could also attract ravens, which are a threat to desert tortoise as predators of juvenile tortoises. The draft EIS/EIR for the proposed Eagle Mountain Landfill (County of Riverside and BLM 1996) identified several common species that inhabit the disturbed Kaiser Eagle Mountain Mine and surrounding mine shafts as a result of that disturbance, including common raven. With regard to synergistic effects, landfills are well known to attract ravens and other birds. Human activities, including dumping of garbage, landfills, roads, increased nesting opportunities, irrigation, and increased vehicle use have lead to increased numbers of common ravens in California deserts. The proposed Project, when considered together with the landfill, could result in a cumulative predation impact on desert tortoise. However, neither food nor water are limiting factors for raven populations in the area under existing conditions. Water sources present in the project area include a water treatment pond, the open water portions of the CRA, and MWD’s Eagle Mountain Pumping Station (which is part of the CRA system). In addition, humans have occupied the town of Eagle Mountain for many years. Perching, roosting and nesting sites for ravens are plentiful under the existing condition of the project area. Increased water alone would likely not increase predator populations. Nevertheless, both the proposed Project and the landfill will have mitigation and monitoring requirements for ravens, reducing this cumulative impact to *less than significant*.

The brine ponds could be an attractant for birds and possibly bats who would be exposed to evaporation pond water containing high concentrations of salt and metals. However, the brine pond will have netting to prevent birds from having access. The landfill will not have evaporation ponds. The three thermal solar facilities to the east in Chuckwalla Valley may have evaporation ponds if wet-cooling techniques are employed, but the CEC [the permitting agency for thermal solar power plants in California] and State law strongly discourages use of water for cooling, and it is highly likely that all thermal solar plants will be dry-cooled. Therefore the proposed Eagle Mountain Pumped Storage Project will have the only evaporation pond in this portion of the Eagle Mountains and *would not contribute to a cumulative impact*.

No cumulative impacts to biological resources are anticipated with Project implementation.

5.5.6 Aesthetics

The Project transmission line would have *significant adverse effects* on aesthetics and visual resources resulting from the portion of the transmission line from Eagle Mountain Road to the Interconnection Substation. This impact *is significant and unavoidable* with Project implemenation. Proposed solar projects will cover approximately 10,000 acres within the Chuckwalla Valley and interconnection transmission lines along the I-10 corridor and interconnection at the Red Bluff substation. Cumulative projects include the proposed DPV2 Transmission Line Project, with two 500 kilovolt (kV) transmission lines parallel to the existing DPV1. These projects considered together would result in a significant cumulative impact. Because the proposed Project will add to the region’s increase in developed facilities and progressive change in visual character of the natural landscape, its contribution to this cumulative impact would be *cumulatively considerable*.

5.5.7 Cultural Resources

This section evaluates potential cumulative cultural resources impacts. It does not evaluate cumulative impacts on historical resources defined in CEQA Guideline §15064.5. The remains of Camp Desert Center and the evacuation hospital are located at the southern end of Eagle Mountain Road. The proposed transmission line route comes no closer than 0.25 miles north of the closest recorded World War II Desert Training Center/Arizona-California Maneuver Area (DTC/C-AMA) site and the Interconnection Collector Substation is located 2 miles to the north and east, respectively, of the known DTC/C-AMA features. Results of a Class III survey of the transmission line and water line indicate that no historic properties exist where these alignments diverge from existing access roads. The transmission and water pipelines cross over buried portions of the CRA, which is very likely eligible for the National Register of Historic Places (NRHP) based on its historical and engineering significance. Impacts to materials, feeling, setting, and association are therefore expected to be *potentially significant*. In addition, the transmission line crosses over the Eagle Mountain Industrial Railroad in two places. A formal significance determination of the rail line remains to be undertaken by the BLM but there have been substantial previous impacts to its integrity and it is unlikely to be found NRHP-eligible. The Eagle Mountain townsite and mine are now over 50 years old and will need to be evaluated as potential historic resources. Other cumulative projects may have similar impacts on historic resources, resulting in a cumulative impact. However, implementation of mitigation measures (MM CR-1, MM CR-3, MM CR-5, MM CR-6, and MM CR-11) would reduce the Project's contribution to *less than cumulatively considerable*.

All cumulative projects would require mitigation measures to protect cultural and paleontological resources including monitoring, services of a qualified archaeologist and paleontologist, and procedures for addressing human remains. The proposed Project would implement mitigation measures (MM CR-3, MM CR-4, MM CR-5, MM CR-6, MM CR-7, MM CR-8, MM CR-9, MM CR-10, and MM CR-11), reducing the proposed Project's contribution to this cumulative impact to *less than cumulatively considerable.*

5.5.8 Land Use / Public Services

The proposed Project is one of several projects planned for the Chuckwalla Basin, which cumulatively, will increase the conversion of rural, undeveloped and/or disturbed lands to a developed land use character. The Project's overall contribution to cumulative land use effects is incremental due to development within a previously developed and disturbed location, and the fact that only the transmission line will be visible once the Project is operational. The following assessment considers the proposed Eagle Mountain Landfill project, various proposed solar projects, and relevant probable future projects as determined by the BLM.

The proposed Project will be constructed on an existing mining site and would not divide an existing community; as such, the proposed reservoirs would not contribute to a cumulative impact. The proposed transmission line and substation would not divide a community as they would be constructed through unpopulated areas, and to the extent possible, to take advantage of existing corridors, whereby minimizing impacts on land use. Similarly, the proposed water pipeline will cross undeveloped desert and previously farmed lands. The pipeline will cross State Route 177; however, the pipelines will be tunneled underneath the road. Therefore, neither the transmission line nor the water pipeline would divide a community and would not contribute to a cumulative impact.

As discussed in Section 3.9 Land Use, the proposed Project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project. The proposed transmission line route will not affect the Desert Center Airport Influence Area. It would also cross BLM lands managed for ‘Limited” and “Moderate” MUC designations as part of the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan, including crossing approximately 6 miles of NECO’s Desert Wildlife Management Area. Most of the transmission line is within two designated BLM utility corridors identified in the NECO plan.

BLM-administered lands surrounding the upper reservoir will largely be unaffected and serve as a buffer element. An access road to the upper reservoir that currently crosses public lands will be utilized by the proposed Project for construction and operation. Minor improvements to the access road will not conflict with BLM’s “Limited” MUC designation for the area.

The proposed Project would not conflict with any applicable habitat conservation plan or natural community conservation plan. No habitat conservation plan or natural community conservation plan has been developed for the Project area. The cumulative effects analysis is based on the conservative (and unlikely) assumption that all of the proposed renewable energy projects that are proposed will be constructed. The incremental effect of the proposed Project, combined with the effects of the other projects within the geographic scope of the cumulative analysis would not contribute to a cumulative land use impact.

The proposed Project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services. The proposed Project would be served by existing fire and police projection as well as existing schools, parks, and other public facilities. Therefore, the proposed Project would not contribute to a cumulative impact to public resources.

5.5.9 Recreation

The Project would not displace recreation such that increased use of existing recreational facilities would result in substantial or accelerated deterioration. No developed recreation sites occur within the Project boundary or in the immediate vicinity. The entire Kaiser Eagle Mountain Iron Mine site is currently [and will continue to be] fenced and inaccessible to the general public.

The highly disturbed property is unsuitable for public recreation. The future condition of the site with highly variable water levels is not conducive for recreation. Furthermore, there are no facilities in the area that could be affected by displaced recreation. There are no regional parks or open spaces operated by the Riverside County Regional Park and Open Space District in the Chuckwalla Valley. There are no California State public parks within the Chuckwalla Valley. Therefore, the few recreational users of the Project area would be dispersed over a very large area. The Project's proposed transmission line and to a lesser extent the buried water pipeline will add to the basin's developed landscape, but will have no significant effects on available open space and dispersed recreational opportunities. Further, no recreational facilities are proposed. Therefore, the Project would not contribute to a cumulative impact from construction or expansion of recreational facilities in the region.

Development and operation of the proposed Project in addition to other potential projects, including the proposed landfill and cumulative solar projects, may have an effect on the wilderness experiences of visitors to the remote eastern margins of the Joshua Tree National Park (JTNP). This would be most noticeable as park visitors approach the Wilderness boundary. Similar activities have occurred in the past as the Kaiser Mine was in operation from the 1950s, before the designation of JTNP's Wilderness Areas. Once operational, the only visible elements of the Project will be portions of the reservoirs (from a very remote and high elevation zone within the JTNP) and a portion of the transmission line that will be difficult to detect at a distance of several miles. Very few users reach these areas. In similar situations, Congress has indicated "the fact that non-wilderness activities or uses can be seen or heard from areas within a wilderness area shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area" (CDPA, 1994). Therefore, this cumulative impact would be less than significant and the incremental impact of the proposed Project would be *less than cumulatively considerable*.

5.5.10 Population and Housing

The proposed Project would be expected to have a *less than significant* effect on population and housing. The Project would not induce substantial population growth nor contribution to any short-term cumulative impacts related to population and housing. Workers for construction and operation would come from Riverside County and the southern California region. The Project may import some non-local workers; however, these workers would be temporary and would not add substantially to the population. Foreseeable development in the Project area includes primarily renewable energy electrical generation and transmission infrastructure projects.

In the event an influx of construction workers occurred within the area as a result of construction of large renewable energy projects, many of these workers would likely choose to stay at motels in Blythe or the nearby desert cities (Indio to Palm Springs) because of the temporary nature of Project construction activities. It is assumed these construction workers would not permanently relocate to the area. Due to the availability of temporary and permanent housing to both the regional and local labor force associated with both the proposed Project and the reasonably foreseeable projects, the proposed Project would not contribute to cumulative increases in demand for local housing.

The proposed Project would not displace any people or necessitate construction of replacement housing elsewhere. Therefore, there would be no impact from displacement and *no contribution to a cumulative impact*.

5.5.11 Transportation

Traffic generated by the Project's construction and operation will add to that generated by the cumulative projects listed above. Traffic generated during construction will increase congestion on area roads. There are two proposed solar projects in the Chuckwalla Valley: (1) the First Solar "Desert Sunlight Solar Farm" project, and (2) the enXco "Eagle Mountain" project. Details regarding traffic generation from these projects are not available; however, because both projects are adjacent to Kaiser Road, both will likely use Kaiser Road for access during construction and operation. The Desert Sunlight Solar Farm is proposed on BLM land 6 miles north of Desert Center. The enXco Eagle Mountain Project is proposed just south of the Desert Sunlight Solar Farm.

However, the proposed Project's construction period is not expected to overlap with the construction period for the proposed landfill or the proposed solar energy projects thus eliminating cumulative effects of traffic during construction. Implementation of the Project will not cause area roads to exceed, either individually or cumulatively, a level of service standard established by the Riverside County Congestion Management Agency. Further, a Transportation Management Plan (MM AQ-6) will be implemented to control construction traffic onto the site and within the Project vicinity.

Operation of the pumped storage hydroelectric facility will require a labor force of about 30 employees. This translates to approximately 60 daily one-way trips. Operation of the facility would also generate minor truck traffic during activities such as delivery and off-site waste shipments. Project operation is anticipated to generate up to four truck trips per day, which would not affect the level of service on area roadways and intersections. The addition of operational traffic to the cumulative project would not be expected to significantly affect local roadways, and *no cumulative effect* would result.

5.5.12 Air Quality

The cumulative analysis considers whether the Project, in combination with other related and reasonably foreseeable local and regional developments, would create a significant cumulative effect. Other developments identified include several solar projects and the Eagle Mountain Landfill. However, construction of these projects are removed in time (would not occur simultaneously) with the proposed Project.

CEQA guidance indicates that cumulative impacts are to be assessed in a two-step process: (1), to determine if a significant adverse overall or cumulative impact would occur, and (2), to determine if the Project's contribution to that impact would be "cumulatively considerable."

In general, the cumulative air quality analysis can consider applicable planning documents that guide development at, or in the vicinity of, the Project and within the region; under CEQA this is considered a plan-based approach. The cumulative contribution of the proposed Project to criteria pollutants is considered in the on-going planning by the South Coast Air Quality Management District to meet the State and Federal regulatory ambient air quality standards into the future. This planning is based on inventories of emissions to be anticipated from development in accordance with each of the county general plans within the air basin.

As discussed previously, the proposed Project alone would result in a significant construction-related impact from NO_x in construction years 2012 through 2014. If a project would individually have a significant air quality impact, the Project would also be considered to have a *significant cumulative air quality impact*. As such, the Project would also have a significant cumulative contribution to NO_x impacts as a precursor to ozone formation in construction years 2012 through 2014.

Additionally, although daily CO, PM_{10}, and $PM_{2.5}$ construction emissions from the proposed Project are below the significance threshold, the CO, PM_{10}, and $PM_{2.5}$ emissions from the cumulative projects scenario have the potential to exceed the significance threshold. However, given the location and timing of the cumulative projects, the CO, PM_{10}, and $PM_{2.5}$ impacts are not likely to be cumulatively significant. Additionally, given the temporary nature of construction activities, and assuming implementation of the mitigation measures, the severity and frequency of these impacts would be limited. It is therefore concluded that the cumulative impact from construction would be *less than significant* for CO, PM_{10}, and $PM_{2.5}$.

5.5.13 Greenhouse Gas Emissions

The specific emissions from this proposed Project would not be expected to individually have an impact on global climate change, but they are also analyzed for the potential for a significant contribution to the cumulative impact of Greenhouse Gas Emissions (GHG) emissions.

As noted in Section 3.15 Greenhouse Gas Emissions, the proposed Project would displace energy production demand of peaker plants (fossil-fueled power plants), and would reduce existing GHG emissions and assist with meeting California's future energy demands with a larger portfolio of renewable power generation sources. Because the proposed Project would not contribute to GHG emissions, its contribution to the cumulative impact of GHGs would be less than cumulatively considerable. Moreover, the proposed Project would have a beneficial effect on cumulative GHG emissions.

5.5.14 Noise

The cumulative analysis considers whether the Project, in combination with other cumulative development, would create a significant cumulative effect. The other cumulative developments include several solar projects and the Eagle Mountain Landfill. However, the construction of the cumulative projects are removed in time (would not occur simultaneously) from the proposed Project.

CEQA guidance indicates that cumulative impacts are to be assessed in a two-step process: (1) determine if a significant adverse overall or cumulative impact would occur, and (2) determine if the Project's contribution to that impact would be "cumulatively considerable."

The following section evaluate cumulative effects from noise levels that may exceed noise standards, permanent increase in ambient noise levels, significant increases in noise at sensitive receptors, and temporary or periodic increases in ambient noise above baseline levels. It does not evaluate ground-borne vibrations or ground borne noise levels, however, because of the distances from construction activity to sensitive receptors (1.5 to 4 miles). It also does not address cumulative issues from airport noise issues because the Project site is not within an airport land use plan or 2 miles or a public or public use airport.

The proposed Project would generate noise impacts during construction. Although receptors are screened from the mine pits where much of the construction would take place, truck traffic would generate noise. Tunnel construction would occur beneath rock and 1.5 to 4 miles from any sensitive receptor, resulting in no contribution to cumulative impacts. The proposed powerhouse would be located underground and would not affect noise levels aboveground. During construction, truck traffic and transmission construction would create a temporary adverse increase in noise along Eagle Mountain and Kaiser roads. Construction would move continuously, reducing temporal aspect.

The potential noise impacts of the proposed Project are from the construction phase as the noise from project operations would be minimal. During construction there would be an adverse temporary increase in noise along Kaiser Road. The majority of the proposed solar projects in the area would not use Kaiser Road; and as such, would not add to this adverse temporary noise impact from traffic on Kaiser Road. One solar project that would add to the traffic on Kaiser Road would be the First Solar Inc. project; however project construction would not overlap in timing (the solar project would be expected to break ground in 2010; whereas the proposed Project is expected is expected to commence in 2013-2014). Noise from Project operations would be minimal and *would not contribute to any cumulative noise impact*.

5.5.15 Hazards and Hazardous Materials

This section evaluates potential cumulative impacts on hazards and hazardous materials. The Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials within one-quarter mile of an existing or proposed school. No acutely toxic hazardous materials will be used on site during construction. The closest school is located more than 1 mile away from the reservoirs and powerhouse. The site is not on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Further, the site has little to no risk of wildfire and no nearby urbanized areas. The Project would have no contribution to any cumulative impact in these areas.

The Project's hazards from the routine transport, use or disposal of hazardous materials would be *less than significant*. The proposed Project and cumulative projects would use, store and transport hazardous materials (i.e., petroleum products, lubricants, solvents) subject to regulatory controls designed to minimize the potential for spills and other releases into the environment through improper storage and/or handling. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, infrequent use of those materials (and therefore reduced chances of release), and/or temporary containment berms. In addition, the construction contractor will implement mitigation measures MM HM-1. Therefore, any Project contribution to a cumulative impact would be *less than cumulatively considerable*.

5.5.16 Environmental Justice

The Project will not result in a disproportionate effect on minority populations, low income populations or Native Americans, and the Project does not pose any substantial effects relative to environmental justice.

5.6 Energy Conservation [CEQA Guidelines Appendix F]

The CEQA Guidelines §15126.4(a)(1)(C) states: "Energy conservation measures, as well as other appropriate mitigation measures, shall be discussed when relevant." Whereas CEQA Guidelines Appendix F recognizes the goal of conserving energy and implies the wise and efficient use of energy, the means of achieving this goal include:

- Decreasing overall per capita energy consumption
- Decreasing reliance on natural gas and oil
- Increasing reliance on renewable energy sources

As designed, the proposed Project will reliably integrate solar and wind generation and offset natural gas-fired power with the overall benefit of reduced GHG emissions and direct contribution to long-term climate change effects. The Project provides an economical supply of peaking capacity, as well as load following, electrical system regulation through spinning reserve, and immediately available standby generating capacity. These latter benefits, referred to as ancillary services, are considered essential for integration of renewable wind and solar power resources to meet State RPS of 33 percent by year 2020, and to offset fossil-fueled peak power generation to help meet State GHG emissions reductions goals.

The proposed Project has been designed to play a vital role in the integration of renewable energy resources already mandated to be developed by the State of California; as such, the Project is intended to meet existing and future energy demands.

6 Mitigation Summary

In accordance with the California Environmental Quality Act (CEQA), the State Water Resources Control Board (SWRCB) is the Lead Agency for preparation of the EIR and the incorporated [draft] Mitigation Monitoring and Reporting Program (MMRP) contained within this chapter (Public Resources Code §21081.6). As such, the SWRCB is responsible for certifying its contents, and taking action to approve or deny approval of the Eagle Mountain Pumped Storage Hydroelectric Project (Proposed Project). As the Lead Agency, the SWRCB is responsible for ensuring the mitigation program is implemented. Several agencies will be responsible for verification and timing of specific aspects of the mitigation program.

The mitigation program has been designed to avoid, minimize, rectify, reduce, eliminate or compensate for potentially significant impacts caused by construction, operation or maintenance of the Project. (State CEQA Guidelines §10597, 15126.4 & 15370). Implementation of the recommended mitigation program would reduce potentially significant impacts to a less than significant level; except for the resource areas of Groundwater, Aesthetics, and Air Quality for unavoidable and significant environmental impacts; of which will require a statement of overriding consideration (State CEQA Guideline §15093) [refer to Section 3.0 Environmental Analysis and Section 5.0 CEQA Mandated Topics for complete discussion].

The mitigation program includes both Project Design Features (PDFs) and Mitigation Measures (MMs). PDFs are design elements inherent to the Project that reduce or eliminate potential impacts. Because PDFs are incorporated into the Project, either in the Project design or by law as part of Project implementation, they do not constitute mitigation measures. However, the PDFs are described within the mitigation program and are described within the analysis of each CEQA resource topic. Where applicable, mitigation measures are provided to reduce impacts from the Proposed Project to a less than significant level.

Table 6-1 Summary of Project Impacts, Mitigation Program, and Residual Effect [below] presents a listing by threshold of significance by resource area, identified environmental impacts, mitigation program component, and level of significance after mitigation is incorporated into the Project. The table also identifies cumulative impacts resulting from build out of the Proposed Project in conjunction with the approved and pending cumulative projects.

Table 6-2 Mitigation Monitoring and Reporting Program [below] provides a checklist table listing each MM and PDF, implementation timing, party responsible for monitoring or reporting, and agency responsible for verification and enforcement. The Mitigation Monitoring and Reporting Program is designed to ensure compliance during Project implementation and will be incorporated into the SWRCB's conditions of approval for the Proposed Project.

Table 6-1 Summary of Project Impacts, Mitigation Program, and Residual Effect

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Section 3.1 Geology and Soils			
Impact 3.1-1 Earthquakes and Faults. On-site faults have been evaluated and found to be not active. Therefore, the risk of surface rupture at the site caused by faulting is very low.	*Less than significant*	No mitigation is required.	N/A
Impact 3.1-2 Ground Subsidence. Ground subsidence is not considered to be a potential hazard associated with this Project.	*Less than significant*	No mitigation is required.	N/A
Impact 3.1-3 Active and Inactive Mines. Ore reserves within the Project boundary, constituting a small percentage of the available iron ore on the site, will not be accessible for the life of the Project, including a portion of CSLC mineral	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
reserves. Iron ore and other rock resources in the mine site outside the Project boundary will remain accessible for mining.			
Impact 3.1-4 Soil Erosion. There will be potential increases in soil erosion resulting from construction of this Project.	*Potentially significant and subject to the mitigation program*	**MM GEO-1. Erosion Control Plan**. Erosion and sediment control measures for each area type, including proposed Best Management Practices, are listed in the Erosion Control Plan in Section 12.2. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization BMPs will be undertaken as appropriate.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		The contractor shall utilize and implement the following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water. • Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary. • The installation of riprap at the washes which will prevent or minimize erosion. • Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion. • Silt fences will be installed when working around a wash to prevent sediment from entering washes during a rain storm and will be constructed as described in Attachment B of Section 12.2 (e.g., buried to a depth of at least 12	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		inches. • The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations, personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods. • Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff. • Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agencies for verification and enforcement: SWRCB and FERC	
Impact 3.1-5 Landslides and Mass Movements. Slope raveling and localized, surficial slope failures and/or rock falls are expected in areas where mining has exposed adversely oriented fracture sets on the pit walls.	*Potentially significant and subject to the mitigation program*	**PDF GEO-1. Subsurface Investigations.** Detailed investigations to support final engineering will be conducted in two stages, as detailed in Section 12.1. These generally include: **Stage 1 Subsurface Investigations:** Based on available information and the current Project configuration, conduct a limited field program designed to confirm that basic Project feature locations are appropriate and to provide basic design parameters for the final layout of the Project features. Phase 1 Subsurface investigations will be initiated within 60 days of licensing and receipt of site access, field work will be completed within 4 months of the start of field investigations, and results filed with the FERC 6 months after the start of field investigations. The Stage 1 subsurface site investigation program for the Project will commence as soon as site access is obtained. The Stage 1 program will provide the information needed to finalize Project features and to plan a second-stage program to support final design	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		of the Project. Final design will be approved by the FERC and the DSOD (for dam design). The detailed scope of the Stage 1 program is discussed in a technical memorandum found in Section 12.1. **Stage 2 Subsurface Investigations:** Using the results of the Stage 1 work, and based on any design refinements developed during pre-design engineering, conduct additional explorations that will support final design of the Project features and bids for construction of the Project. **PDF GEO-2. Geologic Mapping.** During site investigations, geologic mapping will be performed by Project Engineers to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining. The stability of the cut slopes	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		and benches will be assessed at this time. During construction, areas within the pits that exhibit unstable slopes because of adverse fracture sets exposed in the pit walls will be scaled of loose rock and unstable blocks. Material scaled from the side slopes will be removed and disposed of outside the pit, or pushed downslope and buried in the bottom of the pit. Rock slopes within the East and Central Pits that lie below an elevation of 5 feet above the maximum water level will be scaled of loose and unstable rock during construction. Existing cut slopes that lie above these elevations will not be modified unless there is evidence of potential failure areas that could impact project facilities. Final project design will be approved by FERC.	
Impact 3.1-6 Liquefaction. The potential for liquefaction-induced settlements is very low to non-existent	*Less than significant*	No mitigation is required	N/A
Impact 3.1-7 Reservoir Triggered Seismicity. The	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
potential of reservoir triggered seismicity at the site is remote			
Section 3.2 Surface Water			
Impact 3.2-1 Existing Surface Water. There are no perennial streams in the Project area. Springs are located outside of the Project area, and are not hydrologically connected to groundwater in the Chuckwalla Aquifer.	*Potentially significant impact and subject to mitigation*	**MM GEO-1. Erosion Control Plan**. Erosion and sediment control measures for each area type, including proposed Best Management Practices, are listed in the Erosion Control Plan in Section 12.2. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Additional soil stabilization BMPs will be undertaken as appropriate. The contractor shall utilize and implement the following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water. • Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary. • The installation of riprap at the washes which will prevent or minimize erosion. • Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion. • Silt fences will be installed when working around a washto prevent sediment from entering into a wash	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		during a rain storm. They will be constructed as described in Attachment B of Section 12.2, including being buried to a depth of at least 12 inches. • The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations, personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods. • Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff. • Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation,*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		monitoring and reporting: Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB and FERC	
Impact 3.2-2 Eutrophication. The Project will not add nutrients to the environment.	*Less than significant*	No mitigation is required.	N/A
Impact 3.2-3 Water quality impacts to the project created surface waters. Potential impacts include sedimentation from erosion as a result of land disturbing activities during construction and increased metals as a result former mining activities on the Project site.	*Potentially significant and subject to the mitigation program*	**MM SW-1. On-site studies of acid production potential.** When access is granted to Eagle Crest Energy Company (ECE) for the purpose of collecting samples, field and analytical program will be undertaken as described in the Phase 1 Geotechnical Program detailed in Section 12.1. This program will: 1. Obtain samples from each pit (upper and lower) across the stratigraphic section (porphyritic quartz monzonite, upper quartzite, middle quartzite, schistose meta arkose, vitreous quartzite and the ore zones). 2. Perform analysis for total, pyrite and sulfate sulfur (ASTM Method 1915-97(2000) for total sulfur, and ASTM 1915-99 method E (2000) for sulfide sulfur.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		3. Calculate acid production potential (APP) by the method of Sobek et al. (1978) and calculate acid production by the method of Lawrence (1990). 4. Determine the neutralization potential (NP) by the method of Sobek et al. (1978). Calculate the net neutralizing potential (NNP): NNP = NP – APP expressed as kg calcium carbonate/ton. In the event that acid production potential is found, water treatment to neutralize acid will be added to the water treatment facility (PDF GW-2). The performance standard will be maintenance of water quality at a level comparable to the source water quality. *Implementation Timing:* Pre-design geotechnical studies *Party responsible for implementation, monitoring and reporting:* Applicant *Responsible Agencies for verification and enforcement:* SWRCB and FERC **PDF GW-2. Water Treatment Facility.** In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels. Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. In addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well, preventing eutrophication from occurring. **MM GW-6. Water Quality Sampling.** Water quality sampling will be done at the source wells, and within the reservoirs, and in monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Figure 3.3-18 shows the locations of these wells. Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		other potential contaminants as needed to maintain groundwater quality under the direction of the State Board and FERC. *Implementation Timing:* Final engineering *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB and FERC **MM GEO-1. Erosion Control Plan.** Erosion and sediment control measures for each area type, including proposed BMPs are listed in the Erosion Control Plan in Section 12.2. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization BMPs will be undertaken as appropriate. The contractor shall utilize and implement the following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water. • Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary. • The installation of riprap at the washes which will prevent or minimize erosion. • Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion. • Silt fences will be installed when	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		working around a wash to prevent sediment from entering into a wash during a rain storm. They will be constructed as described in Attachment B of Section 12.2, including being buried to a depth of at least 12 inches. • The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations, personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods. • Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff. • Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water. *Implementation Timing:* Final	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting:* Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB and FERC	
Section 3.3 Groundwater			
Impact 3.3-1 Perennial Yield and Regional Groundwater Level Effects. Pumping will exceed recharge for approximately 4 years of the 50-year Project life. During the remaining years, recharge will exceed pumping. By 2065, at the end of the 50-year FERC Project license period, the aquifer storage (cumulative change) will have been increased by about 74,000 acre-feet. This will not result in depletion of groundwater supplies.	*Less than significant*	--	**Less than significant** for project-specific impact analysis. However, in combination with pumping for all reasonably foreseeable projects (cumulative impact), basin overdraft of about 9 feet is likely to occur over the life of the Project, in which case, this Project would contribute to a ***significant adverse cumulative effect.***

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.3-2 Local Groundwater Level Effects. Although not significant Basin-wide, the modeling predicts initial Project water supply pumping will cause drawdown of the groundwater levels in the vicinity of the Project's wells.	*Potentially significant and subject to mitigation*	**MM GW-1. Groundwater Level Monitoring.** A groundwater level monitoring network will be developed to confirm that Project pumping is maintained at levels that are in the range of historic pumping. The monitoring network will consist of both existing and new monitoring wells to assess changes in groundwater levels beneath the CRA, as well as in the Pinto Basin, and in areas east of the water supply wells. Table 3.3-10 lists the proposed monitoring network and Figure 3.3-17 shows their proposed locations. In addition to the proposed monitoring wells, groundwater levels, water quality, and production will be recorded at the Project pumping wells. If monitoring indicates that groundwater is being draw down at greater levels and faster rates than expected (exceeding the "Maximum Allowable Changes" identified in Table 3.3-9), pumping rates for the initial fill will be reduced to a level that meets the levels specified in Table 3.3-9. The initial fill period would therefore be extended to a maximum of 4.5 to 6 years. *Implementation Timing:* Final Design,	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		construction and life of the Project *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM GW-2. Well Monitoring.** Wells on neighboring properties whose water production may be impaired by Project groundwater pumping will be monitored during the initial fill pumping period. If it is determined that Project pumping is lower water levels in those wells by 5 feet or more, the Project will either replace or lower the pumps, deepen the existing well, construct a new well, and/or compensate the well owner for increased pumping costs to maintain water supply to those neighboring properties. *Implementation Timing:* Pre-construction and initial fill pumping period *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: SWRCB and FERC	
Impact 3.3-3 Groundwater Flow Direction Effects. The short- and long-term pumping effects will not significantly change groundwater flow directions.	*Less than significant*	No mitigation required.	N/A
Impact 3.3-4 Subsidence and Hydrocompaction Potential. It is unlikely that lowering of water levels below their historic lows by up to additional 5 feet at the CRA will cause subsidence. Direct contact of seepage water with the CRA is unlikely because groundwater levels are about 135 feet below ground surface at the CRA.	*Potentially significant and subject to mitigation*	**MM GW-3. Extensionmeters.** Two extensiometers shall be constructed to measure potential inelastic subsidence that could affect operation of the CRA; one in the upper Chuckwalla Valley near OW-3 and the other in the Orocopia Valley near OW15. Figures 3.3-17 and 18 shows the locations of the extensometers. In the unlikely event that the data shows inelastic subsidence is occurring due to Project groundwater pumping the Project will eliminate inelastic subsidence by: • Redistributing pumping by constructing additional wells and modifying the pumping rates to reduce drawdown. • Reducing pumping or by artificially increasing recharge in order to better	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		match the net annual groundwater withdrawal to the net annual recharge. If structures are impacted, they will be mitigated through engineered solutions that may consist of re-leveling, placement of compacted fill, soil-cement, pressure grouting, installation of piles and grade-beams, or steel-reinforcement. As necessary, portions or all of the impacted structure will be repaired or replaced in consultation with MWD. *Implementation Timing:* Pre-construction and life of the Project *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM GW-4. Seepage Recovery Wells.** Seepage from the <u>Lower Reservoir</u> will be extracted through seepage recovery wells. The proposed recovery well locations are shown on Figure 3.3-18. Seepage from the Lower Reservoir will be maintained to prevent a significant rise in water levels	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		beneath the CRA. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. Aquifer tests will be performed during final engineering design to confirm the seepage recovery well pumping rates and aquifer characteristics. The tests will be performed by constructing one of the seepage recovery wells and pumping the well while observing the drawdown in at least two seepage recovery or monitoring wells. Upon completion of this testing, the model will be re-run and the optimal locations of the remainder of the seepage recovery wells will be determined to effectively capture water from the Lower Reservoir and maintain groundwater level changes at less than significant levels beneath the CRA. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties. If needed based upon monitoring results, and acceptable based upon water quality monitoring results, as an adaptive	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		management measure Project pumping drawdown can be mitigated by allowing seepage from the reservoirs to occur without pump-back recovery. If seepage from the reservoirs is unimpeded, groundwater levels could rise beneath the CRA by up to 3 feet. *Implementation Timing:* Final engineering and life of Project. Monitoring on a quarterly basis for the first 4 years of Project pumping. As a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary. *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM GW-5. Seepage Recovery Wells.** Seepage from the Upper Reservoir will be controlled through a separate set of seepage recovery wells, locations of which are shown on Figure 3. 3-18. Seepage from the upper reservoir will be maintained below the bottom elevation of the landfill liner. Target	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		levels have been assigned to the monitoring wells as shown in Table 3.3-10. A testing program will also be employed for seepage recovery wells for the Upper Reservoir to assess the interconnectedness of the joints and fractures and the pumping extraction rate. Drawdown observations will be made in nearby observation wells to support final engineering design. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties. *Implementation Timing:* Final engineering and life of Project; monitoring on a quarterly basis for the first 4 years of Project pumping; as a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary. *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agencies for verification and enforcement: SWRCB and FERC	
Impact 3.3-5 Groundwater Quality. Seepage water could migrate into the Chuckwalla Valley Groundwater Basin and could affect water quality in the aquifer.	*Potentially significant and subject to mitigation*	**MM GW-6. Water Quality Sampling.** Water quality sampling will be done at the source wells, and within the reservoirs, and in monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Figure 3.3-18 shows the locations of these wells. Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and other potential contaminants as needed to maintain groundwater quality under the direction of the State Board and FERC . *Implementation Timing:* Final engineering *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB and FERC	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		PDF GW-1. Groundwater Seepage. The Owner will limit seepage from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the brine disposal ponds that will be part of the water quality management system for the Project. Final design for seepage control will be approved by FERC prior to construction. Seepage control from the Project reservoirs will be accomplished using systematic procedures such as design and construction control measures that will include the following: • During final engineering design, a detailed reconnaissance of the reservoir basins and pond areas will be conducted to identify zones where leakage and seepage would be expected to occur. These areas will include faults, fissures and cracks in the bedrock, and zones that may have direct connection to the alluvial deposits of the Chuckwalla Valley. During the reconnaissance, the effectiveness of various methods for seepage and leakage control to mitigate the effects of these particular features	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		will be evaluated, including grouting, seepage blankets, and RCC or soil cement treatments, and other methods if needed. • Methods for seepage and leakage control will include curtain grouting of the foundation beneath the dam footprint and around the reservoir rim, as needed; backfill concrete placement and/or slush grouting of faults, fissures, and cracks detected in the field reconnaissance; placement of low permeability materials over zones too large to be grouted and over areas of alluvium within the lower reservoir; seepage and leakage collection systems positioned based upon the results of the hydrogeologic analyses; and clay or membrane lining of the brine ponds associated with the Project's water quality management system. The collection systems would recycle water into the Project reservoirs or the reverse osmosis system. • Design and construction of a Comprehensive Monitoring Program, consisting of observation wells and piezometers that will be used to assess the effectiveness of the seepage and leakage control measures.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Based on monitoring results, additional actions may be taken to further control leakage and seepage from the reservoirs and ponds. Such measures may include curtain grouting and the expansion of seepage and leakage collection systems. Other measures, such as use of stepped RCC or soil cement overlay on the eastern portion of the lower reservoir may also be used depending on results of final engineering design analyses. In addition, portions of the tunnels and shaft of the Project will experience very high water pressures; whereas, current plans are based on lining of the tunnels with concrete, and in some locations steel liners will be installed. These liners will also effectively block seepage from occurring. **PDF GW-2. Water Treatment Facility.** In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. In addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well, preventing eutrophication from occurring.	
Impact 3.3-6 Colorado River Effects. The groundwater levels in the area are around 500 feet msl, and will not deplete groundwater levels in a manner that could encounter the accounting surface elevations.	*No impact*	No mitigation is required.	N/A
Impact 3.3-7 Loss of Existing Wells. Existing wells located within the central and eastern mining pits would be destroyed by development of the Project reservoirs.	*Potentially significant and subject to mitigation*	**MM GW-7. Replacement Wells.** Existing wells located within the central and eastern mining pits to be developed as Project reservoirs will be replaced at locations outside of the reservoirs as shown on Figure 3.3-18. Table 3.3-10 lists those wells scheduled for replacement. *Implementation Timing:* Final engineering	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC	
Section 3.4 Agricultural & Forestry Resources			
Impact 3.4-1: Impacts to Agricultural Lands or Forestry Lands. None of the facilities or structures of the Project are anticipated to have a significant adverse effect on existing agricultural lands or forest. No currently active farmland or forest is proposed to be crossed by the water pipeline or transmission line corridor. The Central Project area is within mining pit and therefore does not have the ability to impact active farmland or forestry	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
resources.			
Section 3.5 ***Biological Resources***			
Impact 3.5-1 Construction Impacts on Plants. Pre-construction surveys and construction controls such as an employee awareness program, on-site Project Biologist, restricted areas, revegetation plan, and minimal surface disturbance plans will be employed avoid or reduce these impacts.	*Potentially significant and subject to the mitigation program*	**MM BIO-1. Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG). *Implementation Timing:* Final Engineering / Pre-Construction / Life Of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team / Project Biologist *Responsible Agencies for verification and enforcement*: FERC / SWRCB / BLM / USFWS / CDFG	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM BIO-2. Biological Reporting to Resource Agencies. As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies. *Implementation Timing:* Final Engineering / Pre-Construction / Life Of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team / Project Biologist *Agency for verification and enforcement*: FERC / SWRCB / BLM / USFWS / CDFG **MM BIO-3. Designation of an Authorized Project Biologist.** An	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - "Authorized Biologist." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/ Project Biologist	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: FERC/USFWS/CDFG **MM BIO-4. Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site "rules" and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: FERC/SWRCB/BLM *Plants* **MM BIO-5. Minimize Surface Disturbance.** During construction in native habitats, all surface disturbance shall be restricted to the smallest area necessary to complete the construction. New spur roads and improvements to existing access roads shall be designed to preserve existing desert wash topography and flow patterns. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires the following mitigation measures for plants: • Avoid plant populations during construction. Where avoidance is not practical, Project effects on the species and population must be assessed. • Require mitigation of project impacts in suitable habitat within the range of the impacted species, using commonly applied mitigation measures. *Implementation Timing:* construction	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM **MM BIO-6. California Desert Native Plants Act.** In compliance with the California Desert Native Plants Act (CDNPA), the County Agricultural Commissioner shall be consulted for direction regarding disposal of plants protected by the CDNPA. This may include salvage for subsequent revegetation of temporarily disturbed areas on site, salvage by an approved nursery, landscaper or other group, or other methods of disposal. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/County Agricultural Commissioner **MM BIO-7. Revegetation Plan.** A	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		revegetation plan (*see* Section 12.14) shall be implemented for areas that are temporarily disturbed during construction. In order to accommodate the specific features of the desert that make revegetation difficult – namely lack of predictable rainfall, lack of an “A” soil horizon, and the difficulty of re-establishing a soil community of micro-organisms – a detailed Revegetation Plan shall address the following measures and include: • Quantitative identification of the baseline community, both annual, herbaceous perennial and woody perennial species. • Soil salvage and replacement on areas to be revegetated. • Final site preparation and grading to include features that enhance germination and growth of native species. This includes surface pitting for the accumulation of sediments, water and seed and the construction of small swales for such species as California ditaxis and desert unicorn plant, which are commonly found in road swales and shoulders. All disturbed washes shall be recontoured to eliminate erosion and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		encourage the reestablishment of the drainage to its pre-construction condition. • Vertical mulching and other techniques to promote a hospitable environment for germination and growth. • Seeding and/or planting of seedlings of colonizing species. • Development of a soil micro-community by inoculation of mycorrhizal fungi and planting species that develop a mycorrhizal net. • Weed control. • Initial irrigation, if necessary. • A realistic schedule of regrowth of native species, and remedial measures, if needed. • Monitoring and reporting. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: FERC/SWRCB/BLM **MM BIO-8. Invasive Species Monitoring and Control.** To minimize the spread of invasive non-native vegetation a weed control program shall be implemented during construction. This program (*see* Section 12.14) includes: • Baseline surveys for weed species that are present and/or are most likely to invade the Project site and surrounding area. • Methods quantifying weed invasion. • Methods for minimizing weed introduction and/or spread. • Triggers which prompt weed control. • Methods and a schedule for weed control and eradication. • Success standards. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: FERC/SWRCB/BLM/ USFWS/CDFG *Wildlife* **MM BIO-9. Couch's Spadefoot.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requirements shall be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments. Surveys on the Central Project Area shall elucidate the presence of any artificial impoundments that could subsidize Couch's spadefoot reproduction. Should those exist then surveys shall be conducted at the appropriate time to determine if larvae are present. If present, the impoundment will be avoided, if possible. If avoidance is not possible, then a new impoundment will be constructed as close as is feasible, to replicate and replace each lost impoundment with similar characteristics. All larvae shall be removed to the new impoundment. During construction on all Project facilities, should ephemeral pools develop in response to intense rainfall showers from early spring through fall these shall be examined for	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		larvae of Couch's spadefoot. If larvae are present, the pools shall be flagged and avoided by construction activities. Where pools cannot be avoided, new pools shall be constructed and larvae transplanted under the supervision of the Project Biologist. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **PDF BIO-1. Pre-Construction Special Species and Habitat Survey**. Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2. **PDF BIO-2. Pre-construction Plant Survey.** Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 and 2009 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approved in the Re-Vegetation Plan.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).	
Impact 3.5-2 Construction Impacts on Wildlife Species. Within in the Central Project Area, the baseline condition of the habitat is highly disturbed, with limited wildlife use. The transmission line and water pipeline will cross higher quality habitat areas and may impact species occupying those areas.	*Potentially significant and subject to the mitigation program*	**MM BIO-1. Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG). *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Biological Technical Advisory Team/Project Biologist *Responsible Agency(ies) for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM BIO-2. Biological Reporting to Resource Agencies. As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist *Agency for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-3. Designation of an Authorized Project Biologist.** An	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - "Authorized Biologist." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/ Project Biologist	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: FERC/USFWS/CDFG **MM BIO-4. Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance may result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site "rules" and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: FERC/SWRCB/BLM **MM BIO-9. Couch's Spadefoot.** The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan requirements shall be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments. Surveys on the Central Project Area shall elucidate the presence of any artificial impoundments that could subsidize Couch's spadefoot reproduction. Should those exist then surveys shall be conducted at the appropriate time to determine if larvae are present. If present, the impoundment will be avoided, if possible. If avoidance is not possible, then a new impoundment will be constructed as close as is feasible, to replicate and replace each lost impoundment with similar characteristics. All larvae shall be removed to the new impoundment. During construction on all Project facilities, should ephemeral pools develop in response to intense rainfall showers from early spring through fall these shall be examined for larvae of Couch's spadefoot. If larvae are	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		present, the pools shall be flagged and avoided by construction activities. Where pools cannot be avoided, new pools shall be constructed and larvae transplanted by the Project Biologist. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-10. Breeding Bird Surveys and Avoidance.** For all construction activities in vegetated habitat that are scheduled to occur between approximately February 15 and July 30, surveys shall be completed in all potential nesting sites for active bird nests. Unless otherwise directed by the CDFG, if an active bird nest is located, the nest site shall be flagged or staked a minimum of five yards in all directions. This flagged zone shall not be disturbed until the nest becomes inactive. Alternatively, grading and site preparation may occur prior to February 15 to preclude interference with nesting birds.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Implementation Timing: construction *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/CDFG **MM BIO-11. Brine Ponds Management.** Brine ponds shall be managed to minimize their attractiveness and access to migratory birds. This consists of making resources provided by the ponds less available (by designing the ponds to be unattractive to birds) and netting the ponds to prevent access by birds (Figure 3.5-19). *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-12. Burrowing Owls Phase III Survey.** Based on the results of the 2009 surveys, a Phase III survey shall be completed to further assess bird use of the Project area and potential impacts if required	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		by the CDFG (CBOC, 1993). This includes a nesting season survey, followed by a winter survey if no burrows or owls are observed during the nesting season. Each of these surveys shall span several visits and days. A pre-construction survey shall be conducted within 30 days of the start of Project construction to assess species presence on-site. Recommendations from the surveys shall be implemented as adaptive management measures. *Implementation Timing:* pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-13. Burrowing Owl Breeding Season.** The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan limits the construction period to September 1 through February 1 if burrowing owls are present, to avoid disruption of breeding activities. CDFG (1995) has recommended several mitigation	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		measures for resident owls. Disruption of burrowing owl nesting activities shall be avoided during construction. Active nests shall be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging, owls may be passively relocated. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-14. Raptor Buffer.** The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan identifies ¼-mile as an important buffer distance for prairie falcon or golden eagle aerie. No aeries or nests have been observed within a ¼ mile, but pre-construction surveys on the Central Project Area will confirm if a ¼-mile construction buffer will be required during the nesting seasons. *Implementation Timing:* pre-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		construction/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/BLM **MM BIO-15. Bat Survey.** The following applicable measures are required by the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan: • Survey for bat roosts within 1 mile of a project, or within 5 miles of any permanent stream or riparian habitat on a project site. • Projects authorized within 1 mile of a significant bat roost site would have applicable mitigation measures, including, but not restricted to seasonal restrictions, light abatement, bat exclusion, and gating of alternative sites. Any exclusion must be performed at a non-critical time, by an authorized bat biologist. Pre-construction bat surveys shall be completed by a qualified bat biologist to determine the existence, location and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		condition of bat roosts on the site. Because foraging areas used by resident bats may be critical to the functioning of those colonies, foraging habitat on the Project also will be identified, if possible. If needed based on the results of these surveys, a mitigation plan shall be developed to avoid roosting and foraging impacts to resident bats, minimize that disturbance or, as an inescapable measure, evict bats. This plan shall include (as relevant): • Designation of avoidance areas and associated measures. • Eviction of bats outside of the maternity season. • A monitoring program to determine impacts from the Project. • Extending the monitoring program for the brine ponds to include bats, as deemed necessary. *Implementation Timing:* pre-construction/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: FERC/SWRCB **MM BIO-16. Wildlife Fencing.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan recommends fencing potential hazards to bighorn sheep. A security fence shall be constructed around portions of the Central Project Area to *exclude larger terrestrial wildlife* – bighorn sheep, deer, coyotes, foxes, badgers – from entering Project areas that could pose a hazard to these species (Figure 3.6-4). Such areas shall include the transmission switchyard and other structures that may be dangerous to wildlife. Where exclusion fencing is required, security gates will be remain closed except during specific vehicle entry and may be electronically activated to open and close immediately after vehicle(s) have entered or exited. Permanent security fences will be installed around the upper and lower reservoirs, switchyard and brine ponds, for security, safety and general liability purposes, and will prevent wildlife access except at designated drinking points. Fences will contain “dips”	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		where the fence will go below the high water mark so that wildlife can reach the water for drinking. These fences will also be equipped with tortoise exclusion fencing. In addition, temporary tortoise exclusion fences will be installed around work zones during construction, and will be sufficiently low (3 feet) to permit passage by sheep. These temporary fences will be removed at the end of construction. Figure 3.6-4 shows the concept for the temporary construction fencing, if additional fencing is needed during construction to protect tortoises, this fencing will be installed and maintained during the construction period. All required exclusion fencing shall be maintained for the life of the Project. All fences will be inspected monthly and during/following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately, followed by permanent repair within one week. *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/BLM **MM BIO-17. Construction and Operation Restricted Areas.** Construction and maintenance activities shall be restricted to minimize Project impacts. These restrictions shall include vehicle speed limits on both paved and dirt roads (the speed limit shall be based on County regulations); avoidance areas, work areas in which workers must be accompanied by a biological monitor, specified parking areas, trash deposition, repair, and refueling areas; looking under parked vehicles prior to movement; and the appropriate response upon finding a special-status species. For construction, this will include the entire construction period. For operations, this will apply to scheduled and unscheduled maintenance activities. *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agency for verification and enforcement: BLM **MM BIO-18. Construction during Daylight Hours.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires that, in areas without wildlife exclusion fencing or those areas that have not been cleared of tortoises, construction activities will only take place during daylight hours. This permits avoidance of construction-related mortalities of fossorial, diurnal species such as the desert tortoise, or nocturnally active species, such as the desert rosy boa. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/ Contractor *Responsible Agency for verification and enforcement*: BLM **MM BIO-19. Construction of Pipeline Trenches.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan identifies that pipeline trenches	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		must be closed, covered, and/or inspected. Pipeline trenches shall be closed, temporarily fenced, or covered each day. Each day, any open trenches shall be inspected by an approved biological monitor, under the supervision of the Authorized Biologist, at first light, midday, and at the end of each day to ensure animal safety. Ramps shall be provided to encourage animals to escape on their own. The biological monitor shall be confirmed by the Approved Project Biologist. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/ Contractor *Responsible Agency for verification and enforcement*: FERC/BLM **MM BIO-20. Minimize Nightime Lighting Impacts.** Facility lighting will be designed, installed, and maintained to prevent casting of nighttime light into adjacent native habitat. *See also* MM AES-1. *Implementation Timing:* final	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-22. Habitat Compensation.** CDFG standard off-site compensation for loss of occupied burrowing owl habitat consists of a minimum of 6.5 acres of lands, approved by CDFG and protected in perpetuity, for each pair of owls or unpaired resident bird. In addition, existing unsuitable burrows on the protected lands should be enhanced (i.e., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1. Habitat compensation for burrowing owls, if needed, will be subsumed by compensation for lost desert tortoise habitat, which also constitutes burrowing owl habitat. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires compensation for disturbance of Desert Dry Wash Woodland in WHMAs at the rate of 3:1. The Project does not disturb	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		any Desert Dry Woodland inside a WHMA. However, the compensation for desert tortoise habitat (148.9 acres of compensation habitat) that is lost to the Project will compensate for the loss of approximately 15.4 acres of Desert Dry Wash Woodland expected to be lost or disturbed during construction activities. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/Project Biologist *Responsible Agency for verification and enforcement*: FERC/BLM/CDFG/ USFWS **PDF BIO-1. Pre-Construction Special Species and Habitat Survey.** Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2. **PDF BIO-3. Pre-construction Mammals Surveys.** Prior to construction, surveys will be conducted for all burrows that might host a badger or kit fox. (These surveys can be simultaneous with those for desert tortoise burrows.) Active burrows and all fox natal dens will be avoided, where possible. The perimeters of all avoidance areas will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is infeasible, occupancy of burrows will be determined through fiberoptics and/or night vision equipment. All occupants will be encouraged to leave their burrows using one-way doors, burrow excavation in the late afternoon/early	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		evening (to encourage escape at night), or other approved methods. All burrows from which badgers or foxes have been removed will be fully excavated and collapsed to ensure that animals cannot return prior to or during construction.	
Impact 3.5-3 Operational Effects on Plant Species. Plant community structure and resulting fauna may be altered if non-native invasive species that are currently in the area spread during construction and/or maintenance activities increase both abundance and distribution of those species.	*Potentially significant and subject to the mitigation program*	**MM BIO-1. Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG). *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Biological Technical Advisory Team/Project Biologist *Responsible Agency(ies) for verification and enforcement*: FERC/SWRCB/BLM/	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		USFWS/CDFG **MM BIO-2. Biological Reporting to Resource Agencies.** As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist *Agency for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-3. Designation of an**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Authorized Project Biologist. An Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - "Authorized Biologist." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Team/ Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM BIO-4. Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		limits, work areas that must be accompanied by a biological monitor, parking areas, looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site “rules” and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program. *Implementation Timing:* construction/life of Project *Party responsible for implementation,*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		monitoring and reporting: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM *Plants* **MM BIO-5. Minimize Surface Disturbance.** During construction in native habitats, all surface disturbance shall be restricted to the smallest area necessary to complete the construction. New spur roads and improvements to existing access roads shall be designed to preserve existing desert wash topography and flow patterns. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires the following mitigation measures for plants: • Avoid plant populations during construction. Where avoidance is not practical, Project effects on the species and population must be assessed. • Require mitigation of project impacts in suitable habitat within the range of the impacted species, using commonly applied mitigation measures.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Implementation Timing: construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM **MM BIO-6. California Desert Native Plants Act.** In compliance with the California Desert Native Plants Act (CDNPA), the County Agricultural Commissioner shall be consulted for direction regarding disposal of plants protected by the CDNPA. This may include salvage for subsequent revegetation of temporarily disturbed areas on site, salvage by an approved nursery, landscaper or other group, or other methods of disposal. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/County Agricultural	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Commissioner **MM BIO-7. Revegetation Plan.** A revegetation plan (*see* Section 12.14) shall be implemented for areas that are temporarily disturbed during construction. In order to accommodate the specific features of the desert that make revegetation difficult – namely lack of predictable rainfall, lack of an "A" soil horizon, and the difficulty of re-establishing a soil community of micro-organisms – a detailed Revegetation Plan shall address the following measures and include: • Quantitative identification of the baseline community, both annual, herbaceous perennial and woody perennial species. • Soil salvage and replacement on areas to be revegetated. • Final site preparation and grading to include features that enhance germination and growth of native species. This includes surface pitting for the accumulation of sediments, water and seed and the construction of small swales for such species as California ditaxis and desert unicorn plant, which are	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		commonly found in road swales and shoulders. All disturbed washes shall be recontoured to eliminate erosion and encourage the reestablishment of the drainage to its pre-construction condition. • Vertical mulching and other techniques to promote a hospitable environment for germination and growth. • Seeding and/or planting of seedlings of colonizing species. • Development of a soil micro-community by inoculation of mycorrhizal fungi and planting species that develop a mycorrhizal net. • Weed control. • Initial irrigation, if necessary. • A realistic schedule of regrowth of native species, and remedial measures, if needed. • Monitoring and reporting. *Implementation Timing:* final engineering/construction *Party responsible for implementation, monitoring and reporting*: Project	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM **MM BIO-8. Invasive Species Monitoring and Control.** To minimize the spread of invasive non-native vegetation a weed control program shall be implemented during construction. This program (*see* Section 12.14) includes: • Baseline surveys for weed species that are present and/or are most likely to invade the Project site and surrounding area. • Methods quantifying weed invasion. • Methods for minimizing weed introduction and/or spread. • Triggers which prompt weed control. • Methods and a schedule for weed control and eradication. • Success standards. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **PDF BIO-1. Pre-Construction Special Species and Habitat Survey**. Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2. **PDF BIO-2. Pre-construction Plant Survey.** Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 and 2009 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approved in the Re-Vegetation Plan. Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).	
Impact 3.5-4 Operational Effects to Wildlife Species. Loss of resources to wildlife	*Potentially significant and subject to the*	**MM BIO-1. Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
is expected to be functionally negligible for most species. The primary onsite impacts to species from operation of the Project are limited to loss of individuals that move onto the site, including during transmission line maintenance. Faunal community structure may be altered if predators are attracted to reservoirs due to available water or night lighting.	*mitigation program*	specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG). *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Biological Technical Advisory Team/Project Biologist *Responsible Agency(ies) for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-2. Biological Reporting to Resource Agencies.** As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist *Agency for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-3. Designation of an Authorized Project Biologist.** An Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		tortoises - "Authorized Biologist." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/ Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM BIO-4. Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas, looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site "rules" and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM **MM BIO-9. Couch's Spadefoot.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requirements shall be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments. Surveys on the Central Project Area shall elucidate	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		the presence of any artificial impoundments that could subsidize Couch's spadefoot reproduction. Should those exist then surveys shall be conducted at the appropriate time to determine if larvae are present. If present, the impoundment will be avoided, if possible. If avoidance is not possible, then a new impoundment will be constructed as close as is feasible, to replicate and replace each lost impoundment with similar characteristics. All larvae shall be removed to the new impoundment. During construction on all Project facilities, should ephemeral pools develop in response to intense rainfall showers from early spring through fall these shall be examined for larvae of Couch's spadefoot. If larvae are present, the pools shall be flagged and avoided by construction activities. Where pools cannot be avoided, new pools shall be constructed and larvae transplanted by the Authorized Project Biologist. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/CDFG **MM BIO-10. Breeding Bird Surveys and Avoidance.** For all construction activities in vegetated habitat that are scheduled to occur between approximately February 15 and July 30, surveys shall be completed in all potential nesting sites for active bird nests. Unless otherwise directed by the CDFG, if an active bird nest is located, the nest site shall be flagged or staked a minimum of five yards in all directions. This flagged zone shall not be disturbed until the nest becomes inactive. Alternatively, grading and site preparation may occur prior to February 15 to preclude interference with nesting birds. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/CDFG **MM BIO-11. Brine Ponds Management.** Brine ponds shall be managed to minimize	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		their attractiveness and access to migratory birds. This consists of making resources provided by the ponds less available (by designing the ponds to be unattractive to birds) and netting the ponds to prevent access by birds (Figure 3.5-19). *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-12. Burrowing Owls Phase III Survey.** Based on the results of the 2009 surveys, a Phase III survey shall be completed to further assess bird use of the Project area and potential impacts (CBOC, 1993). This includes a nesting season survey, followed by a winter survey if no burrows or owls are observed during the nesting season. Each of these surveys shall span several visits and days. A pre-construction survey shall be conducted within 30 days of the start of Project construction to assess species presence on-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		site. Recommendations from the surveys shall be implemented as adaptive management measures. In consultation with CDFG, the pre-construction survey may obviate the need for the Phase III survey. *Implementation Timing:* pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-13. Burrowing Owl Breeding Season.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan limits the construction period to September 1 through February 1 if burrowing owls are present, to avoid disruption of breeding activities. CDFG (1995) has recommended several mitigation measures for resident owls. Disruption of burrowing owl nesting activities shall be avoided during construction. Active nests shall be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		owls may be passively relocated. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-14. Raptor Buffer.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan identifies ¼-mile as an important buffer distance for prairie falcon or golden eagle aerie. No aeries or nests have been observed within a ¼ mile, but pre-construction surveys on the Central Project Area will confirm if a ¼-mile construction buffer will be required during the nesting seasons. *Implementation Timing:* pre-construction/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: FERC/BLM **MM BIO-15. Bat Survey.** The following applicable measures are required by the Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan: • Survey for bat roosts within 1 mile of a project, or within 5 miles of any permanent stream or riparian habitat on a project site. • Projects authorized within 1 mile of a significant bat roost site would have applicable mitigation measures, including, but not restricted to seasonal restrictions, light abatement, bat exclusion, and gating of alternative sites. Any exclusion must be performed at a non-critical time, by an authorized bat biologist. Pre-construction bat surveys shall be completed by a qualified bat biologist to determine the existence, location and condition of bat roosts on the site. Because foraging areas used by resident bats may be critical to the functioning of those colonies, foraging habitat on the Project also will be identified, if possible. If needed based on the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		results of these surveys, a mitigation plan shall be developed to avoid roosting and foraging impacts to resident bats, minimize that disturbance or, as an inescapable measure, evict bats. This plan shall include (as relevant): • Designation of avoidance areas and associated measures. • Eviction of bats outside of the maternity season. • A monitoring program to determine impacts from the Project. • Extending the monitoring program for the brine ponds to include bats, as deemed necessary. *Implementation Timing:* pre-construction/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB **MM BIO-16. Wildlife Fencing.** The Northern and Eastern Colorado Desert	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Coordinated Management (NECO) Plan recommends fencing potential hazards to bighorn sheep. A security fence shall be constructed around portions of the Central Project Area to *exclude larger terrestrial wildlife* – bighorn sheep, deer, coyotes, foxes, badgers – from entering Project areas that could pose a hazard to these species (Figure 3.6-4). Such areas shall include the transmission switchyard and other structures that may be dangerous to wildlife. Where exclusion fencing is required, security gates will be remain closed except during specific vehicle entry and may be electronically activated to open and close immediately after vehicle(s) have entered or exited. Permanent security fences will be installed around the upper and lower reservoirs, switchyard and brine ponds, for security, safety and general liability purposes, and will prevent wildlife access except at designated drinking points. Fences will contain “dips” where the fence will go below the high water mark so that wildlife can reach the water for drinking. These fences will also be equipped with tortoise exclusion fencing. In addition, temporary tortoise exclusion fences will be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		installed around work zones during construction, and will be sufficiently low (3 feet) to permit passage by sheep. These temporary fences will be removed at the end of construction. Figure 3.6-4 shows the concept for the temporary construction fencing, if additional fencing is needed during construction to protect tortoises, this fencing will be installed and maintained during the construction period. All required exclusion fencing shall be maintained for the life of the Project. All fences will be inspected monthly and during/following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately, followed by permanent repair within one week. *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist/Contractor *Responsible Agency for verification and enforcement*: FERC/BLM **MM BIO-20. Minimize Nightime Lighting**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Impacts. Facility lighting will be designed, installed, and maintained to prevent casting of nighttime light into adjacent native habitat. *See also* MM AES-1. *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB *Special Habitats* **MM BIO-22. Habitat Compensation.** CDFG standard off-site compensation for loss of occupied burrowing owl habitat consists of a minimum of 6.5 acres of lands, approved by CDFG and protected in perpetuity, for each pair of owls or unpaired resident bird. In addition, existing unsuitable burrows on the protected lands should be enhanced (i.e., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1. Habitat compensation for burrowing owls, if needed, will be subsumed by compensation for lost desert tortoise habitat, which also	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		constitutes burrowing owl habitat. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires compensation for disturbance of Desert Dry Wash Woodland in WHMAs at the rate of 3:1. The Project does not disturb any Desert Dry Woodland inside a WHMA. However, the compensation for desert tortoise habitat (148.9 acres of compensation habitat) that is lost to the Project will compensate for the loss of approximately 15.4 acres of Desert Dry Wash Woodland expected to be lost or disturbed during construction activities. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/Project Biologist *Responsible Agency for verification and enforcement*: FERC/BLM/CDFG/ USFWS **PDF BIO-4. Raptor Protection of Transmission Line**. Eagle Crest Energy Company (ECE) will design and construct	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation. The design plan (filed for Commission approval) will include adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.	
Impact 3.5-5 Indirect Impacts of Operation and Maintenance. Neither the Central Project Area nor the transmission or pipeline corridors will experience greater disturbance than currently exists. The Project will not affect the normal movements of wildlife. It is not likely that there would be a measurable change in the density of predators, or, as a result, a significant change in	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
impacts to local fauna.			
Impact 3.5-6 Impacts of Brine Ponds. Birds and bats may be affected by ingesting harmful elements and/or highly saline water in the brine ponds.	*Potentially significant and subject to the mitigation program*	**MM BIO-11. Brine Ponds Management.** Brine ponds shall be managed to minimize their attractiveness and access to migratory birds. This consists of making resources provided by the ponds less available (by designing the ponds to be unattractive to birds) and netting the ponds to prevent access by birds (Figure 3.5-19). *Implementation Timing:* final engineering/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/SWRCB	**Less than significant**
Impact 3.5-7 Transmission Impacts to Birds. Birds (including golden eagles) could be affected by collision with transmission lines or electrocution.	*Potentially significant and subject to the mitigation program*	**PDF BIO-4. Raptor Protection of Transmission Line**. Eagle Crest Energy Company (ECE) will design and construct raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		The design plan (filed for Commission approval) will include adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.	
Impact 3.5-8 Wetlands, Seeps, and Springs. Since there are no wetlands in the Project vicinity, there will be no impacts to wetlands. There will be no impact on seeps and springs in the Eagle Mountains. Available information indicates that these springs are not hydrologically connected to the Pinto or Chuckwalla Valley Basin aquifers since they are located in the mountains above the Pinto and Chuckwalla basins.	*No impact*	No mitigation is required.	N/A
Impact 3.5-9 Dry Desert Washes. There are many small washes crossed by the pipeline and transmission line that will be regulated by the CDFG under Section	*Potentially significant and subject to the mitigation program*	**MM BIO-21. Dry Desert Washes.** There are many small washes crossed by the pipeline and transmission line that are regulated by the CDFG. A Streambed Alteration Agreement (Section 1602 of the CDFG Code) shall be obtained, which will	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
1602 of the CDFG Code. This impact to local washes may include degradation or loss of wash habitat, which would be monitored and limited under standard terms of the Streambed Alteration Agreement; and which will identify the condition and location of all State jurisdictional waters, impacts, and mitigation measures.		identify the condition and location of all State jurisdictional waters, impacts, and mitigation measures. Mitigation includes the acreage assessment of washes that may be affected, construction requirements associated with working on or near the washes, and compensation for lost or damaged acreage. It is anticipated that this compensation will be included in the habitat compensation for special-status species (MM BIO-22 and MM TE-6). *Implementation Timing:* pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist *Responsible Agency for verification and enforcement*: FERC/CDFG	
Impact 3.5-10 Operational Effects to Fish Species. Project lands include no streams or ponds that could support any species of fish.	*No impact*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Section 3.6 Threatened & Endangered Species			
Impact 3.6-1 Coachella **Valley Milkvetch.** Based on site reconnaissance and literature review, this species is not expected to be located on-site, or in areas that will be affected by the Project. Therefore, it is highly unlikely that there would be any Project effects on the milkvetch. However, pre-construction surveys will be conducted to insure that no Coachella Valley Milkvetch will be disturbed.	*Potentially significant and subject to the mitigation program*	**PDF BIO-2. Pre-construction Plant Survey.** Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 and 2009 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approved in the Re-Vegetation Plan.	**Less than significant.**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).	
Impact 3.6-2 American Peregrine Falcon. Based on site reconnaissance and literature review, this species is not expected to be located on-site or in areas affected by the Project. This species is unknown to inhabit Riverside and Imperial counties, and has not been found during previous surveys in the Project area, including the Central Project Area. Therefore it is highly unlikely that there would be any Project effects on peregrine falcon. However, pre-construction surveys will be conducted to insure that no American Peregrine Falcon will be disturbed.	*Potentially significant and subject to the mitigation program*	**PDF BIO-1. Pre-Construction Special Species and Habitat Survey**. Following licensing and access to the Central Project Area, surveys for special status species (endangered, rare or threatened) and habitats that could support special status species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.6-3 Gila Woodpecker. Based on site reconnaissance and literature review, this species is not expected to be located on-site or in areas affected by the Project, nor residential areas. Between the small residential areas and the Project is a broad area of inhospitable habitat. However, pre-construction surveys will be conducted to insure that no Gila Woodpecker will be disturbed.	*Potentially significant and subject to the mitigation program*	**PDF BIO-1. Pre-Construction Special Species and Habitat Survey.** Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2.	**Less than significant**
Impact 3.6-4 Desert Tortoise. Desert tortoise may be affected by Project construction, particularly along the proposed transmission corridor.	*Potentially significant and subject to the mitigation program*.	**MM TE-1. Desert Tortoise Pre-construction Surveys and Clearance Surveys.** Desert tortoises shall be removed from construction areas by the Project Biologist. Such tortoises shall be processed (cataloged, photographed, and numbered) prior to placement outside the construction zones but on public or private land, or the Project ROW (*see* Appendix 12.14 Desert Tortoise Removal and Translocation Plan). .	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		On the linear facilities, this is achieved by first surveying for all desert tortoises that might be within construction zones or are likely to enter construction zones, immediately prior to the start of construction. (These surveys can be simultaneous with those for badger and kit fox.). Active burrows will be identified, measured, and the entrance “gated” (a 3-inch twig inserted into the floor of the runway) for monitoring tortoise use. The locations of all desert tortoises will be mapped so that those locations can be monitored for tortoise use during construction. On the Central Project Area, there is little likelihood of desert tortoises except along the southern and eastern edges because of the altered landscape and massive and abundant tailings piles. Surveys first will be conducted in the Central Project Area to determine the presence of desert tortoise. If there is any suggestion of tortoise presence, either due to the presence of tortoise habitat and/or tortoise sign, a clearance survey (*see* Appendix 12.14 Desert Tortoise Removal and Translocation Plan) will be completed in those areas after tortoise-proof fencing is	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		installed (*see* MM TE-3: Desert Tortoise Exclusion Fencing). A minimum of two clearance passes will be completed. Surveys will coincide with heightened tortoise activity, from mid-March to mid-April and during October. This will maximize the probability of finding all tortoises. Any tortoises found will be removed per mitigation MM TE-3: Desert Tortoise Translocation or Removal. Surveys and clearance on the substation will proceed identically to that on the Central Project Area, with the exception that a pre-construction survey prior to clearance surveys is not necessary. *Implementation Timing:* pre-construction *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM TE-2. Desert Tortoise Construction Monitoring.** No construction in unfenced areas (*see* MM TE-3: Desert Tortoise Exclusion Fencing) on the linear	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		facilities will occur without biological monitors. This includes both construction monitoring and maintenance activities that require surface disturbance. An adequate number of trained and experienced monitors must be present during all construction activities, depending on the various construction tasks, locations, and season. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan suggests that construction activities occur when tortoises are inactive – November 1 to March 15 – where possible. However, adequate monitoring will mitigate concerns about take due to heightened activity levels the remainder of the year. All desert tortoises will be removed from harm's way by a biologist approved by the Project Biologist (MM BIO-2). The Project Biologist must be sufficiently qualified to ensure approval by USFWS and CDFG for all tortoise protection measures that may be implemented by the Project. USFWS describes a single designation for biologists who can be approved to handle tortoises, "Authorized Biologist." Such biologists have demonstrated to USFWS that they	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. Active burrows and special-resource burrows will be avoided, where possible. Where avoidance of any burrow is infeasible, occupancy will first be determined through the use of fiberoptics, probes or mirrors. All burrows that could potentially host a tortoise will be excavated with hand tools in the method prescribed by the Desert Tortoise Council (1994, rev. 1999), *Guidelines for handling desert tortoises during construction projects.* Any tortoises found will be removed from the construction area per MM TE-4: Desert Tortoise Translocation or Removal Plan. Pipeline trenches will be closed, temporarily fenced, or covered each day. Each day, any open trenches will be inspected by an	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		approved biological monitor at first light, midday, and at the end of each day to ensure tortoise safety. If necessary, temporary fencing will be installed in the active work area to separate a tortoise from active construction, in order to maximize protection. If a tortoise is injured or killed, surface-disturbing activities must cease in the area of the killed or injured tortoise and the Project Biologist contacted. Injured tortoises will be taken to a qualified veterinarian if their survival is expected. USFWS will determine if the tortoise can be returned to the wild, should it recover. As a mitigation performance standard, following site clearance, a report will be prepared by the Project Biologist to document the clearance surveys, construction monitoring, the capture and release locations of all tortoises found, individual tortoise data, and other relevant data. This report will be submitted to the CDFG and USFWS. *Implementation Timing:* construction	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM TE–3. Desert Tortoise Exclusion Fencing.** The substation will be enclosed with a permanent tortoise exclusion fence to keep adjacent tortoises from entering the site. The fencing type will be one- by two-inch vertical mesh galvanized fence material, extending at least two feet above the ground and buried at least one foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent the tortoise from digging under the fence. Tortoise-proof gates will be established at all site entry points. All fence construction will be monitored by qualified biologists to ensure that no tortoises are harmed. Following installation, the fencing will be inspected monthly and during all major rainfall events. Any damage to the fencing will be repaired immediately. Parking and storage will occur within the substation and disturbed, previously fenced areas.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Any areas on the Central Project Area that are determined through surveys to require fencing will be fenced as outlined above (Figure 3.6-4). Where a fence is discontinuous (between tailings piles for example), the fence ends will extend well up the slope of the piles, to ensure that tortoises cannot go around the end. Alternative methods may be explored to ensure that the fences are functional at excluding tortoises. *Implementation Timing:* construction and life of the Project *Party responsible for implementation, monitoring and reporting*: Project Biologist and contractor *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM TE–4. Desert Tortoise Removal and Translocation Plan.** The Desert Tortoise Removal and Translocation Plan is found in its entirety within Section 12.14. For both the Central Project Area and the linear facilities, it is anticipated that any tortoises removed would not be "translocated" or "relocated" in the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		biological sense of putting an animal in a location outside its home range. Instead, any tortoise would simply be removed to another part of its home range. Because construction on the Central Project Area will occur on highly disturbed previously mined areas, any tortoise found there during clearance would likely be a transient or in a peripheral part of its home range, certainly outside its core use areas or parts of its home range that could support its survival. By moving such a tortoise to a location immediately adjacent to its capture site outside the fenced construction area, the Project would be maintaining the tortoise within its home range, not translocating it. The tortoise merely would be excluded from undesirable areas. For utility corridors and fence construction, tortoises would be removed a short distance from the construction zone. Tasks will include the following: • Tortoise handling and temperature requirements • Data gathered on removed tortoises • Translocation site preparation (if any) and choice	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• Monitoring – All tortoises removed will be monitored sufficiently to ensure safety. *Implementation Timing:* construction *Party responsible for implementation, monitoring and reporting*: Project Biologist and contractor *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM TE-6. Habitat Compensation.** The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan states that all lands within a DWMA will be designated as Category I Desert Tortoise Habitat[1], with required compensation of 5 acres for every acre disturbed. All lands outside a DWMA are considered Category III habitat, with a 1:1 compensation ratio. The Project overlaps 16.7 acres of Category I Habitat and 65.4 acres of Category III	

[1] BLM habitat categories (BLM 1988), ranging in decreasing importance from Category I to Category III, were designed as management tools to ensure future protection and management of desert tortoise habitat and its populations. These designations were based on tortoise density, estimated local tortoise population trends, habitat quality, and other land-use conflicts. Category I habitat areas are considered essential to the maintenance of large, viable populations.

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Habitat. The habitat compensation is 148.9 acres (Figure 3.6-3). This land would need to be purchased in the same population of desert tortoises as occupy the site. In addition, the following features should apply to compensation lands: • Be part of a larger block of lands that are currently protected or able to be protected • Are not subject to intensive habitat degradation (e.g., recreational use, grazing use, agriculture) • Have inherently moderate to good habitat that will naturally and ultimately regenerate when current disturbances are removed • Preferably are bordered by native habitat suitable for tortoises and/or • In part, may represent a buffer for a block of good habitat Selection of compensation lands will be done in consultation with CDFG and USFWS. *Implementation Timing:* final	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		engineering/pre-construction *Party responsible for implementation, monitoring and reporting*: Project Applicant *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM TE-7. Operations and Maintenance.** Tortoises observed during routine maintenance activities will be allowed to voluntarily move out of harm's way. Transmission line repair activities that will result in surface disturbance will require biological monitoring, per mitigation MM TE-2. *Implementation Timing:* pre-construction/construction/life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist contractor *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM BIO-1. Biological Mitigation and Monitoring Program.** Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG). *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Biological Technical Advisory Team/Project Biologist *Responsible Agency(ies) for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-2. Biological Reporting to Resource Agencies.** As part of implementing protection measures, regular reports shall be submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Biological Technical Advisory Team/Project Biologist *Agency for verification and enforcement*: FERC/SWRCB/BLM/ USFWS/CDFG **MM BIO-3. Designation of an Authorized Project Biologist.** An Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - “Authorized Biologist.” Such biologists have demonstrated to the USFWS	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. *Implementation Timing:* final engineering/pre-construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator / Biological Technical Advisory Team/ Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG **MM BIO-4. Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) (*see* Section 12.14) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas, looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site "rules" and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program. *Implementation Timing:* construction/life of Project *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: FERC/SWRCB/BLM	
Impact 3.5-5 Increase to Raven Population. If ravens were to increase in response to additional water resources at the Project, these ravens could forage in the JTNP or disperse into the JTNP from enhanced reproductive	*Potentially significant and subject to the mitigation program*	**MM TE-5. Raven Monitoring and Control Program.** The Raven Monitoring and Control Plan is found in its entirety within Section 12.14. Proposed projects on Federal lands that may result in increased raven populations must incorporate mitigation to reduce or eliminate the opportunity for raven proliferation. The	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
opportunities at the Project.		USFWS has developed a program to monitor and manage raven populations in the California desert in an effort to enhance desert tortoise recovery. In order to integrate monitoring and management, the USFWS has agreed to an "in-lieu" fee to replace quantitative raven monitoring on new projects in the range of the desert tortoise. The Project owner will pay in-lieu fees to USFWS that will be directed toward a future quantitative regional monitoring program aimed at understanding the relationship between ongoing development in the desert region, raven population growth and expansion and raven impacts on desert tortoise populations. The vehicle for this program is a Memorandum of Understanding between the Project owner, CDFG and USFWS. The Raven Monitoring and Control Plan may include this in-lieu fee if it is determined that ravens may increase over current levels due to the Project. In addition to this in-lieu fee, the program will include, at a minimum: • A suite of construction and operations measures to reduce food scavenging and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		drinking by ravens (e.g., trash containment, minimization of pooling water) • Roadkill removal • Qualitative monitoring of raven use of the site during operations, conducted on a pre-determined schedule by the onsite Project environmental compliance officer and • Breeding season nest surveys *Implementation Timing:* construction and life of Project *Party responsible for implementation, monitoring and reporting*: Project Biologist *Responsible Agency for verification and enforcement*: FERC/USFWS/CDFG	
Section 3.6 Aesthetics			
Impact 3.7-1 Central Project Area. Visual impacts associated with the development of the Project's central facility are largely	*Potentially significant and subject to the mitigation program*	**MM AES-1. Lighting.** To minimize lighting effects and potential light pollution, the final engineering design shall incorporate directional lighting, light hoods, low pressure sodium bulbs or LED lighting,	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
short-term due to construction activity and have a low potential to impact scenic vistas within the vicinity of the Project area. Visual impacts from the Central Project Area would be less than significant and no mitigation measures would be required.		and operational devices to allow surface night-lighting in the central site to be turned on as-needed for safety. The Project operator shall fund night sky monitoring to be conducted in collaboration with the National Park Service (NPS) during the post-licensing design period (to represent baseline conditions) and during construction and the initial operational period. *Implementation Timing:* Final engineering/pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB/FERC	
Impact 3.7-2 Transmission Line Construction Activities. The Project's transmission line will create short-term visual impacts associated with construction activities including: visibility of Project vegetation disturbance, as well as from	*Potentially significant and subject to the mitigation program*	**MM AES-4. Transmission Line.** For construction of the transmission line, existing access roads and construction laydown areas shall be used to the extent feasible. The transmission line disturbed zones that will not be required for long term maintenance access will be revegetated with native vegetation immediately following completion of transmission line construction,	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
construction equipment, materials, personnel, and construction staging areas.		consistent with the recommendations in the Biological Resources Revegetation Plan (*see* Section 12.14). *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB/ FERC **PDF AES-1. Staging Areas.** Staging areas and areas needed for equipment operation, material storage and assembly shall be combined with construction lands to the extent feasible, and organized to minimize the total footprint needed. Staging, storage, and temporary construction areas shall be reclaimed as soon as the use of each such area is completed.	
Impact 3.7-3 Operation of Transmission Line from the Project Site to MWD Eagle Mountain Pump Station. No significant visual impacts would occur	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
for this line segment.			
Impact 3.7-4 Operation of Transmission Line from the MWD Eagle Mountain Pump Station to Eagle Mountain Road Turnoff. Visual impacts would result from construction of this segment of the transmission line. The project would be designed consistent with VRM Class III management objectives (regulatory LORS).	*Potentially significant and subject to the mitigation program*	**MM AES-3. Road Crossings.** For design of the transmission line, road crossings shall be aligned perpendicular to the road to minimize views up and down ROW corridors, and towers should be placed at the maximum distance from the road ROW. Steel lattice structures with a dull, galvanized steel finish shall be utilized to reduce visual contrast. Conductors shall be selected to reduce glare and visual contrast. The corridor should be collocated with the existing MWD transmission corridor, and tower spacing at Victory Pass designed so that as few towers as possible are skylighted on the ridgeline. These considerations will be balanced with engineering constraints and concerns for minimizing impacts to other resources such a desert tortoise and cultural resources. Final design will be approved by FERC. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*:	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB/FERC **MM AES-4. Transmission Line.** For construction of the transmission line, existing access roads and construction laydown areas shall be used to the extent feasible. The transmission line disturbed zones that will not be required for long term maintenance access will be revegetated with native vegetation immediately following completion of transmission line construction, consistent with the recommendations in the Biological Resources Revegetation Plan (*see* Section 12.14). *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB/ FERC	
Impact 3.7-5 Operation of Transmission Line from	*Significant and unavoidable*	**MM AES-3. Road Crossings.** For design of the transmission line, road crossings shall	**Significant and unavoidable**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
the Eagle Mountain Road Turnoff to the Interconnection Substation. The transmission line segment from the Eagle Mountain Road turnoff to the interconnection substation (2.5 miles) would constitute a new utility feature within the landscape, creating high visual contrast within foreground view zones, resulting in a significant and unavoidable impact.		be aligned perpendicular to the road to minimize views up and down ROW corridors, and towers should be placed at the maximum distance from the road ROW. Steel lattice structures with a dull, galvanized steel finish shall be utilized to reduce visual contrast. Conductors shall be selected to reduce glare and visual contrast. The corridor should be collocated with the existing MWD transmission corridor, and tower spacing at Victory Pass designed so that as few towers as possible are skylighted on the ridgeline. These considerations will be balanced with engineering constraints and concerns for minimizing impacts to other resources such a desert tortoise and cultural resources. Final design will be approved by FERC. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB/FERC	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM AES-4. Transmission Line. For construction of the transmission line, existing access roads and construction laydown areas shall be used to the extent feasible. The transmission line disturbed zones that will not be required for long term maintenance access will be revegetated with native vegetation immediately following completion of transmission line construction, consistent with the recommendations in the Biological Resources Revegetation Plan (*see* Section 12.14). *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB/ FERC	
Impact 3.7-6 Construction and Operation of the Water Pipeline. Short-term construction impacts are anticipated due to the water pipeline's low profile and	*Potentially significant and subject to the mitigation program*	**MM AES-2. Water Pipeline**. For construction of the water pipeline, reduce side cast disposal of soils from open cut construction (by replacing disturbed soil within the trench and limiting the width of the construction disturbance) to reduce color	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
proximity to existing access roads, SR 177 and transmission utilities.		contrast and disturbance with surrounding landscape. The area disturbed during pipeline construction shall be backfilled and revegetated with native vegetation immediately following completion of pipeline construction. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Contractor/Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB/FERC	
Section 3.8 ***Cultural Resources***			
Impact 3.8-1 Transmission Line Route from the Crossing of the CRA to the Interconnector Substation. Construction of the substation and transmission lines will not result in significant impacts on cultural resources related to	*Potentially significant and subject to the mitigation program.*	**MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program.** **<u>Management Activity</u>:** Implement project-specific education program. • A qualified archaeologist will implement a cultural resources element for the	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
the World War II DTC/CAMA. Historic sites are more likely to occur within the study corridor (which extends out 1 mile on each side of the Project area proper).		Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view. • The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities. • The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-4. Offer Opportunities for Public Interpretation.** Unlike other hydroelectric projects where public access and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped Storage Project boundaries. Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park. **Management Activity:** Develop informative signage that will be available to the public. ECE will develop and install one weather-tolerant sign that will be placed outside the main gate of the facility. The sign will provide information about the prehistory and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified. The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within 1 year of completion of the boundary fence. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/ Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-5. Review Effectiveness of the Historic Properties Management Plan.** **<u>Management Activity</u>:** Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP. **<u>Performance Standard</u>:** Develop	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-6. Consult with California SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC.** **<u>Management Activity</u>:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties. • Include summaries of cultural resource treatments as an update to a HPMP implementation summary table. • Report the status of ECE's public interpretation projects. • Recommend modifications to the Project HPMP that will improve its	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		implementation if appropriate. • Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report with FERC. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM CR-7. Class I Investigation. In the event that Project activities would extend beyond the areas previously surveyed, then background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of Class I literature review is the EIC at the University of California, Riverside. **Management Activity:** compare proposed Project location with Cultural Resources Management Maps. • Determine if the Project area is located within 100 feet of a potentially significant previously recorded	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		archeological site. • Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground utility line). • Determine if the area has been previously surveyed for cultural resources. **<u>Performance Standard</u>:** based on the results of the above-noted Management Activity. • Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional archaeologist. • Previous ground-disturbing activity may be documented or observed therefore no Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be distributed to the California SHPO, the BLM, Riverside County, interested	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-8. Class III Cultural Resources Field Investigation.** Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III survey in compliance with Section 106 of the National Historic Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579). **<u>Management Activity</u>:** Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside. **<u>Performance Standards</u>:** Review results of the Class III Survey and the associated recommendations. • If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO. • If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may proceed. If SHPO does not concur, then the resource is treated as potentially significant. • If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity, identifiable limits, structure, function, research potential, and cultural/historical context – see definition under 4.2.3	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-9. Testing Phase Cultural Resources Field Investigation.** Conduct limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the National Register eligibility of individual resources and an assessment of the Project effects on historic properties. The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		avoided by a proposed action, qualifies as significant. The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and: • is associated with events that have made a significant contribution to the broad patterns of history • is associated with the lives of persons significant in the past • embodies the distinctive characteristics of a type, period or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction or • has yielded, or may be likely to yield, information important in prehistory or history **Management Activity:** Engage services of a qualified archaeologist to collect data	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		sufficient to determine if a cultural resource qualifies as significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward this report to BLM for consultation with SHPO, interested Indian Tribes and FERC. **<u>Performance Standards</u>:** Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO. • If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		proceed following consultation with the California SHPO. • If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment measure). *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM CR-10. Data Recovery or Alternative Mitigation. ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE, SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes **Management Activity:** ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with the California SHPO, the BLM, the Advisory Council on Historic Preservation, and interested Indian Tribes, as	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties. **Performance Standard:** Review results of the data recovery or other mitigation and consult with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains.** As with all development	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation emergency. **Management Activities:** Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Human Remains, found in Appendix A of the HPMP. **<u>Performance Standards</u>:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted. *Implementation Timing:* Grading/earthwork/construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: Project Archeologist/Riverside County Coroner, as required	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.8-2 Transmission Line and Water Pipeline Crossing of the CRA. This impact is considered *potentially significant and subject to the mitigation program*. The transmission and water pipelines cross over buried portions of the CRA, which is very likely eligible for the NRHP based on its historical and engineering significance. The CRA is not visible from the surface in this area, however, except for a road and flood control berm.	*Potentially significant and subject to the mitigation program*	**MM CR-1. Protect Known Historic Properties.** Of the cultural resources recorded within the Project boundaries (*see* Table 3.8.4), only the CRA (P-33-6726) is evaluated as potentially eligible for listing under Criterion "A" – broad patterns of history; and Criterion "C" – embodies distinctive characteristics of a type, period, region, or method of construction. No formal determination of eligibility has been made, but the CRA will be treated as potentially eligible. **<u>Management Activity</u>:** Design transmission line and water pipes to avoid direct or indirect impacts to the buried portion of the CRA. Inspect once every 2 years to observe if conditions are stable or if any disturbance or deterioration has occurred. ECE will design transmission tower locations, plan conductor installation procedures, and design water line placements to avoid impacts to this crucial element of southern California's water delivery infrastructure. Consultation with the MWD will occur for that purpose. The CRA is buried in the areas of the Project APE and no	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		impacts to its integrity are anticipated. • The inspections will be made by a ground surface level as appropriate. • Digital photographs will be taken and compared with photographs from the previous inspections. • The Project Environmental Coordinator or designee will summarize observations made during inspections every 2 years during construction. This summary will be included in the HPMP Implementation Summary Report (HPMP Implementation Report). ECE will provide a HPMP Implementation Report on a 6-year review cycle after construction, in coordination with California SHPO. • Although none are presently identified, in the event that interested Indian Tribes identify TCPs in the future during the planning, construction, and/or operation of the Project within the APE, the Project Environmental Coordinator shall direct qualified individuals to conduct additional consultation with the Indian Tribes, BLM, and SHPO to evaluate and document the properties in accordance with National Register Bulletin 38	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		(Parker and King, 1998). If the properties are determined to be eligible for listing in the NRHP, appropriate measures will be developed to mitigate adverse effects through consultation with the Indian Tribes, BLM, and SHPO. Priority will be given to preservation in place when possible, followed by data recovery, documentation, restoration or other measures as approved by the Tribes, BLM and SHPO. **<u>Performance Standards</u>:** Inspect the CRA in the area of the APE every 2 years during construction. • Provide a summary of observations on a 2-year cycle during the construction phase and a 6-year reporting cycle thereafter. • If notable changes are observed in site conditions consult with SHPO to determine if further remedial actions are appropriate. • Conduct appropriate consultation and treatment if TCP are identified in the future. *Implementation Timing:* Engineering design/construction/operation	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Environmental Coordinator /Contractor *Responsible Agency for verification and enforcement*: FERC **MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program.** **<u>Management Activity</u>:** Implement project-specific education program. • A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities. • The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation,*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		monitoring and reporting: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-5. Review Effectiveness of the Historic Properties Management Plan.** **<u>Management Activity</u>:** Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP. **<u>Performance Standard</u>:** Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-6. Consult with California**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC. **<u>Management Activity</u>:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties. • Include summaries of cultural resource treatments as an update to a HPMP implementation summary table. • Report the status of ECE's public interpretation projects. • Recommend modifications to the Project HPMP that will improve its implementation if appropriate. • Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		review comments, ECE will file the HPMP Implementation Report with FERC. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains.** As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation emergency. **<u>Management Activities</u>:** Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP. **<u>Performance Standards</u>:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		shall be consulted. *Implementation Timing:* Grading/earthwork/construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: Project Archeologist/Riverside County Coroner, as required	
Impact 3.8-3 Transmission Line Crossing of the Eagle Mountain Railroad. The transmission line crosses over the Eagle Mountain Railroad in two places. A formal significance determination of the rail line remains to be undertaken by the BLM but there have been substantial previous impacts to its integrity and it is unlikely to be found NRHP-eligible.	*Potentially significant and subject to the mitigation program*	**MM CR-2. Inventory and Evaluate Cultural Resources Within the Kaiser Mine Property.** An inventory of this portion of the APE will be undertaken in compliance with Section 106 of the National Historic Preservation Act and according to regulatory procedures provide in 36 CFR 800. The inventory will also include other accessible portions of the APE within the Kaiser property. The entire townsite and associated portions of the railroad will be re-recorded, and the various elements will be considered as contributors to a National Register district. **<u>Management Activity</u>:** A Work Plan will be developed and executed following issuance	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		of the FERC license and upon gaining legal access to the subject lands. A phased approach will be taken in order to make prudent and well-informed decisions on Section 106 compliance within the Kaiser property. The first phase will be a scoping reconnaissance of the APE within the Kaiser property and the entirety of the Eagle Mountain townsite. Portions of the site have been re-used from 1988 until 2003 for a prison. A high school and residential community has occupied portions of the site until recent years. Today it exists as a mix of abandoned and re-occupied post-war minimal traditional style dwellings, Kaiser operations buildings, modern buildings, ruins, and foundations. Questions concerning what remains of the original townsite plan and integrity of the Eagle Mountain townsite will be assessed to determine whether a district is feasible or warranted and what the scope of a survey should include. This information will be applied to the development of a Work Plan for the recording and evaluation of the site. • The Work Plan will include a draft historic context and historical	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		information about the footprint and content of the original townsite and its development over time. The context will include a consideration of the Eagle Mountain as a late example of a company town in the American West. This information will be used to develop an approach to the documentation of the site and consideration of whether a potential district may exist. The draft Work Plan will be submitted to SHPO, BLM, and FERC for review, comment, and approval of the survey approach. • Updates to DPR 523 forms will be developed for the townsite, mine, and railroad and will be used as the basis for formal evaluations of the townsite, mine, and railroad for listing in the NRHP will be made according to 36 CFR 800 and 36 CFR 60.4. Individual buildings or structures will be documented on DPRb forms. A District Record (DPR 523d) will be completed, if appropriate. Any other resources discovered during survey also will be documented and evaluated. The results will be provided in California Archaeological Resource Management Report format and to the Secretary of the Interior's standards for archaeological	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		reporting. **<u>Performance Measures</u>:** • SHPO, BLM, and FERC concurrence will be obtained for the determination of NRHP-eligibility of the Eagle Mountain townsite, mine, railroad, and any other documented cultural resources within the Project APE, including consideration for the potential of any resources as contributing elements to a historic district, if evidence exists for one to be present. • If any resources are determined to be historic properties, recommendations will be developed to avoid or mitigate impacts through appropriate treatments in accordance with the Secretary of the Interior's standards. These include in order of preference: project design to avoid direct impacts; moving of standing buildings or structures in the APE to other areas of the townsite or mine so that integrity of setting, feeling, and materials can be retained; or data recovery and documentation. *Implementation Timing:* Pre-construction *Party responsible for implementation, monitoring and reporting*: Environmental	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Coordinator *Responsible Agencies for verification and enforcement*: SHPO/BLM/FERC **MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program.** **<u>Management Activity</u>:** Implement project-specific education program. • A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view. • The Program will present concepts of cultural resources management in a	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities. • The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agencies for verification and enforcement: FERC/SHPO **MM CR-4. Offer Opportunities for Public Interpretation.** Unlike other hydroelectric projects where public access and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped Storage Project boundaries. Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park. **<u>Management Activity</u>:** Develop informative signage that will be available to the public. ECE will develop and install one weather-tolerant sign that will be placed outside the main gate of the facility. The sign will provide information about the prehistory and history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified. The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within 1 year of completion of the boundary fence. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Coordinator/ Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-5. Review Effectiveness of the Historic Properties Management Plan.** **<u>Management Activity</u>:** Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP. **<u>Performance Standard</u>:** Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-6. Consult with California SHPO, the BLM, Riverside County,**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		interested Indian Tribes, and FERC. **<u>Management Activity</u>:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties. • Include summaries of cultural resource treatments as an update to a HPMP implementation summary table. • Report the status of ECE's public interpretation projects. • Recommend modifications to the Project HPMP that will improve its implementation if appropriate. Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		with FERC. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-7. Class I Investigation.** In the event that Project activities would extend beyond the areas previously surveyed, then background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Class I literature review is the EIC at the University of California, Riverside. **<u>Management Activity</u>:** compare proposed Project location with Cultural Resources Management Maps. • Determine if the Project area is located within 100 feet of a potentially significant previously recorded archeological site. • Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground utility line). • Determine if the area has been previously surveyed for cultural resources. **<u>Performance Standard</u>:** based on the results of the above-noted Management Activity. • Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		archaeologist. • Previous ground-disturbing activity may be documented or observed therefore no Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be distributed to the California SHPO, the BLM, Riverside County, interested Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-8. Class III Cultural Resources Field Investigation.** Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III survey in compliance with Section 106 of the National Historic	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579). **Management Activity:** Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside. **<u>Performance Standards</u>:** Review results of the Class III Survey and the associated recommendations. • If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO. • If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		proceed. If SHPO does not concur, then the resource is treated as potentially significant. • If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity, identifiable limits, structure, function, research potential, and cultural/historical context – see definition under 4.2.3 below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-9. Testing Phase Cultural Resources Field Investigation.** Conduct	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the National Register eligibility of individual resources and an assessment of the Project effects on historic properties. The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be avoided by a proposed action, qualifies as significant. The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and: • is associated with events that have made a significant contribution to the broad patterns of history • is associated with the lives of persons significant in the past • embodies the distinctive characteristics	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		of a type, period or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction or • has yielded, or may be likely to yield, information important in prehistory or history **Management Activity:** Engage services of a qualified archaeologist to collect data sufficient to determine if a cultural resource qualifies as significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		this report to BLM for consultation with SHPO, interested Indian Tribes and FERC. **<u>Performance Standards</u>:** Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO. • If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may proceed following consultation with the California SHPO. • If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		measure). *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-10. Data Recovery or Alternative Mitigation.** ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE, SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes **<u>Management Activity</u>:** ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with the California SHPO, the BLM, the Advisory Council on Historic Preservation, and interested Indian Tribes, as appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties. **Performance Standard:** Review results of the data recovery or other mitigation and consult with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed. *Implementation Timing:* Pre-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains.** As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		or in the case that resources are exposed in the event of a Project operation emergency. **<u>Management Activities</u>:** Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP. **<u>Performance Standards</u>:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted. *Implementation Timing:* Grading/earthwork/construction *Party responsible for implementation,*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		monitoring and reporting: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: Project Archeologist/Riverside County Coroner, as required	
Impact 3.8-4 Central Project Site. Because of the large degree of disturbance on the site, it is unlikely that significant pre-historic cultural resources remaining on the site. However, there is the potential for historic resources	*Potentially significant and subject to the mitigation program*	**MM CR-2. Inventory and Evaluate Cultural Resources Within the Kaiser Mine Property.** An inventory of this portion of the APE will be undertaken in compliance with Section 106 of the National Historic Preservation Act and according to regulatory procedures provide in 36 CFR 800. The inventory will also include other accessible portions of the APE within the Kaiser property. The entire townsite and associated portions of the railroad will be re-recorded, and the various elements will be considered as contributors to a National Register district. **<u>Management Activity</u>:** A Work Plan will be developed and executed following issuance of the FERC license and upon gaining legal access to the subject lands. A phased approach will be taken in order to make prudent and well-informed decisions on Section 106 compliance within the Kaiser property. The first phase will be a scoping	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		reconnaissance of the APE within the Kaiser property and the entirety of the Eagle Mountain townsite. Portions of the site have been re-used from 1988 until 2003 for a prison. A high school and residential community has occupied portions of the site until recent years. Today it exists as a mix of abandoned and re-occupied post-war minimal traditional style dwellings, Kaiser operations buildings, modern buildings, ruins, and foundations. Questions concerning what remains of the original townsite plan and integrity of the Eagle Mountain townsite will be assessed to determine whether a district is feasible or warranted and what the scope of a survey should include. This information will be applied to the development of a Work Plan for the recording and evaluation of the site. • The Work Plan will include a draft historic context and historical information about the footprint and content of the original townsite and its development over time. The context will include a consideration of the Eagle Mountain as a late example of a company town in the American West. This information will be used to develop an	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		approach to the documentation of the site and consideration of whether a potential district may exist. The draft Work Plan will be submitted to SHPO, BLM, and FERC for review, comment, and approval of the survey approach. • Updates to DPR 523 forms will be developed for the townsite, mine, and railroad and will be used as the basis for formal evaluations of the townsite, mine, and railroad for listing in the NRHP will be made according to 36 CFR 800 and 36 CFR 60.4. Individual buildings or structures will be documented on DPRb forms. A District Record (DPR 523d) will be completed, if appropriate. Any other resources discovered during survey also will be documented and evaluated. The results will be provided in California Archaeological Resource Management Report format and to the Secretary of the Interior's standards for archaeological reporting. **<u>Performance Measures</u>:** • SHPO, BLM, and FERC concurrence will be obtained for the determination of NRHP-eligibility of the Eagle Mountain townsite, mine, railroad, and any other documented cultural resources within the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Project APE, including consideration for the potential of any resources as contributing elements to a historic district, if evidence exists for one to be present. • If any resources are determined to be historic properties, recommendations will be developed to avoid or mitigate impacts through appropriate treatments in accordance with the Secretary of the Interior's standards. These include in order of preference: project design to avoid direct impacts; moving of standing buildings or structures in the APE to other areas of the townsite or mine so that integrity of setting, feeling, and materials can be retained; or data recovery and documentation. *Implementation Timing:* Pre-construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator *Responsible Agencies for verification and enforcement*: SHPO/BLM/FERC **MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Program. **<u>Management Activity</u>:** Implement project-specific education program. • A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view. • The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities. • The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-4. Offer Opportunities for Public Interpretation.** Unlike other hydroelectric projects where public access	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped Storage Project boundaries. Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park. **Management Activity:** Develop informative	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		signage that will be available to the public. ECE will develop and install one weather-tolerant sign that will be placed outside the main gate of the facility. The sign will provide information about the prehistory and history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified. The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within 1 year of completion of the boundary fence. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/ Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-5. Review Effectiveness of the**	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Historic Properties Management Plan. **<u>Management Activity</u>:** Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP. **<u>Performance Standard</u>:** Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-6. Consult with California SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC.** **<u>Management Activity</u>:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• Include summaries of cultural resource treatments as an update to a HPMP implementation summary table. • Report the status of ECE's public interpretation projects. • Recommend modifications to the Project HPMP that will improve its implementation if appropriate. • Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report with FERC. *Implementation Timing:* Pre-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-7. Class I Investigation.** In the event that Project activities would extend beyond the areas previously surveyed, then background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of Class I literature review is the EIC at the University of California, Riverside.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		<u>Management Activity</u>: compare proposed Project location with Cultural Resources Management Maps. • Determine if the Project area is located within 100 feet of a potentially significant previously recorded archeological site. • Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground utility line). • Determine if the area has been previously surveyed for cultural resources. **<u>Performance Standard</u>:** based on the results of the above-noted Management Activity. • Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional archaeologist. • Previous ground-disturbing activity may be documented or observed therefore no	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be distributed to the California SHPO, the BLM, Riverside County, interested Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-8. Class III Cultural Resources Field Investigation.** Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III survey in compliance with Section 106 of the National Historic Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579). **Management Activity:** Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside. **<u>Performance Standards</u>:** Review results of the Class III Survey and the associated recommendations. • If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO. • If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may proceed. If SHPO does not concur, then the resource is treated as potentially significant.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity, identifiable limits, structure, function, research potential, and cultural/historical context – see definition under 4.2.3 below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-9. Testing Phase Cultural Resources Field Investigation.** Conduct limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		National Register eligibility of individual resources and an assessment of the Project effects on historic properties. The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be avoided by a proposed action, qualifies as significant. The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and: • is associated with events that have made a significant contribution to the broad patterns of history • is associated with the lives of persons significant in the past • embodies the distinctive characteristics of a type, period or method of construction; or represents a significant and distinguishable entity whose	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		components may lack individual distinction or • has yielded, or may be likely to yield, information important in prehistory or history **<u>Management Activity</u>:** Engage services of a qualified archaeologist to collect data sufficient to determine if a cultural resource qualifies as significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward this report to BLM for consultation with SHPO, interested Indian Tribes and FERC.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		<u>Performance Standards</u>: Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO. • If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may proceed following consultation with the California SHPO. • If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment measure). *Implementation Timing:* Pre-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-10. Data Recovery or Alternative Mitigation.** ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE, SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes **Management Activity:** ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with the California SHPO, the BLM, the Advisory Council on Historic Preservation, and interested Indian Tribes, as appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties. **Performance Standard:** Review results of the data recovery or other mitigation and consult with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains.** As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation emergency. **<u>Management Activities</u>:** Steps that ECE	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP. **<u>Performance Standards</u>:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted. *Implementation Timing:* Grading/earthwork/construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: Project Archeologist/Riverside County Coroner, as required	
Impact 3.8-5 Unknown / Buried Cultural Resources. The only substantial prehistoric and historic sites identified in either the Class I inventory or Class III survey within the study corridor are located outside of the Project boundaries or APE. The Project involves grading and excavation for several Project features. In the event that any unknown (remaining) cultural resources are found, the mitigation program would be triggered.	*Potentially significant and subject to the mitigation program*	**MM CR-2. Inventory and Evaluate Cultural Resources Within the Kaiser Mine Property.** An inventory of this portion of the APE will be undertaken in compliance with Section 106 of the National Historic Preservation Act and according to regulatory procedures provide in 36 CFR 800. The inventory will also include other accessible portions of the APE within the Kaiser property. The entire townsite and associated portions of the railroad will be re-recorded, and the various elements will be considered as contributors to a National Register district. **<u>Management Activity</u>:** A Work Plan will be developed and executed following issuance of the FERC license and upon gaining legal access to the subject lands. A phased approach will be taken in order to make prudent and well-informed decisions on Section 106 compliance within the Kaiser property. The first phase will be a scoping reconnaissance of the APE within the Kaiser property and the entirety of the Eagle Mountain townsite. Portions of the site have	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		been re-used from 1988 until 2003 for a prison. A high school and residential community has occupied portions of the site until recent years. Today it exists as a mix of abandoned and re-occupied post-war minimal traditional style dwellings, Kaiser operations buildings, modern buildings, ruins, and foundations. Questions concerning what remains of the original townsite plan and integrity of the Eagle Mountain townsite will be assessed to determine whether a district is feasible or warranted and what the scope of a survey should include. This information will be applied to the development of a Work Plan for the recording and evaluation of the site. • The Work Plan will include a draft historic context and historical information about the footprint and content of the original townsite and its development over time. The context will include a consideration of the Eagle Mountain as a late example of a company town in the American West. This information will be used to develop an approach to the documentation of the site and consideration of whether a potential district may exist. The draft Work Plan	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		will be submitted to SHPO, BLM, and FERC for review, comment, and approval of the survey approach. • Updates to DPR 523 forms will be developed for the townsite, mine, and railroad and will be used as the basis for formal evaluations of the townsite, mine, and railroad for listing in the NRHP will be made according to 36 CFR 800 and 36 CFR 60.4. Individual buildings or structures will be documented on DPRb forms. A District Record (DPR 523d) will be completed, if appropriate. Any other resources discovered during survey also will be documented and evaluated. The results will be provided in California Archaeological Resource Management Report format and to the Secretary of the Interior's standards for archaeological reporting. **<u>Performance Measures</u>:** • SHPO, BLM, and FERC concurrence will be obtained for the determination of NRHP-eligibility of the Eagle Mountain townsite, mine, railroad, and any other documented cultural resources within the Project APE, including consideration for the potential of any resources as contributing elements to a historic	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		district, if evidence exists for one to be present. • If any resources are determined to be historic properties, recommendations will be developed to avoid or mitigate impacts through appropriate treatments in accordance with the Secretary of the Interior's standards. These include in order of preference: project design to avoid direct impacts; moving of standing buildings or structures in the APE to other areas of the townsite or mine so that integrity of setting, feeling, and materials can be retained; or data recovery and documentation. *Implementation Timing:* Pre-construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator *Responsible Agencies for verification and enforcement*: SHPO/BLM/FERC **MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program.** **<u>Management Activity</u>:** Implement project-	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		specific education program. • A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view. • The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• The Program will include a Monitoring Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-4. Offer Opportunities for Public Interpretation.** Unlike other hydroelectric projects where public access and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Storage Project boundaries. Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park. **<u>Management Activity</u>:** Develop informative signage that will be available to the public. ECE will develop and install one weather-tolerant sign that will be placed outside the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		main gate of the facility. The sign will provide information about the prehistory and history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified. The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within 1 year of completion of the boundary fence. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/ Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-5. Review Effectiveness of the Historical Properties management Plan.** **<u>Management Activity</u>:** Every 6 years, ECE will determine if modifications will improve	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		the effectiveness of the HPMP. **<u>Performance Standard</u>:** Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-6. Consult with California SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC.** **<u>Management Activity</u>:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because cultural resource discoveries and treatments are most likely during that period. Thereafter,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties. • Include summaries of cultural resource treatments as an update to a HPMP implementation summary table. • Report the status of ECE’s public	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		interpretation projects. • Recommend modifications to the Project HPMP that will improve its implementation if appropriate. • Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report with FERC. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and*	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		enforcement: FERC/SHPO **MM CR-7. Class I Investigation.** In the event that Project activities would extend beyond the areas previously surveyed, then background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of Class I literature review is the EIC at the University of California, Riverside. **Management Activity:** compare proposed Project location with Cultural Resources Management Maps. • Determine if the Project area is located within 100 feet of a potentially	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		significant previously recorded archeological site. • Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground utility line). • Determine if the area has been previously surveyed for cultural resources. **<u>Performance Standard</u>:** based on the results of the above-noted Management Activity. • Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional archaeologist. • Previous ground-disturbing activity may be documented or observed therefore no Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		distributed to the California SHPO, the BLM, Riverside County, interested Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-8. Class III Cultural Resources Field Investigation.** Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III survey in compliance with Section 106 of the National Historic Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579). **Management Activity:** Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside. **<u>Performance Standards</u>:** Review results of the Class III Survey and the associated recommendations. • If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO. • If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may proceed. If SHPO does not concur, then the resource is treated as potentially significant. • If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		identifiable limits, structure, function, research potential, and cultural/historical context – see definition under 4.2.3 below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator /Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO **MM CR-9. Testing Phase Cultural Resources Field Investigation.** Conduct limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the National Register eligibility of individual resources and an assessment of the Project effects on historic properties.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be avoided by a proposed action, qualifies as significant. The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and: • is associated with events that have made a significant contribution to the broad patterns of history • is associated with the lives of persons significant in the past • embodies the distinctive characteristics of a type, period or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction or • has yielded, or may be likely to yield, information important in prehistory or	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		history **<u>Management Activity</u>:** Engage services of a qualified archaeologist to collect data sufficient to determine if a cultural resource qualifies as significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward this report to BLM for consultation with SHPO, interested Indian Tribes and FERC. **<u>Performance Standards</u>:** Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		• If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may proceed following consultation with the California SHPO. • If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment measure). *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Responsible Agencies for verification and enforcement: FERC/SHPO **MM CR-10. Data Recovery or Alternative Mitigation.** ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE, SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes **<u>Management Activity</u>:** ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		the California SHPO, the BLM, the Advisory Council on Historic Preservation, and interested Indian Tribes, as appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties. **Performance Standard:** Review results of the data recovery or other mitigation and consult with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed. *Implementation Timing:* Pre-construction/construction/operation *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agencies for verification and enforcement*: FERC/SHPO	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains. As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation emergency. **<u>Management Activities</u>:** Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP. **Performance Standards:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted. *Implementation Timing:* Grading/earthwork/construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: Project Archeologist/Riverside County Coroner, as required	
Section 3.9			

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Land Use / Public Services			
Impact 3.9-1 Short-term Construction Impact from Transmission Line and Interconnection to Substation. The proposed transmission line and substation will cause short-term land use impacts as a result of construction activity.	*Potentially significant and subject to the mitigation program*	**PDF LU-1. Construction Access**. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points. **PDF LU-2. Construction Notice.** Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal.	**Less than significant**
Impact 3.9-2 Operational Impact from Transmission Line and Interconnection to Substation. Long-term land use-related impacts associated with the transmission line/substation construction will be the permanent change from undeveloped desert to lands reserved for utilities.	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.9-3 Short-term Construction Impacts from the Water Pipeline Corridor. Construction of the water pipeline will cause short-term impacts as a result of construction activity.	*Potentially significant and subject to the mitigation program*	**PDF LU-1. Construction Access**. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points. **PDF LU-2. Construction Notice.** Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal. **PDF LU-3. Pipeline Construction.** Impacts from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.	**Less than significant**
Impact 3.9-4 Operational Impacts from the Water	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Pipeline Corridor. Long-term land use-related impacts associated with the water pipeline corridor construction will be the permanent change from undeveloped desert to lands reserved for utilities.			
Impact 3.9-5 Local Land Use Policies. The proposed Project would not conflict with any land use plan of an agency having jurisdiction over the Project. Local land use policies and zoning codes do not apply to the Project site, due to the overriding Federal Power Reserve land designation.	*Less than significant*	No mitigation is required.	N/A
Impact 3.9-6 CDCA Plan Amendment for Utility Right-of-Way. Based upon review of BLM's CDCA plan amendment criteria and required determinations, it appears that the Project is consistent with all criteria,	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
and that a determination in favor of adopting a plan amendment can be made.			
Impact 3.9-7 Existing and Proposed Land Uses in the Central Project Site. Implementation of the proposed Project will result in a change in the use of land within the Central Project Area from an inactive iron mine to a pumped storage hydroelectric facility. Additionally, this Project could be operating in conjunction with the proposed Eagle Mountain landfill. The Project layout has been modified to eliminate conflicts with existing and proposed land uses.	*Potentially significant and subject to the mitigation program*	**PDF LU-4. Construction Staging Area**. The Project layout has been modified to eliminate conflicts with existing and proposed land uses. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the MWD regarding the proximity of the brine ponds to the CRA. **MM LU-2. Coordinate with MWD.** Engineering designs of crossings of MWD facilities will be submitted to MWD for their review and approval. *Implementation Timing:* Pre-construction *Party responsible for implementation,*	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		monitoring and reporting: Applicant *Responsible agency for verification and enforcement:* MWD and FERC	
Impact 3.9-8 Landfill Construction Timing. The pumped storage Project is likely to be built and operational prior to initiation of landfill construction at Eagle Mountain. Construction periods for the two projects are not likely to overlap or create any conflicts	*Less than significant*	No mitigation is required.	N/A
Impact 3.9-9 Landfill Operations. The proposed Eagle Mountain Pumped Storage Project will use the Central and East Pits to store water, areas that are not proposed to be used during Phases 1-4 of the landfill. The powerhouse and water conveyance tunnels will be underground and will not	*Less than significant*	No mitigation is required.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
affect landfill construction or operations.			
Impact 3.9-10 Landfill Use of the East Pit. The Eagle Mountain Pumped Storage Project's use of the East Pit does not exclude the East Pit's use as a landfill in perpetuity. In the event that, at some future date many decades from now, decision-makers determine that the landfill use of the East Pit has greater social or economic value than the proposed Project's use of the East Pit, the water could be drained and the East Pit used as a component of the landfill.	*Less than significant*	No mitigation is required.	N/A
Impact 3.9-11 Potential Impacts to the Landfill Liner. Seepage from the upper reservoir could potentially encounter the	*Potentially significant and subject to the mitigation program*	**PDF GW-1. Groundwater Seepage.** The Owner will limit seepage from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
lining of the landfill.		brine disposal ponds that will be part of the water quality management system for the Project. Final design for seepage control will be approved by FERC prior to construction. Seepage control from the Project reservoirs will be accomplished using systematic procedures such as design and construction control measures that will include the following: • During final engineering design, a detailed reconnaissance of the reservoir basins and pond areas will be conducted to identify zones where leakage and seepage would be expected to occur. These areas will include faults, fissures and cracks in the bedrock, and zones that may have direct connection to the alluvial deposits of the Chuckwalla Valley. During the reconnaissance, the effectiveness of various methods for seepage and leakage control to mitigate the effects of these particular features will be evaluated, including grouting, seepage blankets, and RCC or soil cement treatments, and other methods if needed. • Curtain grouting of the foundation beneath the dam footprint and around the	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		reservoir rim, as needed; backfill concrete placement and/or slush grouting of faults, fissures, and cracks detected in the field reconnaissance; placement of low permeability materials over zones too large to be grouted and over areas of alluvium within the lower reservoir; seepage and leakage collection systems positioned based upon the results of the hydrogeologic analyses; and clay or membrane lining of the brine ponds associated with the Project's water quality management system. The collection systems would recycle water into the Project reservoirs or the reverse osmosis system. • Design and construction of a Comprehensive Monitoring Program, consisting of observation wells and piezometers that will be used to assess the effectiveness of the seepage and leakage control measures. Based on monitoring results, additional actions may be taken to further control leakage and seepage from the reservoirs and ponds. Such measures may include curtain grouting and the expansion of seepage and leakage collection systems.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Other measures, such as use of stepped RCC or soil cement overlay on the eastern portion of the lower reservoir may also be used depending on results of final engineering design analyses. In addition, portions of the tunnels and shaft of the Project will experience very high water pressures; whereas, current plans are based on lining of the tunnels with concrete, and in some locations steel liners will be installed. These liners will also effectively block seepage from occurring. **MM GW-5. Seepage Recovery Wells.** Seepage from the <u>Upper Reservoir</u> will be controlled through a separate set of seepage recovery wells, locations of which are shown on Figure 3. 3.3-18. Seepage from the upper reservoir will be maintained below the bottom elevation of the landfill liner. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. A testing program will also be employed for seepage recovery wells for the Upper Reservoir to assess the interconnectedness of the joints and fractures and the pumping extraction rate. Drawdown observations will be made in nearby observation wells to support final	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		engineering design. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties. *Implementation Timing:* Final engineering and life of Project; monitoring on a quarterly basis for the first 4 years of Project pumping; as a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary. *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC	
Impact 3.9-12 Compatibility of Specific Features and Ancillary Facilities Interferences. Design adjustments have been made to avoid	*Potentially significant and subject to the mitigation program*	**PDF LU-4. Construction Staging Area**. The Project layout has been modified to eliminate conflicts with existing and proposed land uses. Construction staging and lay-down areas have been relocated to a	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
interference with proposed landfill components, so that the proposed pumped storage Project does not conflict with construction or long-term operation of the proposed landfill project's specific features and ancillary facilities.		parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the MWD regarding the proximity of the brine ponds to the CRA.	
Impact 3.9-13 Potential Conflicts with Other Landfill Facilities and Rock Resources. On the basis of the analysis presented, it is concluded that the proposed pumped storage Project does not conflict with construction roads, other operational components, or use of rock and fine-tailings resources at the mine site.	*Less than significant*	No mitigation is required.	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.9-14 Methane Gas from Eagle Mountain Landfill. Based upon the analysis presented, it is concluded that methane gas produced by the proposed landfill will not be affected in any way by the proposed pumped storage Project.	*Less than significant*	No mitigation is required.	**Less than significant**
Impact 3.9-15 Impact to Public Services. To insure that there is no impact to public facilities, the Project will pay Development Impact Fees. The payment of these fees will insure that acceptable response times and service ratios are maintained for public services.	*Potentially significant and subject to the mitigation program*	**MM LU-1. Development Impact Fee.** Prior to the start of commercial operation the Applicant shall pay to Riverside County the required Development Impact Fee for the Project area in accordance with Riverside County Ordinance 659, as amended through 659.7 and Chapter 4.60 of the Riverside County Code (Development Impact Fees). *Implementation Timing:* Prior to start of Commercial Operations *Party responsible for implementation, monitoring and reporting:* Operator / Environmental Coordinator *Responsible agency for verification and enforcement:* SWRCB and FERC	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Section 3.10 Recreation			
Impact 3.10-1 Recreational Use. The proposed transmission line and water pipeline corridors cross lands, in part, managed by the BLM, which are available for dispersed recreational use. Access to some OHV tracks may be impeded temporarily during construction of the linear facilities.	*Less than significant*	No mitigation required.	N/A
Impact 3.10-2 Wilderness Area. The Project would not directly or indirectly disrupt activities in an established federal, state, or local recreation and/or wilderness area. The Project area is not located in a designated federal wilderness area.	*Less than significant*	No mitigation required.	N/A
Section 3.11 Population and Housing			

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.11-1 Residential or Business Displacement During Construction. Implementation of the Project will not displace significant number of people, affect existing housing or business establishments, or require replacement housing elsewhere.	*Less than significant*	No mitigation is required.	N/A
Impact 3.11-2 Impacts on Community Infrastructure and Services. Because of the available infrastructure capacity within the region, the Project would not require construction of significant additional infrastructure.	*Less than significant*	No mitigation is required.	N/A
Impact 3.11-3 Impacts on Local Government Finances. Payment of Riverside County Development Impact fees is required. In addition, purchase of construction materials and equipment required to construct the	*Less than significant*	No additional mitigation is required. *See* MM LU-1.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Project would increase local and regional tax bases. The substantial sales tax revenues would be considered beneficial impact as a direct result of Project implementation.			
Section 3.12 Transportation			
Impact 3.12-1 Construction-related Traffic. The Project will cause an increase in traffic that is not substantial in relation to the existing traffic load and capacity of the street system. The Project will not decrease a level of service standard established by the County.	*Potentially significant and subject to the mitigation program*	**MM AQ-6 Transportation Management Plan**. The Construction Contractor shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **PDF LU-1. Construction Access**. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points. **PDF LU-2. Construction Notice.** Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal.	
Impact 3.12-2 Operational Traffic. Daily traffic, including service and delivery trucks, will be approximately 64 one-way trips.	*Less than significant*	No mitigation is required.	N/A
Section 3.13			

Potential Environmental Impact Summary	**Level of Significance**	**Mitigation Program**	**Level of Significance after Implementation of Mitigation Program**
Air Quality			
Impact 3.13-1 Annual Emissions during Construction. The proposed Project represents less than 0.07 percent of the forecasted annual NOx emissions within the Mojave Desert Air Basin.	*Less than significant*	No mitigation is required.	**N/A**
Impact 3.13-2 Daily Emissions during Construction. These emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd.	*Potentially significant and subject to the mitigation program*	**MM AQ-1. Fugitive Dust.** Periodic watering or application of suitable surfactant will be conducted for short-term stabilization of disturbed surface areas and storage piles as needed to minimize visible fugitive dust emissions. For dirt roads, watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is done for the day. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC	**Significant and unavoidable**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM AQ-2. Trackout. To prevent Project-related trackout onto paved surfaces, the following measures will be undertaken through the construction period: • Prevention and clean up of Project-related trackout or spills on publicly maintained paved surfaces within 24 hours. • Covering loaded haul vehicles operating on public paved roads. • Material transported off-site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust. • Paving, gravel covering, or chemically stabilizing on-site roads as soon as feasible. • Limiting onsite vehicle speeds on unpaved surfaces to 25 mph. • Operating a wash rack for drivers to wet down material before leaving the facility. • Operate a wheel washer (or equivalent) to remove soil from vehicle tires as needed. *Implementation Timing:* Construction	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-3. Grading.** Graded site surfaces will be stabilized upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-4. Surface Disturbance.** Areas of active surface disturbance (such as grading) will be limited to no more than 15 acres per day. *Implementation Timing:* Construction	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Party responsible for implementation, monitoring and reporting: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-5. Earth-moving Activities.** Non-essential earth-moving activities will be reduced during windy conditions; i.e., when visible dusting occurs from moist and dry surfaces due to wind erosion. Clearing, grading, earth-moving, or excavation activities will cease if winds exceed 25 mph averaged over 1-hour duration. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC In addition, compliance with the following mitigation measures AQ-6 through AQ-12 would further reduce impacts from engine exhaust and NOx and other criteria pollutant emissions.	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		MM AQ-6. Transportation Management Plan. The Construction Contractor shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-7. Diesel Trucks.** All diesel truck operators shall strictly abide by the applicable State law requirements for idling, as described in the airborne toxic control measure (CCR, Title 13, section 2485), which limits vehicles with gross vehicular weight ratings of more than 10,000 pounds to	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		no more than 5 minutes in a 60-minute period of idling of the primary engine or the diesel-fueled auxiliary power system at any location. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-8. Equipment.** Use electrical drops in place of temporary electrical generators, and substitute low- and zero emitting construction equipment and/or alternative fueled or catalyst equipped diesel construction equipment wherever economically feasible. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-9. Generators.** Electrical	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		generators must be properly permitted with the SCAQMD. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-10. Heavy-duty Diesel Trucks.** Heavy-duty diesel trucks shall be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-11. Construction Equipment.** At least 50 percent diesel fleet hours will utilize 2002 or later year diesel construction equipment,	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		Implementation Timing: Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-12. Off-road Construction Equipment.** Older off-road construction equipment shall be retrofitted with appropriate emission control devices prior to onsite use, where feasible. *Implementation Timing:* Construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC **MM AQ-13. Air Quality Study Design.** The Project applicant/owner (Eagle Crest Energy Company [ECE]) shall work collaboratively with the National Park Service (NPS) to establish an air quality study design for 2 years of ozone monitoring to be conducted upon completion of construction and Project operations	

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		beginning. ECE will fund the annual expenses as a cost-share with the NPS and other transmission operators. The funding contribution for this study will be based on a percentage of total miles of transmission line. If the proposed Project is found to have a significant impact on ozone levels within Joshua Tree National Park, the Project owner will develop a transmission management plan to reduce ozone emissions. *Implementation Timing:* Final design/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Construction Contractor/Environmental Coordinator *Responsible Agencies for verification and enforcement*: SWRCB and FERC	
Impact 3.13-3 Emissions during Operation. Air pollutant emissions associated with operations and maintenance activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed	*Less than significant*	No mitigation is required.	**N/A**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
SCAQMD significance thresholds for operation.			
Section 3.14 Noise			
Impact 3.14-1 Construction Noise, Central Project Site. The maximum construction noise coming from the Central Project Site would likely not be audible at the school or nearby residences. The same construction activities would generate noise levels at the boundary of JTNP that would be up to 43 dBA temporarily.	*Less than significant*	No mitigation is required.	N/A
Impact 3.14-2 Construction Noise, Linear Features. The maximum construction noise at the nearest sensitive receptors attributed to the transmission line and water pipeline would be adverse for up to several weeks during construction, but due	*Potentially significant impact and subject to the mitigation program*	**MM N-1. Construction Equipment.** The Contractor shall utilize construction equipment with properly operating and maintained noise mufflers and intake silencers, consistent with manufacturers' standards in order to reduce or avoid construction noise levels. *Implementation Timing:* Construction	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
to the nature of linear facilities, only for several days at any one location. About 20 residences would be affected by noise from increased traffic along Kaiser Road during construction.		*Party responsible for implementation, monitoring and reporting*: Contractor/ Environmental Coordinator *Responsible Agency for verification and enforcement*: SWRCB	
Impact 3.14-3 Operational Noise. The operation of the proposed Project would result in a minimal increase in road traffic and would not substantially increase ambient noise levels along Kaiser Road. The proposed powerhouse would be located underground and would not affect noise levels aboveground. Noise from operation of the transmission line (low level hissing or crackling), could be adverse but would only be noticeable in wet weather conditions in close proximity to the transmission line.	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Section 3.15 Greenhouse Gas Emissions			
Impact 3.15-1 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The proposed Project will offset CO_2e production and enhance integration of reliable of wind and solar power to meet the State's RPS, thus having a beneficial impact on GHG production.	*Less than significant*	No mitigation is required.	**N/A**
Impact 3.15-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. The State Water Resources Control Board currently does not have an adopted climate action plan or general plan policies related to GHG emissions. In addition, the	*Less than significant*	No mitigation is required.	**N/A**

Potential Environmental Impact Summary	**Level of Significance**	**Mitigation Program**	**Level of Significance after Implementation of Mitigation Program**
Project would not conflict with the State's ability to reach the overall goals of AB 32. Therefore, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.			
Section 3.16 Hazards and Hazardous Materials			
Impact 3.16-1 Hazardous Materials during Construction. Due to the proximity of the transmission line to the World War II-era camps, and the recent history of military training on the Central Project site, any unexploded ordnance (UXO) found on-site could be hazardous to workers on-site.	*Potentially significant and subject to the mitigation program*	**MM HM-1. UXO Plan.** The Contractor, in consultation with the Project owner's Environmental Coordinator, shall implement a UXO Identification, Training and Reporting Plan (UXO Plan) to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance. Implementation shall include: (1) a description of the training program outline and materials, and the qualifications of the trainers; (2) identification of available trained experts that will respond to notification of discovery of any ordnance (unexploded or not); (3) a	**Less than significant**

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
		work plan to recover and remove discovered ordnance; and (4) work stoppage until site is determined clear by the Environmental Coordinator. **Verification:** The UXO Plan shall be implemented no less than 60 days prior to the initiation of construction activities at the site. *Implementation Timing:* Final engineering/pre-construction/construction *Party responsible for implementation, monitoring and reporting*: Environmental Coordinator/Contractor *Responsible Agency for verification and enforcement*: SWRCB/FERC	
Impact 3.16-2 Hazardous Materials during Operation. Hazardous material usage in the vicinity would mainly be limited to the Project site. The Project site is not located within one-quarter mile of a school.	*Less than significant*	No mitigation is required.	N/A

Potential Environmental Impact Summary	Level of Significance	Mitigation Program	Level of Significance after Implementation of Mitigation Program
Impact 3.16-3 Located on a Hazardous Materials Site per Government Code Section 65962.5. The site is not on a list of hazardous materials sites pursuant to Government Code Section 65962.5	*Less than significant*	No mitigation is required.	N/A
Section 3.17 Environmental Justice			
The Project will not result in a disproportionate effect on minority populations, low income populations, or Native Americans, and the Project does not pose any substantial effects relative to environmental justice.	*No impact*	No mitigation required.	N/A

Table 6.2 Mitigation Monitoring and Reporting Program

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Geology and Soils			
MM GEO-1. Erosion Control Plan. Erosion and sediment control measures for each area type, including proposed Best Management Practices, are listed in the Erosion Control Plan in Section 12.2. The contractor shall limit impacts to soil erosion through implementation of an Erosion Control Plan limiting surface disturbance to only those areas necessary for construction. Where natural topsoil occurs, it would be salvaged and stockpiled prior to construction, and the soil piles would be stabilized. Following construction, all areas where natural topsoils were removed that are not occupied by permanent Project facilities would be re-graded, have the topsoils replaced, and be seeded with native vegetation to reduce erosion potential. Additional soil stabilization BMPs will be undertaken as appropriate. The contractor shall utilize and implement the	Final engineering / pre-construction / construction	Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
following best management principles for effective temporary and final soil stabilization during construction. Preserving existing vegetation where required and when feasible to prevent or minimize erosion. Once existing vegetation is cleared, construction will follow immediately behind to reduce unnecessary exposure of scarified soil to wind and water. •Sloping roadways and excavations away from washes will prevent or minimize erosion into washes. Where haul roads cross surface washes, the ground will be cleared of loose soil and pre-existing sediments, as necessary. •The installation of riprap at the washes which will prevent or minimize erosion. •Small earthen embankments will be built within washes in order to slow or divert surface water to reduce erosion. •Silt fences will be installed when working around a wash to prevent sediment from entering washes during a rain storm and will be constructed as described in Attachment B of Section 12.2 (e.g., buried to a depth of at least 12 inches.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
•The construction contractor will be required to preserve and protect existing vegetation not required, or otherwise authorized, to be removed. Vegetation will be protected from damage or injury caused by construction operations, personnel, or equipment by the use of temporary fencing, protective barriers, or other similar methods. •Water will be applied to disturbed soil areas of the Project site to control wind erosion and dust. Water applications will be monitored to prevent excessive runoff. •Sediment controls, structural measures that are intended to complement and enhance the soil stabilization (erosion control) measures, will be implemented. Sediment controls are designed to intercept and filter out soil particles that have been detached and transported by the force of water. Erosion and sediment control measures for each area type, including proposed BMPs, are listed in the Erosion Control Plan in Section 12.2.			
PDF GEO-1. Subsurface Investigations. Detailed investigations to support final	Upon Site Access	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
engineering will be conducted in two stages, as detailed in Section 12.1. These generally include: **Stage 1 Subsurface Investigations:** Based on available information and the current Project configuration, conduct a limited field program designed to confirm that basic Project feature locations are appropriate and to provide basic design parameters for the final layout of the Project features. Phase 1 Subsurface investigations will be initiated within 60 days of licensing and receipt of site access, field work will be completed within 4 months of the start of field investigations, and results filed with the FERC 6 months after the start of field investigations. The Stage 1 subsurface site investigation program for the Project will commence as soon as site access is obtained. The Stage 1 program will provide the information needed to finalize Project features and to plan a second-stage program to support final design of the Project. Final design will be approved by the FERC and the DSOD (for dam design).			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
The detailed scope of the Stage 1 program is discussed in a technical memorandum found in Section 12.1. **Stage 2 Subsurface Investigations:** Using the results of the Stage 1 work, and based on any design refinements developed during pre-design engineering, conduct additional explorations that will support final design of the Project features and bids for construction of the Project.			
PDF GEO-2. Geologic Mapping. During site investigations, geologic mapping will be performed by Project Engineers to identify conditions of the overburden and bedrock exposed in the mine pits (reservoir areas) that may affect the stability of existing slopes during reservoir level fluctuations. Mapping will identify the degree and orientation of jointing and fracturing, faulting, weathering, and the dimensions of the benches excavated during mining. The stability of the cut slopes and benches will be assessed at this time. During construction, areas within the pits that	Upon Site Access	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
exhibit unstable slopes because of adverse fracture sets exposed in the pit walls will be scaled of loose rock and unstable blocks. Material scaled from the side slopes will be removed and disposed of outside the pit, or pushed downslope and buried in the bottom of the pit. Rock slopes within the East and Central Pits that lie below an elevation of 5 feet above the maximum water level will be scaled of loose and unstable rock during construction. Existing cut slopes that lie above these elevations will not be modified unless there is evidence of potential failure areas that could impact project facilities. Final project design will be approved by FERC.			
Surface Water			
MM SW-1. On-site studies of acid production potential. When access is granted to Eagle Crest Energy Company (ECE) for the purpose of collecting samples, field and analytical program will be undertaken as described in the Phase 1 Geotechnical Program detailed in Section 12.1. This program will: 5. Obtain samples from each pit (upper and	Pre-design geotechnical studies	Applicant	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
lower) across the stratigraphic section (porphyritic quartz monzonite, upper quartzite, middle quartzite, schistose meta arkose, vitreous quartzite and the ore zones). 6. Perform analysis for total, pyrite and sulfate sulfur (ASTM Method 1915-97(2000) for total sulfur, and ASTM 1915-99 method E (2000) for sulfide sulfur. 7. Calculate acid production potential (APP) by the method of Sobek et al. (1978) and calculate acid production by the method of Lawrence (1990). 8. Determine the neutralization potential (NP) by the method of Sobek et al. (1978). Calculate the net neutralizing potential (NNP): NNP = NP – APP expressed as kg calcium carbonate/ton. In the event that acid production potential is found, water treatment to neutralize acid will be added to the water treatment facility (PDF GW-2). The performance standard will be maintenance of water quality at a level comparable to the source water quality.			
See **PDF GW-2. Water Treatment Facility.**	--	--	--
See **MM GW-6. Water Quality Sampling**	--	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
See **MM GEO-1. Erosion Control Plan**.	--	--	--
Groundwater			
MM GW-1. Groundwater Level Monitoring. A groundwater level monitoring network will be developed to confirm that Project pumping is maintained at levels that are in the range of historic pumping. The monitoring network will consist of both existing and new monitoring wells to assess changes in groundwater levels beneath the CRA, as well as in the Pinto Basin, and in areas east of the water supply wells. Table 3.3-10 lists the proposed monitoring network and Figure 3.3-17 shows their proposed locations. In addition to the proposed monitoring wells, groundwater levels, water quality, and production will be recorded at the Project pumping wells. If monitoring indicates that groundwater is being draw down at greater levels and faster rates than expected (exceeding the "Maximum Allowable Changes" identified in Table 3.3-9), pumping rates for the initial fill will be reduced to a level that meets the levels specified in	Final Design / Construction / Life Of The Project	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Table 3.3-9. The he initial fill period would therefore be extended to a maximum of 4.5 to 6 years.			
MM GW-2. Well Monitoring. Wells on neighboring properties whose water production may be impaired by Project groundwater pumping will be monitored during the initial fill pumping period. If it is determined that Project pumping is lower water levels in those wells by 5 feet or more, the Project will either replace or lower the pumps, deepen the existing well, construct a new well, and/or compensate the well owner for increased pumping costs to maintain water supply to those neighboring properties.	Pre-Construction / Initial Fill Pumping Period	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM GW-3. Extensionmeters. Two extensiometers shall be constructed to measure potential inelastic subsidence that could affect operation of the CRA; one in the upper Chuckwalla Valley near OW-3 and the other in the Orocopia Valley near OW15. Figures 3.3-17 and 18 shows the locations of the extensometers. In the unlikely event that the data shows	Pre-Construction / Life Of The Project	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
inelastic subsidence is occurring due to Project groundwater pumping the Project will eliminate inelastic subsidence by: • Redistributing pumping by constructing additional wells and modifying the pumping rates to reduce drawdown. • Reducing pumping or by artificially increasing recharge in order to better match the net annual groundwater withdrawal to the net annual recharge. If structures are impacted, they will be mitigated through engineered solutions that may consist of re-leveling, placement of compacted fill, soil-cement, pressure grouting, installation of piles and grade-beams, or steel-reinforcement. As necessary, portions or all of the impacted structure will be repaired or replaced in consultation with MWD.			
MM GW-4. Seepage Recovery Wells. Seepage from the <u>Lower Reservoir</u> will be extracted through seepage recovery wells. The proposed recovery well locations are shown on Figure 3.3-18. Seepage from the Lower Reservoir will be maintained to prevent a	Final Engineering / Life Of The Project Monitoring on a quarterly basis for the first 4 years of Project	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
significant rise in water levels beneath the CRA. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. Aquifer tests will be performed during final engineering design to confirm the seepage recovery well pumping rates and aquifer characteristics. The tests will be performed by constructing one of the seepage recovery wells and pumping the well while observing the drawdown in at least two seepage recovery or monitoring wells. Upon completion of this testing, the model will be re-run and the optimal locations of the remainder of the seepage recovery wells will be determined to effectively capture water from the Lower Reservoir and maintain groundwater level changes at less than significant levels beneath the CRA. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings. Annual reports will be prepared and distributed to interested parties. If needed based upon monitoring results, and acceptable based upon water quality monitoring	pumping. As a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary.		

Mitigation Program	**Implementation Timing**	**Party Responsible for Implementation, Monitoring and Reporting**	**Agency Responsible for Verification and Enforcement**
results, as an adaptive management measure Project pumping drawdown can be mitigated by allowing seepage from the reservoirs without pump-back recovery, which, if left unimpeded, could raise groundwater levels beneath the CRA by up to 3 feet.			
MM GW-5. Seepage Recovery Wells. Seepage from the <u>Upper Reservoir</u> will be controlled through a separate set of seepage recovery wells, locations of which are shown on Figure 3.3.3-18. Seepage from the upper reservoir will be maintained below the bottom elevation of the landfill liner. Target levels have been assigned to the monitoring wells as shown in Table 3.3-10. A testing program will also be employed for seepage recovery wells for the Upper Reservoir to assess the interconnectedness of the joints and fractures and the pumping extraction rate. Drawdown observations will be made in nearby observation wells to support final engineering design. Groundwater monitoring will be performed on a quarterly basis for the first 4 years of Project pumping; as a performance standard this program may be extended to bi-annually or annually depending on the findings.	Final Engineering / Life Of The Project Monitoring on a quarterly basis for the first 4 years of Project pumping; as a performance standard, the program may be extended to bi-annually or annually depending on the findings for consistency and reliability of the program, and modified where necessary.	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Annual reports will be prepared and distributed to interested parties.			
MM GW-6. Water Quality Sampling. Water quality sampling will be done at the source wells, and within the reservoirs, and in monitoring wells upgradient and downgradient of the reservoirs and brine disposal lagoon consistent with applicable portions of California Code of Regulations Title 27. Figure 3.3-18 shows the locations of these wells. Monitoring will be done on a quarterly basis for the first 4 years and may be reduced to biannually thereafter based on initial results. Results of the sampling will be used to adjust water treatment volume, and to add or adjust treatment modules for TDS and other potential contaminants as needed to maintain groundwater quality under the direction of the State Board and FERC .	Final engineering	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM GW-7. Replacement Wells. Existing wells located within the central and eastern mining pits to be developed as Project reservoirs will be replaced at locations outside of the reservoirs as shown on Figure 3.3-18. Table 3.3-10 lists those wells scheduled for replacement.	Final engineering	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
PDF GW-1. Groundwater Seepage. The Owner will limit seepage from the Project reservoirs to the extent feasible using specified grouting, seepage blankets, and RCC or soil cement treatments. This includes the upper reservoir, lower reservoir, and the brine disposal ponds that will be part of the water quality management system for the Project. Final design for seepage control will be approved by FERC prior to construction. Seepage control from the Project reservoirs will be accomplished using systematic procedures such as design and construction control measures that will include the following: • During final engineering design, a detailed reconnaissance of the reservoir basins and pond areas will be conducted to identify zones where leakage and seepage would be expected to occur. These areas will include faults, fissures and cracks in the bedrock, and zones that may have direct connection to the alluvial deposits of the Chuckwalla Valley. During the reconnaissance, the effectiveness of various methods for seepage and leakage control to mitigate the effects of these particular features will be evaluated, including grouting, seepage blankets, and RCC or soil cement	--	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
treatments, and other methods if needed. • Methods for seepage and leakage control will include curtain grouting of the foundation beneath the dam footprint and around the reservoir rim, as needed; backfill concrete placement and/or slush grouting of faults, fissures, and cracks detected in the field reconnaissance; placement of low permeability materials over zones too large to be grouted and over areas of alluvium within the lower reservoir; seepage and leakage collection systems positioned based upon the results of the hydrogeologic analyses; and clay or membrane lining of the brine ponds associated with the Project's water quality management system. The collection systems would recycle water into the Project reservoirs or the reverse osmosis system. • Design and construction of a Comprehensive Monitoring Program, consisting of observation wells and piezometers that will be used to assess the effectiveness of the seepage and leakage control measures. • Based on monitoring results, additional actions may be taken to further control leakage and seepage from the reservoirs and ponds. Such measures may include curtain grouting and the expansion of seepage and leakage			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
collection systems. • Other measures, such as use of stepped RCC or soil cement overlay on the eastern portion of the lower reservoir may also be used depending on results of final engineering design analyses. • In addition, portions of the tunnels and shaft of the Project will experience very high water pressures; whereas, c urrent plans are based on lining of the tunnels with concrete, and in some locations steel liners will be installed. These liners will also effectively block seepage from occurring.			
PDF GW-2. Water Treatment Facility. In order to maintain TDS at a level consistent with existing groundwater quality, a water treatment plant using a RO desalination system and brine disposal lagoon will be constructed as a part of the Project to remove salts and metals from reservoir water and maintain TDS concentrations equivalent to source water levels. Treated water will be returned to the lower reservoir while the concentrated brine from the RO process will be directed to brine ponds. In	--	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
addition to removing salts from the water supply, other contaminants, nutrients, and minerals, if present, would be removed as well, preventing eutrophication from occurring.			
Agricultural and Forestry Resources			
No mitigation required.	--	--	--
Biological Resources			
MM BIO-1 Biological Mitigation and Monitoring Program. Concurrent with final engineering design a comprehensive site-specific biological mitigation and monitoring program shall be developed in consultation with the Biological Technical Advisory Team. The Technical Advisory Team shall be composed of the Owner's staff Environmental Coordinator and consultants, and staff from the resource managing agencies (BLM, USFWS, and CDFG).	Final Engineering / Pre-Construction / Life Of Project	Environmental Coordinator / Biological Technical Advisory Team / Project Biologist	SWRCB / FERC / BLM/ USFWS / CDFG
MM BIO-2 Biological Reporting to Resource Agencies. As part of implementing protection measures, regular reports shall be	Final Engineering / Pre-Construction / Life Of Project	Environmental Coordinator / Biological Technical	SWRCB / FERC / BLM/ USFWS / CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
submitted to the relevant resource agencies to document the Project activities, mitigation implemented and mitigation effectiveness. As a performance standard, adaptive management recommendations shall be updated as needed and in consultation with the coordinating agencies. Reporting shall include monthly reports during construction, annual comprehensive reports, and special-incident reports. The Project Biologist shall be responsible for reviewing and signing reports prior to submittal to the agencies.		Advisory Team / Project biologist	
MM BIO–3 Designation of an Authorized Project Biologist. An Authorized Project Biologist shall be responsible for implementing and overseeing the biological compliance program. This person shall be sufficiently qualified to ensure approval by the USFWS and the CDFG for all biological protection measures that may be implemented by the Project. The USFWS describes a single designation for biologists who can be approved to handle tortoises - "Authorized Biologist." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move	Final Engineering / Pre-Construction / Life Of Project	Environmental Coordinator / Biological Technical Advisory Team / Project Biologist	FERC / USFWS / CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist.			
MM BIO-4 Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) shall be implemented to ensure that Project construction and operation occur within a framework of safeguarding environmentally sensitive resources. Although facility construction has the greatest potential to harm environmental resources, the WEAP shall be designed to address those environmental issues that pertain to Project operations, such as general conduct, repairs and maintenance. The WEAP shall include information on biological resources that may occur on the site, with emphasis on listed and special-status species. Education shall include, but not be limited to, ecology, natural history, endangerment factors, legal protection, site mitigation measures, and hierarchy of command. Site rules of conduct shall be	Construction / Life Of Project	Environmental Coordinator / Contractor	SWRCB / FERC / BLM

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
identified, including but not limited to: speed limits, work areas that must be accompanied by a biological monitor, parking areas, looking under parked vehicles prior to moving them, trash deposition, off-site conduct in the area of the Project, and other employee response protocols. Willful non-compliance shall result in sufficiently severe penalties to the contractor that the contractor may dismiss the offending employee. The educational format will be a video, shown initially by the Project Biologist and ultimately by a limited staff of trained and approved personnel. The Project Biologist also may be videotaped giving the first program, for assistance to further instructors. All workers completing the education program shall be given a wallet card with site "rules" and contact cell phone numbers, and an environmental training completion sticker to affix to their hard hat. Each shall sign a sheet attesting to completing the training program.			
MM BIO-5 Minimize Surface Disturbance. During construction in native habitats, all surface disturbance shall be restricted to the	Construction	Environmental Coordinator / Contractor	SWRCB / FERC / BLM

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
smallest area necessary to complete the construction. New spur roads and improvements to existing access roads shall be designed to preserve existing desert wash topography and flow patterns. The NECO Plan requires the following mitigation measures for plants: • Avoid plant populations during construction. Where avoidance is not practical, Project effects on the species and population must be assessed. • Require mitigation of project impacts in suitable habitat within the range of the impacted species, using commonly applied mitigation measures.			
MM BIO-6 California Desert Native Plants Act. In compliance with the California Desert Native Plants Act (CDNPA), the County Agricultural Commissioner shall be consulted for direction regarding disposal of plants protected by the CDNPA. This may include salvage for subsequent revegetation of temporarily disturbed areas on site, salvage by an approved nursery, landscaper or other group, or other methods of disposal.	Final Engineering / Construction	Project Biologist / Contractor	FERC / County Agricultural Commissioner
MM BIO-7 Revegetation Plan. A revegetation plan (*see* Section 12.14) shall be	Final Engineering / Construction	Project Biologist / Contractor	FERC/SWRCB/BLM

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
implemented for areas that are temporarily disturbed during construction. In order to accommodate the specific features of the desert that make revegetation difficult – namely lack of predictable rainfall, lack of an "A" soil horizon, and the difficulty of re-establishing a soil community of micro-organisms – a detailed Revegetation Plan shall address the following measures and include: • Quantitative identification of the baseline community, both annual, herbaceous perennial and woody perennial species. • Soil salvage and replacement on areas to be revegetated. • Final site preparation and grading to include features that enhance germination and growth of native species. This includes surface pitting for the accumulation of sediments, water and seed and the construction of small swales for such species as California ditaxis and desert unicorn plant, which are commonly found in road swales and shoulders. All disturbed washes shall be recontoured to eliminate erosion and encourage the reestablishment of the drainage to its pre-construction condition. • Vertical mulching and other techniques to promote a hospitable environment for			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
germination and growth. • Seeding and/or planting of seedlings of colonizing species. • Development of a soil micro-community by inoculation of mycorrhizal fungi and planting species that develop a mycorrhizal net. • Weed control. • Initial irrigation, if necessary. • A realistic schedule of regrowth of native species, and remedial measures, if needed. • Monitoring and reporting.			
MM BIO-8 Invasive Species Monitoring and Control. To minimize the spread of invasive non-native vegetation a weed control program shall be implemented during construction. This program (*see* Section 12.14) includes: • Baseline surveys for weed species that are present and/or are most likely to invade the Project site and surrounding area. • Methods quantifying weed invasion. • Methods for minimizing weed introduction and/or spread. • Triggers which prompt weed control. • Methods and a schedule for weed control and eradication. • Success standards.	Construction	Project Biologist / Contractor	FERC/SWRCB/BLM/ USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
MM BIO-9 Couch's Spadefoot. The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan requirements shall be implemented to avoid disturbance of impoundments and restriction of surface flow to impoundments. Surveys on the Central Project Area shall elucidate the presence of any artificial impoundments that could subsidize Couch's spadefoot reproduction. Should those exist then surveys shall be conducted at the appropriate time to determine if larvae are present. If present, the impoundment will be avoided, if possible. If avoidance is not possible, then a new impoundment will be constructed as close as is feasible, to replicate and replace each lost impoundment with similar characteristics. All larvae shall be removed to the new impoundment. During construction on all Project facilities, should ephemeral pools develop in response to intense rainfall showers from early spring through fall these shall be examined for larvae of Couch's spadefoot. If larvae are present, the	Construction	Project Biologist / Contractor	SWRCB /FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
pools shall be flagged and avoided by construction activities. Where pools cannot be avoided, new pools shall be constructed and larvae transplanted under the supervision of the Project Biologist.			
MM BIO-10 Breeding Bird Surveys and Avoidance. For all construction activities in vegetated habitat that are scheduled to occur between approximately February 15 and July 30, surveys shall be completed in all potential nesting sites for active bird nests. Unless otherwise directed by the CDFG, if an active bird nest is located, the nest site shall be flagged or staked a minimum of five yards in all directions. This flagged zone shall not be disturbed until the nest becomes inactive. Alternatively, grading and site preparation may occur prior to February 15 to preclude interference with nesting birds.	Construction	Project Biologist	FERC / CDFG
MM BIO-11. Brine Ponds Management. Brine ponds shall be managed to minimize their attractiveness and access to migratory birds. This consists of making resources provided by the ponds less available (by designing the ponds to be unattractive to birds) and netting the	Final Engineering / Construction / Life Of Project	Project Biologist	FERC / SWRCB

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
ponds to prevent access by birds (Figure 3.5-19).			
MM BIO-12 Burrowing Owls Phase III Survey. Based on the results of the 2009 surveys, a Phase III survey shall be completed to further assess bird use of the Project area and potential impacts if required by the CDFG (CBOC, 1993). This includes a nesting season survey, followed by a winter survey if no burrows or owls are observed during the nesting season. Each of these surveys shall spans several visits and days. A pre-construction survey shall be conducted within 30 days of the start of Project construction to assess species presence on-site. Recommendations from the surveys shall be implemented as adaptive management measures.	Pre-Construction / Life Of Project	Project Biologist	SWRCB / FERC
MM BIO-13 Burrowing Owl Breeding Season. The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan limits the construction period to September 1 through February 1 if burrowing owls are present, to avoid disruption of breeding	Construction	Project Biologist / Contractor	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
activities. CDFG (1995) has recommended several mitigation measures for resident owls. Disruption of burrowing owl nesting activities shall be avoided during construction. Active nests shall be avoided by a minimum of a 250-foot buffer until fledging has occurred (February 1 through August 31). Following fledging, owls may be passively relocated.			
MM BIO-14 Raptor Buffer. The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan identifies ¼-mile as an important buffer distance for prairie falcon or golden eagle aerie. No aeries or nests have been observed within a ¼ mile, but pre-construction surveys on the Central Project Area will confirm if a ¼ mile construction buffer will be required during the nesting seasons.	Pre-Construction / Construction / Life Of Project	Project Biologist / Contractor	FERC / BLM
MM BIO-15 Bat Survey. The following applicable measures are required by the Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan: • Survey for bat roosts within 1 mile of a project, or within 5 miles of any permanent	Pre-Construction / Construction / Life Of Project	Project Biologist / Contractor	FERC / SWRCB

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
stream or riparian habitat on a project site. • Projects authorized within 1 mile of a significant bat roost site would have applicable mitigation measures, including, but not restricted to seasonal restrictions, light abatement, bat exclusion, and gating of alternative sites. Any exclusion must be performed at a non-critical time, by an authorized bat biologist. Pre-construction bat surveys shall be completed by a qualified bat biologist to determine the existence, location and condition of bat roosts on the site. Because foraging areas used by resident bats may be critical to the functioning of those colonies, foraging habitat on the Project also will be identified, if possible. If needed based on the results of these surveys, a mitigation plan shall be developed to avoid roosting and foraging impacts to resident bats, minimize that disturbance or, as an inescapable measure, evict bats. This plan shall include (as relevant): • Designation of avoidance areas and associated measures. • Eviction of bats outside of the maternity			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
season. • A monitoring program to determine impacts from the Project. • Extending the monitoring program for the brine ponds to include bats, as deemed necessary.			
MM BIO-16. Wildlife Fencing. The Northern and Eastern Colorado Desert Coordinated Management **(**NECO) Plan recommends fencing potential hazards to bighorn sheep. A security fence shall be constructed around portions of the Central Project Area to *exclude larger terrestrial wildlife* – bighorn sheep, deer, coyotes, foxes, badgers – from entering Project areas that could pose a hazard to these species (Figure 3.6-4). Such areas shall include the transmission switchyard and other structures that may be dangerous to wildlife. Where exclusion fencing is required, security gates will be remain closed except during specific vehicle entry and may be electronically activated to open and close immediately after vehicle(s) have entered or exited. Permanent security fences will be installed around the upper and lower reservoirs,	Final Engineering / Construction / Life Of Project	Project Biologist / Contractor	FERC/BLM

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
switchyard and brine ponds, for security, safety and general liability purposes, and will prevent wildlife access except at designated drinking points. Fences will contain "dips" where the fence will go below the high water mark so that wildlife can reach the water for drinking. These fences will also be equipped with tortoise exclusion fencing. In addition, temporary tortoise exclusion fences will be installed around work zones during construction, and will be sufficiently low (3 feet) to permit passage by sheep. These temporary fences will be removed at the end of construction. Figure 3.6-4 shows the concept for the temporary construction fencing, if additional fencing is needed during construction to protect tortoises, this fencing will be installed and maintained during the construction period. All required exclusion fencing shall be maintained for the life of the Project. All fences will be inspected monthly and during/following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately, followed by permanent repair within one week.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
MM BIO-17 Construction and Operation Restricted Areas. Construction and maintenance activities shall be restricted to minimize Project impacts. These restrictions shall include vehicle speed limits on both paved and dirt roads (the speed limit shall be based on County regulations); avoidance areas, work areas in which workers must be accompanied by a biological monitor, specified parking areas, trash deposition, repair, and refueling areas; looking under parked vehicles prior to movement; and the appropriate response upon finding a special-status species. For construction, this will include the entire construction period. For operations, this will apply to scheduled and unscheduled maintenance activities.	Final Engineering / Construction / Life Of Project	Project Biologist / Contractor	BLM
MM BIO-18 Construction during Daylight Hours. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan requires that, in areas without wildlife exclusion fencing or those areas that have not been cleared of tortoises, construction activities will only take place during daylight hours. This permits avoidance of construction-related mortalities of fossorial, diurnal species such as	Final Engineering / Construction	Project Biologist / Contractor	BLM

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
the desert tortoise, or nocturnally active species, such as the desert rosy boa.			
MM BIO-19 Construction of Pipeline Trenches. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan identifies that pipeline trenches must be closed, covered, and/or inspected. Pipeline trenches shall be closed, temporarily fenced, or covered each day. Each day, any open trenches shall be inspected by an approved biological monitor, under the supervision of the Authorized Biologist, at first light, midday, and at the end of each day to ensure animal safety. Ramps shall be provided to encourage animals to escape on their own. The biological monitor shall be confirmed by the Approved Project Biologist.	Final Engineering / Construction	Project Biologist / Contractor	FERC / BLM
MM BIO-20 Minimize Nightime Lighting Impacts. Facility lighting will be designed, installed, and maintained to prevent casting of nighttime light into adjacent native habitat. See also MM AES-1.	Final Engineering / Construction / Life Of Project	Environmental Coordinator / Contractor	SWRCB / FERC
MM BIO-21. Dry Desert Washes. There are many small washes crossed by the pipeline and	Pre-Construction / Life Of Project	Environmental Coordinator /	FERC / CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
transmission line that are regulated by the CDFG. A Streambed Alteration Agreement (Section 1602 of the CDFG Code) shall be obtained, which will identify the condition and location of all State jurisdictional waters, impacts, and mitigation measures. Mitigation includes the acreage assessment of washes that may be affected, construction requirements associated with working on or near the washes, and compensation for lost or damaged acreage. It is anticipated that this compensation will be included in the habitat compensation for special-status species (MM BIO-22 and MM TE-6).		Biological Technical Advisory Team / Project Biologist	
MM BIO-22: Habitat Compensation. CDFG standard off-site compensation for loss of occupied burrowing owl habitat consists of a minimum of 6.5 acres of lands, approved by CDFG and protected in perpetuity, for each pair of owls or unpaired resident bird. In addition, existing unsuitable burrows on the protected lands should be enhanced (i.e., cleared of debris or enlarged) or new burrows installed at a ratio of 2:1. Habitat compensation for burrowing owls, if needed, will be subsumed by compensation for lost desert tortoise habitat,	Construction / Life Of Project	Environmental Coordinator / Biological Technical Advisory Team / Project Biologist	FERC / BLM / CDFG / USFWS

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
which also constitutes burrowing owl habitat. The Northern and Eastern Colorado Desert Coordinated Management (NECO) requires compensation for disturbance of Desert Dry Wash Woodland in WHMAs at the rate of 3:1. The Project does not disturb any Desert Dry Woodland inside a WHMA. However, the compensation for desert tortoise habitat (148.9 acres of compensation habitat) that is lost to the Project will compensate for the loss of approximately 15.4 acres of Desert Dry Wash Woodland expected to be lost or disturbed during construction activities.			
PDF BIO-1 Pre-Construction Special Species and Habitat Survey. Following licensing and access to the Central Project Area, surveys for special species and habitats that could support special species will be conducted. A thorough examination of the Central Project Area and local springs and seeps will provide information to determine if any avoidance or adaptive management is required. Simultaneously, the site will be assessed for use by other wildlife. Based on the results of these surveys, the biological mitigation and	After FERC licensing / Full site access	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
monitoring program will be modified in ongoing consultation with the USFWS and the CDFG. Reporting requirements for the pre-construction surveys are specified in MM BIO-2.			
PDF BIO-2 Pre-construction Plant Survey. Preconstruction surveys will identify special-status plant populations and also species protected by the CDNPA. For annuals or herbaceous perennials that are dormant during certain seasons, data from 2008 and 2009 surveys will be used to assist in locating populations during dormant seasons. Based on these combined surveys, avoidance areas in construction zones will be established for special plant resources. The perimeters will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is not feasible, and the species can be reasonably transplanted (e.g., foxtail cactus, Wiggins' cholla, other cacti and species protected by the CDNPA), plants will be salvaged and transplanted in areas approved	Pre-construction	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
in the Re-Vegetation Plan. Transplantation will be part of the revegetation plan developed for the Project. Salvaging seed and replanting may also be an option considered for certain species (e.g., smoke tree, ironwood).			
PDF BIO-3 Pre-construction Mammals Surveys. Prior to construction, surveys will be conducted for all burrows that might host a badger or kit fox. (These surveys can be simultaneous with those for desert tortoise burrows.) Active burrows and all fox natal dens will be avoided, where possible. The perimeters of all avoidance areas will be marked with wooden stakes, at least 3 feet high, and no more than 10 feet apart. Each stake will be flagged with red and white candy-striped flagging or other obvious barrier tape. Where avoidance is infeasible, occupancy of burrows will be determined through fiberoptics and/or night vision equipment. All occupants will be encouraged to leave their burrows using one-way doors, burrow excavation in the late afternoon/early evening (to encourage escape at night), or other approved methods. All burrows from which badgers or foxes have been	Pre-construction	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
removed will be fully excavated and collapsed to ensure that animals cannot return prior to or during construction.			
PDF BIO-4 Raptor Protection of Transmission Line. ECE will design and construct raptor-friendly transmission lines in strict accordance with the industry standard guidelines set forth in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006*, by Avian Power Line Interaction Committee, Edison Electric Institute, and Raptor Research Foundation. The design plan (filed for Commission approval) will include adequate separation of energized conductors, ground wires, and other metal hardware, adequate insulation, and any other measures necessary to protect raptors from electrocution hazards.	Pre-construction	--	--
Threatened & Endangered Species			
MM TE-1: Desert Tortoise Pre-construction Surveys and Clearance Surveys. Desert tortoises shall be removed from construction areas by the Project Biologist. Such tortoises shall be processed (cataloged, photographed, and numbered) prior to placement outside the	Pre-construction	Project Biologist	FERC/USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
construction zones but on public or private land, or the Project ROW (*see* Appendix 12.14 Desert Tortoise Removal and Translocation Plan). On the linear facilities, this is achieved by first surveying for all desert tortoises that might be within construction zones or are likely to enter construction zones, immediately prior to the start of construction. (These surveys can be simultaneous with those for badger and kit fox.). Active burrows will be identified, measured, and the entrance "gated" (a 3-inch twig inserted into the floor of the runway) for monitoring tortoise use. The locations of all desert tortoises will be mapped so that those locations can be monitored for tortoise use during construction. On the Central Project Area, there is little likelihood of desert tortoises except along the southern and eastern edges because of the altered landscape and massive and abundant tailings piles. Surveys first will be conducted in the Central Project Area to determine the presence of desert tortoise. If there is any suggestion of tortoise presence, either due to the presence of tortoise habitat and/or tortoise sign, a clearance survey (*see* Appendix 12.14 Desert			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Tortoise Removal and Translocation Plan) will be completed in those areas after tortoise-proof fencing is installed (*see* MM TE-3: Desert Tortoise Exclusion Fencing). A minimum of two clearance passes will be completed. Surveys will coincide with heightened tortoise activity, from mid-March to mid-April and during October. This will maximize the probability of finding all tortoises. Any tortoises found will be removed per mitigation MM TE-3: Desert Tortoise Translocation or Removal. Surveys and clearance on the substation will proceed identically to that on the Central Project Area, with the exception that a pre-construction survey prior to clearance surveys is not necessary.			
MM TE-2: Desert Tortoise Construction Monitoring. No construction in unfenced areas (*see* MM TE-3: Desert Tortoise Exclusion Fencing) on the linear facilities will occur without biological monitors. This includes both construction monitoring and maintenance activities that require surface disturbance. An adequate number of trained and experienced	Construction	Project Biologist	FERC/USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
monitors must be present during all construction activities, depending on the various construction tasks, locations, and season. The Northern and Eastern Colorado Desert Coordinated Management (NECO Plan) suggests that construction activities occur when tortoises are inactive – November 1 to March 15 – where possible. However, adequate monitoring will mitigate concerns about take due to heightened activity levels the remainder of the year. All desert tortoises will be removed from harm's way by a biologist approved by the Project Biologist (MM BIO-2). The Project Biologist must be sufficiently qualified to ensure approval by USFWS and CDFG for all tortoise protection measures that may be implemented by the Project. USFWS describes a single designation for biologists who can be approved to handle tortoises, "Authorized Biologist." Such biologists have demonstrated to USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The CDFG must also approve such			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. Active burrows and special-resource burrows will be avoided, where possible. Where avoidance of any burrow is infeasible, occupancy will first be determined through the use of fiberoptics, probes or mirrors. All burrows that could potentially host a tortoise will be excavated with hand tools in the method prescribed by the Desert Tortoise Council (1994, rev. 1999), *Guidelines for handling desert tortoises during construction projects.* Any tortoises found will be removed from the construction area per MM TE-4: Desert Tortoise Translocation or Removal Plan. Pipeline trenches will be closed, temporarily fenced, or covered each day. Each day, any open trenches will be inspected by an approved biological monitor at first light, midday, and at the end of each day to ensure tortoise safety. If necessary, temporary fencing will be installed in the active work area to separate a tortoise from active construction, in order to maximize			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
protection. If a tortoise is injured or killed, surface-disturbing activities must cease in the area of the killed or injured tortoise and the Project Biologist contacted. Injured tortoises will be taken to a qualified veterinarian if their survival is expected. USFWS will determine if the tortoise can be returned to the wild, should it recover. As a mitigation performance standard, following site clearance, a report will be prepared by the Project Biologist to document the clearance surveys, construction monitoring, the capture and release locations of all tortoises found, individual tortoise data, and other relevant data. This report will be submitted to the CDFG and USFWS.			
MM TE–3: Desert Tortoise Exclusion Fencing. The substation will be enclosed with a permanent tortoise exclusion fence to keep adjacent tortoises from entering the site. The fencing type will be one- by two-inch vertical mesh galvanized fence material, extending at least two feet above the ground and buried at	Construction / Life Of Project	Project Biologist / Contractor	FERC/USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
least one foot. Where burial is impossible, the mesh will be bent at a right angle toward the outside of the fence and covered with dirt, rocks, or gravel to prevent the tortoise from digging under the fence. Tortoise-proof gates will be established at all site entry points. All fence construction will be monitored by qualified biologists to ensure that no tortoises are harmed. Following installation, the fencing will be inspected monthly and during all major rainfall events. Any damage to the fencing will be repaired immediately. Parking and storage will occur within the substation and disturbed, previously fenced areas. Any areas on the Central Project Area that are determined through surveys to require fencing will be fenced as outlined above (Figure 3.6-4). Where a fence is discontinuous (between tailings piles for example), the fence ends will extend well up the slope of the piles, to ensure that tortoises cannot go around the end. Alternative methods may be explored to ensure that the fences are functional at excluding tortoises.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
MM TE–4: Desert Tortoise Removal and Translocation Plan. The Desert Tortoise Removal and Translocation Plan is found in its entirety within Section 12.14. For both the Central Project Area and the linear facilities, it is anticipated that any tortoises removed would not be “translocated” or “relocated” in the biological sense of putting an animal in a location outside its home range. Instead, any tortoise would simply be removed to another part of its home range. Because construction on the Central Project Area will occur on highly disturbed previously mined areas, any tortoise found there during clearance would likely be a transient or in a peripheral part of its home range, certainly outside its core use areas or parts of its home range that could support its survival. By moving such a tortoise to a location immediately adjacent to its capture site outside the fenced construction area, the Project would be maintaining the tortoise within its home range, not translocating it. The tortoise merely would be excluded from undesirable areas. For utility corridors and fence construction, tortoises would be removed a	Construction	Project Biologist / Contractor	FERC/USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
short distance from the construction zone. Tasks will include the following: • Tortoise handling and temperature requirements • Data gathered on removed tortoises • Translocation site preparation (if any) and choice • Monitoring – All tortoises removed will be monitored sufficiently to ensure safety.			
MM TE-5: Raven Monitoring and Control Program. The Raven Monitoring and Control Plan is found in its entirety within Section 12.14. Proposed projects on Federal lands that may result in increased raven populations must incorporate mitigation to reduce or eliminate the opportunity for raven proliferation. The USFWS has developed a program to monitor and manage raven populations in the California desert in an effort to enhance desert tortoise recovery. In order to integrate monitoring and management, the USFWS has agreed to an "in-	Construction / Life Of Project	Project Biologist	FERC/USFWS/CDFG

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
lieu" fee to replace quantitative raven monitoring on new projects in the range of the desert tortoise. The Project owner will pay in-lieu fees to USFWS that will be directed toward a future quantitative regional monitoring program aimed at understanding the relationship between ongoing development in the desert region, raven population growth and expansion and raven impacts on desert tortoise populations. The vehicle for this program is a Memorandum of Understanding between the Project owner, CDFG and USFWS. The Raven Monitoring and Control Plan may include this in-lieu fee if it is determined that ravens may increase over current levels due to the Project. In addition to this in-lieu fee, the program will include, at a minimum: • A suite of construction and operations measures to reduce food scavenging and drinking by ravens (e.g., trash containment, minimization of pooling water) • Roadkill removal • Qualitative monitoring of raven use of the site during operations, conducted on a pre-			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
determined schedule by the onsite Project environmental compliance officer • Breeding season nest surveys			
MM TE-6: Habitat Compensation. The Northern and Eastern Colorado Desert Coordinated Management (NECO) Plan states that all lands within a DWMA will be designated as Category I Desert Tortoise Habitat[2], with required compensation of 5 acres for every acre disturbed. All lands outside a DWMA are considered Category III habitat, with a 1:1 compensation ratio. The Project overlaps 19 acres of Category I Habitat and 65 acres of Category III Habitat. A minimum total compensation, then, would be 160 acres (Figure 3.6-3). This land would need to be purchased in the same population of desert tortoises as occupy the site. In addition, the following features	Final Engineering / Pre-Construction	Project Applicant	FERC/USFWS/CDFG

[2] BLM habitat categories (BLM 1988), ranging in decreasing importance from Category I to Category III, were designed as management tools to ensure future protection and management of desert tortoise habitat and its populations. These designations were based on tortoise density, estimated local tortoise population trends, habitat quality, and other land-use conflicts. Category I habitat areas are considered essential to the maintenance of large, viable populations.

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
should apply to compensation lands: • Be part of a larger block of lands that are currently protected or able to be protected • Are not subject to intensive habitat degradation (e.g., recreational use, grazing use, agriculture) • Have inherently moderate to good habitat that will naturally and ultimately regenerate when current disturbances are removed • Preferably are bordered by native habitat suitable for tortoises • In part, may represent a buffer for a block of good habitat.			
MM TE-7: Operations and Maintenance. Tortoises observed during routine maintenance activities will be allowed to voluntarily move out of harm's way. Transmission line repair activities that will result in surface disturbance will require biological monitoring, per mitigation MM TE-2.	Pre-Construction / Construction / Life Of Project	Project Biologist / Contractor	FERC/USFWS/CDFG
Aesthetic Resources			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
MM AES-1. Lighting. To minimize lighting effects and potential light pollution, the final engineering design shall incorporate directional lighting, light hoods, low pressure sodium bulbs or LED lighting, and operational devices to allow surface night-lighting in the central site to be turned on as-needed for safety. The Project operator shall fund night sky monitoring to be conducted in collaboration with the National Park Service (NPS) during the post-licensing design period (to represent baseline conditions) and during construction and the initial operational period.	Final Engineering / Pre-Construction / Construction/Operation	Contractor / Environmental Coordinator	SWRCB / FERC
MM AES-2. Water Pipeline. For construction of the water pipeline, reduce side cast disposal of soils from open cut construction to reduce color contrast and disturbance with surrounding landscape. The area disturbed during pipeline construction shall be backfilled and revegetated with native vegetation immediately following completion of pipeline construction.	Final Engineering / Pre-Construction / Construction	Contractor / Environmental Coordinator	SWRCB / FERC
MM AES-3. Road Crossings. For design of the transmission line, road crossings shall be aligned as perpendicular as possible to	Final Engineering / Pre-Construction / Construction	Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
minimize views up and down ROW corridors, and towers should be placed at the maximum feasible distance from the road ROW. Steel lattice structures with a dull, galvanized steel finish shall be utilized to reduce visual contrast. Conductors shall be selected to reduce glare and visual contrast. To the extent feasible, the tower corridor should be collocated with the existing MWD transmission corridor, and tower spacing at Victory Pass designed so that as few towers as possible are skylighted on the ridgeline.			
MM AES-4. Transmission Line. For construction of the transmission line, existing access roads and construction laydown areas shall be used to the extent feasible. The transmission line disturbed zones that will not be required for long term maintenance access will be revegetated with native vegetation immediately following completion of transmission line construction, consistent with the recommendations in the Biological Resources Revegetation Plan (*see* Section 12.14).	Final Engineering / Pre-Construction / Construction	Contractor / Environmental Coordinator	SWRCB / FERC
PDF AES-1. Staging Areas. Staging areas and areas needed for equipment operation,	--	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
material storage and assembly shall be combined with construction lands to the extent feasible, and organized to minimize the total footprint needed. Staging, storage, and temporary construction areas shall be reclaimed as soon as the use of each such area is completed.			
Cultural Resources			
MM CR-1. Protect Known Historic Properties. Of the cultural resources recorded within the Project boundaries (*see* Table 3.8.4), only the CRA (P-33-6726) is evaluated as potentially eligible for listing under Criterion "A" – broad patterns of history; and Criterion "C" – embodies distinctive characteristics of a type, period, region, or method of construction. No formal determination of eligibility has been made, but the CRA will be treated as potentially eligible. **<u>Management Activity</u>:** Design transmission line and water pipes to avoid direct or indirect impacts to the buried portion of the CRA. Inspect once every 2 years to observe if	Engineering Design / Construction / Operation	Environmental Coordinator / Contractor	FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
conditions are stable or if any disturbance or deterioration has occurred. ECE will design transmission tower locations, plan conductor installation procedures, and design water line placements to avoid impacts to this crucial element of southern California's water delivery infrastructure. Consultation with the MWD will occur for that purpose. The CRA is buried in the areas of the Project APE and no impacts to its integrity are anticipated. • The inspections will be made by a ground surface level as appropriate. • Digital photographs will be taken and compared with photographs from the previous inspections. • The Project Environmental Coordinator or designee will summarize observations made during inspections every 2 years during construction. This summary will be included in the HPMP Implementation Summary Report (HPMP Implementation Report). ECE will provide a HPMP Implementation Report on a 6-year review cycle after construction, in coordination with California SHPO.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
• Although none are presently identified, in the event that interested Indian Tribes identify TCPs in the future during the planning, construction, and/or operation of the Project within the APE, the Project Environmental Coordinator shall direct qualified individuals to conduct additional consultation with the Indian Tribes, BLM, and SHPO to evaluate and document the properties in accordance with National Register Bulletin 38 (Parker and King, 1998). If the properties are determined to be eligible for listing in the NRHP, appropriate measures will be developed to mitigate adverse effects through consultation with the Indian Tribes, BLM, and SHPO. Priority will be given to preservation in place when possible , followed by data recovery, documentation, restoration or other measures as approved by the Tribes, BLM and SHPO. **<u>Performance Measures</u>:** • Inspect the CRA in the area of the APE every 2 years during construction. • Provide a summary of observations on a 2-year cycle during the construction phase and			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
a 6-year reporting cycle thereafter. • If notable changes are observed in site conditions consult with SHPO to determine if further remedial actions are appropriate. • Conduct appropriate consultation and treatment if TCP are identified in the future.			
MM CR-2. Inventory and Evaluate Cultural Resources Within the Kaiser Mine Property. An inventory of this portion of the APE will be undertaken in compliance with Section 106 of the National Historic Preservation Act and according to regulatory procedures provide in 36 CFR 800. The inventory will also include other accessible portions of the APE within the Kaiser property. The entire townsite and associated portions of the railroad will be re-recorded, and the various elements will be considered as contributors to a National Register district. **<u>Management Activity</u>:** A Work Plan will be developed and executed following issuance of the FERC license and upon gaining legal access to the subject lands. A phased approach will be taken in order to make prudent and well-	Pre-construction	Environmental Coordinator	SHPO / BLM / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
informed decisions on Section 106 compliance within the Kaiser property. The first phase will be a scoping reconnaissance of the APE within the Kaiser property and the entirety of the Eagle Mountain townsite. Portions of the site have been re-used from 1988 until 2003 for a prison. A high school and residential community has occupied portions of the site until recent years. Today it exists as a mix of abandoned and re-occupied post-war minimal traditional style dwellings, Kaiser operations buildings, modern buildings, ruins, and foundations. Questions concerning what remains of the original townsite plan and integrity of the Eagle Mountain townsite will be assessed to determine whether a district is feasible or warranted and what the scope of a survey should include. This information will be applied to the development of a Work Plan for the recording and evaluation of the site. • The Work Plan will include a draft historic context and historical information about the footprint and content of the original townsite and its development over time. The context will include a consideration of the Eagle Mountain as a late example of a company town in the			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
American West. This information will be used to develop an approach to the documentation of the site and consideration of whether a potential district may exist. The draft Work Plan will be submitted to SHPO, BLM, and FERC for review, comment, and approval of the survey approach. • Updates to DPR 523 forms will be developed for the townsite, mine, and railroad and will be used as the basis for formal evaluations of the townsite, mine, and railroad for listing in the NRHP will be made according to 36 CFR 800 and 36 CFR 60.4. Individual buildings or structures will be documented on DPRb forms. A District Record (DPR 523d) will be completed, if appropriate. Any other resources discovered during survey also will be documented and evaluated. The results will be provided in California Archaeological Resource Management Report format and to the Secretary of the Interior's standards for archaeological reporting. **Performance Measures**: • SHPO, BLM, and FERC concurrence			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
will be obtained for the determination of NRHP-eligibility of the Eagle Mountain townsite, mine, railroad, and any other documented cultural resources within the Project APE, including consideration for the potential of any resources as contributing elements to a historic district, if evidence exists for one to be present. • If any resources are determined to be historic properties, recommendations will be developed to avoid or mitigate impacts through appropriate treatments in accordance with the Secretary of the Interior's standards. These include in order of preference: project design to avoid direct impacts; moving of standing buildings or structures in the APE to other areas of the townsite or mine so that integrity of setting, feeling, and materials can be retained; or data recovery and documentation.			
MM CR-3. Implement a Historic Properties Management Plan for the Worker Environmental Awareness Program. **Management Activity:** Implement project-specific education program.	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
• A qualified archaeologist will implement a cultural resources element for the Worker Environmental Awareness Program that is tailored to the Eagle Mountain Pumped Storage Project and workforce. This Program will focus on possible discovery and mitigation procedures during the construction phase of the Project as well as preservation obligations of Project staff. • The Program will include a printed handout for all Project personnel and a Power Point presentation or video that all Project personnel will be required to view. • The Program will present concepts of cultural resources management in a simple, understandable format, including a review of preservation laws and sanctions, examples of possible discoveries, and notification procedures in the event of discoveries. These are key elements of the HPMP including the Unanticipated Discoveries Plan and the steps to follow in evaluating potential cultural resources needs that are triggered by proposed construction activities. • The Program will include a Monitoring			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Protocol and Provisions for Enforcement that may be presented to refresh personnel and introduce new staff to cultural resource concepts and Project-specific issues. • Project equipment and vehicle operators will be educated on the importance of staying within Project boundaries and also the prohibitions of going off designated routes of travel such as Eagle Mountain Road or Kaiser Road.			
MM CR-4. Offer Opportunities for Public Interpretation. Unlike other hydroelectric projects where public access and recreational opportunities may be afforded, safety concerns and proximity to a proposed landfill project preclude offering public access within the core of the Pumped Storage Project boundaries. Opportunities for public interpretation are therefore extremely limited. Some appropriate signage that interprets the history of the area already exists, including the 2009 E Clampus Vitus monument on Eagle Mountain Road for the 36th Evacuation Hospital associated with the World War II DTC and a Riverside County	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
historical marker that acknowledges the Iron Chief, Eagle Mountain, and other mines of the area. The DTC/CAMA is also thoroughly and professionally interpreted at the General Patton Memorial Museum in Chiriaco Summit, located off of I-10 between Indio and Desert Center. The prehistory and Native American cultural traditions of the region are interpreted at the Agua Caliente Cultural Museum in Palm Springs, the Malki Museum on the Morongo Indian Reservation, the Palm Spring Desert Museum, the Coachella Valley Museum and Cultural Center, and at Joshua Tree National Park. **Management Activity:** Develop informative signage that will be available to the public. ECE will develop and install one weather-tolerant sign that will be placed outside the main gate of the facility. The sign will provide information about the prehistory and history of the general area, Native American groups who inhabited the area, and background on the functioning of the Project. Local museums and historical monuments will also be identified.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
The public interpretive sign will be developed in coordination with the development of the HPMP and will be installed within 1 year of completion of the boundary fence.			
MM CR-5. Review Effectiveness of the Historic Properties Management Plan. **Management Activity:** Every 6 years, ECE will determine if modifications will improve the effectiveness of the HPMP. **Performance Standard:** Develop recommendations for changes to the HPMP that may be discussed with California SHPO, the BLM, Riverside County, interested Indian Tribes, FERC, and other consulting parties.	Pre-Construction/ Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO
MM CR-6. Consult with California SHPO, the BLM, Riverside County, interested Indian Tribes, and FERC. **Management Activity:** Develop a HPMP Implementation Report. The HPMP Implementation Report will be distributed for review according to a 2-year cycle during the construction phase of the Project because	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
cultural resource discoveries and treatments are most likely during that period. Thereafter, in the operation and maintenance phase, the HPMP Implementation Reports will be coordinated with the 6-year cycle of the Licensed Hydropower Recreation Development Report (FERC Form 80). The report will summarize, in table format, all ECE cultural resources consultations and/or surveys performed for Project modifications, activities related to the Erosion Control Plan, or any other activities that have been reviewed due to their potential to result in soil disturbance in areas not previously disturbed. The HPMP Implementation Report will: • Describe the proposed modifications, the type of cultural survey or other activity performed, the results of the survey or other activity, and actions taken (e.g. SHPO consultation and/or other consultation, mitigation, no action determined appropriate, etc.). • Summarize observations made of historic properties. • Include summaries of cultural resource			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
treatments as an update to a HPMP implementation summary table. • Report the status of ECE's public interpretation projects. • Recommend modifications to the Project HPMP that will improve its implementation if appropriate. Develop a format for the HPMP Implementation Report and its associated Summary Table that will present the cultural resources activities and considerations in which ECE participated over a 2-year reporting cycle during construction and the 6-year reporting cycle thereafter. The HPMP Implementation Report will be provided to California SHPO, BLM, Riverside County, and interested Indian Tribes for a 30-day review and comment period every 6 years in coordination with FERC Form 80. Following a consideration of review comments, ECE will file the HPMP Implementation Report with FERC.			
MM CR-7. Class I Investigation. In the event that Project activities would extend beyond the areas previously surveyed, then	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
background literature will be reviewed to identify the location, character, and significance of known cultural resources in the area of a proposed action and the potential of the proposed action to affect historic properties. The Class I investigation will rely on information contained within ECE's Project archives. Should these data not prove sufficient, the Project Environmental Coordinator may determine that additional documentation is necessary to address a particular action under consideration that extends beyond the 1-mile buffer of the already completed Class I investigation. The most important source of Class I literature review is the EIC at the University of California, Riverside. **Management Activity:** compare proposed Project location with Cultural Resources Management Maps. • Determine if the Project area is located within 100 feet of a potentially significant previously recorded archeological site. • Determine if Project area has been characterized as actively eroding or previously disturbed by other ground-disturbing activity (e.g., by machine excavation or underground			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
utility line). • Determine if the area has been previously surveyed for cultural resources. **<u>Performance Standard</u>:** based on the results of the above-noted Management Activity. • Project area is located within 100 feet of a previously recorded potentially significant archeological site. Delay Project pending SHPO consultation and possible follow-up studies by a Secretary of the Interior-qualified professional archaeologist. Previous ground-disturbing activity may be documented or observed therefore no Project effect on cultural resources expected. Project may proceed. ECE includes Project description and permit considerations in the HPMP Implementation Report that will be distributed to the California SHPO, the BLM, Riverside County, interested Indian Tribes and FERC on a 2-year cycle during the construction phase and on a 6-year review cycle thereafter in coordination with Form 80.			
MM CR-8. Class III Cultural Resources Field Investigation. Any modifications or additions to the APE in previously unsurveyed and undisturbed areas will require a Class III	Pre-construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
survey in compliance with Section 106 of the National Historic Preservation Act and according to 36 CFR 800. ECE will conduct an on-the-ground inventory of the APE for a proposed action that confirms the presence of known cultural resources and that may result in identification of previously unrecorded cultural resources. A Class III investigation may involve the excavation of shovel tests placed at 50-foot intervals within the APE or implementation of an alternative investigative strategy approved by ECE's Project Environmental Coordinator and the California SHPO. Any investigations on easements through BLM land require a Fieldwork Authorization to a BLM permit-holding archaeologist in compliance with the Federal Land Policy and Management Act of 1976, as amended (PL 94-579). **Management Activity:** Consult with BLM or other land holding agencies as to what Section 106 or Section 110 compliance needs may still be required and implement as specified. Engage services of a qualified archaeologist to brief the Project Environmental Coordinator on correct scoping and protocols and conduct Class III survey such as a walkover survey and/or			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
systematic subsurface shovel testing (e.g. perform an identification level archeological field survey.) The actual scope of work will depend upon the proposed Project location and size of the proposed activity as well as BLM requirements on BLM land. The archaeologist will perform the Class III survey and prepare a report that describes the investigation and results. ECE will forward this report to the California SHPO, interested Indian Tribes and FERC. All new reports and site forms will be submitted to the EIC, University of California, Riverside. **Performance Standards:** Review results of the Class III Survey and the associated recommendations. • If the Class III survey did not locate cultural resources, then the proposed action may proceed following consultation with BLM and SHPO. • If the Class III survey locates cultural resources that the archaeologist recommends as not potentially significant, then the ECE Project Environmental Coordinator consults with SHPO. If consensus is reached on the recommendation, then the action may proceed.			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
If SHPO does not concur, then the resource is treated as potentially significant. • If the Class III survey locates cultural resources that the archaeologist recommends as potentially significant (i.e. demonstrates good integrity, identifiable limits, structure, function, research potential, and cultural/historical context – *see* definition under 4.2.3 below), then ECE's Project Environmental Coordinator consults with SHPO. If SHPO concurs with evaluation, then a Testing Phase investigation is recommended unless action may be designed to avoid the resource. Alternative Project locations will be reviewed.			
MM CR-9. Testing Phase Cultural Resources Field Investigation. Conduct limited archeological excavations and analyses, or other investigations such as documentation of structures, to assess the National Register eligibility of individual resources and an assessment of the Project effects on historic properties. The purpose of this measure is to determine if a cultural resource recommended as potentially significant and that cannot be avoided by a	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
proposed action, qualifies as significant. The criteria for sites eligible to the NRHP may be found at 36 CFR 60.4. A site is eligible to the NRHP if it contains qualities that are significant in American history, architecture, archaeology, engineering, and culture and possesses integrity of location, design, setting, materials, workmanship, feeling, and association and: • is associated with events that have made a significant contribution to the broad patterns of history • is associated with the lives of persons significant in the past • embodies the distinctive characteristics of a type, period or method of construction; or represents a significant and distinguishable entity whose components may lack individual distinction or • has yielded, or may be likely to yield, information important in prehistory or history **Management Activity:** Engage services of a qualified archaeologist to collect data sufficient to determine if a cultural resource qualifies as			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
significant. If the site is located on BLM land, an excavation permit is required for testing programs that remove more than one cubic meter of soil from an individual site, in compliance with the Archaeological Resources Protection Act of 1979, as Amended (PL 96-95). Archaeological Resources Protection Act permits require submittal of a Treatment Plan/Research Design for which BLM is required to consult with SHPO and interested Indian Tribes prior to approving field investigation. The archaeologist will perform a Testing Phase investigation and prepare a report that describes the Testing Phase investigation and results. ECE will forward this report to BLM for consultation with SHPO, interested Indian Tribes and FERC. **<u>Performance Standards</u>:** Review results of the Testing Phase Report and the associated recommendations, and consult with BLM and SHPO. • If the Testing Phase investigation indicates that the cultural resource does not qualify as significant, Project may proceed following consultation with the California			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
SHPO. • If the Testing Phase investigation indicates that the cultural resource qualifies as significant, ECE Manager consults with BLM and SHPO. If SHPO concurs with the recommendation that the cultural resource is potentially eligible for listing in the NRHP and if the Project is not amended to avoid the resource, consultation with SHPO will continue. A qualified archaeologist will develop the scope of work that will serve as mitigation of Project effects. ECE Manager will consult with the SHPO and gain consensus on the appropriate mitigation (may involve further Data Recovery field investigation, monitoring, or another alternative treatment measure).			
MM CR-10. Data Recovery or Alternative Mitigation. ECE will investigate activities designed to mitigate effects upon a historic property that an action will affect. This may include data recovery, documentation, restoration or other measures. Such investigations will be preceded by development of an action-specific Memorandum of Agreement that has been approved by ECE,	Pre-Construction / Construction / Operation	Environmental Coordinator / Contractor	FERC / SHPO

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
SHPO, the BLM, the Advisory Council on Historic Preservation, FERC, and, as appropriate, interested Indian Tribes **<u>Management Activity</u>:** ECE Project Environmental Coordinator works with Project proponent and qualified archaeologist and consults with the SHPO to avoid Project adverse impacts, minimize Project adverse effects through possible design modifications and or through data recovery or an alternative mutually agreed-upon method. If NRHP-eligible resource may not be avoided, ECE's archaeologist develops a Memorandum of Agreement (MOA) and ECE consults with the California SHPO, the BLM, the Advisory Council on Historic Preservation, and interested Indian Tribes, as appropriate and files the MOA with FERC for approval. When an appropriate MOA is agreed upon, the archaeologist will perform the Data Recovery mitigation and prepare a report that describes the mitigation and the results. ECE will forward this report to the consulting parties. **<u>Performance Standard</u>:** Review results of the data recovery or other mitigation and consult			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
with SHPO, the BLM, the Advisory Council on Historic Preservation, interested Indian Tribes, and the FERC. When consulting parties concur that mitigation has been successfully achieved, the action may proceed.			
MM CR-11. Treatment of Unanticipated Discoveries of Cultural Resources and Human Remains. As with all development projects in the State, should unforeseen artifacts become uncovered during site grading, the Applicant is required to adhere to all State of California procedures, including Section 21083.2(i) of the CEQA Statutes and Section 15064.5 of the CEQA Guidelines regarding stoppage of work, handling of discovered materials, and notification of proper authorities to ensure that the construction/operation of the Project would not have an adverse effect on cultural resources. ECE is responsible for addressing action impacts to cultural sites and human remains should they be exposed as a result of ground disturbing activities by ECE or one of its Licensees; erosion control measures, or erosion of any inventoried historic properties, or in the case that resources are exposed in the event of a Project operation	Grading / Earthwork / Construction	Environmental Coordinator / Contractor Project Archeologist / Riverside County Coroner, as required	N/A

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
emergency. **<u>Management Activities</u>:** Steps that ECE shall follow in the event that unanticipated finds of cultural materials or human remains are made within the Project are contained within the project-specific Plan and Procedures Addressing Unanticipated Discoveries of Cultural Resources and Human Remains, found in Appendix A of the HPMP. **<u>Performance Standards</u>:** ECE shall consult with the California SHPO, BLM, interested Indian Tribes, Riverside County Coroner, as appropriate and depending on the land jurisdiction on which any discoveries are made, and FERC, should human remains be discovered in a non-contemporary context. If ECE discovers contemporary contexts with human remains, local law enforcement agencies and the Riverside County Coroner shall be consulted.			
Land Use / Public Services			
MM LU-1. Development Impact Fee. Prior	Prior to start of	Operator /	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
to the start of commercial operation the Applicant shall pay to Riverside County the required Development Impact Fee for the Project area in accordance with Riverside County Ordinance 659, as amended through 659.7 and Chapter 4.60 of the Riverside County Code (Development Impact Fees).	Commercial Operations	Environmental Coordinator	
PDF LU-1. Construction Access. Construction access to/from the substation site will be from the Eagle Mountain Road exit and follow the Frontage Road east to the site. The Contractor will be responsible for monitoring construction access points.	--	--	--
PDF LU-2. Construction Notice. Two weeks prior to beginning construction, notices shall be posted locally stating hours of operation for construction near the Desert Center community and along SR 177. The Contractor will be responsible for monitoring construction sites for authorized personal.	--	--	--
PDF LU-3. Pipeline Construction. Impacts	--	--	--

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
from water pipeline construction will be minimized or avoided by (1) grading out the sidecast to meet existing grades; (2) minimizing disturbance, construction timing to avoid seasonal rain, and maintaining surface contours and natural function of washes crossed; and (3) use of existing access roads, when feasible, thereby avoiding new ground disturbance.			
PDF LU-4. Construction Staging Area. The Project layout has been modified to eliminate conflicts with existing and proposed land uses. Construction staging and lay-down areas have been relocated to a parcel southwest of the lower reservoir and outside of the proposed landfill to eliminate conflict with the proposed landfill truck marshalling and railyard facilities. Low voltage cables from the underground powerhouse have been routed through the underground powerhouse access tunnel to avoid conflicts with landfill Phase 3. Water treatment facilities have been relocated further from the CRA to address concerns of the MWD regarding the proximity of the brine ponds to the CRA.	--	--	--
See **PDF GW-1 Groundwater Seepage.**			

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
See **MM GW-5 Seepage Recovery Wells.**			
Recreation			
No mitigation is required.	--	--	--
Population & Housing			
No mitigation is required.	--	--	--
Transportation			
See **MM AQ-6 Transportation Management Plan.**			
See **PDF LU-1 Construction Access.**			
See **PDF LU-2 Construction Notice.**			
Air Quality			
MM AQ-1. Fugitive Dust. Periodic watering or application of suitable surfactant will be conducted for short-term stabilization of disturbed surface areas and storage piles as	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
needed to minimize visible fugitive dust emissions. For dirt roads, watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is done for the day.			
MM AQ-2. Trackout. To prevent Project-related trackout onto paved surfaces, the following measures will be undertaken through the construction period: • Prevention and clean up of Project-related trackout or spills on publicly maintained paved surfaces within 24 hours. • Covering loaded haul vehicles operating on public paved roads. • Material transported off-site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust. • Paving, gravel covering, or chemically stabilizing on-site roads as soon as feasible. • Limiting onsite vehicle speeds on unpaved surfaces to 25 mph. • Operating a wash rack for	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
drivers to wet down material before leaving the facility. • Operate a wheel washer (or equivalent) to remove soil from vehicle tires as needed.			
MM AQ-3. Grading. Graded site surfaces will be stabilized upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-4. Surface Disturbance. Areas of active surface disturbance (such as grading) will be limited to no more than 15 acres per day.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-5. Earth-moving Activities. Non-essential earth-moving activities will be reduced during windy conditions; i.e., when visible dusting occurs from moist and dry surfaces due to wind erosion. Clearing, grading, earth-moving, or excavation activities will cease if winds exceed 25 mph averaged over 1-hour duration. In addition, compliance with the following	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
mitigation measures AQ-6 through AQ-12 would further reduce impacts from engine exhaust and NOx and other criteria pollutant emissions.			
MM AQ-6. Transportation Management Plan. The Construction Contractor shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-7. Diesel Trucks. All diesel truck operators shall strictly abide by the applicable State law requirements for idling, as described in the airborne toxic control measure (CCR, Title 13, section 2485), which limits vehicles with gross vehicular weight ratings of more than 10,000 pounds to no more than 5 minutes in a	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
60-minute period of idling of the primary engine or the diesel-fueled auxiliary power system at any location.			
MM AQ-8. Equipment. Use electrical drops in place of temporary electrical generators, and substitute low- and zero emitting construction equipment and/or alternative fueled or catalyst equipped diesel construction equipment wherever economically feasible.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-9. Generators. Electrical generators must be properly permitted with the SCAQMD.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-10. Heavy-duty Diesel Trucks. Heavy-duty diesel trucks shall be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-11. Construction Equipment. At least 50 percent diesel fleet hours will utilize 2002 or later year diesel construction equipment,	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
MM AQ-12. Off-road Construction Equipment. Older off-road construction equipment shall be retrofitted with appropriate emission control devices prior to onsite use,	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
where feasible.			
MM AQ-13. Air Quality Study Design. The Project applicant/owner (Eagle Crest Energy Company [ECE]) shall work collaboratively with the National Park Service (NPS) to establish an air quality study design for 2 years of ozone monitoring to be conducted upon completion of construction and Project operations beginning. ECE will fund the annual expenses as a cost-share with the NPS and other transmission operators. The funding contribution for this study will be based on a percentage of total miles of transmission line. If the proposed Project is found to have a significant impact on ozone levels within Joshua Tree National Park, the Project owner will develop a transmission management plan to reduce ozone emissions.	Construction	Construction Contractor / Environmental Coordinator	SWRCB / FERC
Noise			
MM N-1 Construction Equipment. The Contractor shall utilize construction equipment with properly operating and maintained noise mufflers and intake silencers, consistent with manufacturers' standards in order to reduce or	Construction	Contractor / Environmental Coordinator	SWRCB

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
avoid construction noise levels.			
Greenhouse Gas Emissions			
No mitigation is required.	--	--	--
Hazards & Hazardous Materials			
MM HM-1. UXO Plan. The Contractor, in consultation with the Project owner's Environmental Coordinator, shall implement a UXO Identification, Training and Reporting Plan (UXO Plan) to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance. Implementation shall include: (1) a description of the training program outline and materials, and the qualifications of the trainers; (2) identification of available trained experts that will respond to notification of discovery of any ordnance (unexploded or not); (3) a work plan to recover and remove discovered ordnance; and (4) work stoppage until site is determined clear by the Environmental Coordinator..	Final Engineering / Pre-Construction / Construction	Environmental Coordinator / Contractor	SWRCB / FERC

Mitigation Program	Implementation Timing	Party Responsible for Implementation, Monitoring and Reporting	Agency Responsible for Verification and Enforcement
Verification: The UXO Plan shall be implemented no less than 60 days prior to the initiation of construction activities at the site.			
Environmental Justice			
No mitigation is required.	--	--	--

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8.0 Organizations and Persons Consulted

Meetings and conference calls to discuss the proposed Eagle Mountain Pumped Storage Project (Project) have been held with the following list of stakeholders. Meeting agendas and meeting notes were maintained for the agency meetings, and are available in the project file.

State of California: State Water Resources Control Board, California Fish and Game, Office of Mine Reclamation, Regional Water Quality Control Board (Palm Desert), Metropolitan Water District of Southern California, California Public Utilities Commission, California Energy Commission, California Independent System Operator.

Federal Agencies: U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service.

Local Agencies: Riverside County Planning Department, Planning Departments in Indio and Cathedral City.

Local Landowners: A community meeting was sponsored by the Applicant on April 22, 2009 in Lake Tamarisk to meet the landowners, explain the Project, and listen to their concerns. The Applicant has held independent meetings with several local landowners, including coordination with local landowners for groundwater quality sampling of their well.

The following agencies and Tribes were consulted during the preparation of this DEIR:

Organization	Individual/Office	Address	City	State	Zip
Bureau of Indian Affairs	Palm Springs Field Office	PO Box 2245	Palm Springs	CA	92262
Bureau of Indian Affairs	Pacific Regional Office	2800 Cottage Way	Sacramento	CA	95825
Bureau of Indian Affairs	Southern California Agency	2038 Iowa Avenue, Suite 101	Riverside	CA	92507-0001
Bureau of Land Management	Palm Springs South Coast Field Office	690 W. Garnet Avenue PO Box 581260	North Palm Springs	CA	92258-1260
Bureau of Land Management	California State Office	2800 Cottage Way Suite W1834	Sacramento	CA	95825-1886
Department of Interior, Bureau of Reclamation	Lower Colorado Regional Office	PO Box 61470 Attn: BCOO-4800	Boulder City	NV	89006
Environmental Protection Agency	Regional Office Region 9 (AZ, CA, HI, NV)	75 Hawthorne Street	San Francisco	CA	94105
Federal Emergency Management Agency	Region IX	1111 Broadway, Suite 1200	Oakland	CA	94607-4052
Federal Energy Regulatory Commission	Portland Regional Office	805 SW Broadway Fox Tower Suite 550	Portland	OR	97205
National Marine Fisheries Service	Regional Office Southwest Fisheries Science Center	8604 La Jolla Shores Drive	La Jolla	CA	92037-1508
National Marine Fisheries Service	Pacific West Region-WA, OR, ID, CA, NV, HI, AS	501 W Ocean Blvd, Suite 4200	Long Beach	CA	90802-4221
National Park Service	Joshua Tree National Park	74485 National Park Drive	Twentynine Palms	CA	92277-3597
National Park Service	Regional Office	Jackson Center One 1111 Jackson Street, Suite 95700	Oakland	CA	94607
National Park Service	Joshua Tree National Park	74485 National Park Drive	Twentynine Palms	CA	92277-3597
NOAA Fisheries	Southwest Region	650 Capital Mall, Suite 8-300	Sacramento	CA	95814
U.S. Army Corps of Engineers	State District Office, Regulatory Branch/Permits	1325 J Street	Sacramento	CA	95814
U.S. Army Corps of Engineers	State District Office, Regulatory Branch/Permits	911 Wiltshire Blvd, PO Box 532711	Los Angeles	CA	90053
U.S. Army Corps of Engineers	Divisional Office Regulatory Branch South Pacific Region-	333 Market Street	San Francisco	CA	94105-2197

Organization	Individual/Office	Address	City	State	Zip
	CO, NM, TX, AZ, CA, NV, UT, WY				
U.S. Army Corps of Engineers	Southern CA Area Office	40015 Sierra Highway, Suite B145	Palmdale	CA	93550
U.S. Army Corps of Engineers	San Francisco District Office	1455 Market St # 1760	San Francisco	CA	94103
U.S. Fish and Wildlife Service		2800 Cottage Way Room W-2605	Sacramento	CA	95825-1886
U.S. Fish and Wildlife Service		2493 Portola Rd Suite B	Ventura	CA	93003-7726
U.S. Fish and Wildlife Service	Attn: FERC Coordinator	911 NE 11th Avenue	Portland	OR	97232
U.S. Fish and Wildlife Service	Arcata FWO	1655 Heindon Road	Arcata	CA	55214
U.S. Fish and Wildlife Service	Carlsbad Fish & Wildlife Office	6010 Hidden Valley Road	Carlsbad	CA	92011
U.S. Forest Service	Pacific Southwest Region	1323 Club Drive	Vallejo	CA	94592
United States Senate		112 Hart Senate Bldg	Washington	DC	20510
United States Senate		331 Hart Senate Bldg	Washington	DC	20510
Department of Interior, Bureau of Reclamation		27708 Jefferson Avenue Suite 202	Temecula	CA	92509
U.S. Geological Survey	Water Resources Division	Placer Hall 6000 J Street Suite 2012	Sacramento	CA	95819-6129
American River Conservancy		8913 Highway 49, PO Box 562	Coloma	CA	
American Rivers	National	409 Spring Street	Nevada City	CA	95959
California Hydropower Reform Coalition		2140 Shattuck Avenue, 5th Floor	Berkeley	CA	94704
California Outdoors		PO Box 401	Coloma	CA	95613
California Sportfishing Protection Alliance		1248 E. Oak Avenue	Woodland	CA	95776
California Trout		870 Market Street, Suite 859	San Francisco	CA	94102
California Wild Heritage Campaign		915 20th Street	Sacramento	CA	95814
Center for Sierra Nevada Conservation		PO Box 603	Georgetown	CA	95634
Chico Paddleheads		179 Valley Ridge Drive	Paradise	CA	95969
Foothill Conservancy		PO Box 1255	Pine Grove	CA	95665
Friends of the River		915 - 20th Street	Sacramento	CA	95814

Organization	Individual/Office	Address	City	State	Zip
Natural Heritage Institute		2140 Shattuck Avenue, 5th Floor	Berkeley	CA	94704
Planning and Conservation League		926 J Street, #612	Sacramento	CA	95814
Sierra Club		85 Second Street, Second Floor	San Francisco	CA	94105-3441
Sierra Nevada Alliance		PO Box 7989	So. Lake Tahoe	CA	96158
California Sportfishing Protection Alliance		1360 Neilson Street	Berkeley	CA	94702
Trout Unlimited		1808B 5th Street	Berkeley	CA	94701
Kaiser Ventures, LLC.		3633 E. Inland Blvd., Suite 480	Ontario	CA	91764
Kaiser Eagle Mountain, LCC.		Box 37	Desert Center	CA	92239
S.P. Pazargad	Engineering Construction, Inc Alta Mesa Pumped Storage	7120 Hayvenhurst Avenue #108	Van Nuys	CA	91406
Lake Tamarisk Library		PO Box 260 43-880 Tamarisk Dr	Desert Center	CA	92239
Larry Charpied CCV		PO Box 321	Desert Center	CA	92239
Donna Charpied Citizens for the Chuckwalla Valley		PO Box 397	Desert Center	CA	92239
Perkins Coie, LLP.		10885 NE 4th Street Suite 700	Bellevue	WA	98004
Perkins Coie, LLP.		10885 NE 4th Street	Bellevue	WA	98004
Michael Campbell Imperial Irrigation District		333 E. Barioni Blvd	Imperial	CA	92251-1773
Akin Gump Strauss Hauer & Feld, LLP.		1333 New Hampshire Avenue NW	Washington	DC	20036-1551
Duncan Weinberg Genzer and Pembroke, PC		1615 M Street, NW Suite 800	Washington	DC	20005
Lewis, Brisbois Bisgaard & Smith, LLP.		221 N Figueroa Street Suite 1200	Los Angeles	CA	90012-2639
Law Offices of GKRSE		1500 K Street, NW Suite 330	Washington	DC	20005
Margit Chiriaco Rusche		62450 Chiriaco Road	Chiriaco Summit	CA	92201-8202
Gary Johnson Mine		PO Box 170	Palm Desert	CA	92261-0170

Organization	Individual/Office	Address	City	State	Zip
Reclamation, LLC.					
California Air Resources Board		PO Box 2815	Sacramento	CA	95812-2815
Resources Agency of California		1416 9th Street Room 1311	Sacramento	CA	95814-5511
California Department of Fish and Game	Eastern Sierra Inland Deserts Region	78-078 Country Club Drive Suite 109	Bermuda Dunes	CA	
California Department of Fish and Game	Regional Office Region 6-Eastern Sierra and Inland Deserts	3602 Inland Empire Blvd Suite C-220	Ontario	CA	91764
California Department of Fish and Game		1701 Nimbus Road Suite A	Rancho Cordova	CA	95670-4503
California Department of Fish and Game		1419 9th Street	Sacramento	CA	95814
California State Parks	Inland Empire District	17801 Lake Perris Drive	Perris	CA	92571
Metropolitan Water District of Southern California		PO Box 107	Desert Center	CA	92239
California Department of Water Resources	California Regional Water Quality Control Board Colorado River Basin Region 7	73-720 Fred Waring Drive, Suite 100	Palm Desert	CA	92260
California Department of Water Resources		1416 9th Street PO Box 942836	Sacramento	CA	94236-0001
California Department of Conservation	Office of Mine Reclamation	MS 09-06 801 K Street	Sacramento	CA	95814
California Department of Conservation	Compliance Section Office of Mine Reclamation	MS 24-01 801 K St	Sacramento	CA	95814-3500
California Fish & Game Commission	ATTN: Environmental Services Division	1416 9th Street	Sacramento	CA	95814-5511
California Office of Attorney General		300 S Spring Street Floor 2	Los Angeles	CA	90013-1230
California Office of Historic Preservation		PO Box 942896 1416 9th Street	Sacramento	CA	95814
California Office of the Governor		State Capitol Building	Sacramento	CA	95814
California Public Utilities Commission		505 Van Ness Avenue	San Francisco	CA	94102-3214
California State Lands Commission	Division of Environmental Planning	100 Howe Avenue, Suite 100-South	Sacramento	CA	95825-8202

Organization	Individual/Office	Address	City	State	Zip
California State Lands Commission		100 Howe Avenue, Suite 100-South	Sacramento	CA	95825-8202
California State Lands Commission		200 Oceangate 12th Floor	Long Beach	CA	90802
California State Water Resources Control Board	Division of Water Rights	1001 I Street 15th Floor	Sacramento	CA	95814
California Department of Fish and Game		78078 Country Club Drive Suite 109	Bermuda Dunes	CA	92203
California Department of Fish and Game	Region 6-Eastern Sierra and Inland Deserts	3602 Inland Empire Blvd Suite C-220	Ontario	CA	91764
California Department of Conservation	Office of Mine Reclamation	801 K Street MS 09-06	Sacramento	CA	91764
California State Water Resources Control Board		PO Box 2000	Sacramento	CA	95814
County Sanitation Districts of Los Angeles County, CA		PO Box 4998	Whittier	CA	90607
Turlock Irrigation District		PO Box 949 333 E Canal Drive	Turlock	CA	
California Department of Parks and Recreation		PO Box 942896	Sacramento	CA	94296-0001
Metropolitan Water District of Southern California		PO Box 54153, 700 North Alameda Street	Los Angeles	CA	90012
California Department of Fish and Game		1701 Nimbus Road Suite A	Rancho Cordova	CA	95670-4503
California Office of Attorney General		1300 I Street #125	Sacramento	CA	95814-2919
California Public Utilities Commission		505 Van Ness Avenue	San Francisco	CA	94102-3214
Placer County Water Agency		144 Fergusson Road	Auburn	CA	95604
Placer County Water Agency		PO Box 6570	Auburn	CA	95604
Riverside, County of	TLMA- Planning	4080 Lemon Street, 12th Floor	Riverside	CA	9250l
Cathedral City		68-700 Avenida Lalo Guerrero	Cathedral City	CA	92234
City of Indio	Community Development Department	100 Civic Center Mall PO Drawer 1788	Indio	CA	92202
Barona Band of Mission Indians		1095 Barona Road	Lakeside	CA	92040

Organization	Individual/Office	Address	City	State	Zip
Cabazon Tribal Business Committee		84-245 Indio Springs Drive	Indio	CA	92201
Cahuilla Band of Mission Indians		PO Box 391760	Anza	CA	92539-1760
Chemehuevi Tribal Council		PO Box 1976	Havasu Lake	CA	92362
Morongo Band of Mission Indians		49750 Seminole Drive	Cabazon	CA	92230
Torres-Martinez Desert Cahuilla Indians		PO Box 1160	Thermal	CA	92274
Native American Lands Conservancy		3963 Squalicum Lake Road	Bellingham	WA	98226
Twenty-Nine Palms Band of Mission Indians		46-200 Harrison Place	Coachella	CA	92236
Aqua Caliente Band of Cahuilla Indians		5401 Dinah Shore Drive	Palm Springs	CA	92264

9 List of Preparers

Name	Project Role/ Sections Prepared	Title	Highest Degree Obtained	Subject of Degree	Agency/Company
Ginger Gillin, C.F.P.	Project Manager, Fishery Resources	Senior Environmental Scientist	M.S.	Wildlife Biology, Aquatic Option	GEI Consultants, Inc.
Richard Westmore P.E.	Project Description	Project Engineer	M.S.	Civil Engineering	GEI Consultants, Inc.
Alice Karl, Ph.D.	Terrestrial Resources and T & E Species	Wildlife Biologist	Ph.D.	Ecology	Alice E. Karl and Associates
Richard Shatz, P.G. 4853, C.E.G. 1514, C.H.G. 84	Groundwater Resources	Senior Hydrogeologist	M.S.	Geology	GEI Consultants, Inc.
Rick Suttle	Aesthetics, Recreation, and Land Use	Landscape Architect	M.S.	Landscape Architecture	Ruettiger, Tonelli & Associates
Michael Dahm, AICP	Socio-economics, GIS	Land Use Planner	B.S.	Urban and Regional Planning	Ruettiger, Tonelli & Associates
Robert Lambe, Ph.D.	Surface Water Resources	Geologist	Ph.D.	Geology and Geochemistry	GEI Consultants, Inc.
Nick D. Miller	Construction timing, groundwater supply wells, seepage control, spillway, pipeline and operating costs	Engineer	M.E.	Civil Engineering	GEI Consultants, Inc.
Jeffrey Brown, P.G. 5144, C.E.G. 1930	Geology	Senior Geologist	B.A.	Earth Sciences	GEI Consultants, Inc.

Name	Project Role/ Sections Prepared	Title	Highest Degree Obtained	Subject of Degree	Agency/Company
Paul Miller	Noise and Senior Reviewer for Air Quality and Climate Change	Principal	M.S.	Zoology	Paul Miller and Associates
Michael Ratte	Air Quality and Climate Change	Senior Air Quality Environmental Scientist	B.S.	Meteorology	K.B. Environmental Sciences, Inc.
John Pizzimenti, Ph. D	In-house Consultant QA/QC	Senior Vice President	Ph.D.	Evolutionary Biology	GEI Consultants, Inc.
Jerry Schaefer, Ph.D.	Cultural Resources	Archeologist	Ph.D.	Archeology	ASM Affiliates
Sarah Watkins	Mapping	Geologist/GIS Analyst	B.S.	Geology	GEI Consultants, Inc.
Camilla Williams, P.G., C.E.G. 1491	Regulatory oversight, thresholds of significance, QA/QC groundwater analysis, final editorial review	Water Quality Certification Unit, Chief	B.S.	Geology	State Water Resources Control Board
Paul Murphey, P.G., 7014	Regulatory oversight, thresholds of significance, QA/QC groundwater analysis, final editorial review	Engineering Geologist	B.S.	Geology	State Water Resources Control Board