Chapter 4
Environmental Consequences

4.1 Introduction and Overview of Section

This chapter analyzes the potential environmental consequences or impacts as a result of the Agency Preferred Alternative, the Imperial Valley Solar (IVS) project, the other Build Alternatives, and the three No Action Alternatives. These analyses consider both short-term impacts during construction and decommissioning, and long-term impacts during operations. The scope of the impact analyses presented in this chapter is commensurate with the level of detail for the alternatives provided in Chapter 2, Alternatives Including the Proposed Action, and the availability and/or quality of data necessary to assess impacts. Existing conditions on and in the vicinity of the project site, as described in Chapter 3, Affected Environment, were used as the baseline conditions for assessing the potential environmental impacts of the alternatives.

4.1.1 Impact Analysis Methodology

The impact assessment that follows focuses on the general impacts that could occur as a result of implementing each of the alternatives. The methodology for this assessment conforms with the guidance found in the following sections of the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Section 1502.24: Methodology and Scientific Accuracy, 40 CFR Section 1508.7: Cumulative Impact, and 40 CFR Section 1508.8: Effects.

The CEQ regulations require that agencies "…rigorously explore and objectively evaluate…" the impacts of the alternatives. This section describes the impact assessment methodologies; defines the resources; identifies applicable regulations, plans, and policies/management goals; discusses short- and long-term and cumulative impacts; identifies mitigation and measures to address adverse impacts; and summarizes the unavoidable adverse impacts for each environmental parameter. This section also discusses irreversible and irretrievable commitments of resources, growth inducing impacts, and short-term versus long-term productivity of the environment.

4.1.2 Terminology Used

Terms referring to the intensity, scope (geographic extent), and duration of impacts are used in this chapter. Impacts are not necessarily negative; some are positive benefits and are identified as such. The following terminology is used in the impacts analysis:

- **Adverse:** The effect is negative to a particular resource or a number of resources.
- **Beneficial:** The effect is positive to a particular resource or a number of resources.
- **Cumulative:** The cumulative effects that result from individually minor but collectively significant actions taking place over a period of time.
- **Short-term:** The effect occurs only for a short time after implementation of a management action. For example, construction noise impacts from construction activities would be considered short-term.
- **Long-term:** The effect occurs for an extended period after implementation of a management action. Operational noise during power plant operations would be a long-term impact, as it would last as long as the plant is in operation.

4.1.3 Mitigation Measures

For the adverse impacts identified in the resource discussions in the individual sections in the chapter, mitigation measures were developed that would be implemented during all appropriate phases of the project from initial ground breaking, construction, operations, and through closure and decommissioning. The mitigation measures include measures proposed by the applicant; Conditions of Certification (COCs) proposed by the California Energy Commission; and regulatory requirements of other federal, state, and local agencies. The measures will also include terms and conditions from the Biological Opinion (BO) when the BO for the project is issued by the United States Fish and Wildlife Service (USFWS) and additional BLM-proposed mitigation measures and standard right-of-way (ROW) grant terms and conditions.

These requirements are referred to generically as “Mitigation Measures” throughout this Final Environmental Impact Statement (FEIS). Because these Mitigation Measures are derived from a variety of sources, they also are required, and their implementation is regulated, by various agencies. For instance, the Mitigation Measures proposed by the applicant have been accepted by the BLM and the CEC and have been incorporated into the project description. This, in turn, is the project description that has been presented to the USFWS for consultation and is the

project description upon which the terms and conditions of the Biological Opinion (BO) will be based. The project applicant will be required to comply with the terms and conditions of the BO.

Some of the Mitigation Measures are required by agencies other than the BLM and their implementation will be enforced by those other agencies against the project applicant. For instance, many of the air quality measures will be enforced by the Imperil County Air Pollution Control District (ICAPCD). The project applicant will be required by the Record of Decision (ROD) and the ROW grant to comply with the requirements of those other agencies (see, e.g., 43 Code of Federal Regulations [CFR] 2805.12(a) Federal and State Laws and Regulations), (i)(6) (more stringent state standards for public health and safety, environmental protection and siting, constructing, operating, and maintaining any facilities and improvements on the ROW). Any non-compliance with implementation of these other Federal or state requirements may impact the approval status of the ROD and ROW grant.

As noted above, the BLM recognizes that the CEC Energy Commission COCs are not generally within the enforcement authority of the BLM because those COCs are requirements originating in State laws and regulations. While the project applicant must comply with these measures, they are not directly enforceable by the BLM except in the general sense referred to above. For those COCs that are also within the enforcement authority of the BLM because of overlapping authorities, the BLM incorporates those COCs into its ROW grant as its own terms and conditions subject to its enforcement authority. Table 4-1 contains a list of COCs and denotes those measures that will be monitored and managed by the CEC, and those that will be subject to joint administration between the BLM and CEC.

In some instances, the BLM identified potential mitigation measures for impacts to public land resources that would not be, and have not been, identified as mitigation measures required by these other agencies. In these instances, individual mitigation measures have been developed by the BLM, which will be incorporated into the ROW grant and will be monitored and managed solely by the BLM. In addition, standard terms and conditions for approval of the use of public land will be identified in the ROD and incorporated into the ROW grant and, therefore, will be enforced by the BLM as part of any ROW grant approved for the project.

4.1.4 Due Diligence and Bonding Requirements

If approved, the solar energy ROW authorization will include diligent development terms and conditions, consistent with the requirements of 43 CFR 2805.12(i)(5). Failure of the holder to comply with the diligent development terms and conditions provides the BLM Authorized Officer the authority to suspend or terminate the authorization (43 CFR 2807.17).

Table 4-1 Summary of California Energy Commission Conditions of Certification and Bureau of Land Management Monitoring

Condition	Summary	CEC	BLM	Comment
Air Quality				
Exhaust Emissions Control	Follow exhaust emissions control standards for construction equipment	X		Component of monitoring to be managed by the California Energy Commission (CEC)
Fugitive Dust Control	Follow fugitive dust control standards during construction	X		Component of monitoring to be managed by CEC
Emergency Generator	Best available control technology requirements for emergency generator engine during operations	X		Component of monitoring to be managed by CEC
Gasoline Tank	Requirements for gasoline storage tank on-site during operations	X		Component of monitoring to be managed by CEC
Operational and Maintenance Vehicles	Vehicle standards during operations	X		Component of monitoring to be managed by CEC
AQ-SC1	Designate an Air Quality Construction Mitigation Manager	X		Component of monitoring to be managed by CEC
AQ-SC2	Develop an Air Quality Construction Mitigation Plan	X		Component of monitoring to be managed by CEC
AQ-SC3	Fugitive Dust Control Plan for Construction	X		Component of monitoring to be managed by CEC
AQ-SC4	Monitoring and response to dust plumes	X		Component of monitoring to be managed by CEC
AQ-SC5	Diesel-fueled engine control	X		CEC-specific requirement
AQ-SC6	New model year vehicles for maintenance and mirror washing	X		CEC-specific requirement
AQ-SC7	Fugitive Dust Control Plan for Operations	X		Component of monitoring to be managed by CEC
AQ-SC8	Provide copies of ATC and PTO	X		CEC-specific requirement
AQ-SC9	Follow emissions standards for emergency generator and fire pump engines	X		CEC-specific requirement
AQ-SC10	Gasoline tank and appurtenances vapor recovery and standing loss requirements	X		Component of monitoring to be managed by CEC
Biological Resources				
BIO-1	Designated Biologist selection and qualifications	X		Component of monitoring to be managed by CEC
BIO-2	Designated Biologist duties	X		Component of monitoring to be managed by CEC

Condition	Summary	CEC	BLM	Comment
BIO-3	Biological Monitor selection and qualifications	X		Component of monitoring to be managed by CEC
BIO-4	Biological Monitor duties	X		Component of monitoring to be managed by CEC
BIO-5	Designated Biologist and Biological Monitor authorities	X		Component of monitoring to be managed by CEC
BIO-6	Worker Environmental Awareness Program	X		Component of monitoring to be managed by CEC
BIO-7	Biological Resources Mitigation Implementation and Monitoring Plan	X		Component of monitoring to be managed by CEC
BIO-8	General biological impact avoidance and mitigation measures	X		Component of monitoring to be managed by CEC
BIO-9	FTHL impact avoidance and mitigation measures	X	X	
BIO-10	FTHL compensation lands	X	X	
BIO-11	Provision of access to project site and mitigation by project owner and CEC, BLM, CDFG, USFWS, and Corps to verify compliance and effectiveness of mitigation measures	X	X	
BIO-12	Raven Management Plan	X	X	
BIO-13	Exclusionary fencing and covering on and around the evaporation ponds	X	X	
BIO-14	Pre-construction nest surveys	X		Component of monitoring to be managed by CEC
BIO-15	Pre-construction surveys for American badgers and desert kit fox	X		Component of monitoring to be managed by CEC
BIO-16	Burrowing owl impact avoidance and minimization measures	X		Component of monitoring to be managed by CEC
BIO-17	Jurisdictional streambed and waters of the U.S. impact minimization and compensation measures	X		Other state regulation (CDFG and Corps)
BIO-18	Noxious Weed Management Plan	X	X	
BIO-19	Provide information on special-status plant species and conduct surveys as directed by BLM		X	
BIO-20	Decommissioning and Reclamation Plan	X	X	
Climate Change				
None	Not applicable	--	--	--

Condition	Summary	CEC	BLM	Comment
Cultural and Paleontological Resources				
CUP-1	Identify and evaluate cultural resources in Area of Potential Effects	X	X	
CUP-2	Avoid and protect potentially significant cultural resources	X	X	
CUP-3	Develop and implement Historic Properties Treatment Plan(s)	X	X	
CUP-4	Conduct data recovery or other actions to resolve adverse effects	X	X	
CUP-5	Monitor construction at known environmentally sensitive areas	X	X	
CUP-6	Train construction personnel	X	X	
CUP-7	Properly treat human remains	X	X	
CUP-8	Monitor construction in areas of high sensitivity for buried resources	X	X	
CUP-9	Continue consultation with Native American and other traditional groups		X	
CUP-10	Protect and monitor National Register- and/or California Register-eligible properties	X	X	
CUP-11	Complete identification efforts for the Anza Trail and coordinate mitigation efforts		X	
PAL-1	Designate PRS and Monitors	X		Component of monitoring to be managed by CEC
PAL-2	Provide maps and drawings to the PRS	X		Component of monitoring to be managed by CEC
PAL-3	Develop PRMMP if directed by PRS	X		Component of monitoring to be managed by CEC
PAL-4	Worker Environmental Awareness Program, and conduct weekly training, if required by PRS	X		Component of monitoring to be managed by CEC
PAL-5	Monitor in areas on grading, excavation, trenching, and augering	X		Component of monitoring to be managed by CEC
PAL-6	Collect fossil materials in accordance with the PRMMP	X		Component of monitoring to be managed by CEC
PAL-7	Develop Final Paleontological Resources Report	X		Component of monitoring to be managed by CEC

Condition	Summary	CEC	BLM	Comment
Fire and Fuels Management				
WORKER SAFETY-1	Submittal of Construction Safety and Health Program	X	X	
WORKER SAFETY-1	Submittal of Operations and Maintenance Safety and Health Program	X	X	
Geology, Soils, Topography, Mineral Resources, and Seismic				
GEO-1	Comply with the most current California Building Code standards in the design and construction of the project	X	X	
GEO-2	Submittal of erosion and sedimentation control plan, soils, geotechnical, or foundation reports, grading plan, and design of proposed drainage structures.	X	X	
Grazing, and Wild Horses and Burros				
None	Not applicable	--	--	--
Land Use and Corridor Analysis				
None	Not applicable	--	--	--
Noise and Vibration				
NOISE-1	Notify residents within 2 miles of the of the commencement of construction	X		Component of monitoring to be managed by CEC
NOISE-2	Noise Complaint Process	X		Component of monitoring to be managed by CEC
NOISE-3	Noise Control Program and Statement	X		Component of monitoring to be managed by CEC
NOISE-4	Noise level restrictions and survey	X		Component of monitoring to be managed by CEC
NOISE-5	Noise Hazard Surveys	X		Component of monitoring to be managed by CEC
NOISE-6	Construction time restrictions	X		Component of monitoring to be managed by CEC
Public Health and Safety, and Hazardous Materials				
None	Not applicable	--	--	--
Recreation				
REC-1	Develop a Comprehensive Interpretive Plan for the Anza Trail		X	

Condition	Summary	CEC	BLM	Comment
Socioeconomics and Environmental Justice				
None	Not applicable	--	--	--
Special Designations				
None	Not applicable	--	--	--
Traffic and Transportation				
TRANS-1	Construction Traffic Control Plan	X		Component of monitoring to be managed by CEC
TRANS-2	Authority to construct from the railroad for the railroad crossing	X		Component of monitoring to be managed by CEC
TRANS-3	Repair damaged public road rights-of-way	X		Component of monitoring to be managed by CEC
TRANS-4	SunCatcher Mirror Positioning Plan and monitoring	X		Component of monitoring to be managed by CEC
Visual Resources				
VIS-1	Surface treatment of project structures and buildings	X		Component of monitoring to be managed by CEC
VIS-2	Temporary and permanent exterior lighting	X		Component of monitoring to be managed by CEC
VIS-3	Realignment of proposed transmission interconnection	X		Component of monitoring to be managed by CEC
VIS-4	Setback of SunCatchers from Interstate 8	X		Component of monitoring to be managed by CEC
VIS-5	Contribute funds to the BLM and NPS to provide improvements to benefit visitors on the Anza Trail	X		Component of monitoring to be managed by CEC
VIS-6	Reflective glare mitigation	X		Component of monitoring to be managed by CEC
VIS-7	Setback and revegetation of staging areas	X		Component of monitoring to be managed by CEC
Hydrology, Water Use, and Water Quality				
SOIL&WATER-1	Drainage, Erosion, and Sedimentation Control Plan	X		Other State regulation (Water Board)
SOIL&WATER-2	Monitoring and verification of water use	X	X	
SOIL&WATER-3	Industrial Facility SWPPP	X		Other State regulation (Water Board)
SOIL&WATER-4	Potable water requirements	X	X	
SOIL&WATER-5	NPDES General Permit for Construction Activity	X		Other State regulation (Water Board)
SOIL&WATER-6	Waste Discharge Requirements	X		Other State regulation (Water Board)
SOIL&WATER-7	Storm Water Damage Monitoring and Response Plan	X	X	
SOIL&WATER-8	Septic system and leach field requirements	X		Other State regulation (Water Board)

Condition	Summary	CEC	BLM	Comment
SOIL&WATER-9	Assured water supply	X		Other State regulation (Water Board)
SOIL&WATER-10	Decommissioning Plan	X	X	

Table Source: United States Bureau of Land Management and LSA Associates, Inc. (2010).

Table Key: Anza Trail = Juan Bautista de Anza National Historic Trail; ATC = Authority-to-Construct; BLM = United States Bureau of Land Management; California Register = California Register of Historical Resources; CDFG = California Department of Fish and Game; CEC = California Energy Commission; Corps = United States Army Corps of Engineers; FTHL = flat-tailed horned lizard; National Register = National Register of Historic Places; NPDES = National Pollutant Discharge Elimination System; NPS = National Park Service; PRMMP = Paleontological Resources Monitoring and Mitigation Plan; PRS = Paleontological Resources Specialist; PTO = Permit-to-Operate; SWPPP = Storm Water Pollution Prevention Plan; USFWS = United States Fish and Wildlife Service.

If approved, the solar energy ROW authorization will include a required "Performance and Reclamation" bond to ensure compliance with the terms and conditions of the ROW authorization, consistent with the requirements of 43 CFR 2805.12(g). The "Performance and Reclamation" bond will consist of three components that address:

- Hazardous materials;
- Decommissioning and removal of improvements and facilities; and
- Reclamation, revegetation, restoration, and soil stabilization.

4.1.5 Terms and Conditions Found in the Federal Land Policy and Management Act and Bureau of Land Management Regulations

Title V of the Federal Land Policy and Management Act (FLPMA) of 1976 addresses the issuance of ROW authorizations on public land. BLM has identified all the lands that will be occupied by facilities associated with the Imperial Valley Solar (IVS) project that are needed for construction, operation, and maintenance of the project. The general terms and conditions for all public land rights-of-way are described in Section 505 of FLPMA, and include measures to minimize damage and otherwise protect the environment; require compliance with air and water quality standards, and with more stringent state standards for public health and safety; environmental protection; siting; construction; operation; and maintenance of ROWs. The United States Secretary of the Interior may prescribe additional terms and conditions as he or she deems necessary to protect Federal property, provide for efficient management, and among other things, generally protect the public interest in the public lands subject to or lands adjacent thereto.

For the IVS project, terms and conditions will be incorporated in the ROW grant that are necessary to protect public safety, including security fencing and on-site personnel. The environmental consequences analysis in this FEIS identifies impacts and mitigation measures to reduce/eliminate adverse environmental impacts of the IVS project. The mitigation measures identified by the BLM and incorporated as terms and conditions of the ROW grant provide those actions necessary to prevent unnecessary or undue degradation of the public lands as required by Section 302 of FLPMA. The additional mitigation measures that are identified and described in this FEIS and that will be enforced by the other agencies, as noted above, provide additional protection to public land resources.

Specifically, the FEIS identifies recommended mitigation measures that would:

(1) Require compliance with ICAPCD regulations to reduced vehicle and equipment emissions, and minimize dust during project construction, operations, and decommissioning;

(2) Require planning and compliance with Federal, State and local agency requirements for drainage, erosion and sediment control, wastewater management, groundwater use and monitoring, and storm water control and monitoring;

(3) Require actions to protect public health and safety including traffic control, transmission line standards, and worker safety plans; and

(4) Require biological and cultural resources mitigation to protect sensitive environmental resources, cause the least damage to the environment, and protect the public interest, while allowing the project to be constructed.

Finally, all BLM ROW grants are approved subject to regulations contained at 43 CFR 2800. Those regulations specify that the BLM may, at any time, change the terms and conditions of a ROW grant "…as a result of changes in legislation, regulations, or as otherwise necessary to protect public health or safety or the environment." (43 CFR 2805.15(e)).

The BLM will monitor conditions and review any ROW grant issued for the IVS project to evaluate if future changes to the grant terms and conditions are necessary or justified under this provision of the regulations to further minimize or reduce impacts resulting from the project.

4.1.6 Incomplete or Unavailable Information

Impacts are quantified where possible. Impacts are sometimes described using ranges of potential impacts or in qualitative terms. In the absence of quantitative data, impacts are described based on the professional judgment of the interdisciplinary team of technical specialists using the best available information. Impact analyses based on incomplete or unavailable information are identified in this chapter where applicable.

4.1.7 Chapter Format

The impact assessment in this chapter discusses the impacts to elements of the human and natural environment from future activities. Each resource impact assessment provides the following information:

- Methodology of the impact analysis
- Definition of the resource
- Applicable regulations, plans and policies/management goals
- Direct and indirect impacts for the Agency Preferred Alternative, the IVS project, the other Build Alternatives, and the No Action Alternatives
- Cumulative impacts
- Mitigation, project design features and other measures
- Unavoidable adverse impacts

In accordance with the CEQ regulations and BLM's NEPA handbook (H-1790-1), Chapter 4 concludes with discussions of the following:

- Irretrievable and irreversible impacts
- Growth-inducing impacts
- Short-term versus long-term productivity of the environment
- Summary of unavoidable adverse impacts

4.2 Air Quality

This section evaluates potential indirect and direct air quality impacts associated with the Imperial Valley Solar (IVS) project and the project alternatives, and identifies mitigation measures recommended for potential adverse impacts.

4.2.1 Methodology

This impact assessment focuses on the general air quality impacts that could occur as a result of implementing Build or No Action Alternatives. The methodology for this assessment conforms with the guidance found in the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) at 40 Code of Federal Regulations (CFR) 1502.24 (Methodology and Scientific Accuracy), 40 CFR 1508.7 (Cumulative Impact), and 40 CFR 1508.8 (Effects).

The CEQ regulations require that agencies rigorously explore and objectively evaluate the impact of the alternatives. Under NEPA, the United States Bureau of Land Management (BLM) considered three regulatory benchmarks in determining whether the IVS project or the project alternatives would result in an adverse air quality impact when evaluated against the baseline air quality conditions in the area. The potential risk of air quality impacts was assessed with respect to the following three regulatory benchmarks:

- The project construction and/or operation emissions would exceed the General Conformity applicability thresholds for Federal nonattainment pollutants.
- The project operations would exceed Prevention of Significant Deterioration (PSD) permit applicability thresholds for Federal attainment pollutants.
- The project would cause, for Federal attainment pollutants, air quality impacts in exceedance of the National Ambient Air Quality Standards (NAAQSs).

If the IVS project or the project alternatives exceed either of the first two regulatory benchmarks, those impacts would be considered potentially adverse and would require a further refined impact and mitigation analysis to demonstrate that the IVS project or the project alternatives would not result in an adverse impact due to an exceedance of the NAAQSs.

4.2.2 Definition of Resource

In accordance with the Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentrations of various pollutants in the atmosphere. The measurement of these criteria pollutants in ambient air are expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography and the prevailing meteorological conditions.

This analysis evaluates the expected air quality impacts from emissions of criteria air pollutants from the construction and operation of the IVS project and the project alternatives. Criteria air pollutants are defined as air contaminants for which the State and/or Federal governments have established ambient air quality standards (AAQSs) to protect public health.

The criteria pollutants analyzed in this section are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM). Two subsets of particulate matter are addressed: inhalable particulate matter (less than 10 microns in diameter [PM_{10}]) and fine particulate matter (less than 2.5 microns in diameter [$PM_{2.5}$]). Nitrogen oxides (NO_X, consisting primarily of nitric oxide [NO] and NO_2) and volatile organic compound (VOC) emissions readily react in the atmosphere as precursors to O_3 and, to a lesser extent, particulate matter. Sulfur oxides (SO_X) readily react in the atmosphere to form particulate matter and are major contributors to acid rain (acid rain is a broad term referring to a mixture of wet and dry deposited material from the atmosphere that contains higher than normal amounts of nitric and sulfuric acids).

Global climate change and greenhouse gas (GHG) emissions are discussed separately in Sections 3.4, Climate Change, and 4.4, Climate Change.

4.2.3 Applicable Regulations, Plans, and Policies/Management Goals

The *California Desert Conservation Area Plan* (CDCA Plan) (BLM, 1980, as amended) provides the following management direction for air quality protection in the region:

- Areas will be managed to protect their air quality and visibility in accordance with Class II objectives of Part C of the Clean Air Act Amendments, unless otherwise designated another class by the State of California as a result of recommendations developed by any BLM air quality management plan.

The Federal, State, and local laws, ordinances, regulations, and standards (LORS) applicable to the control of criteria pollutant emissions and mitigation of air quality impacts for the IVS project are summarized in Table 4-2.

Table 4-2 Air Quality Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
40 CFR Part 52	Nonattainment NSR requires a permit and requires BACT and offsets. Permitting and enforcement delegated to ICAPCD. PSD requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The IVS project is a new source that does not have a Rule-listed emission source; therefore, the PSD trigger levels are 250 tpy for NO_X, VOCs, SO_2, $PM_{2.5}$, and CO.
40 CFR Part 60	NSPS, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compression ignition internal combustion engines, including emergency fire water pump engines.
40 CFR Part 93, General Conformity	Requires determination of conformity with the SIP for projects requiring Federal approvals if project annual emissions are above specified levels.
State	
HSC Section 40910–40930	Permitting of source needs to be consistent with ARB-approved Clean Air Plans.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.
CCR Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the type of fuels allowed, establishes maximum emission rates, and establishes recordkeeping requirements on stationary compression ignition engines, including emergency fire water pump engines.
Local (ICAPCD)	
ICAPCD Rule 201 – Permits Required	Requires an Authority to Construct before construction of an emission source occurs. Prohibits operation of any equipment that emits or controls air pollutants without first obtaining a permit to operate.
ICAPCD Rule 207 – New and Modified Stationary Source Review	Specifies BACT/offsets technology and requirements for a new emissions unit that has potential to emit any regulated pollutants. Also, specifies ICAPCD participation requirements for power plant projects under the jurisdiction of the California Energy Commission.
ICAPCD Rule 400 – Fuel Burning Equipment – Nitrogen Oxides	Limits the emission levels of NO_X from any source to no more than 140 lbs/hr of NO_X, calculated as NO_2.
ICAPCD Rule 401 – Opacity of Emissions	Limits the opacity of discharges from any single source to less than 20 percent opacity or No. 1 on the Ringlemann Chart.
ICAPCD Rule 403 – General Limitations on the Discharge of Air Contaminants	Limits the concentration of the discharge of air contaminants, combustion contaminants, and particulate matter into the atmosphere.

Applicable LORS	Description
ICAPCD Rule 405 – Sulfur Compounds Emission Standards, Limitations, and Prohibitions	Limits the concentration of the discharge of sulfur compounds and the sulfur content of liquid fuels.
ICAPCD Rule 407 – Nuisances	Prohibits the discharge from any source of any air contaminant that may cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which endangers such persons or public or which may cause injury or damage to business or property.
ICAPCD Rule 415 – Transfer and Storage of Gasoline	This rule specifies the vapor recovery requirement for tank filling (Phase I) and vehicle refueling (Phase II) for gasoline storage and refueling facilities.
ICAPCD Rule VIII – Fugitive Dust Rules 800 through 806	These rules identify mitigation requirements to reduce fugitive dust emissions.
ICAPCD Rule 1101 – New Source Performance Standards	Incorporates the Federal NSPS (40 CFR 60) rules by reference.

Table Source: Staff Assessment/Draft Environmental Impact Statement (2010).

Table Key: ARB = California Air Resources Board; BACT = Best Available Control Technology; CCR = California Code of Regulations; CFR = Code of Federal Regulations; CO = carbon monoxide; HSC = Health and Safety Code; ICAPCD = Imperial County Air Pollution Control District; IVS = Imperial Valley Solar; lbs/hr = pounds per hour; NO_2 = nitrogen dioxide; NO_X = nitrogen oxides; NSPS = New Source Performance Standards; NSR = New Source Review; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; PSD = Prevention of Significant Deterioration; SIP = State Implementation Plan; SO_2 = sulfur dioxide; tpy = tons per year; VOCs = volatile organic compounds.

4.2.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other build alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.2.4.1 IVS Project: 750 MW Project

Construction

The total duration of project construction for the IVS project is estimated to be approximately 40 months. The actual construction duration would depend in part on the timing of transmission upgrades by San Diego Gas & Electric (SDG&E) and the actual rate of SunCatcher installation.

Different areas on the project site and the construction laydown areas would be disturbed at different times over the construction period. Approximately 3,000 acres (ac) on the 6,500 ac project site would be temporarily disturbed during construction, and approximately 2,750 ac would be permanently disturbed during project operations.

Combustion emissions would result from the use of off-road construction equipment, including diesel construction equipment for site grading, excavation, and construction of on-site structures and the water and soil binder spray trucks used to control construction dust emissions. Fuel combustion emissions also would result from on-road construction vehicles, including heavy-duty diesel trucks used to deliver materials, other diesel trucks used during construction, and workers' personal vehicles and pickup trucks used to transport workers to and from and around the construction site. Fugitive dust would result from site grading/excavation activities; installation of new transmission lines, water, and on-site hydrogen gas pipelines; construction of power plant facilities, roads, and substations; and vehicle travel on paved/unpaved roads.

The estimated daily and annual construction emissions for the IVS project, assuming implementation of mitigation, are provided in Tables 4-3 and 4-4, respectively. As shown, Month 6 is anticipated to result in the highest monthly construction emissions and Months 4 through 15 are anticipated to have the highest annual (12-month) construction emissions. Table 4-4 shows that the maximum annual (12-month) construction-related emissions are below the General Conformity Rule applicability thresholds for PM_{10} (70 tons) and O_3 precursors (NO_X [100 tons] and VOCs [100 tons]).

Table 4-3 Maximum Daily Construction Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOCs	PM_{10}	$PM_{2.5}$
On-site Construction Emissions						
On-site Combustion Emissions	312.35	0.31	274.67	56.38	18.95	17.40
On-site Fugitive Dust Emissions	--	--	--	--	243.63	35.92
Subtotal of On-site Emissions	**312.35**	**0.31**	**274.67**	**56.38**	**262.58**	**53.31**
Off-site Emissions						
Off-site Combustion Emissions	317.51	0.64	567.20	99.49	19.47	17.04
Off-site Fugitive Dust	--	--	--	--	174.54	19.35
Subtotal of Off-site Emissions	**317.51**	**0.64**	**567.20**	**99.49**	**194.00**	**36.39**
Total Maximum Daily Emissions	**629.86**	**0.95**	**841.87**	**155.87**	**456.58**	**89.70**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SA/DEIS; SES 2009i, Table 5.2-20 Revised).

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; SO_X = sulfur oxides; VOCs = volatile organic compounds.

Table 4-4 Maximum Annual (12-Month) Construction Emissions (tons/yr)

Emissions	NO_X	SO_X	CO	VOCs	PM_{10}	$PM_{2.5}$
On-site Construction Emissions						
On-site Combustion Emissions	40.14	0.04	36.91	7.88	2.58	2.37
On-site Fugitive Dust Emissions	--	--	--	--	36.36	5.31
Subtotal of On-site Emissions	**40.14**	**0.04**	**36.91**	**7.88**	**38.94**	**7.68**
Off-site Emissions						
Off-site Combustion Emissions	47.42	0.09	75.82	14.17	2.91	2.55
Off-site Fugitive Dust	--	--	--	--	18.93	1.93
Subtotal of Off-site Emissions	**47.42**	**0.09**	**75.82**	**14.17**	**21.84**	**4.49**
Total Maximum Annual Emissions	**87.56**	**0.13**	**112.72**	**22.05**	**60.78**	**12.17**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SA/DEIS; SES 2009i, Table 5.2-21 Revised).

Table Key: CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; SO_X = sulfur oxides; tons/yr = tons per year; VOCs = volatile organic compounds.

The construction emission sources described above would remain the same with the applicant proposed modifications with the exception of the emissions associated with trucking water from the Dan Boyer Water Company well to the IVS project site for construction and initial operations. It is anticipated that water trucked to the construction site would require an additional 13 round trips a day between the well and the IVS project site. The capacity of each truck is 7,000 gallons (gal). Each truck would travel approximately 7 miles (mi) one-way (14 mi round trip). The peak daily and annual emissions from all construction activities with water delivery via truck were estimated. The water truck trips would generate a small amount of the total construction related emissions, as shown in Tables 4-5 and 4-6.

Table 4-5 Estimated Maximum Daily Construction Emissions of Criteria Pollutants (lbs/day) (Month 6)

Maximum Daily Construction Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	443.96	78.10	532.47	72.07	488.08	0.59
Total Emissions from Water Delivery Trucks	19.16	3.06	2.02	0.71	7.04	0.01
Total Maximum Daily Emissions	**463.12**	**81.16**	**534.49**	**72.78**	**495.12**	**0.60**
% Water Supply Emissions of Total Emissions	4.1%	3.8%	0.4%	1.0%	1.4%	1.7%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, security vehicles, and SunCatcher delivery trucks.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides.

Table 4-6 Estimated Maximum Annual Construction Emissions of Criteria Pollutants (tons/yr) (Months 4 through 15)

Maximum Annual Construction Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	58.894	10.426	70.679	10.051	66.294	0.08
Total Emissions from Water Delivery Trucks	3.436	0.554	0.361	0.129	1.266	0.00
Total Maximum Annual Construction Emissions	**62.33**	**10.98**	**71.04**	**10.18**	**67.56**	**0.08**
% Water Supply Emissions of Total Emissions	5.5%	5.1%	0.5%	1.3%	1.9%	0.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, security vehicles, and SunCatcher delivery trucks.

Table Key: CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides; tons/yr = tons per year.

The other three applicant proposed modifications (transmission line, water line, and hydrogen storage) would require construction very similar to the construction for the IVS project as originally proposed for those project components. Therefore, the construction related air quality impacts of those three applicant proposed modifications would be the same as under the original IVS project.

Operation

The IVS project would be a nominal 750-megawatt (MW) solar electrical generating facility. The direct air pollutant emissions from power generation are negligible; however, there are required auxiliary equipment and maintenance activities necessary to operate and maintain the facility.

Mirror washing would be required approximately once every month, requiring 14 gallons of water per dish with an average washing rate of 20 minutes per washed dish pair, or 10 minutes per dish, because each wash vehicle will be able to wash two SunCatchers simultaneously. Assuming that travel time to the next pair of dishes would be less than 5 minutes, two dishes would be washed within 25 minutes. In addition to monthly washing, seasonal scrubbing is anticipated. Seasonal scrubbing would occur prior to the peak electricity demand season from June to September. This mechanical scrubbing would require approximately 45 minutes per dish. Maintenance of the power conversion unit (PCU) and associated maintenance vehicle operations, which would be primarily due to the replacement of the main piston seals, would be required every 6,000 hours of running time (i.e., about 20 months of solar operation).

To minimize operating emissions, the following measures have been incorporated in the IVS project to minimize the operating and maintenance vehicles' emissions:

- Maintenance vehicle measures
    - All wash vehicles and other maintenance trucks will be gasoline-fueled vehicles that meet California vehicle emissions standards for the model year obtained.
    - Propane-fueled forklifts and manlifts will be used for maintenance activities requiring such equipment.
    - All security vehicles for site inspection will be hybrid-electric vehicles.
- Travel demand for operation and maintenance will be optimized to minimize vehicle miles traveled (VMT).
- Polymer-based soil binders will be applied to the unpaved roads to create stabilized surfaces, and all vehicles would be restricted to only traveling on these stabilized roads in order to reduce particulate emissions.
- Paved and sealed roads will be cleaned with vacuum-sweeping and/or water-flushing as necessary.
- Van-pooling from El Centro will be provided to employees during operations.
- Stationary and mobile source emission reduction measures
    - An electric fire water pump will be used instead of a diesel-fueled pump.
    - A 5,000-gallon (gal) regular gasoline storage tank will be used on site, and truck refueling would be kept to a minimum.
    - Hydrogen will be produced, stored, and distributed on site to remove the need for hydrogen cylinders and their delivery to the site.

The following are the stationary and mobile emission source operating assumptions that were used to develop the operation emission estimates for the IVS project:

- Stationary Emission Sources
    - 335 brake-horsepower (bhp) backup diesel generator (testing 15 minutes per week, 13 hours per year)

    - 5,000 gal gasoline storage tank (85,000 gal per year tank filling and vehicle refueling throughput; revised maximum daily throughput basis includes one 4,000 gal storage tank filling event and maximum daily vehicle refueling of 500 gal)

- Mobile Emissions Source

    - Mobile emissions sources required for operation and maintenance are estimated based on VMT and operating hours (each mobile source has a different basis for the emissions estimates).

The estimated IVS project on-site stationary and on-/off-site mobile source maximum daily and annual operations emissions are shown in Tables 4-7 and 4-8, respectively. Table 4-8 shows that maximum annual operation emissions are well below the General Conformity Rule applicability thresholds for PM_{10} (70 tons) and O_3 precursors (NO_x [100 tons] and VOCs [100 tons]).

The operational emission sources described above would remain the same with the applicant proposed modifications with the exception of the emissions associated with trucking water to the site for initial operation. That water will be delivered to the IVS site by 7 daily truck round trips with each water truck carrying 7,000 gal. Each truck would travel approximately 7 mi one-way (14 mi round trip). For calculating operations emissions under the worst-case truck transport option, the analysis assumed that 7 truck round trips would be made each day, 7 a week. The total operation daily and annual emissions were estimated including the delivery of water via truck. The water truck trips would represent a small amount of the total operations related emissions as shown in Tables 4-9 and 4-10.

The other three applicant proposed modifications (transmission line, water line, and hydrogen storage) would result in operations very similar to the operation of the IVS project as originally proposed for those project components. Therefore, the operation related air quality impacts of those three applicant proposed modifications would be the same as under the original IVS project.

Table 4-7 Maximum Daily Operations Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	15.58	0.07	110.19	14.42	0.29	0.25
On-site Gasoline Tank Emissions	--	--	--	31.78	--	--
On-site Fugitive Dust Emissions	--	--	--	--	121.80	17.98
Subtotal of On-site Emissions	**15.58**	**0.07**	**110.19**	**46.20**	**122.09**	**18.23**
Off-site Emissions						
Off-site Combustion Emissions	11.21	0.04	53.26	2.30	0.47	0.30
Off-site Fugitive Dust	--	--	--	--	22.66	2.04
Subtotal of Off-site Emissions	**11.21**	**0.04**	**53.26**	**2.30**	**23.13**	**2.34**
Total Maximum Daily Emissions	**26.79**	**0.11**	**163.45**	**48.50**	**145.22**	**20.57**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009i, Table 5.2-25a; SES 2009n, DR 130).

Table Key: CO = carbon monoxide; IVS = Imperial Valley Solar; lbs/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; VOC = volatile organic compounds.

Table 4-8 Maximum Annual Operations Emissions (tons/yr)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	2.52	0.01	19.73	2.56	0.04	0.04
On-site Gasoline Tank Emissions	--	--	--	0.92	--	--
On-site Fugitive Dust Emissions	--	--	--	--	20.91	3.09
Subtotal of On-site Emissions	**2.52**	**0.01**	**19.73**	**3.48**	**20.95**	**3.12**
Off-site Emissions						
Off-site Combustion Emissions	1.23	0.01	9.21	0.37	0.06	0.03
Off-site Fugitive Dust	--	--	--	--	2.23	0.10
Subtotal of Off-site Emissions	**1.23**	**0.01**	**9.21**	**0.37**	**2.29**	**0.13**
Total Maximum Annual Emissions	**3.75**	**0.02**	**28.94**	**3.85**	**23.24**	**3.26**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009i, Table 5.2-25b; SES 2009n, DR 130).

Table Key: CO = carbon monoxide; IVS = Imperial Valley Solar; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; tons/yr = tons per year; VOC = volatile organic compounds.

Table 4-9 Estimated Maximum Daily Operations Emissions of Criteria Pollutants (lbs/day)

Maximum Daily Operational Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	145.21	20.58	163.46	21.77	26.79	0.11
Total Emissions from Water Delivery Trucks	10.32	1.64	1.08	0.38	3.78	0.00
Total Maximum Daily Operational Emissions	**155.53**	**22.22**	**164.54**	**22.15**	**30.57**	**0.11**
% Water Supply Emissions of Total Emissions	6.6%	7.4%	0.7%	1.7%	12.4%	0.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from the diesel generator, maintenance and security vehicles and equipment, worker vehicles, visitor cars, and delivery trucks.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides.

Table 4-10 Estimated Maximum Annual Operations Emissions of Criteria Pollutants (lbs/day)

Maximum Annual Operational Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	23.24	4.08	28.95	3.85	3.75	0.02
Total Emissions from Water Delivery Trucks	1.86	0.21	0.19	0.07	0.68	0.00
Total Maximum Annual Operational Emissions	**25.10**	**4.29**	**29.14**	**3.92**	**4.43**	**0.02**
% Water Supply Emissions of Total Emissions	7.4%	5.0%	0.7%	1.8%	15.4%	0.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from the diesel generator, the gasoline tank, maintenance and security vehicles and equipment, worker vehicles, visitor cars and delivery trucks.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides.

Overlap of Construction and Operation Activities

The operation of individual groups of SunCatchers will begin as soon as the construction of each group is complete. As a result, it is anticipated that the first SunCatchers would be ready to operate and produce electricity in Month 8 of the construction schedule. It is anticipated that in the first month of operation, 18 MW of generation capacity would be available and that an additional 18 MW would be added every month through Month 18, after which 27 MW of capacity would begin to be added every month thereafter until construction completion in Month 40. Maximum short-term emissions during periods when project construction and operations would overlap would occur first in Month 8 because construction activities would

decline as more SunCatchers are brought online. The maximum annual (12-month) overlapping emissions would occur during Months 13 to 24 for PM_{10} and $PM_{2.5}$ and during Months 8 to 19 for all other criteria pollutants.

The estimated mitigated maximum daily and annual (12-month) emissions during the maximum construction/operation overlapping periods are shown in Tables 4-11 and 4-12, respectively. Table 4-12 shows that the maximum annual (12-month) overlapping construction/operation emissions are below the General Conformity Rule applicability thresholds for PM_{10} (70 tons) and O_3 precursors (NO_X [100 tons] and VOCs [100 tons]).

The first installed SunCatchers would be producing electricity as construction of additional SunCatchers is ongoing. The overlapping daily and annual emissions estimates that incorporate the additional water delivery by truck are summarized in Tables 4-13 through 4-15. The water truck trips would represent a small amount of the emissions during the overlapping construction and operations activities. As shown in those tables, the maximum overlapping annual emissions occur in months 8 through 19 for CO, VOC, NO_X, and SO_X; the maximum overlapping annual emissions occur in months 13 through 24 for PM_{10} and $PM_{2.5}$.

The other three applicant proposed modifications (transmission line, water line, and hydrogen storage) would result in construction/operation overlapping activities and air quality effects very similar to under the IVS project as originally proposed for those project components. Therefore, the overlapping construction/operation related air quality impacts of those three applicant proposed modifications would be the same as under the original IVS project.

Initial Commissioning

Initial commissioning refers to the period prior to beginning commercial operation when the equipment will be undergoing initial tests. For the IVS project, initial commission would occur throughout the construction period when each installed SunCatcher is tested prior to becoming operational. Because the IVS project will use a non-fuel-fired generating technology, major changes in emissions associated with the initial commissioning activities compared to normal operation are not anticipated.

Table 4-11 Maximum Daily Construction/Operation Overlapping Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOCs	PM_{10}	$PM_{2.5}$
On-site Construction Emissions						
On-site Construction Combustion Emissions	232.53	0.24	199.21	45.95	15.20	13.95
On-site Construction Fugitive Dust Emissions	--	--	--	--	194.84	29.09
Subtotal of On-site Construction Emissions	**232.53**	**0.24**	**199.21**	**45.95**	**210.04**	**43.05**
Off-site Construction Emissions						
Off-site Construction Combustion Emissions	317.51	0.64	567.20	99.49	17.25	16.09
Off-site Construction Fugitive Dust	--	--	--	--	107.00	10.51
Subtotal of Off-site Construction Emissions	**317.51**	**0.64**	**567.20**	**99.49**	**124.25**	**26.60**
Total Maximum Daily Construction Emissions	**550.05**	**0.88**	**766.41**	**145.44**	**333.33**	**69.65**
On-site Operation Emissions						
On-site Operation Combustion Emissions	1.21	0.02	2.71	0.37	0.02	0.02
On-site Operation Fugitive Dust Emissions	--	--	--	3.55	2.92	0.43
Subtotal of On-site Operation Emissions	**1.21**	**0.02**	**2.71**	**3.93**	**2.94**	**0.45**
Off-site Operation Emissions						
Off-site Operation Combustion Emissions	0.27	0.00	1.28	0.06	0.01	0.01
Off-site Operation Fugitive Dust	--	--	--	--	0.54	0.05
Subtotal of Off-site Operation Emissions	**0.27**	**0.00**	**1.28**	**0.06**	**0.56**	**0.06**
Total Maximum Hourly Operation Emissions	**1.47**	**0.02**	**3.99**	**3.98**	**3.50**	**0.50**
Construction/Operation Overlap Totals	**551.52**	**0.90**	**770.40**	**149.42**	**336.83**	**70.15**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SA/DEIS; SES 2009i, Table 5.2-27b).

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; SO_X = sulfur oxides; VOCs = volatile organic compounds.

Table 4-12 Maximum Annual Construction/Operation Overlapping Emissions (tons/yr)

Emissions	NO_X	SO_X	CO	VOCs	PM_{10}	$PM_{2.5}$
On-site Construction Emissions						
On-site Construction Combustion Emissions	30.43	0.03	31.49	6.50	1.45	1.33
On-site Construction Fugitive Dust Emissions	--	--	--	--	30.09	4.31
Subtotal of On-site Construction Emissions	**30.43**	**0.03**	**31.49**	**6.50**	**31.54**	**5.64**
Off-site Construction Emissions						
Off-site Construction Combustion Emissions	43.85	0.08	71.26	13.19	2.83	2.50
Off-site Construction Fugitive Dust	--	--	--	--	17.39	1.84
Subtotal of Off-site Construction Emissions	**43.85**	**0.08**	**71.26**	**13.19**	**20.22**	**4.34**
Total Maximum Hourly Construction Emissions	**74.29**	**0.11**	**102.75**	**19.69**	**51.75**	**9.98**
On-site Operation Emissions						
On-site Operation Combustion Emissions	0.41	0.00	3.10	0.40	0.01	0.01
On-site Operation Fugitive Dust Emissions	--	--	--	0.65	6.21	0.92
Subtotal of On-site Operation Emissions	**0.41**	**0.00**	**3.10**	**1.05**	**6.22**	**0.93**
Off-site Operation Emissions						
Off-site Operation Combustion Emissions	0.19	0.00	1.45	0.06	0.02	0.01
Off-site Operation Fugitive Dust	--	--	--	--	0.66	0.03
Subtotal of Off-site Operation Emissions	**0.19**	**0.00**	**1.45**	**0.06**	**0.68**	**0.04**
Total Maximum Hourly Operation Emissions	**0.61**	**0.00**	**4.55**	**1.11**	**6.90**	**0.97**
Construction/Operation Overlap Totals	**74.90**	**0.12**	**107.29**	**20.80**	**58.66**	**10.95**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SA/DEIS; SES 2009i, Table 5.2-27c).

Table Key: CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; SO_X = sulfur oxides; tons/yr = tons per year; VOCs = volatile organic compounds.

Table 4-13 Estimated Maximum Daily Construction and Operations Overlapping Emissions for Month 8 (lbs/day)

Maximum Daily Construction and Operations Overlapping Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	326.25	58.6	411.91	64.30	381.01	0.50
Total Emissions from Water Delivery Trucks	19.41	3.10	2.04	0.72	7.13	0.01
Total Maximum Daily Overlapping Emissions	**345.66**	**61.70**	**413.95**	**65.02**	**388.14**	**0.51**
% Water Supply Emissions of Total Emissions	5.6%	5.0%	0.5%	1.1%	1.8%	2.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, the diesel generator, the gasoline tank, maintenance and security vehicles and equipment, visitor cars, delivery trucks and SunCatcher delivery trucks.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides.

Table 4-14 Estimated Maximum Annual Construction and Operations Overlapping Emissions for Months 8 through 19 (tons/day)

Maximum Annual Construction and Operations Overlapping Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	52.224	9.156	67.869	10.361	55.244	0.07
Total Emissions from Water Delivery Trucks	3.726	0.584	0.391	0.139	1.376	0.00
Total Maximum Annual Overlapping Emissions	**55.95**	**9.74**	**68.26**	**10.05**	**56.62**	**0.07**
% Water Supply Emissions of Total Emissions	6.7%	6.0%	0.6%	1.4%	2.4%	0.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, the diesel generator, the gasoline tank, maintenance and security vehicles and equipment, visitor cars, delivery trucks and SunCatcher delivery trucks.

Table Key: CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides; tons/day = tons per day.

Table 4-15 Estimated Maximum Annual Construction and Operations Overlapping Emissions for Months 13 through 24 (tons/yr)

Maximum Annual Construction and Operations Overlapping Emissions	PM_{10}	$PM_{2.5}$	CO	ROC	NO_X	SO_X
Total of Other Source Emissions	56.814	9.486	62.319	8.331	50.664	0.07
Total Emissions from Water Delivery Trucks	3.986	0.614	0.421	0.149	1.466	0.00
Total Maximum Annual Overlapping Emissions	**60.80**	**10.10**	**62.74**	**8.48**	**52.13**	**0.07**
% Water Supply Emissions of Total Emissions	6.6%	6.1%	0.7%	1.8%	2.8%	0.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, the diesel generator, the gasoline tank, maintenance and security vehicles and equipment, visitor cars, delivery trucks and SunCatcher delivery trucks.

Table Key: CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ROC = reactive organic compounds; SO_X = sulfur oxides; tons/yr = tons per year.

Dispersion Modeling Assessment

Emissions are the actual mass of pollutants emitted from a proposed project; however, the impacts from a proposed project are the concentration of pollutants that reach the ground level. When emissions are expelled at a high temperature and velocity through a relatively tall stack, the pollutants are greatly diluted by the time they reach ground level. For the IVS project, there are no tall emission stacks; however, the construction and maintenance vehicles and emergency engine do have high-temperature exhausts. The emissions from the IVS project, both stationary source and on-site mobile source emissions, were analyzed through the use of air dispersion models to determine the probable impacts at ground level.

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations that are repeatedly calculated by a computer for multiple ambient conditions to derive theoretical maximum off-site pollutant concentrations for short-term (1-hour, 3-hour, 8-hour, and 24-hour) and annual periods. The model results are generally described as maximum concentrations and often as a unit of mass per volume of air (e.g., $\mu g/m^3$).

The United States Environmental Protection Agency (EPA) guideline American Meteorological Society (AMS)/EPA Regulatory Model (AERMOD) was used to estimate ambient impacts from construction and operation of the IVS project. The construction emission sources for the site were grouped into two categories: equipment (off-road equipment); and vehicles (on-road equipment), where the exhaust and fugitive dust emissions for each type were calculated for

particulate matter modeling. Emissions from onsite equipment engines were modeled as point sources and fugitive emission sources were modeled as area sources. Similar modeling procedures were used to determine impacts from the operating stationary source (emergency engine) and the maintenance vehicle exhaust and fugitive dust emissions.

The inputs for typical air dispersion models include stack information (exhaust flow rate, temperature, and stack dimensions), specific engine and vehicle emission data, and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For the IVS project, the meteorological data used as inputs to the model included hourly wind speeds and directions measured at the Imperial County Airport meteorological station from 1991 to 1995.

For the determination of one-hour average and annual average construction NO_x concentrations the Ozone Limiting Method (OLM) was used to determine worst-case near field NO_2 impacts. The NO_x emissions from internal combustion sources, such as diesel engines, are primarily in the form of nitric oxide (NO) rather than NO_2. The NO converts into NO_2 in the atmosphere, primarily through the reaction with ambient O_3, and NO_x OLM assumes full conversion of stack or tailpipe NO emission with the available ambient O_3. The NOx OLM method used assumed an initial NO_2/NO_x ratio of 0.1 for diesel equipment. Actual monitored hourly background O_3 concentration data (for the 1991 to 1995 El Centro 9th Street monitoring station data that correspond with the meteorological files) were used to calculate maximum potential NO to NO_2 conversion to determine the maximum hourly NO_2 impacts.

The findings of the dispersion analysis for the IVS project short-term direct construction and operation air quality impacts are discussed below.

Construction Impacts

Using estimated peak hourly, daily, and annual construction equipment exhaust emissions, the IVS project construction emissions were modeled. To determine the construction impacts on ambient standards (i.e. 1-hour through annual) the on-site off-road construction equipment tailpipe emissions were modeled assuming that the emissions would occur during a daily construction schedule of 6 am to 7 pm, and the onsite facility security, material delivery, and fugitive dust emissions were modeled evenly throughout all hours of the day. The predicted IVS project emission concentration levels were added to a conservatively estimated background of existing emission concentration levels to determine the cumulative impact resulting from the combination of the cumulative projects described in Section 2.10, Overview of the Cumulative Impacts Analysis, and the IVS project. The results of that modeling analysis are presented in Table 4-16. The construction modeling analysis includes both the onsite fugitive dust and

vehicle tailpipe emission sources, which include the control measures incorporated in the IVS project which were listed above.

Table 4-16 Maximum Construction Impacts

Pollutants	Average Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	88.94	152.6	241.5	339	71%
NO_2	Annual	1.25	20.9	22.2	57	39%
CO	1-hour	78.32	3,565	3,643	23,000	16%
CO	8-hour	20.60	2,878	2,899	10,000	29%
PM_{10}	24-hour	31.37	146	177.4	50	355%
PM_{10}	Annual	6.11	47.5	53.6	20	268%
$PM_{2.5}$	24-hour	4.76	27.1	31.9	35	91%
$PM_{2.5}$	Annual	0.91	8.8	9.7	12	81%
SO_2	1-hour	0.09	47.2	47.3	665	7%
SO_2	3-hour	0.04	42.4	42.4	1,300	3%
SO_2	24-hour	0.01	18.4	18.4	105	18%
SO_2	Annual	0.001	2.7	2.7	80	3%

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009i, Table 5.2-29 revised).

Table Key: $\mu g/m^3$ = micrograms per cubic meter; CO = carbon monoxide; IVS = Imperial Valley Solar; NO_2 = nitrogen dioxide; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_2 = sulfur dioxide.

The modeling analysis shows that, after implementation of the measures included in the IVS project, the construction of the IVS project is not predicted to cause new exceedances of the Federal AAQSs for attainment pollutants; however, the SSAB already exceeds the Federal AAQSs for PM_{10}. It should be noted that the modeled maximum PM_{10} concentrations shown in Table 4-16 would almost certainly occur during days with low average wind speeds and not correspond to the high wind speed days assumed to cause the maximum background concentration. As such, the construction emissions of the IVS project were determined to be below the General Conformity Rule applicability thresholds for the Federal nonattainment pollutants at the project site, PM_{10} and O_3. Therefore, no adverse impacts under NEPA would occur after implementation of the measures included in the IVS project.

Operation Modeling Analysis

The impacts of the NO_X, PM_{10}, CO, and SO_X emissions resulting from operation of the IVS project were modeled and analyzed using the AERMOD model. The maintenance and stationary source emissions were modeled using the emissions data in Tables 4-7 and 4-8. The emergency diesel generator is the only stationary emission source modeled. Unlike traditional

fossil fueled power plants, most operating emissions from the IVS project would occur from maintenance activities which require the use of mobile emissions sources. Similar to the assessment of construction impacts, the modeled impacts were added to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations to assess the potential operation related air quality impacts of the IVS project. Table 4-17 presents the results of that modeling analysis.

Table 4-17 Operation Emission Impacts

Pollutants	Average Period	Project Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	69.18	152.6	221.8	339	65%
NO_2	Annual	0.23	20.9	21.1	57	37%
CO	1-hour	217.77	3,565	3783	23000	16%
CO	8-hour	64.48	2,878	2942	10000	29%
PM_{10}	24-hour	5.45	146	151.5	50	303%
PM_{10}	Annual	0.96	47.5	48.5	20	242%
$PM_{2.5}$	24-hour	0.77	27.1	27.9	35	80%
$PM_{2.5}$	Annual	0.14	8.8	8.9	12	75%
SO_2	1-hour	1.42	47.2	48.6	665	7%
SO_2	3-hour	0.85	42.4	43.3	1300	3%
SO_2	24-hour	0.18	18.4	18.6	105	18%
SO_2	Annual	0.0004	2.7	2.7	80	3%

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009i, Table 5.2-30a).

Table Key: $\mu g/m^3$ = micrograms per cubic meter; CO = carbon monoxide; IVS = Imperial Valley Solar; NO_2 = nitrogen dioxide; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_2 = sulfur dioxide.

The modeling analysis shows that, after implementation of the measures included in the IVS project, operation of the IVS project is not predicted to cause new exceedances of the Federal AAQSs for attainment pollutants, but, as noted above, the SSAB already exceeds the Federal AAQSs for PM_{10}. As also noted above, the modeled maximum PM_{10} concentrations in Table 4-17 would almost certainly occur during days with low average wind speeds and not correspond to the high wind speed days assumed to cause the maximum background concentration. As such, the operating emissions of the IVS project were determined to be well below the General Conformity Rule applicability thresholds for the Federal nonattainment pollutants at the project site, PM_{10} and O_3. Therefore, no adverse impacts under NEPA would occur after implementation of the measures included in the IVS project.

Construction/Operation Overlapping Impacts

The analysis of the potential emissions during the period when construction and operation would overlap, summarized in Tables 4-11 and 4-12, indicates that the mitigated construction/operation overlapping emissions would be no higher than those determined for the worst-case project construction period. Therefore, as was determined for project construction, no adverse impacts under NEPA would occur after implementation of the construction and operation measures included in the IVS project.

Indirect Pollutant and Secondary Pollutant Impacts

The IVS project would result in direct emissions of chemically reactive pollutants (NO_x, SO_x, and VOC), but would also have indirect emission reductions associated with the reduction of fossil-fuel fired power plant emissions because the IVS project would reduce or displace the need for their operation. The exact nature and location of such reductions is not known and most would occur outside of the SSAB; however, it is reasonable to assume that some of those reductions would occur in the SSAB because the electricity supplied by this proposed project would be partially directed to Imperial Irrigation District transmission lines, or SDG&E transmission lines from the neighboring upwind San Diego Air Basin. However, the overall magnitude of the local emission reductions or the downwind impact of the upwind emission reductions is speculative, so the discussion below focuses solely on the direct emissions from the IVS project in Imperial County.

Ozone

There are no regulatory agency models approved for assessing single source O_3 impacts. However, because of the known relationship of NO_x and VOC emissions to O_3 formation, it can be said that the emissions of NO_x and VOC from the IVS project have the potential (if left unmitigated) to contribute to higher O_3 levels in the region.

$PM_{2.5}$ Impacts

Secondary particulate (i.e., $PM_{2.5}$) formation is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of specific reactive air pollutants. The basic process assumes that SO_x and NO_x emissions are converted into sulfuric acid and nitric acid first, and these react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate

phase will tend to fall out; however, the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. There are two conditions that are of interest, described as *ammonia rich* and *ammonia poor*. Ammonia rich indicates that there is more than enough ammonia to react with all the sulfuric acid and to establish a balance of nitric acid-ammonium nitrate. Further ammonia emissions in this case would not necessarily lead to increases in ambient $PM_{2.5}$ concentrations. In the case of an ammonia poor environment, there is insufficient ammonia to establish a balance and thus additional ammonia would tend to increase $PM_{2.5}$ concentrations.

The Imperial County part of the Salton Sea Air Basin has extensive agricultural and cattle feedlot activity and is considered ammonia rich. The available chemical characterization data shows that the $PM_{2.5}$ concentrations in Calexico, which could be severely impacted by pollutant transport from Mexicali, are primarily combustion particulate and fugitive dust. The ammonium nitrate and ammonium sulfate fine particulate concentrations in Calexico in 2002 and 2003 comprised 23 percent of the $PM_{2.5}$. Because of the known relationship of NO_x and SO_x emissions to $PM_{2.5}$ formation and the known availability of ammonia in this ammonia rich area, it can be said that the emissions of NO_x and SO_x from the IVS project have the potential (if left unmitigated) to contribute to higher $PM_{2.5}$ levels in the region; however, the region is in attainment with $PM_{2.5}$ standards and the low level of NO_x and SO_x emissions from the IVS project are not expected to impact that status.

Conformity Analysis

The IVS project is located in a Federal nonattainment area and requires the approval of the United States Bureau of Land Management, a Federal agency. Therefore, the IVS project is subject to the general conformity regulations (40 CFR Part 93). The project area is classified as serious nonattainment of the Federal PM_{10} AAQSs and moderate nonattainment of the Federal O_3 AAQSs, and the general conformity emissions applicability thresholds for these nonattainment classifications is 100 tons/year of direct and indirect O_3 precursor emissions (NO_x and VOC), 70 tons/year of direct and indirect PM_{10} emissions, and 70 tons/year of direct and indirect PM_{10} precursors identified as major PM_{10} contributors in the SIP. The currently applicable PM_{10} SIP does not identify secondary pollutants (NO_x, SO_x, and VOC) as major contributors to ambient PM_{10} concentrations and focuses on fugitive dust emissions from agricultural activities, unpaved roads, and other sources.

Without appropriate mitigation, the proposed project's maximum annual direct and indirect emissions of PM_{10} during construction and operation would have the potential to exceed 70 tons per year, and the NO_x emissions during construction would have the potential to exceed 100

tons per year. However, with the measures included in the IVS project, the PM_{10}, NO_x, and VOC emissions during construction and operation would all be below the General Conformity applicability thresholds, as shown in Tables 4-4, 4-8, and 4-12. Therefore, because the mitigated emissions of the IVS project were determined to be below the applicable General Conformity Rule applicability thresholds, the IVS project is not required to complete a conformity analysis, and conformance with the SIP is assumed.

The Imperial County Air Pollution Control District (ICAPCD) issued a Preliminary Determination of Compliance (PDOC) for the IVS project on August 20, 2009 and after a 30-day comment period that ended on September 24, 2009, issued a Final Determination of Compliance on October 14, 2009. Compliance with all ICAPCD rules and regulations was demonstrated to the ICAPCD's satisfaction in the Final Determination of Compliance (FDOC). The ICAPCD's FDOC conditions are provided in the project mitigation measures provided later in this section.

The ICAPCD is responsible for issuing Federal New Source Review (NSR) permits and has been delegated enforcement of the applicable New Source Performance Standard (Subpart IIII). However, the IVS project will not require a Federal NSR or Title V permit and would not require a PSD permit from EPA prior to the initiation of construction.

Impact Summary for the IVS Project (750 MW Alternative)

The IVS project includes measures that would reduce the project's stationary source NO_x, VOC, SO_2, PM_{10}, and $PM_{2.5}$ emissions through the use of Best Available Control Technology (BACT), minimizing delivery and employee trips, and reducing mobile source emissions by using lower emitting gasoline and propane fueled new vehicles. With the inclusion of these measures and compliance with the ICAPCD measures provided later in this section, the IVS project would not result in adverse air quality impacts.

4.2.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative would result in short- and long-term air quality impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the air quality effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project. The short- and long-term air quality impacts of the four applicant-proposed modifications would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and

operation activities similar to the IVS project relative to the four proposed modifications. The measures described in the following section to address adverse short- and long-term air quality impacts of the IVS project would also apply to the Agency Preferred Alternative.

4.2.4.3 300 MW Alternative

The maximum daily and annual construction emissions for the 300 MW Alternative are not expected to differ from the IVS project, but the total duration of construction and total construction period emissions would be reduced because the 300 MW Alternative would not require 40 months to construct. Therefore, the worst-case daily and annual construction emissions and construction pollutant concentration impacts for this alternative would be the same as for the IVS project as shown in Tables 4-3, 4-4, and 4-16.

The maximum daily and annual operation emissions for the 300 MW Alternative are expected to be less than under the IVS project due to its smaller size. Therefore, the worst-case daily and annual operation pollutant concentration impacts for the 300 MW Alternative would be less than those shown previously in Table 4-17 for the IVS project. However, the amount of the emissions and pollutant concentration reductions would not be quite proportional to the decrease in project size due a reduction in economy of scale and requirements for certain activities/emission sources that do not scale down or scale down proportionately with changes in the size of the project.

The estimated onsite stationary and onsite and offsite mobile source emissions for the 300 MW Alternative, using the same emission control assumptions as for the IVS project, are summarized in Tables 4-18 and 4-19.

Tables 4-18 and 4-19 indicate that the maximum daily operation emissions from the 300 MW Alternative would range from approximately 45 to 80 percent of the emissions of the IVS project, and the maximum annual operation emissions would range from approximately 43 to 51 percent of the emissions of the IVS project. Table 4-19 also shows that the maximum annual operation emissions from the 300 MW Alternative would remain well below the General Conformity Rule applicability thresholds for PM10 (70 tons) and O3 precursors, (NO_x [100 tons] and VOC [100 tons]).

Table 4-18 300 MW Alternative Maximum Daily Operations Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	8.10	0.047	48.89	6.02	0.17	0.15
On-site Gasoline Tank Emissions	--	--	--	31.78 (Table Note 1)	--	--
On-site Fugitive Dust Emissions	--	--	--	--	53.72	7.92
Subtotal of On-site Emissions	**8.10**	**0.04**	**46.89**	**37.80**	**53.89**	**8.07**
Off-site Emissions						
Off-site Combustion Emissions	8.42	0.02	29.48	1.35	0.34	0.23
Off-site Fugitive Dust Emissions	--	--	--	--	17.79	1.90
Subtotal of Off-site Emissions	**8.42**	**0.02**	**29.48**	**1.35**	**18.13**	**2.14**
Total Maximum Daily Emissions	**16.52**	**0.07**	**76.37**	**39.15**	**72.01**	**10.21**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009n, DR 133, Table DR 133a).

Table Note 1: Assumes one 4,000-gallon gasoline delivery and 500 gallons of vehicle refueling during a worst-case day.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; MW = megawatt; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; VOC = volatile organic compounds.

Table 4-19 300 MW Alternative Maximum Annual Operations Emissions (tons/yr)

	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	1.17	0.00	8.34	1.05	0.02	0.02
On-site Gasoline Tank Emissions	--	--	--	0.71	--	--
On-site Fugitive Dust Emissions	--	--	--	--	8.66	1.27
Subtotal of On-site Emissions	**1.17**	**0.00**	**8.34**	**1.76**	**8.68**	**1.29**
Off-site Emissions						
Off-site Combustion Emissions	0.73	0.00	4.93	0.20	0.03	0.02
Off-site Fugitive Dust Emissions	--	--	--	--	1.35	0.08
Subtotal of Off-site Emissions	**0.73**	**0.01**	**4.93**	**0.20**	**1.39**	**0.10**
Total Maximum Annual Emissions	**1.90**	**0.01**	**13.27**	**1.96**	**10.06**	**1.39**

Table Source: Staff Assessment/Draft Environmental Impact Statement (SES 2009n, DR 133, Table DR 133b).

Table Key: CO = carbon monoxide; MW = megawatt; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; tons/yr = tons per year; VOC = volatile organic compounds.

The short- and long-term air quality impacts of the four applicant proposed modifications would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to the four proposed modifications.

In summary, the air quality impacts of the 300 MW Alternative would be:

- The worst-case daily construction emissions and ground level pollutant concentration impacts would be the same as the IVS project and would require the same level of mitigation. The total construction period and total construction emissions and long-term ground level pollutant concentration impacts would be reduced for the 300 MW Alternative compared to the IVS project.

- The benefits of the IVS project in displacing fossil fuel fired generation and reducing associated, but mainly out of air basin, criteria pollutant emissions would be slightly reduced under the 300 MW Alternative.

- The impacts of the IVS project would not occur on the part of the total site not used for the 300 MW Alternative. The part of the total site not used for the 300 MW Alternative would become available for other uses that are consistent with BLM's land use plan.

If the 300 MW Alternative were approved, other renewable projects would likely be developed on other sites in the in Imperial County, the Mojave Desert, or in adjacent states to fill the 450 MW gap not supplied by the IVS project as developers strive to provide renewable power that complies with utility requirements and State and Federal mandates. For example, there are two large wind projects proposed on BLM land within a few miles of the IVS project site in addition to large wind projects proposed in Mexico, south of the project site. In addition, there are seven large solar projects proposed on BLM land in the area served by the BLM El Centro Field Office. There are currently 70 applications for solar projects covering 611,692 ac in the California Desert District pending with BLM. Those types of renewable energy projects could have similar air quality impacts to the IVS project, in other locations.

4.2.4.4 Drainage Avoidance #1 Alternative

The maximum daily and annual construction emissions under the Drainage Avoidance #1 Alternative are not expected to differ from the IVS project, but the total duration of construction and total construction period emissions would be reduced because the Drainage Avoidance #1 Alternative would not require 40 months to construct. Therefore, the worst-case daily and

annual construction emissions and construction pollutant concentration impacts for the Drainage Avoidance #1 Alternative would be the same as shown in Tables 4-3, 4-4, and 4-16 for the IVS project.

The maximum daily and annual operation emissions under the Drainage Avoidance #1 Alternative are expected to decrease compared to the IVS project due to the smaller number of operational components. Therefore, the worst-case daily and annual operation pollutant concentration impacts for the Drainage Avoidance #1 Alternative would be less than those shown in Table 4-17 for the IVS project. However, the amount of the emissions and pollutant concentration reduction under the Drainage Avoidance #1 Alternative will not be quite proportional to the decrease in project size due a reduction in economy of scale and requirements for certain activities/emission sources that do not scale down or scale down proportionately with project site.

The estimated emissions for the Drainage Avoidance #1 Alternative are summarized in Tables 4-20 and 4-21.

Table 4-20 Drainage Avoidance #1 Alternative Maximum Daily Operations Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	13.62	0.06	94.12	12.22	0.26	0.22
On-site Gasoline Tank Emissions	--	--	--	31.78 (Table Note 1)	--	--
On-site Fugitive Dust Emissions	--	--	--	--	103.95	15.34
Subtotal of On-site Emissions	**13.62**	**0.06**	**94.12**	**44.00**	**104.21**	**15.57**
Off-site Emissions						
Off-site Combustion Emissions	10.48	0.03	47.02	2.05	0.44	0.28
Off-site Fugitive Dust Emissions	--	--	--	--	21.38	2.00
Subtotal of Off-site Emissions	**10.48**	**0.03**	**47.02**	**2.05**	**21.82**	**2.28**
Total Maximum Daily Emissions	**24.10**	**0.10**	**141.14**	**46.05**	**126.03**	**17.85**

Table Source: Staff Assessment/Draft Environmental Impact Statement, CEC interpolation of the applicant's emission data supplied for the IVS project (SES 2009i) and the 300 MW Alternative (SES 2009n, DR 133, Table DR 133a).

Table Note 1: Assumes one 4,000-gallon gasoline delivery and 500 gallons of vehicle refueling during a worst-case day.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; MW = megawatts; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; VOC = volatile organic compounds.

Table 4-21 Drainage Avoidance #1 Alternative Maximum Annual Emissions (tons/yr)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	2.17	0.01	16.74	2.16	0.03	0.03
On-site Gasoline Tank Emissions	--	--	--	0.86	--	--
On-site Fugitive Dust Emissions	--	--	--	--	17.70	2.61
Subtotal of On-site Emissions	**2.17**	**0.01**	**16.74**	**3.03**	**17.73**	**2.65**
Off-site Emissions						
Off-site Combustion Emissions	1.10	0.01	8.09	0.33	0.05	0.03
Off-site Fugitive Dust Emissions	--	--	--	--	2.00	0.09
Subtotal of Off-site Emissions	**1.10**	**0.01**	**8.09**	**0.33**	**2.05**	**0.12**
Total Maximum Annual Emissions	**3.26**	**0.01**	**24.83**	**3.35**	**19.78**	**2.77**

Table Source: Staff Assessment/Draft Environmental Impact Statement, CEC interpolation of the applicant's emission data supplied for the IVS project (SES 2009i) and the 300 MW Alternative (SES 2009n, DR 133, Table DR 133a).

Table Key: CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; tons/yr = tons per year; VOC = volatile organic compounds.

Tables 4-20 and 4-21 indicate that the operation emissions from the Drainage Avoidance #1 Alternative would range from approximately 86 to 95 percent of the maximum daily emissions of the IVS project and would range from approximately 85 to 87 percent of the maximum annual emissions of the IVS project.

Table 4-21 also shows that the maximum annual operation emissions from the Drainage Avoidance #1 Alternative would remain well below the General Conformity Rule applicability thresholds for PM_{10} (70 tons) and O_3 precursors, (NO_x [100 tons] and VOC [100 tons]).

The short- and long-term air quality impacts of the four applicant proposed modifications would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to the four proposed modifications.

In summary, the air quality impacts of the Drainage Avoidance #1 Alternative would be:

- The worst-case daily construction emissions and ground level pollutant concentration impacts under the Drainage Avoidance #1 Alternative would be the same as the IVS project and would require the same level of mitigation. The total construction period and total construction emissions and long-term ground level pollutant concentration impacts under the Drainage Avoidance #1 Alternative would be reduced from those under the IVS project.

- The benefits of the IVS project in displacing fossil fuel fired generation and reducing associated, but mainly out of air basin, criteria pollutant emissions would be slightly reduced under the Drainage Avoidance #1 Alternative.
- The impacts of the IVS project would still occur across the entire proposed project site under the Drainage Avoidance #1 Alternative, but in a less dense configuration due to avoidance of primary drainages.

If the Drainage Avoidance #1 Alternative were to be approved, other renewable projects may be developed on other sites in the in Imperial County, the Mojave Desert, or in adjacent states as described earlier to fill the 118 MW gap not supplied by the IVS project as developers strive to provide renewable power that complies with utility requirements and State and Federal mandates. Those types of renewable energy projects could have similar air quality impacts to the IVS project, in other locations.

4.2.4.5 Drainage Avoidance #2 Alternative

The maximum daily and annual construction emissions under the Drainage Avoidance #2 Alternative are not expected to change from the IVS project, but the total duration of construction and total construction period emissions would be reduced because the Drainage Avoidance #2 Alternative would not require 40 months to construct. Therefore, the worst-case daily and annual construction emissions and construction pollutant concentration impacts for the Drainage Avoidance #2 Alternative would be identical those shown in Tables 4-3, 4-4, and 4-16 for the IVS project.

The maximum daily and annual operation emissions under the Drainage Avoidance #2 Alternative are expected to decrease compared to the IVS project due to its smaller number of operational components. Therefore, the worst-case daily and annual operation pollutant concentration impacts for the Drainage Avoidance #2 Alternative would be less than those shown in Table 4-17 for the IVS project. However, the amount of the emissions and pollutant concentration reduction under the Drainage Avoidance #2 Alternative will not be quite proportional to the decrease in project size due a reduction in economy of scale and requirements for certain activities/emission sources that do not scale down or scale down proportionately with project site.

The operating emissions estimates for the Drainage Avoidance #2 Alternative are summarized in Tables 4-22 and 4-23.

Table 4-22 Drainage Avoidance #2 Alternative Maximum Daily Operations Emissions (lbs/day)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	10.14	0.05	65.65	8.32	0.20	0.18
On-site Gasoline Tank Emissions	--	--	--	31.78 (Table Note 1)	--	--
On-site Fugitive Dust Emissions	--	--	--	--	72.33	10.67
Subtotal of On-site Emissions	**10.14**	**0.05**	**65.65**	**40.10**	**72.53**	**10.85**
Off-site Emissions						
Off-site Combustion Emissions	8.42	0.02	29.48	1.35	0.34	0.23
Off-site Fugitive Dust Emissions	--	--	--	--	17.79	1.9
Subtotal of Off-site Emissions	**8.42**	**0.02**	**29.48**	**1.35**	**18.13**	**2.13**
Total Maximum Daily Emissions	**18.56**	**0.07**	**95.13**	**41.45**	**90.66**	**12.98**

Table Source: Staff Assessment/Draft Environmental Impact Statement, CEC interpolation of the applicant's emission data supplied for the proposed project (SES 2009i) and 300 MW Alternative (SES 2009n, DR 133, Table DR 133a).

Table Note 1: Assumes one 4,000-gallon gasoline delivery and 500 gallons of vehicle refueling during a worst-case day.

Table Key: CO = carbon monoxide; lbs/day = pounds per day; MW = megawatts; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; VOC = volatile organic compounds.

Table 4-23 Drainage Avoidance #2 Alternative Maximum Annual Operations Emissions (tons/yr)

Emissions	NO_X	SO_X	CO	VOC	PM_{10}	$PM_{2.5}$
On-site Operation Emissions						
On-site Combustion Emissions	1.54	0.00	11.45	1.46	0.03	0.03
On-site Gasoline Tank Emissions	--	--	--	0.77	--	--
On-site Fugitive Dust Emissions	--	--	--	--	12.01	1.77
Subtotal of On-site Emissions	**1.54**	**0.00**	**11.45**	**2.23**	**12.03**	**1.79**
Off-site Emissions						
Off-site Combustion Emissions	0.87	0.00	6.10	0.25	0.04	0.02
Off-site Fugitive Dust Emissions	--	--	--	--	1.59	0.09
Subtotal of Off-site Emissions	**0.87**	**0.00**	**6.10**	**0.25**	**1.63**	**0.11**
Total Maximum Annual Emissions	**2.41**	**0.01**	**17.55**	**2.48**	**13.66**	**1.90**

Table Source: Staff Assessment/Draft Environmental Impact Statement, CEC interpolation of the applicant's emission data supplied for the proposed project (SES 2009i) and 300 MW Alternative (SES 2009n, DR 133, Table DR 133a).

Table Key: CO = carbon monoxide; MW = megawatts; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in size; $PM_{2.5}$ = particulate matter less than 2.5 microns in size; SO_X = oxides of sulfur; tons/yr = tons per year; VOC = volatile organic compounds.

Tables 4-22 and 4-23 indicate that the operation emissions from the Drainage Avoidance #2 Alternative would vary from approximately 58 to 85 percent of the maximum daily emissions of the IVS project, and would vary approximately 58 to 64 percent of the maximum annual emissions of the IVS project. Table 4-23 also shows that the maximum annual operation emissions from the Drainage Avoidance #2 Alternative would remain well below the General Conformity Rule applicability thresholds for PM_{10} (70 tons) and O_3 precursors, (NO_x [100 tons] and VOC [100 tons]).

The short- and long-term air quality impacts of the four applicant proposed modifications would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to the four proposed modifications.

In summary, the air quality impacts of the Drainage Avoidance #2 Alternative would be:

- The worst-case daily construction emissions and ground level pollutant concentration impacts under the Drainage Avoidance #2 Alternative would be the same as for the IVS project and would require the same level of mitigation. The total construction period and total construction emissions and long-term ground level pollutant concentration impacts under the Drainage Avoidance #2 Alternative would be reduced from those required to construct the IVS project.

- The benefits of the IVS project in displacing fossil fuel fired generation and reducing associated, but mainly out of air basin, criteria pollutant emissions would be reduced under the Drainage Avoidance #2 Alternative.

- The impacts of the IVS project would not occur on the part of the total site not used for the Drainage Avoidance #2 Alternative. The part of the total site not used for the Drainage Avoidance #2 Alternative would become available for other uses that are consistent with BLM's land use plan.

If the Drainage Avoidance #2 Alternative were to be approved, other renewable projects may be developed on other sites in Imperial County, the Mojave Desert, or in adjacent states as described earlier to fill the 327 MW gap not supplied by the IVS project as developers strive to provide renewable power that complies with utility requirements and State and Federal mandates. Those types of renewable energy projects could have similar air quality impacts to the IVS project in other locations.

4.2.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the IVS project would not be approved by the BLM and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation for the site in the CDCA Plan.

In summary, the potential air quality impacts of this No Action Alternative would be:

- The impacts of the IVS project would not occur. However, the land on which the project is proposed would become available to other uses that are consistent with BLM's land use plan.
- The benefits of the IVS project in reducing fossil fuel use and greenhouse gas emissions from gas-fired generation would not occur under this No Action Alternative.

If the IVS project is not approved, other renewable projects would likely be developed on other sites in Imperial County, the Mojave Desert, or in adjacent states as described earlier as developers strive to provide renewable power that complies with utility requirements and State and Federal mandates. Those types of renewable energy projects could have similar air quality impacts to the IVS project, in other locations.

4.2.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the project site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation for the project site in the CDCA Plan.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the air quality on the site is not expected to change noticeably from existing conditions and, as such, this No Action Alternative would not result in the air quality impacts that would occur under the IVS project and it would also not result in the air quality benefits from the IVS project. However, other renewable energy projects, as described earlier, could be constructed under this No

Action Alternative to meet State and Federal mandates. Those types of renewable energy projects could have similar air quality impacts to the IVS project, in other locations.

4.2.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the IVS project would not be approved by the BLM and BLM would amend the CDCA Plan to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site. As a result, air pollutant emissions and impacts would result from the construction and operation of the solar technology on the project site under this No Action Alternative, similar to the air quality impacts from the IVS project. Different solar technologies require different levels of construction and operations maintenance; however, the benefits of the IVS project in displacing fossil fuel fired generation and reducing associated pollutant emissions could occur with a different solar technology at this site under this No Action Alternative. As such, this No Action Alternative could result in air quality impacts and benefits similar to the impacts under the IVS project.

4.2.5 Cumulative Impacts

Cumulative effects are defined in the CEQ NEPA regulations as "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7).

This analysis is concerned with criteria air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Although possible, rarely would an individual project alone cause a violation of a Federal or state criteria pollutant AAQS. However, a new source of pollution may contribute to violations of criteria pollutant AAQSs because of existing background sources or foreseeable future projects. Air districts attempt to attain the criteria pollutant AAQSs by adopting attainment plans, which comprise a multi-faceted programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for air offsets and the use of Best Available Control Technology (BACT) for new sources of emissions, and restrictions of emissions from existing sources of air pollution.

As a result, most of the preceding impacts discussion reflects cumulative impacts with the IVS project or the other project alternatives. For example, the "Construction Impacts" subsection discusses the IVS project contribution to the local existing background air quality during project construction and the "Operation Impacts" subsection discusses the IVS project contribution to

the local existing background air quality during project operations. The following subsection provides two additional analyses related to cumulative impacts:

(1) A summary of projections for criteria pollutants by the ICAPCD and the ICAPCD programmatic efforts to abate such pollution; and

(2) Analysis of the IVS project's localized cumulative impacts and the IVS project's direct operating emissions combined with other local major emission sources.

Imperial County is designated as non-attainment for the Federal and State O_3 and PM_{10} AAQSs. All other criteria pollutants (NO_2, and SO_2, and $PM_{2.5}$) are considered to be in attainment of the State AAQSs, and in attainment and/or unclassified for the Federal AAQSs.

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for air quality are discussed in detail in Section 2.10, Cumulative Impacts Analysis.

4.2.5.1 Ozone

The current Federally approved O_3 plan for Imperial County is the *1991 Air Quality Attainment Plan*. This plan includes recommendations for measures to control stationary source and mobile source reactive organic gases (ROG) and NO_x emissions. Measures applicable to the IVS project include additional NO_x control for internal combustion engines (ICEs). The IVS project equipment would comply with the measures listed in the 1991 plan.

Imperial County failed to meet Federal attainment for the 8-hour O_3 Federal; AAQS, and was formally reclassified as moderate nonattainment of the Federal 8-hour O_3 standard in 2008. On September 23, 2009, the EPA proposed that Imperial County be approved as attainment of the 1997 Federal 8-hour O_3 AAQS. The State has proposed that Imperial County be designated non-attainment for the revised 2008 Federal 8-hour O_3 AAQS, but that standard is now being reconsidered by the EPA. So, at this time it is unclear if completion of the 8-hour O_3 attainment planning efforts by Imperial County are required, or if an O_3 attainment maintenance plan will be required instead. Imperial County is currently required to develop an 8-hour attainment plan and is in the process of completing this plan. The most recent interim draft O_3 plan contains control measures or strategies for the reduction of NO_x and ROG emissions from stationary and mobile sources. The only measures potentially applicable to the IVS project would include transportation control measures to reduce trips to and from the site; including carpool/vanpool measures, and facility design measures to enable the use of public transportation and reduce trips to and from the site during shift changes and lunch. The IVS project includes several transportation control measures including vanpools and the use of low emission electric-hybrid

vehicles, as appropriate. Because the measures in the interim draft ozone plan are not currently approved or directly applicable, the IVS project may be required to include additional emission control measures during the life of the project order to comply with new ICAPCD rules, if any are enacted as part of the revised 8-hour O_3 SIP.

4.2.5.2 Particulate Matter

The current Federally approved PM_{10} plan for Imperial County is the *1993 State Implementation Plan for PM10 in the Imperial Valley*. That plan focuses on the reduction of fugitive dust emissions from wind erosion, agricultural operations including open burning, unpaved roads, and construction activities. The recommended mitigation measures for construction and operation of the IVS project would comply with the recommended PM_{10} mitigation measures in this plan.

The EPA reclassified Imperial County from moderate to serious non-attainment of the 24-hour PM_{10} Federal AAQS for PM_{10} on August 11, 2004. As part of this re-classification, Imperial County is required to develop a new PM_{10} Attainment Plan that provides for at least a 5 percent annual reduction in PM_{10} or PM_{10} precursor emissions until the area reaches attainment status. Imperial County completed a new PM_{10} Attainment Plan on August 11, 2009 that addresses impacts of PM_{10} transport from Mexicali, Mexico, the impact of PM_{10} generated by natural events such as wind and wildfire, and PM_{10} impacts from local sources. The plan states that the PM_{10} Federal AAQS has been attained except for international emissions. The plan relies on control measures already adopted as ICAPCD rules. The core of the PM_{10} control program is based on the Imperial County Regulation VIII fugitive dust rules, most provisions of which were effective January 2006. Regulation VIII includes Rule 801 Construction and Earthmoving Activities, Rule 802 Bulk Materials, Rule 803 Carry-Out and Track-out, Rule 804 Open Areas, Rule 805 Paved and Unpaved Roads, and Rule 806 Conservation Management Practices. EPA approval of this plan is pending.

The IVS project would comply with these control measures by complying with the existing ICAPCD rules and the project mitigation measures.

4.2.5.3 Localized Cumulative Impacts

Because the IVS project air quality impacts can be reasonably estimated through air dispersion modeling (as discussed above in the Operational Modeling Analysis subsection), the contributions of the IVS to localized cumulative impacts can be estimated. To represent past

and, to an extent, present projects that contribute to ambient air quality conditions, ambient air quality monitoring data (i.e., background) was used.

In consultation with the ICAPCD, a survey was conducted of new development projects and stationary sources that have potential for emissions of criteria air contaminants within 6 mi of the IVS project site. Projects that are either under construction, or have received permits to be built or operate in the foreseeable future were identified. A total of 31 projects were reviewed, of which 24 are outside a 6-mi radius of the IVS project site and were eliminated from the list of cumulative emission sources. Six projects were eliminated due to their annual permitted emission increases being negative, negligible, or less than 5 tons per year. The last project was eliminated because it is indefinitely on hold. Therefore, it was determined that no stationary sources requiring a cumulative modeling analysis were identified within a 6-mi radius of the project site. Refer to Section 2.10 for more information on those projects.

In addition to the projects determined through consultation with the ICAPCD, there are a number of other large development projects proposed in the region. For example, two large wind projects are proposed on BLM land within a few miles of the project site, and large wind projects are proposed in Mexico, south of the project site. There are seven large solar projects proposed on BLM land within the area served by the BLM El Centro Field Office. This potential for substantial new development in the SSAB and corresponding increase in emissions in the SSAB requires the incorporation of measures that are designed to mitigate the potential contribution of the IVS project to cumulative air quality impacts by reducing the dedicated on-site vehicle emissions and fugitive dust emissions during project operation. Those measures are described in detail in the following sections.

4.2.6 Mitigation, Project Design Features, and Other Measures

4.2.6.1 Measures During Construction

Measures Incorporated in the IVS Project

The following measures have been incorporated in the IVS project by the applicant to address short term air quality effects during construction:

Exhaust Emissions Control

- Low-emitting gasoline and diesel engines meeting State and Federal emissions standards (Tiers I, II and III) will be used for construction equipment, including, but not limited to catalytic converter systems and particulate filter systems.
- All vehicles will be shut down when idling for more than 5 minutes, or as required by the ARB.
- Regular preventive maintenance of equipment engines will be performed to minimize emissions.
- Diesel fueled motor vehicles will use low sulfur and low aromatic fuel meeting California standards.
- Review availability of alternatively fueled pickups and personnel transport buses and at a minimum use gasoline fueled vehicles.

Fugitive Dust Control

- Chemical dust suppressant Soiltac™ or a product with same or better performance will be applied to all on-site unpaved roads and unpaved parking areas. The roads and parking areas will also be maintained or resealed as needed to minimize dust emissions. The soil stabilizer product used will require prior approval by the BLM and the CEC.
- Construction grading requirements for the maintenance roads will be limited to surface scraping of topsoil.
- Water application or other suppression techniques will be used to mitigate dust emissions from wind erosion of areas disturbed by construction activities.
- Paved road surfaces will be vacuum-swept and/or water-flushed to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets affected by construction activities) and paved parking areas.
- All trucks hauling soil, sand, and other loose materials will be covered, or all trucks would be required to maintain at least 2 feet of freeboard.

- Traffic speeds on all unpaved and/or unsealed site areas will be limited to 10 miles per hour.
- Sandbags or other erosion control measures will be installed to prevent silt runoff to roads.
- Disturbed areas will be revegetated as quickly as possible.
- Tires of all trucks that travel off-road will be washed prior to exiting construction site.
- Construction workers will be required to park in sealed laydown areas and will be transported to worksites in buses.
- Vehicles, including SunCatcher material delivery trucks, will be required to travel on paved or sealed roads only.
- The SunCatcher vibratory steel fin tube pedestals have been tested for all expected soil conditions on the site and can be used on the SunCatcher foundations without the need for a concrete pedestal base. This will reduce the need for concrete to be produced at the site or at a nearby concrete batch plant, and will reduce truck trip emissions associated with the delivery of finished concrete or raw materials (water, sand, aggregate, cement).

Additional Measures from the Staff Assessment/Draft Environmental Impact Statement

The Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) identified the following additional measures to address short term air quality impacts during project construction:

AQ-SC1 **Air Quality Construction Mitigation Manager (AQCMM):**The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Measures AQ-SC3, AQ-SC4 and AQ-SC5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall

not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the BLM's Authorized Officer and CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 **Air Quality Construction Mitigation Plan (AQCMP):**The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Measures AQ-SC3, AQ-SC4, and AQ-SC5.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the BLM's Authorized Officer and CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The BLM's Authorized Officer or CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt.

AQ-SC3 **Construction Fugitive Dust Control:**The AQCMM shall submit documentation to the BLM's Authorized Officer and CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the project. Any deviation from the AQCMP mitigation measures shall require prior BLM Authorized Officer and CPM notification and approval.

Verification: The AQCMM shall provide the BLM's Authorized Officer and the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A. a summary of all actions taken to maintain compliance with this condition;

B. copies of any complaints filed with the ICAPCD in relation to project construction; and

C. any other documentation deemed necessary by the BLM Authorized Officer, CPM, and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

The following fugitive dust mitigation measures shall be included in the AQCMP required by Measure AQ-SC2.

A. The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved prior to taking initial deliveries.

B. All unpaved construction roads and unpaved operational site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Measure AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.

C. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

D. Visible speed limit signs shall be posted at the construction site entrances.

E. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

F. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

G. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

H. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM and BLM Authorized Officer.

I. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

J. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

L. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

M. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least 2 feet of freeboard.

N. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

AQ-SC4 **Dust Plume Response Requirement:**The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project

site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM or BLM Authorized Officer any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM or BLM Authorized Officer before that time.

Verification: The AQCMM shall provide the BLM's Authorized Officer and the CPM a Monthly Compliance Report to include:

A. a summary of all actions taken to maintain compliance with this condition;

B. copies of any complaints filed with the ICAPCD in relation to project construction; and

. C. any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 **Diesel-Fueled Engine Control:**The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the AQCMP mitigation measures shall require prior and CPM notification and approval.

Verification: The AQCMM shall include in the Monthly Compliance Report (COMPLIANCE-6) the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to maintain compliance with this condition;

B. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, and the AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by Measure AQ-SC2.

A. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

B. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 3 engine is not available for any off-road equipment larger than 100 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this

condition, the use of such devices is “not practical” for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or

2. The construction equipment is intended to be on site for 5 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

C. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item “b” occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The retrofit control device is causing or is reasonably expected to cause engine damage.

3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

D. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer’s specifications.

E. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

F. Construction equipment will employ electric motors when feasible.

4.2.6.2 Mitigation During Operation

Measures Incorporated in the IVS Project

The following emission control measures have been incorporated on the stationary equipment associated with project operation by the applicant to address short term air quality effects during construction:

Emergency Generator

An ARB/EPA Tier 3 engine, compliant with the New Source Performance Standards, Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, to meet Best Available Control Technology (BACT) requirements will be used for the on-site emergency generator engine. The proposed ARB/EPA Tier 3 engine would have the following emission guarantees:

- NO_X: 4.61 gram/bhp-hour
- CO: 0.39 gram/bhp-hour
- VOC: 0.15 gram/bhp-hour
- $PM_{10}/PM_{2.5}$: 0.06 gram/bhp-hour
- SO_2: 0.12 gram/bhp-hour

Gasoline Tank

A 5,000 gal regular gasoline storage tank that incorporates ARB-certified Phase I (tank filling) and Phase II (vehicle refueling) vapor recovery systems will be used on the site. The tank would be filled only when necessary to reduce turnover and truck refueling would be kept to a minimum. The maximum annual tank throughput is expected to be 85,000 gal.

Operational and Maintenance Vehicles

- Chemical dust suppressant Soiltac™ or a product with same or better performance would be applied to all unpaved maintenance roads.
- All maintenance vehicles would be required to travel only on chemically-sealed or paved roads.
- Mirror washing maintenance would be done efficiently. Each wash vehicle would wash two SunCatchers at the same time to reduce the amount of time wash vehicles operate, and therefore reduce their emissions.
- New gasoline fueled vehicles will be used in place of diesel vehicles to reduce ozone precursor and diesel particulate matter emissions.
- Hybrid-electric vehicles would be used for all security vehicles.
- To reduce emissions from commuting, van pooling of employees from El Centro will be provided.
- Hydrogen would be produced and stored onsite and distributed to each SunCatcher to eliminate a need for hydrogen cylinder delivery truck trips.
- Paved road surfaces would be vacuum-swept and/or water-flushed to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets affected by construction activities) and paved parking areas.
- To reduce exhaust emissions, propane-fueled fork lift and man lifts would be used for maintenance.

Emission Offsets

The applicant has not proposed any emission offsets, and the stationary source and operating fugitive dust emissions for IVS project as currently proposed would be below the ICAPCD offset thresholds.

Additional Measures from the Staff Assessment/Draft Environmental Impact Statement

The SA/DEIS identified the following additional measures to address long term air quality impacts during project operation:

AQ-SC6 The project owner, when obtaining dedicated on-road or off-road vehicles for mirror washing activities and other facility maintenance activities, shall only obtain new model year vehicles that meet California on-road vehicle emission standards or appropriate U.S. EPA/California off-road engine emission standards for the model year when obtained.

Verification: At least 60 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the size and type of the on-site vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and/or purchase schedule. The plan shall be updated every other year and submitted in the Annual Compliance Report.

AQ-SC7 The project owner shall provide a site Operations Dust Control Plan, including all applicable fugitive dust control measures identified in the verification of Measure AQ-SC3 that would be applicable to reducing fugitive dust from ongoing operations; that:

A. describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and

B. identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved roadways, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized. The

soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation.

The performance and application of the fugitive dust controls shall also be measured against and meet the performance requirements of Measure AQ-SC4. The performance requirements of Measure AQ-SC4 shall also be included in the operations dust control plan.

Verification: At least 60 days prior to the start of commercial operation, the project owner shall submit to the BLM's Authorized Officer and the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs. At least 60 days after the start of commercial operation, the project owner shall provide to the BLM's Authorized Officer and the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

AQ-SC8 The project owner shall provide the CPM copies of all ICAPCD issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) document for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the ICAPCD or U.S. Environmental Protection Agency (U.S. EPA), and any revised permit issued by the ICAPCD or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed air permit modifications to the CPM within 5 working days of its submittal either by (1) the project owner to an agency, or (2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC9 The emergency generator engine procured for this project will meet or exceed the NSPS Subpart IIII emission standards for the model year that corresponds to the date of purchase.

Verification: The project owner shall submit the emergency engine specifications to the CPM at least 30 days prior to purchasing the engines for review and approval.

AQ-SC10 The gasoline tank and appurtenances procured for this project will meet or exceed all vapor recovery and standing loss requirements in affect at the time of construction.

Verification: The project owner shall submit the gasoline tank and refueling equipment specifications and documentation of compliance with effective vapor recovery and standing loss requirements to the CPM at least 30 prior to purchasing the equipment for review and approval.

Measures from the Imperial County Air Pollution Control District Regulations

Regulation II – Permits

Rule 201 – Permits Required

This rule requires an Authority to Construct and Permit to Operate before the construction or operation, respectively, of non-exempt emission sources. The FDOC completes the permit application review and the Authority of Construct and Permit to Operate would be provided per rule requirements after the CEC licensing process and after construction of the permitted emission sources, respectively. Compliance with this rule is expected.

Rule 207 – New and Modified Stationary Source Review

This rule establishes the stationary source[1] requirements that must be met to obtain a Permit to Operate, including the requirement to comply with best available control technology (BACT), provide emission offsets for emission increases above specified thresholds; and provide a dispersion modeling analysis, an alternatives analysis, and a compliance certification (if

[1] The maintenance vehicles are not stationary sources and are not subject to ICAPCD rules.

applicable). In the FDOC, the ICAPCD has determined that the proposed emission controls meet BACT requirements. Therefore, compliance with this rule has been demonstrated.

The IVS project, as a minor stationary source, does not require offsets, require a dispersion modeling, analysis, or require a compliance certification per ICAPCD Rule 207.

Regulation IV – Prohibitions

Rule 400 – Fuel Burning Equipment

This rule limits discharge into the atmosphere from fuel burning equipment combustion contaminants exceeding in concentration at the point of discharge 140 lbs/hr of nitrogen oxides, calculated as nitrogen dioxide (NO_2). The emergency engine's maximum hourly NOx emission potential at full load operation is 3.41 lbs/hr; therefore, compliance with this rule is expected.

Rule 401 – Opacity of Emissions

Rule 401 limits visible emissions from emissions sources. This rule prohibits discharge of any emissions, other than uncombined water vapor, for more than three minutes in any hour. Compliance with this rule is expected with the implementation of the project measures.

Rule 403 – General Limitation on the Discharge of Air Contaminants

This rule limits discharge into the atmosphere from any single emission unit, combustion contaminants exceeding in concentration at the point of discharge 0.2 grains per dry cubic foot of gas, calculated to 12% of carbon dioxide (CO_2) at standard conditions averaged over 25 consecutive minutes. The only item subject to this rule is the emergency generator engine which would have negligible combustion contaminant emissions. Compliance with this rule is expected.

Rule 405 – Sulfur Compounds Emission Standards, Limitations, and Prohibitions

This rule limits the concentration of the discharge of sulfur compounds and the sulfur content of liquid fuels. The use of California diesel fuel would ensure compliance with this rule.

Rule 407 – Nuisance

This rule restricts emissions that would cause nuisance or injury to people or property (identical to California Health and Safety Code 41700). Compliance with this rule is expected with the implementation of the project measures.

Rule 415 – Transfer and Storage of Gasoline

This rule specifies the vapor recovery requirement for tank filling (Phase I) and vehicle refueling (Phase II) for gasoline storage and refueling facilities. The proposed gasoline tank would have both Phase I and Phase II vapor controls and would need to comply with the ICAPCD's conditions related to vapor controls. Compliance with this rule is expected.

Regulation VIII – Fugitive Dust Rules

Rule 800 – General Requirements for Control of Fine Particulate Matter

Specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust from anthropogenic (man-made) sources. The rule also specifies test methods for determining compliance with visible dust emission (VDE) standards, stabilized surface conditions, soil moisture content, silt content for bulk materials, silt content for unpaved roads and unpaved vehicle/ equipment traffic areas, and threshold friction velocity. Records shall be maintained only for those days that a control measure was implemented, and kept for two years after the date of each entry. A fugitive dust management plan for unpaved roads is discussed in Rule 805. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 801 – Construction and Earthmoving Activities

Requires fugitive dust emissions throughout construction activities (from pre-activity to active operations and during periods of inactivity) to comply with the conditions of a stabilized surface area and to not exceed an opacity limit of 20%, by means of water application, chemical dust suppressants, or constructing and maintaining wind barriers. A Dust Control Plan is also required and shall be submitted to the APCO at least 30 days prior to the start of any construction activities on any site that will include 10 ac or more of disturbed surface area for residential developments, 5 ac or more of disturbed surface area for non-residential development. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 802 – Bulk Materials

Limits the fugitive dust emissions from the outdoor handling, storage and transport of bulk materials. Requires fugitive dust emissions to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20%. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 803 – Carry-out and Track-out

Limits carry-out and track-out during construction, demolition, excavation, extraction, and other earthmoving activities (Rule 801), from bulk materials handling (Rule 802), and from paved and unpaved roads (Rule 805) where carry-out has occurred or may occur. Specifies acceptable (and unacceptable) methods for cleanup of carry-out and track-out. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 804 – Open Areas

Requires any open area of 0.5 ac or more within urban areas (3 ac or more within rural areas), that contains at least 1,000 square feet of disturbed surface area to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20%, by means of water application, chemical dust suppressants, paving, applying and maintaining gravel, or planting vegetation. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 805 – Paved and Unpaved Roads

Specifies the width of paved shoulders on paved roads and guidelines for medians. Requires gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants on unpaved roadways to prevent exceeding an opacity limit of 20%. Compliance is expected with the implementation of Measures AQ-SC3 and AQ-SC7.

Rule 806 – Conservation Management Practices

This rule limits fugitive emissions from Agricultural Operation Sites. The IVS project facility is not subject to this rule.

Regulation XI – New Source Performance Standards

Rule 1101 – New Source Performance Standards

This rule incorporates the Federal New Source Performance Standards (NSPS; 40 CFR 60) rules by reference. The proposed Tier 3 emergency generator engine meets the emission limit requirements of the only NSPS (Subpart IIII) that applies to the proposed IVS project equipment.

4.2.7 Noteworthy Public Benefits

Renewable energy facilities, such as the IVS project, are needed to meet California's mandated renewable energy goals. While there are no local area air quality public benefits resulting from the proposed project, it would indirectly reduce criteria pollutant emissions within the southwestern United States by reducing fossil fuel-fired generation.

Air quality benefits should not be confused with greenhouse gas/climate change benefits, which are discussed in detail in Section 4.4, Climate Change.

4.2.8 Summary of Impacts

Table 4-24 summarizes the direct, indirect, short- and long term-, and cumulative adverse and beneficial effects of the IVS project, the Agency Preferred Alternative, the other build alternatives, and the No Action Alternatives related to air quality.

As shown in Table 4-24 and as described above, the IVS project includes measures that would reduce the project's stationary source NO_x, VOC, SO_2, PM_{10}, and $PM_{2.5}$ emissions through the use of BACT, minimizing delivery and employee trips, and reducing the IVS project mobile source emissions by using lower emitting gasoline and propane fueled new vehicles. With the inclusion of these measures, the IVS project would not result in adverse air quality impacts. With the inclusion of additional measures described above, the IVS project would not contribute to cumulative adverse air quality impacts.

In summary, the construction and operation of the IVS project would not result in unavoidable adverse air quality impacts.

Table 4-24 Summary of Air Quality Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Short-term dust and vehicle emissions during construction. Long-term dust, and mobile and stationary fuel/combustion emissions. Beneficial long-term effect associated with the reduction in greenhouse emissions and would not contribute to cumulative adverse impacts.	**Project Design Features** Exhaust emissions control and fugitive dust control. Use of an NSPS-compliant emergency generator, certified tank filling and vehicle refueling vapor recover systems for the 5,000 gal fuel tank, and detailed measures for the operation and maintenance vehicles. **Construction Measures** *AQ-SC1:* Air Quality Construction Mitigation Manager *AQ-SC2:* Air Quality Construction Mitigation Plan *AQ-SC3:* Construction fugitive dust control *AQ-SC4:* Dust plume response requirement *AQ-SC5:* Diesel-fueled engine control **Operations Measures** *AQ-SC6:* Vehicles must meet applicable vehicle emissions standards. *AQ-SC7:* Operations Dust Control Plan. *AQ-SC8:* ICAPCD Authority-to-Construct and Permit-to-Operate documents. *AQ-SC9:* Emergency generator to meet or	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
		exceed applicable emissions standards. *AQ-SC10:* Gasoline tank to meet or exceed all vapor recovery and standing loss requirements. **ICAPCD Regulations** *Rule 201:* Authority-to-Construct and Permit-to-Operate documents. *Regulation IV:* Prohibitions (Rule 207: new and modified stationary source requirements, Rule 400: on fuel burning equipment, Rule 401: opacity of emissions, Rule 403: general limitation on the discharge of air contaminants, Rule 405: sulfur compounds emissions standards, limitations, and prohibitions, and Rule 407: nuisance). *Regulation VIII:* Fugitive Dust Rules (Rule 800: general requirements for control of fine particulate matter, Rule 801: construction and earthmoving activities, Rule 802: bulk materials, Rule 803: carry-out and track-out, Rule 804; open areas, Rule 805: paved and unpaved roads, and Rule 806: conservation management practices). *Regulation XI:* NSPS (Rule 1101: NSPS).	
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No short- or long-term dust or vehicle emissions. No long-term beneficial effect.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No short- or long-term dust or vehicle emissions. No long-term beneficial effect.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Potential for short- and long-term dust and vehicle emissions and beneficial effects similar to the Agency Preferred Alternative and the IVS project.	None specified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; gal = gallon; ICAPCD = Imperial County Air Pollution Control District; IVS = Imperial Valley Solar; MW = megawatts; NSPS = New Source Performance Standards; ROW = right-of-way.

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4.3 Biological Resources

This section of provides the analysis of potential effects to biological resources from the construction and operation of the proposed Imperial Valley Solar (IVS) project. This section addresses potential effects to special-status species and Areas of Critical Environmental Concern (ACECs) and includes proposed avoidance and mitigation measures.

Adverse effects to flora and fauna may occur through construction or operation of the facilities or infrastructure under the IVS project. Wildlife can be directly affected by mortality due to construction or operation of the facility or its infrastructure, or indirectly through habitat loss, fragmentation, or conversion. Vegetation can be directly affected by its removal as the ground surface on which it occurs is developed, or indirectly through changing populations of wildlife that feed on plants or through infestation by weedy species from developed or otherwise disturbed construction or operation areas.

Construction, maintenance, and operation of facilities in an area that contains wildlife habitat could constitute an adverse effect on those habitats.

4.3.1 Methodology

The analysis of project effects must comply with the National Environmental Policy Act (NEPA) requirements given the United States Bureau of Land Management (BLM) jurisdiction over the majority of the project site. NEPA requires that an Environmental Impact Statement (EIS) be prepared for a major Federal action that significantly affects the quality of the human environment. The NEPA implementing regulations further require that an agency determine whether an EIS or an Environmental Assessment/Finding of No Significant Impact (EA/FONSI) is required for the proposed action, or whether the proposed action is categorically exempt from NEPA review (40 Code of Federal Regulations [CFR] 1501.4). If an EIS is determined to be necessary, it is further required to provide a "…full and fair discussion of significant environmental impacts…," discussing impacts in proportion to their significance, and only briefly discussing issues that are not significant (40 CFR 1502.1, 1501.7, 1502.2). The Council on Environmental Quality (CEQ) NEPA regulations provide that "significantly" as used in NEPA requires considerations of both context and intensity (40 CFR 1508.27). By preparing this Final Environmental Impact Statement (FEIS), the BLM (as the NEPA lead agency) has determined that the IVS project would generally have a significant effect on the environment.

Effects on biological resources were evaluated by determining the sensitivity, significance, or rarity of each resource that would be adversely affected by the IVS project. Factors considered

in determining whether an alternative would have an effect on biological resources include the extent or degree to which its implementation would do any of the following:

(1) Substantially affect a rare, threatened, or endangered species or its habitat.

(2) Cause the "take" of a highly sensitive resource, such as a threatened, endangered, or special-status species.

(3) Reduce the population of a sensitive species, as designated by Federal and State agencies, or a species with regional and local significance by reducing numbers, altering behavior, reproduction, or survival, or by destroying or disturbing habitat.

(4) Introduce or increase the prevalence of invasive or predatory species; or,

(5) Cause long-term loss or impact of a substantial portion of local habitat.

An adverse effect is found when an undertaking or action alters, directly or indirectly, any of the characteristics of a habitat that provides for life history needs such as feeding, cover, travel, or breeding. The biological resource surveys conducted for the IVS project documented the presence of wildlife species, plant species, and suitable habitats within the surveyed portions of the proposed project areas. The biological resources surveys were conducted based on preliminary designs and locations of the proposed facilities for the IVS project.

4.3.2 Definition of Resource

Biological resources include genetic resources, organisms, populations, or any other biotic component of ecosystems with actual or potential use or value. Biological resources are described in Section 3.3, Biological Resources.

4.3.3 Applicable Regulations, Plans and Policies/Management Goals

The Federal laws, ordinances, regulations, and standards (LORS) applicable to the IVS project are discussed in Table 4-25. State and local LORS that are applicable to the IVS project are also included in Table 4-25. The project applicant is responsible for compliance with applicable State and local rules and regulations and permit requirements.

Table 4-25 Project Compliance with Applicable Laws, Ordinances, Regulations, and Standards Related to Biological Resources

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Federal			
Federal Endangered Species Act (Title 16, United States Code, Section 1531 et seq., and Title 50, Code of Federal Regulations, Part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat.	YES	The applicant has sited the facilities to avoid habitat for listed endangered species. However, habitat is present for a proposed listed endangered species, the flat tail horned lizard (FTHL). In addition, a small herd of Peninsular big horn sheep (PBS) was observed on the IVS project site in March 2009, but this was considered an unusual occurrence. Nonetheless, approximately 250 acres of the site (28 percent of the 881 acres of waters of the U.S., which are vegetated by suitable species) is considered foraging habitat by the USFWS which will require mitigation. No critical habitat has been designated or identified in the project disturbance area. Therefore, the IVS project would be in compliance with this policy.
Migratory Bird Treaty Act (Title 16, United States Code, Sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	Migratory birds may occur at the proposed facility in passing. The applicant will avoid the take of migratory birds. Therefore, the IVS project would be consistent with this policy.
Clean Water Act (Title 33, United States Code, Sections 1251 through 1376, and Code of Federal Regulations (CFR), Part 30, Section	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the Corps for a discharge from dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a regional water	YES	Once the acreage of impacts to waters of the U.S. are determined by the Corps and RWQCB, the applicant would be required to obtain permits for any activity that would result in a discharge from dredged or fill materials into waters of the U.S. Therefore, the IVS project would be consistent with this policy.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
330.5(a)(26))	quality control board (RWQCB) for the discharge of pollutants. By Federal law, every applicant for a Federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity would not violate State and Federal water quality standards.		
United States Army Corps of Engineers (Corps) Section 404 (b)(1) Guidelines (40 CFR 230 et seq.)	Requires the Corps to analyze alternatives in a sequential approach such that the Corps must first consider avoidance and minimization of impacts to the extent practicable to determine whether a proposed discharge can be authorized.	Unknown	The placement of SunCatchers and associated infrastructure in ephemeral streams on the plant site would result in the permanent impact of approximately 165 acres, the temporary impact of 5 acres, and the indirect impact of 13 acres of waters of the U.S. and permanent impact to approximately 312 acres of CDFG jurisdictional streambeds. For the proposed reclaimed water line along Evan Hewes Highway, an estimated 2.33 acres for waters of the U.S. and 0.20 acre of CDFG jurisdictional streambeds may be affected. However, this is subject to additional review from the Corps and CDFG. The Corps will be requiring mitigation in the form of enhancement and rehabilitation of Carrizo Creek and Carrizo Marsh in Anza Borrego State Park, which is owned and managed by California State Parks (CSP). Mitigation ratios would likely range from 3:1 to 5:1 based on the evaluation of direct and indirect impacts to the functions and services on-site relative to the benefit of the enhancement and rehabilitation activities in Carrizo Creek and Carrizo Marsh. At this time, it is estimated that the required mitigation for PBS and Corps jurisdictional waters

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			of the U.S. would be similar, on the order of 250 ac of enhancement and rehabilitation in Carrizo Creek and Carrizo Marsh, which are known foraging areas for the PBS.
National Environmental Policy Act (NEPA), (Title 42, United States Code, section 4321 et seq.)	NEPA requires an evaluation of environmental impacts of projects proposed on Federal lands or receiving Federal funding.	YES	This Environmental Impact Statement (EIS) acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.
California Desert Conservation Area Plan (CDCA Plan) (BLM, 1980, as amended)	The 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 would manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.	YES	Approximately 6,140 acres of the project site is administered by the BLM and is managed under multiple use Class L (Limited Use) categories in conformance with the CDCA Plan. The IVS project consists of an electrical generating facility, a transmission line, a waterline, and ancillary facilities. As such, development of the IVS project is an allowed use under the Multiple-Use Class Guidelines. In addition, the CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a project-specific CDCA Plan amendment along with the ROW grant for the IVS project. Upon BLM's amendment of the CDCA plan for the IVS project, the proposed project would be fully compliant with the CDCA Plan. This Environmental Impact Statement (EIS) acts as the

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.
Flat-tailed Horned Lizard Rangewide Management Strategy (2003 revision)	Provides guidance for the conservation and management of sufficient habitat to maintain viable populations of FTHL in each of the five Management Areas (MAs) in perpetuity.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	The Strategy limits surface-disturbing activities in the MAs and provides for mitigation and compensation measures in known FTHL habitat. The compensation of land through payment of fees for the FTHL (to purchase other lands) makes the IVS project consistent with this policy.
Federal Noxious Weed Act of 1974 (P.L. 93-629) (7 U.S.C. 2801 et seq.; 88 Stat. 2148)	Establishes a Federal program to control the spread of noxious weeds. Authority is given to the Secretary of Agriculture to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	The IVS project may result in construction activities that could further spread weeds already present in the project vicinity. Applicant will implement an active weed management strategy and control methods through a Noxious Weed Management Plan. Therefore, the IVS project would be consistent with this policy.
Executive Order 13112 of February 3, 1999 – Invasive Species (FR doc 99-3184; FR V. 64, No. 25, Presidential documents 6183-6186)	Federal agencies are mandated to take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	The IVS project may result in construction activities that could further spread weeds already present in the project vicinity. Applicant will implement an active weed management strategy and control methods through a Noxious Weed Management Plan. Therefore, the IVS project would be consistent with this policy.
The Bald and Golden Eagle Protection Act (16 USC Sections 668–668d and Title 50, Code of Federal Regulations, Section 22.26)	Prohibits the take of bald and golden eagles unless take is determined to be compatible with the preservation of the eagle, is necessary for the protection of wildlife or of agricultural or other interests in any particular locality, and where the taking is associated with but not the	YES	Implementation of the IVS project is not anticipated to result in the take of bald eagles or golden eagles. Therefore, the IVS project would be consistent with this policy.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	purpose of the activity and cannot practicably be avoided.		
The Bald and Golden Eagle Protection Act (Title 50, Code of Federal Regulations, Section 22.27)	Authorizes 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; the activity, or mitigation for the activity, will provide a net benefit to eagles; and allows inactive nests to be taken only in the case of safety emergencies	YES	There are no eagle nests within the project site; therefore, the project would not lead to the taking of an eagle nest. Therefore, the IVS project would be consistent with this policy.
State			
California Endangered Species Act of 1984 (Fish and Game Code, Sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	The flat-tailed horned lizard (FTHL) is present on the project site. The FTHL is a California Species of Concern that would be adversely affected by the IVS project. Implementation of the identified Avoidance, Minimization, and Mitigation Measures would reduce the severity of potentially adverse effects to this species to the extent feasible. Therefore, the IVS project would be consistent with this policy. Peninsular bighorn sheep (*Ovis canadensis nelsoni*) (PBS) were observed on the IVS project site in March 2009. PBS is a State threatened species that would be adversely affected by the IVS project. Implementation of the identified avoidance, minimization, and mitigation measures would reduce the severity of the adverse effects to this species to the extent feasible. Therefore, the IVS project would be consistent with this policy.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
California Code of Regulations (Title 14, Section 460)	Lists State protected fur-bearing mammals.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	State protected fur-bearing mammals for this project include Desert kit fox. Desert kit foxes are protected under Title 14, California Code of Regulations section 460 and marginally suitable foraging and denning habitat for this species is located on-site. The IVS project would implement Avoidance, Minimization, and Mitigation Measures BIO-15 that would avoid these potentially adverse effects to this species. Therefore, the IVS project would be consistent with this policy.
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.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	The FTHL is present on the project site. The FTHL is a California Species of Concern that would be adversely affected by the IVS project. Implementation of the identified Avoidance, Minimization, and Mitigation Measures would reduce the severity of potentially adverse effects to this species to the extent feasible. Therefore, the IVS project would be consistent with this policy. PBS were observed on the IVS project site in March 2009. PBS is a State threatened species that would be adversely affected by the IVS project. Implementation of the identified avoidance, minimization, and mitigation measures would reduce the severity of the adverse effects to this species to the extent feasible. Therefore, the IVS project would be consistent with this policy.
Nest or Eggs (Fish and Game Code Section 3503)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.	YES (with implementation of Avoidance, Minimization, and Mitigation	Migratory birds and their eggs and young are protected by the Federal Migratory Bird Treaty Act and Fish and Game Code section 3503. The IVS project would implement Avoidance, Minimization, and Mitigation Measures BIO-8 and BIO-14 that would avoid these potentially adverse

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
		Measures)	effects to nesting birds. Therefore, the IVS project would be consistent with this policy.
Birds of Prey (Fish and Game Code Section 3503.5	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.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	Applicant will avoid take of birds of prey through avoidance of nest or eggs during the breeding season and through incorporation of project design features that will prevent electrocution and collision of bird species. The IVS project would be consistent with this policy.
Migratory Birds (Fish and Game Code Section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	Migratory birds and their eggs and young are protected by the Federal Migratory Bird Treaty Act and Fish and Game Code section 3503. The IVS project would implement Avoidance, Minimization, and Mitigation Measures BIO-8 and BIO-14 that would avoid these potentially adverse effects to nesting birds. Potential effects to burrowing owls would be further mitigated by implementation of Avoidance, Minimization, and Mitigation Measure BIO-16. Therefore, the IVS project would be consistent with this policy.
Fur-bearing Mammals (Fish and Game Code Sections 4000 and 4002)	Lists fur-bearing mammals which require a permit for take.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	State protected fur-bearing mammals for this project include Desert kit fox. Desert kit foxes are protected under Title 14, California Code of Regulations Section 460 and marginally suitable foraging and denning habitat for this species is located on-site. The IVS project would implement Avoidance, Minimization, and Mitigation Measures BIO-15 that would avoid these potentially adverse effects to this species. Therefore, the IVS project would be consistent with this policy.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Lake and Streambed Alteration Agreement (Fish and Game Code Sections 1600 et seq.)	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.	YES	Once the acreage of impacts to CDFG jurisdictional streambeds is determined by CDFG, the applicant would be required to obtain permit for any activity that would result in a diversion, obstruction, or change in the natural flow to a bed, channel, or bank of any river, stream, or lake under jurisdiction by CDFG. Therefore, the IVS project would be consistent with this policy.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game 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.	YES	No desert plants covered under this regulation will be removed, harvested, transported, or possessed for purposes of selling said desert plants. Therefore, the IVS project would be consistent with this policy.
California Food and Agriculture Code, Section 403	The California Department of Food and Agriculture is designated to prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	Applicant will implement an active weed management strategy and control methods through a Noxious Weed Management Plan. In addition, applicant will include project design features that would reduce the severity of effects resulting in providing favorable conditions to avian and other FTHL predators. Therefore, the IVS project would be consistent with this policy.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Noxious Weeds (Title 3, California Code of Regulations, Section 4500)	List of plant species that are considered noxious weeds.	YES (with implementation of Avoidance, Minimization, and Mitigation Measures)	Applicant will implement an active weed management strategy and control methods through a Noxious Weed Management Plan. Therefore, the IVS project would be consistent with this policy.
Local			
Imperial County General Plan (Imperial County 1993)	The Conservation and Open Space and Land Use Elements of the General Plan direct the county to evaluate the compatibility of proposed development projects with the preservation of biological resources and open space.	YES	Part of the proposed project would be on county lands that are currently highly disturbed by human activity, and would coincide with the county's goal of developing alternative energy resources, as well as the State's Renewable Portfolio Standard (RPS) goals. The purpose of the EIS is to help evaluate the compatibility of proposed development project with the preservation of biological resources and open space. Therefore, the IVS project would achieve this county goal.
Imperial County Land Use Ordinance (Title 9, Division 10)	Provides grading regulations for proposed development projects throughout the unincorporated areas of the County.	YES	The applicant would be required to adhere to grading regulations identified in this LORS. Therefore, the proposed project is consistent with this county objective.

4.3.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to ephemeral streams, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.3.4.1 IVS Project: 750 MW Alternative

Construction/Operational Effects

Vegetation

Effects to vegetation communities/cover types under the IVS project are summarized in Table 4-26. Previously identified Figure 3-2, Existing Vegetation Communities, illustrates the existing vegetation communities on the project site. No designated sensitive plant communities would be directly affected by the IVS project. Even though there would be rows of vegetation approximately 74 feet (ft) wide between the rows of SunCatchers, these strips of vegetation are expected to have minimal habitat value associated with them. Only common species of lizards, snakes, and bird species such as the house finch with small area requirements are expected to use these vegetated strips. Direct effects to vegetation communities/cover types are discussed below. For purposes of this discussion, the project site is categorized by 3 designations; plant site refers to the majority of the project site where SunCatchers and ancillary facilities will be located, the transmission line refers to the portion of the transmission line within the project site that is outside of the plant site to the south of the plant site along the alignment of the transmission line south to the Imperial Valley Substation, and the reclaimed water pipeline refers to the alignment of the reclaimed water pipeline to the east of the IVS project plant site from the Seeley Wastewater Treatment Plant (SWWTP) to the plant site. For a description of the IVS project plant site, refer to Section 3.3, Biological Resources.

Table 4-26 Effects to Vegetation Communities/Cover Types

Vegetation Communities/Cover Type	Affected Area (acres)
Plant Site	
Sonoran creosote bush scrub	5,024.4
Developed (Dirt and OHV roads)	1,038.7
Subtotal Plant Site	*6,063.1*
Transmission Line	
Sonoran creosote bush scrub	92.7
Developed (Dirt and OHV roads)	0.1
Subtotal Off-Site Transmission Line	*92.8*
Reclaimed Water Pipeline (30-foot-wide ROW)	
Sonoran creosote bush scrub	9.28
Disturbed Sonoran creosote bush scrub	0.91
Desert saltbush scrub	0.20
Disturbed desert saltbush scrub	1.95
Arrowweed scrub	0.65
Tamarisk scrub	1.48
Agricultural	0.87
Disturbed	4.94
Developed	8.73
Ornamental	0.10
Open channel	0.20
Subtotal Off-Site Waterline	*29.22*
TOTAL	**6,185**

Table Key: OHV = off-highway vehicle; ROW = right-of-way.

Due to the placement of the SunCatchers, grading would not occur on the entire 6,063-ac (ac) IVS plant site. Grading of the plant site would directly affect vegetation through the removal of shrubs and herbaceous vegetation. Construction on the plant site would permanently eliminate approximately 5,024.4 ac of Sonoran creosote bush scrub and approximately 1,038.7 ac of disturbed/developed Sonoran creosote bush scrub.

Construction of an approximately 10.35-mile transmission line and spur access roads south of Interstate 8 (I-8) would result in effects to 92.7 ac of Sonoran creosote bush scrub and 0.1 ac of developed habitat.

Construction of an approximately 12-mile (mi) long, 6-inch diameter reclaimed water pipeline that would be connected to the SWWTP would provide reclaimed water for construction and

operation activities. It is anticipated that this pipeline would be constructed within a 30-ft wide ROW along the Evan Hewes Highway, primarily in developed or disturbed areas in and along the road. A total of 29.22 ac, including 13 ac of native vegetation along the 30-ft-wide ROW could be temporarily affected.

Implementation of the IVS project would result in the permanent loss of vegetation communities. Mitigation to offset this effect includes Measures BIO-8, BIO-10, and BIO-18 provided later. Therefore, although the IVS project would affect vegetation communities, this action is not likely to adversely affect vegetation communities with implementation of the identified measures.

United States Army Corps of Engineers Waters of the United States and California Department of Fish and Game Jurisdictional Streambeds

The IVS project will result in permanent impact to waters of the U.S. and California Department of Fish and Game (CDFG) jurisdictional waters. Measure BIO-17 requires that the applicant comply with mitigation requirements stated in the United States Army Corps of Engineers (Corps) Clean Water Act (CWA) Section 404 Authorization as well as requirements in the CDFG Lake or Streambed Alteration Agreement to offset impacts to waters of the U.S. and CDFG jurisdictional streambeds, respectively. Measure BIO-17 has additional measures that are also required of the applicant.

The Corps cannot issue CWA Section 404 Authorization without a Certification or Waiver of Water Quality, or Waste Discharge Requirements from the Regional Water Quality Control Board (RWQCB), pursuant to Section 401 of the CWA. It is highly likely that a CWA Section 401 Certification of Water Quality will be the appropriate CWA Section 401 process for the IVS project. The applicant will be required to comply with all conditions of a CWA Section 401 Certification or Waiver of Water Quality or Waste Discharge Requirements, which will likely include mitigation measures for impacts to waters of the U.S.

Ephemeral streams on the IVS project site provide beneficial functions and services typical of high quality, low disturbance desert scrub systems. These functions include, but are not limited to, groundwater recharge, flood peak attenuation, floodwater storage, sediment trapping and transport, nutrient trapping, and maintenance of wildlife corridors and habitat. The functions that these ephemeral streams provide would be impaired by construction and operation of the IVS project. The total acreage affected in the ephemeral streams would be approximately 165 ac of permanent impacts, 5 ac of temporary impacts, and 13 ac of indirect impacts to Corps jurisdictional waters of the U.S. and approximately 312 ac of permanent impacts to CDFG jurisdictional streambeds.

Direct permanent effects to the ephemeral streams would result from the construction of debris/sediment basins, access roads to the SunCatchers, rip-rap/retaining wall/gabion for bank stabilization, and storm drain outfall structures. Additional direct permanent effects would result from the placement of SunCatchers on 24-inch bases, the placement of culverts and Arizona crossings in the ephemeral streams, and the regular maintenance of access roads to the SunCatchers. Based on correspondence with the Corps, it is estimated the direct permanent effects to ephemeral streams caused by the placement of the SunCatchers and associated infrastructure would be 205,166 linear feet (lf) (109,376 lf for Phase 1 construction and 95,790 lf for Phase 2 construction).

Direct temporary effects to the ephemeral streams include the underground placement of the electrical collection system, the hydrogen distribution system, a 428-ft length of affected ephemeral streams for the placement of the reclaimed waterline, and the mowing of brush down to a height of 3 inches. The direct temporary effects to ephemeral streams would be 5,116 lf for Phase 1 construction only. No additional direct temporary effects to ephemeral streams are anticipated for Phase 2 construction.

For the proposed reclaimed water pipeline along Evan Hewes Highway (which would either span or go under seven irrigation canals, the New River, and adjacent wetlands), it is estimated that 0.20 ac of CDFG jurisdictional streambeds and 2.33 ac of waters of the U.S. would be directly and permanently affected. At a minimum, Best Management Practices (BMPs) will be used to maximize avoidance of impacts to waters of the U.S. and CDFG jurisdictional streambeds for the proposed reclaimed water pipeline. Any impacts to Corps jurisdictional waters of the U.S. would require mitigation in the form of creation, restoration, or enhancement at a Corps-approved location.

The Corps would require a contingency plan to address horizontal drilling under waters of the U.S. in case a drilling implement accidentally drills off the intended alignment and punctures a hole where not intended (this is called a “frac-out”). The Corps would require a Frac-Out Contingency Plan prior to the start of construction of the water pipeline.

The CDFG does not expect any direct and permanent effects to CDFG jurisdictional streambeds along the proposed water pipeline route. However, CDFG would require approval of a Frac-Out Contingency Plan prior to horizontal directional drilling taking place to address and control an inadvertent release of drilling lubricant into the waterway.

The Corps has prepared a *Draft Section 404B-1 Alternatives Analysis for the Imperial Valley Solar Project* (provided in Appendix H) to identify the Least Environmentally Damaging Practicable Alternative (LEDPA) and establish the need for mitigation for any unavoidable and adverse impacts to aquatic resources. The Final Section 404(b)(1) Alternatives Analysis and

Final LEDPA will be completed by the Corps and included with the Corps' Record of Decision (ROD). As part of the Corps' ROD, a suite of special conditions will be developed that will incorporate Measure BIO-17.

Measure BIO-17 specifies that, in addition to minimizing impacts to ephemeral streams where feasible, the replacement of the functions and services of the CDFG jurisdictional streambeds similar to those on the IVS project site at a 1:1 mitigation ratio should be required for the 312 ac of CDFG jurisdictional streambeds permanently affected by the IVS project. This CDFG recommended mitigation could be integrated to some degree (depending on the conditions of the acquired lands) with the requirement to acquire off-site flat-tailed horned lizard (FTHL) habitat. The applicant must demonstrate that the acquired FTHL habitat includes ephemeral streams that can be used to fulfill their streambed mitigation requirement. This is discussed in more detail later in this section.

The applicant would be required to: (1) acquire Sonoran creosote scrub habitat with up to 312 ac of CDFG jurisdictional streambeds; (2) submit a Management Plan for site-specific enhancement of the acquired land; and (3) delegate the land acquisition to CDFG or an approved third party.

Whereas the CDFG recommends requiring a 1:1 mitigation ratio for impacts to ephemeral streams, the Corps has indicated they typically require a minimum 2:1 mitigation ratio for unavoidable impacts, with up to half (1:1 ratio) of the mitigation dedicated to preservation and the other half to enhancement or restoration within the Salton Sea watershed. At this time, the Corps is directing the mitigation planning effort to enhance Carrizo Creek. This creek is west/northwest of the IVS project site in Anza Borrego State Park. Carrizo Creek was chosen by the Corps in coordination with the applicant and the California State Parks (CSP) because of its proximity to the IVS project site, its current protected status as a State Park, and because it is within known PBS populations. The IVS project site is in the hydrologic unit code (HUC) 8 Salton Sea Watershed with ephemeral streams that are tributary to either Coyote Wash or the Westside Main Canal prior to flowing into the Salton Sea. Carrizo Creek is in the HUC 8 Carrizo Creek watershed directly to the north, draining into San Felipe Creek and then to the Salton Sea. In coordination with the Corps and CSP, the applicant is preparing a draft enhancement plan that will cover approximately 25 linear miles of Carrizo Creek from its headwaters downstream through Carrizo Marsh. CSP has provided preliminary tamarisk (*Tamarix* spp.) infestation mapping, which will be updated by the applicant, methods for removal, and potential costs. The enhancement plan will be prepared in accordance with the Corps and EPA Final Mitigation Rule (33 CFR Parts 325 and 332 [40 CFR Part 230]) and will include detailed methods for the initial removal, retreatment methods, limited native replanting of honey and screw bean mesquite trees (*Prosopis glandulosa* and *P. pubescens*, respectively) and arrow weed (*Pluchea sericea*), monitoring and reporting protocols, and performance standards. The

Corps is unlikely to require the applicant to enhance this entire reach of Carrizo Creek to mitigate on-site direct and indirect impacts. The Corps mitigation requirement will likely be on the order of a 3:1 to 5:1 ratio depending on the enhancement plan and other data currently being collected. It is the Corps approach that the applicant will initiate the first phase of the enhancement effort equal to their final mitigation requirements and that the remainder will be completed as required by other agencies (United States Fish and Wildlife Service [USFWS] or CDFG) or completed by other applicants either through establishing an in-lieu fee program, additional permittee-responsible mitigation, or by the CSP through grant funding.

Precise details of the required mitigation would be determined after the Federal CWA 404(b)(1) alternatives analysis is complete. When this occurs, Measure BIO-17 would be updated to reflect mitigation requirements by the Corps.

Indirect permanent effects of the IVS project include the scour that will occur around the SunCatcher pedestals after a rain event due to the exposure of bare soil following vegetation removal and the obstruction of water in the flow path. It has been estimated that a 24-inch-diameter foundation in the bed of the ephemeral streams in the project area would have a scour depth of approximately five ft for flow velocities of 8 to 10 feet per second (fps) (a 100-year storm event). At more common flow velocities of 2 to 5 fps, the scour depths are estimated from 2 to 3.5 ft. More detailed analysis related to scour is presented in Section 4.17, Hydrology, Water Use, and Water Quality. It is anticipated that scour repair and removal of sediment from the debris/sediment basins with heavy equipment would be ongoing throughout the life of the project.

An indirect effect of SunCatchers in the ephemeral streams would be the scour created around the pedestals after a rain event due to the obstruction in the flow path and due to the bare soil following vegetation removal. The hydraulics of flow were used to compute the depth of local scour as well as the area affected by scour by Chang Consultants (2010) using the equation recommended by the Federal Highway Administration (FHWA) in Hydraulic Engineering Circular No. 18, FHWA, 2006 (2010b). Wash D was used as a sample wash to model the indirect effects of scour around SunCatcher pedestals placed in ephemeral streams. The modeling used a 100-year flood event as the precipitation event and determined that the average scour radius during that storm event was a 44.9-square-foot (sf) circle around the SunCatcher pedestal. The scour hole gets partially refilled during the falling stage of the storm flow (i.e., the scour hole becomes smaller by the end of the storm). It calculates that 50 percent of the scour depth is refilled toward the end of the storm for a scour disturbance of 21.9 sq ft around the SunCatcher pedestal (Chang Consultants 2010).

It is anticipated that scour repair would be ongoing throughout the life of the IVS project but would only require maintenance following large storm/flood events. In addition, it is anticipated

that trimming and/or removal of vegetation within the ephemeral streams would continue throughout the life of the IVS project; however, maintenance trimming would consist primarily of removing any shrubs or trees that shade the SunCatchers and any vegetation that would impede the ability of the SunCatcher to track the sun.

Any temporary effects to Corps jurisdictional waters of the U.S. or CDFG jurisdictional wetlands associated with trenching across water bodies would require restoration of the stream and uplands within the buffer areas to the existing elevations, contours, and vegetation communities immediately following construction. The Corps is requiring development of an on-site restoration plan for this purpose, which will be in addition to or incorporate the long-term weed management plan required for construction and operational purposes. While the IVS project is anticipated to result in effects to Corps jurisdictional waters of the U.S. and CDFG jurisdictional streambeds, with implementation of Mitigation Measures BIO-17 (Mitigation of CDFG Streambeds and Corps jurisdictional waters of the U.S.) and BIO-18 (Noxious Weed Management Plan), as well as anticipated special conditions by the Corps to develop an on-site restoration plan for temporary impact areas, the IVS project is not likely to adversely affect waters of the U.S. and CDFG jurisdictional streambeds.

Special-Status Plants

Ground-disturbing activity associated with the IVS project has the potential to disturb either individual plants or populations of special-status plant species should they be present in the project area.

Direct and permanent effects to special-status plant species could occur from construction activities that remove vegetation, disturb soils, or cause sedimentation. These activities include the construction of the IVS project, the placement of transmission lines, maintenance of construction equipment and supplies, staging of equipment and materials, the use or improvement of existing access roads, and the construction of access roads. Indirect and permanent effects of the IVS project construction and operations could include the loss of topsoil, disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased wind and water erosion and sediment transport, and the colonization of nonnative, invasive plant species.

One special-status plant species was found during the spring 2010 botanical surveys: Wiggins' croton (*Croton wigginsii*), which is listed as BLM sensitive. There are 2 special-status species that were addressed in the SA/DEIS with the potential to occur on the project site that are targets of the late summer/early fall 2010 botanical surveys, neither of which has Federal status or State status nor is listed as BLM sensitive; Abram's spurge (*Chamaesyce abramsiana*) (CNPS 2.2) and curly herissantia (*Herrisantia crispa*) (CNPS 2.3).

In order to avoid of populations of special-status plants, the applicant would prepare a Special-Status Plant Protection Plan and provide compensatory mitigation ratio of up to 2:1, as determined by BLM, if impacts to special-status plants cannot be avoided. These compensation measures are described in Mitigation Measure BIO-19. With implementation of the identified Mitigation Measure BIO-19, the IVS project is not likely to adversely affect special-status plant species.

Raptors and Migratory/Special-Status Bird Species

Vegetation at the plant site and along linear facilities provides foraging, cover, and/or breeding habitat for migratory birds, including a number of special-status bird species confirmed to be present at the site. Loggerhead shrike, Le Conte's thrasher, and California horned lark are special-status species known to breed and forage at the site. Western burrowing owls, which also occur at the IVS plant site and linear facilities, are discussed below. Power plant construction would eliminate nesting habitat for these and other species, and could result in direct and cumulative effects to these species due to habitat loss or injury/fatality of individuals. No adverse effects to raptors are anticipated because these species occur infrequently at the IVS area and do not breed there.

The IVS project site does not provide nesting habitat for the golden eagle but does contain marginal to suitable foraging habitat for this eagle. The potential loss of marginal to suitable foraging habitat for the golden eagle as a result of the IVS project would not result in the loss of individual golden eagles or in adverse impacts to golden eagle populations. The IVS project site does not include any golden eagle nesting habitat, nests, breeding territory, or communal roosts. It is not known if the IVS project site functions as a golden eagle migratory corridor; however, the IVS project would not adversely affect golden eagle migratory patterns.

The IVS project site does not provide nesting or forage habitat for the bald eagle. Bald eagles typically live along the coast or rivers and streams and feed primarily on fish. The IVS project site does not include any bald eagle nesting habitat, nests, forage habitat, or roosts. As a result, the IVS project will not result in effects on the bald eagle.

The loss of active bird nests or young is regulated by the Federal Migratory Bird Treaty Act, which protects active nests or eggs. To avoid and minimize effects to nesting birds, mitigation has been incorporated into Mitigation Measures BIO-8 and BIO-14. Measures to minimize effects to nesting birds in Mitigation Measure BIO-8 include minimizing vegetation disturbance and clearance, flagging disturbed areas to confine equipment and vehicles within the flagged areas, and reducing the likelihood of large bird electrocutions and collisions by following the Avian Power Line Interaction Committee guidance (APLIC 2006). Mitigation Measure BIO-14 would minimize effects to nesting birds through conducting ground-disturbing activities outside the bird nesting season (February 1 through July 31) if practicable, conducting a pre-

construction survey should construction activities occur during bird nesting season, and establishing a no disturbance buffer zone should a nest be present. Similar measures have been applied on past projects and the application of these measures has been effective in minimizing effects to nesting birds.

Burrowing Owl

Burrowing owls nesting on the IVS project site could be directly affected by construction of the IVS project. Burrowing owl adults, eggs or young could be crushed or entombed by grading activities. Nesting and foraging activities would also be directly and indirectly affected by construction and operation of the IVS project. The IVS project would also result in permanent loss of 6,185 ac that are currently used by burrowing owls for nesting and foraging. In addition to the potential direct effects to burrowing owl burrows, the IVS project would permanently eliminate a large expanse of habitat on the plant site and along the linear facilities that is currently available for foraging and breeding by burrowing owls. Habitat loss is one of the primary threats to California's burrowing owl population.

To avoid potential effects to burrowing owls that might be nesting on the IVS project site, measures proposed include conducting pre-construction surveys on the plant site and along all linear facilities and utilizing methods recommended by the California Burrowing Owl Consortium (CBOC). To avoid and offset potentially adverse effects to nesting owls, passive removal of the owls has also been proposed. Passive removal involves encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are at least 150 ft from the impact zone and that are within or contiguous to a minimum of 6.5 ac of foraging habitat for each pair of relocated owls. Passive relocation of owls is only implemented during the non-breeding season unless a qualified biologist can verify through non-invasive methods that egg laying/incubation has not begun or juveniles are foraging independently and able to fly. The unoccupied burrows would be collapsed in accordance with CDFG-approved guidelines.

Mitigation measures also identified in this FEIS propose ground-disturbing activities to occur outside the burrowing owl breeding season (February 1 through August 30) when practicable as determined by BLM and clearance surveys by qualified biologists will be conducted prior to each phase of project construction.

Conducting pre-construction surveys, scheduling ground-disturbing activities outside burrowing owl breeding season, and conducting clearance surveys prior to each phase of project construction has been incorporated into Mitigation Measure BIO-16. The BLM would require that surveys and monitoring of burrowing owl burrows within 500 ft of construction activity be conducted. Mitigation Measure BIO-16 also requires that a temporary noise barrier be placed to reduce noise levels near burrows should nesting burrowing owls be within 500 ft of active

construction. Though BLM had initially proposed that burrowing owl would be actively relocated outside of nesting season (February 1 through August 31), active relocation is not allowed by the CDFG code (California Fish and Game Code section 3503.5). In compliance with CDFG regulations, burrowing owls can only be passively relocated followed by the collapsing of burrows.

With implementation of the identified mitigation measures, the IVS project is not likely to adversely affect raptors and migratory or special-status bird species.

Special-Status Mammals

American Badger

American badgers were not detected on the site, but several potential burrows were discovered on-site in addition to a documented occurrence across I-8 from the project site. The project site includes moderately suitable foraging and denning habitat for this species. The American badger is protected under Title 14, California Code of Regulations (CCR) Sections 670.2 and 670.5. Construction of the IVS project could kill or injure American badgers by crushing them with heavy equipment, or could entomb them within a den. Construction activities could also result in disturbance or harassment of individuals. Mitigation Measure BIO-15 requires that, concurrent with the FTHL clearance activities, a qualified biologist would perform a pre-construction survey for badger dens in the project area. This would include areas within 250 ft of all project facilities, utility corridors, and access roads. Should a badger be located on-site, the applicant shall initiate passive removal of the badger and the collapse of the burrow after its removal would occur. This guidance has been incorporated in Mitigation Measure BIO-15.

Desert Kit Fox

The desert kit fox (*Vulpes macrotis*) is not a special status species, but it is protected under Title 14, CCR Section 460, which states that “Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.” These fur-bearing mammals are State protected. Therefore, potential adverse effects impacts to individuals of this species must be avoided. Desert kit fox signs were detected on the IVS site. In addition, marginally suitable foraging and denning habitat for this species is located on-site. Construction of the IVS project could kill or injure desert kit fox by crushing them with heavy equipment, or could entomb them within a den. Construction activities could also result in disturbance or harassment of individuals. Mitigation Measure BIO-15 requires that, concurrent with the FTHL clearance activities, a qualified biologist would perform a pre-construction survey for kit fox dens in the project area, including areas within 250 ft of all project facilities, utility corridors, and access roads. Should a desert kit

fox be located occur on-site, the applicant shall initiate passive removal of the kit fox and the collapse of the burrow after its removal would occur.

Peninsular Bighorn Sheep

A group of five female/yearling Peninsular bighorn sheep were observed in an ephemeral streams on the western half of the project site in March 2009. Although this species could use the IVS project site as foraging habitat, data collected for this project suggests that use of the project site by Peninsular bighorn sheep is transitory and likely a result of drought conditions. As the IVS project is located on flat terrain, sheep entering the area are far from escape-preferred mountainous habitat and the animals likely would be in a highly stressed state. Further, the project site is already surrounded by busy highways and the railroad, suggesting that the sighting was incidental.

The USFWS has determined that the project area provides some forage function for Peninsular bighorn sheep. The USFWS and BLM biologists agree that the observation of Peninsular bighorn sheep on the site in spring 2009 was an unusual occurrence because no known lambing sites or water sites are known near the project site and no other bighorn sheep occurrences have been documented in the vicinity of the project site. USFWS is in the process of preparing a Biological Opinion for the potential adverse project effects to the PBS. Currently, USFWS anticipates requiring mitigation in the form of enhancement or restoration for the estimated 250 ac of foraging habitat on the IVS project site. Mitigation for this foraging habitat would be consistent and overlapping with the Corps proposed mitigation approach at Carrizo Creek and Carrizo Marsh.

BLM determines that the IVS project is not likely to adversely affect Peninsular bighorn sheep with implementation of Mitigation Measures BIO-8 (Construction and Operation Minimization Measures) and BIO-17 (Mitigation of CDFG Streambeds and Corps jurisdictional waters of the U.S.), and anticipated requirements by the USFWS. Mitigation Measure BIO-8 would include erecting fences and gates to preclude large mammal access to the site and to contain construction equipment; covering excavated areas, and sloping the trench or installing wildlife escape ramps in the excavated areas should facilitate the escape of any sheep that wander on site.

Mitigation Measure BIO-17 would include mitigating impacts to Corps jurisdictional waters of the U.S. through the enhancement of Carrizo Creek and Carrizo Marsh in Anza Borrego State Park in known PBS territory.

With implementation of the identified mitigation measure and mitigation required by the USFWS, the IVS project is not likely to adversely affect special-status mammals.

Flat-Tailed Horned Lizard

Surveys in 2007 and 2008 indicated that FTHL inhabits the 6,063-ac plant site and the 92.8-ac off-site transmission corridor. The 12.34 ac of Sonoran creosote bush scrub and salt bush scrub located along the proposed off-site reclaimed water line also provide suitable habitat for FTHL (SES 2008a).

Though the FTHL is not currently listed by the USFWS, it is currently proposed for listing. In anticipation of the FTHL being Federally listed, the BLM has undergone conferencing with the USFWS to address the potential take and loss of habitat associated with the FTHL. If the FTHL becomes listed, the Conferencing Opinion from USFWS would then be converted to a Biological Opinion with a take statement as long as no changes have occurred or if no new information is learned since the issuance of the Conferencing Opinion.

A stated goal of the Flat-tailed Horned Lizard Rangewide Management Strategy (Strategy) is to "provide a framework for securing and managing sufficient habitat to maintain several self-sustaining populations of the FTHL throughout the species' range in the U.S." The Strategy was developed in 1993 and updated in 2003 by the FTHL Interagency Coordinating Committee (ICC) to ensure that FTHL habitat and populations are managed appropriately. The ICC consists of representatives from the USFWS, CDFG, BLM, Bureau of Reclamation (BOR), United States Marine Corps Loma Air Station, United States Navy SW Division, San Diego, United States Naval Air Facility El Centro, Arizona Game and Fish, California State Parks, and Ocotillo Wells.

Direct effects associated with construction activities within these the project areas would result in permanent loss of FTHL habitat. Construction activities could also result in direct mortality, injury, or harassment of FTHLs as a result of encounters with construction vehicles or heavy equipment.

Other direct effects that could occur during construction of the project include individual FTHLs being crushed or entombed in their burrows, collection or vandalism of FTHLs, disruption of FTHL behavior during construction or operation of facilities, and disturbance by noise or vibrations from the heavy equipment. Increased human activity and vehicle travel would occur from the construction and improvement of access roads, which could also disturb, injure, or kill individual FTHLs.

As previously stated, implementation of the IVS project would result in the loss of FTHL habitat. Even though the applicant would retain some vegetation in rows next to the SunCatchers, BLM considers the entire project site affected in regards to FTHL habitat. The BLM considers the 1,038.7 ac of narrow dirt and off highway vehicle (OHV) roads which traverse the project site

equivalent habitat to the undeveloped areas as the horned lizards use all areas within the 6,063.1 ac site.

Compensation for habitat lost outside of the Yuha Desert FTHL Management Area (MA), which would include the 6,063.1-ac project site (including the 1,038.7 ac of dirt and OHV roads that already exist on site), would be at a 1:1 ratio. At a 1:1 ratio, the applicant would be required to compensate for the loss of 6,063.1 ac of FTHL habitat.

The compensation for habitat lost inside the FTHL MA would be increased to a 6:1 ratio. This compensation would be for areas affected by the installation of the 7.56-mi long transmission line outside the project site. Approximately 92.8 ac would be affected within the Yuha Desert FTHL MA as a result of the construction of the transmission line. At a 6:1 ratio, the applicant would be required to compensate for the loss of 556.8 ac (92.9 ac x 6 = 556.8 ac). The applicant would be required to compensate for a total mitigation requirement of 6,619.9 ac when combining the requirements at 1:1 and 6:1.

Impact acreages for the proposed reclaimed water pipeline route were not calculated by the BLM. Although the proposed reclaimed water pipeline is on BLM administered land, construction activities that would occur would be mainly in the developed/ disturbed portions in and along the Evan Hewes Highway. Even though FTHL habitat borders the Evan Hewes Highway, it is anticipated that direct pipeline construction impacts to vegetation and wildlife would be temporary and can be reduced with implementation of Mitigation Measures BIO-1 through BIO-9.

In lieu of the applicant acquiring any compensation lands, compensation acreage can be converted to a monetary equivalent (including administrative costs) that is required to replace the FTHL acreage or adjusted acreage affected by the IVS project. The primary use of the compensation funds is to acquire, protect, or restore FTHL habitat both within and contiguous with MAs. Table 4-27 provides a breakdown of compensation costs for impacts to FTHL and FTHL habitat. The costs are based on BLM's best estimate of current costs per acre and are subject to changing real estate acquisition costs. These compensation funds are incorporated in Mitigation Measure BIO-10 and are based on the calculations provided in Table 4-27.

Table 4-27 Breakdown of Compensation Costs for FTHL

	Project Site (1:1 Ratio) Total Acreage	Off Site Transmission Line (6:1 Ratio) Acres Affected: 92.8	Total
Compensated Acres	6,063.1	(92.8 x 6) = 556.8	6,619.9
Land cost/acre at no less than $500/acre (Table Note 1)	$3,031,550	$278,400	$3,309,950
Level 1 Environmental Site Assessment $3,000/parcel (Table Note 2) (approximately 40 acres/parcel) No. of parcels (acres/40) x $3,000/parcel cost	No. of parcels: (6,063.1/40) = 151.5775 parcels 152 parcels x $3,000 = $456,000	No. of parcels: (556.8/40) = 13.92 parcels 14 parcels x $3,000 = $42,000	166 parcels $498,000
Appraisal at no less than $5,000/parcel (No. of parcels x $5,000)	152 parcels x $5,000 = $760,000	14 parcels x $5,000 = $70,000	$830,000
Fee to clean up, restore, and enhance FTHL habitat at no less than $27/acre (Table Note 3)	6063.1 acres x $27/acre = $163,703.70	556.8 acres x $27/acre = $15,033.60	$178,737.30
Closing and Escrow Costs at $5,00/parcel (Table Note 4)	152 parcels x $5,000 = $760,000	14 parcels x $5,000 = $70,000	$830,000
Biological survey for determining mitigation value of land (habitat based with species specific augmentation) at $5,000/parcel	152 parcels x $5,000 = $760,000	14 parcels x $5,000 = $70,000	$830,000
Third party Administration Costs (Land cost x 10%) (Table Note 5)	$3,031,550 x 10% = $303,155	$278,400 x 10% = $27,840	$330,995
BLM cost to accept donated land (Land cost x 15% x 1.17) (1.17 = 17% of the 15% for overhead costs) (Table Note 6)	$3,031,550 x 15% x 1.17 = $532,037.03	$278,400 x 15% x 1.17 = $48,859.20	$580,896.23
Subtotal	$6,766,445.73	$622,132.80	$7,388,578.53
Long-term management and maintenance fund (LTMM) fee at $692/acre (Table Note 7)	$4,195,665.20	$385,305.60	$4,580,970.80
National Fish and Wildlife Foundation (NFWF) Fees			
NFWF Fee to establish project specific account	--	--	$12,000
NFWF Management fee for acquisition and enhancement actions (subtotal x 3%)	$202,993.37	$18,663.99	$221,657.36

	Project Site (1:1 Ratio) Total Acreage	Off Site Transmission Line (6:1 Ratio) Acres Affected: 92.8	Total
NFWF Management fee for LTMM account (LTMM x 1%)	$41,956.65	$3,853.06	$45,809.71
Subtotal of NFWF Fees	**$244,950.02**	**$22,517.05**	**$279,467.07**
TOTAL (Subtotal + LTMM + NFWF Fees)	**$11,207,060.95**	**$1,029,955.45**	**$12,249,016.40**

Table Note 1: The costs presented in this table are the best estimate as of summer 2010. Actual costs will be determined at the time of the transactions and may change the funding needed to implement the required mitigation obligation. The total compensated acreage is multiplied by $500 an acre to estimate the land cost. This is a generalized estimate taking into consideration a likely jump in land costs due to demand, and an 18 to 24 month time period to acquire the land after agency decisions have been made. If the agencies, developer, or a third party has better, credible information on land costs, in the specific area where project-specific mitigation lands are likely to be purchased, that data overrides this general estimate. Note: Regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.

Table Note 2: For the purposes of determining the costs, a parcel is defined at 40 acres., recognizing that some parcels will be larger and some will be smaller, but 40 acres provides a good estimate for the number of transactions anticipated (based on input from CDD).The total compensated acreage is divided by 40 to figure the number of parcels. The number of parcels is then multiplied by the $3,000 per parcel fee.

Table Note 3: Based on information provided by California Department of Fish and Game.

Table Note 4: The Closing and Escrow Costs are based on two transactions, landowner to a third party and from the third party to the agency.

Table Note 5: The Third party Administration cost includes BLM staff time to work with agencies and landowners, develop a management plan; oversee the land transaction; organize reporting and due diligence; review of acquisition documents and any other work to complete the land acquisition.

Table Note 6: The costs to accept donated land into the public management system include costs for tracking and managing the costs of the donation acceptance which include two physical inspections; review and approval of the Level 1 Environmental Site Assessment; review of all title documents, drafting deed and deed restrictions, issue escrow instructions, mapping the parcels and any other work to complete placing the land into the public management system.

Table Note 7: The Long-term management and maintenance fund cost is an estimate for calculating the general costs. The actual long-term management costs will be determined using a Property Assessment Report (PAR) tailored to the specific acquisition. This cost includes land management, enforcement and defense of easement or title, short and long term monitoring etc.

The issuance of a Conference Opinion from the USFWS would contain measures that the applicant would be required to follow. These measures would be incorporated into the following mitigation measures:

BIO-9 **Flat-Tailed Horned Lizard Avoidance, Minimization, and Mitigation Measures.** The Designated Biologist will contact the BLM, CEC Compliance Project Manager (CPM), and the USFWS before ground disturbing activities, document compliance, be present during operations and maintenance (O&M) activities that take place in FTHL habitat. The project applicant will be responsible for funding before and after impacts analysis, erecting exclusionary fencing along access roads during construction. The applicant's Designated Biologist will salvage any observed FTHL, record data about the salvaged FTHL, and move the salvaged FTHL out of harm's way.

BIO-10 **Flat-Tailed Horned Lizard Compensatory Mitigation.** Identifies the compensation costs to mitigate for FTHL habitat loss, potential take of FTHL, and selection criteria for compensation lands.

BIO-11 **Flat-Tailed Horned Lizard Compliance Verification.** Requires the Designated Biologist to verify for the BLM that all FTHL impact avoidance, minimization, and compensatory measures have been implemented.

The Strategy discusses the use of FTHL barrier fencing in MAs where long-term activities occur. Fencing can be used to exclude FTHL after clearing the construction area of lizards. However, the BLM believes that this action is not practicable due to the large size of the project. The FTHL Strategy was initially based on the recovery plan for desert tortoise, which requires exclusionary fencing for projects affecting desert tortoise. As the detection level during clearance surveys for desert tortoise is greater than FTHL due to the cryptic coloration and the freeze and/or bury behavior to escape detection, the FTHL exclusionary fencing would trap organisms within the so called "cleared" areas rather than excluding them. The BLM consulted with various members of the ICC, and all other signatories agreed with BLM to use the barrier fencing at the discretion of the Designated Biologist in areas deemed appropriate.

After construction is complete, additional project related effects could continue to adversely affect FTHL. Potential indirect operation impacts to FTHL include increased risk of avian predation on FTHL, increased levels of onsite vehicular traffic and disturbance, increased levels of potential collisions with structures, effects of disturbance and lighting, and noxious weeds.

Although implementation of the identified Mitigation Measures BIO-8, BIO-9, BIO-10 and BIO-12 would reduce the severity of affects on the FTHL, the IVS project is likely to adversely affect FTHL.

Avian Predators

Construction and operation of the IVS project could provide new sources of food, water, and nesting and perching sites that might attract unnaturally high numbers of FTHL predators such as the common raven, loggerhead shrike, and American kestrel. Ravens depend on human encroachment to expand into areas where they were previously absent or in low abundance. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. Common raven populations in the Colorado and Mojave deserts increased 1,000 percent from 1968 to 1992 in response to expanding human use of the desert. This increase has had a negative impact on special-status species such as the desert tortoise and FTHL.

Construction and operation of the IVS project would provide new attractants and subsidies that might result in changes in raven population or behavior, which could subsequently affect the FTHL population in the region by increased predation. Water in evaporation ponds; the creation of new perching/roosting/nesting sites; water ponding due to dust suppression; and construction/operation waste have been identified as raven attractants and subsidies. The potential effects to FTHL populations and other species resulting from operation of the IVS project evaporation ponds are discussed later in this section. Effects and mitigation for the remaining three factors are discussed below.

Perching, Roosting, and Nesting Sites

Most raven predation on FTHL is thought to take place during the spring, most likely by breeding birds that spend most of their time foraging within 1,300 ft of their nests. Therefore, IVS structures such as towers, transmission poles and lines, maintenance buildings, and facility fencing offer new nesting and/or perching substrates could facilitate increased risk of predation to FTHL populations by avian predators. The applicant has proposed project design features to reduce nesting and includes physical deterrents to nesting such as bird spikes and nest removal, and monitoring to make sure these design features were working as intended. These measures are described in detail in Mitigation Measure BIO-12, which describes development of the Raven Monitoring and Management Plan.

Ponding

During construction, water would be applied to the graded areas, construction right-of-way, dirt roads, trenches, spoil piles, and other areas of ground disturbance to minimize dust emissions and topsoil erosion. Ponding water resulting from these dust suppression activities has the potential to attract ravens and other predators of FTHL, thereby potentially resulting in increased FTHL predation. As described in Mitigation Measure BIO-8, this potential effect would be minimized by using the minimal amount of water needed for dust abatement.

Food Waste

Ravens are scavengers that forage at landfills, dumpsters behind restaurants and grocery stores, open garbage drums and plastic bags placed on the curb for garbage pickup, and on roadkills. Both construction and operation of the IVS would result in increased waste generation in the project area with improper management of food waste potentially attracting ravens. This potential effect can be avoided with implementation of measures described in Mitigation Measure BIO-8. This measure requires that all food-related waste be placed in self-closing containers and removed daily from the site, and that plastic bags containing trash not be left out for pickup. In addition, to discourage scavenger activity, animal roadkills would be promptly removed from the project site.

To reduce the effects of increased avian predator presence at the IVS project site, the applicant has prepared a draft Raven Monitoring and Management Plan and has recommended impact avoidance and minimization measures, which are incorporated into Mitigation Measure BIO-12. Mitigation Measure BIO-12 specifies that the applicant complete a final Raven Management and Monitoring Plan in consultation with BLM and USFWS. Mitigation Measure BIO-12 would reduce the severity of effects that ravens and other avian predators would have on FTHL numbers through reducing access to anthropogenic food and water resources (subsidies) and discouraging nesting and roosting. This measure would also include the adaptive management of raven management measures should adopted measures become ineffective in controlling predation on FTHL. These measures have been applied on past projects with desert tortoise as prey items and have been modified for the FTHL.

The BLM anticipates that the applicant would be able to produce a final Raven Monitoring and Management Plan that would meet the approval of BLM, CDFG, USFWS well before licensing of the IVS project and updated in the FEIS.

Although implementation of the identified mitigation measures would reduce the severity of affects on the FTHL from avian predators, the IVS project is likely to adversely affect FTHL.

Other Predators

In addition to avian predators, roundtail ground squirrels (*Spermophilus tereticaudus*) are known predators of the FTHL. A potential effect of the SunCatchers is increased vegetation growth as a result of shade and water from the periodic washing beneath those structures. Even though roundtail ground squirrels were not observed on the project site, they are known to occur in the project area. The higher density of vegetation, specifically perennials, could attract roundtail ground squirrels that may not have previously been sustained under the current arid conditions. The possibility of roundtail ground squirrels inhabiting the site would also increase predator species which prey on them, and in turn, could also prey on FTHLs. Implementation of Mitigation Measures BIO-8 and BIO-18, would reduce the severity of these effects. Mitigation Measure BIO-8 includes minimizing soil disturbance and maintaining a vehicle wash with inspection stations to prevent the spread of potential invasive weeds. Mitigation Measure BIO-18 includes measures to minimize effects from noxious weeds through the reestablishment of vegetation on disturbed sites with native seed mixes that are weed free. This measure also includes the monitoring and rapid implementation of control measures to ensure early detection and eradication for noxious weed invasions. Controlling the establishment of roundtail ground squirrels would also discourage foraging at the site by predators of the ground squirrel that could potentially opportunistically prey on FTHL, thereby decreasing predation rates on FTHL.

Although implementation of the identified mitigation measures would reduce the severity of affects on the FTHL from other FTHL predators, the IVS project is likely to adversely affect FTHL.

Evaporation Pond

The IVS project would include two 2,500,000-gallon (gal) evaporation ponds that would collect wastewater from the reverse osmosis water treatment system. Each evaporation pond would be one acre in size.

The creation of a new water source in an area where water is scarce would attract predators to the IVS project site, potentially increasing predation rates on FTHL. Additionally, waterfowl, shorebirds, and other resident or migratory birds that drink or forage at the ponds might be harmed by hyper-saline conditions resulting from the high total dissolved solids (TDS) concentrations. Monitoring results from summer 2007 at Harper Lake Solar Electric Generating System in the Mojave Desert revealed numerous waterfowl deaths at the evaporation ponds due to salt toxicosis. The Harper Lake ponds are similar to those proposed by for the IVS project. As such, the proposed evaporation ponds for the IVS project and the associated risk to birds are a source of significant concern. In addition, the location of the evaporation ponds near

the proposed transmission towers on the project site could result in an increase of avian collisions with the transmission towers as birds may be attracted to the evaporation ponds.

As the evaporation ponds create an attractive nuisance for wildlife, a possible project design feature would be locating the evaporation ponds away from potential collision sites, such as the transmission towers. Other project design features proposed would include construction of exclusionary fencing and installation of netting to cover the evaporation ponds. These project design features have been incorporated as Mitigation Measure BIO-13. In addition to the installation of the fencing and netting, the evaporation ponds would be monitored should any corrective action be needed. Implementation of measures which exclude wildlife from evaporation ponds is preferable to allowing wildlife access to the hyper-saline conditions in the pond water, which has been known to cause death in water fowl.

Implementation of the identified mitigation measures would reduce the severity of affects on the birds attracted to the evaporation ponds. Therefore, the IVS project is not likely to adversely affect birds in regards to evaporation pond mortality.

Increased Risk from Roads/Traffic

Vehicle traffic would increase as a result of IVS project construction and improvement of access roads, resulting in an increase in the risk of injuring or killing FTHL and other wildlife. Construction of the IVS project would be completed over an estimated 40-month period, with a peak at Month 7 of approximately 731 workers per day. Assuming an average of 240 construction personnel vehicles with 1.5 passengers each, it is anticipated an average of approximately 405 workers per day would be on site over the course of construction. Construction is also forecast to generate an average of approximately 270 total one-way vehicle trips per day, mainly from trucks, with a peak of approximately 529 trips per day. During operation approximately 60 trucks, 4 forklifts, and 7 man lifts would be in use continuously throughout a 24-hour period. In addition, 5 delivery truck trips per week are expected, with an estimate of vehicular traffic from 100 workers and 8 visitors on a daily basis.

The potential for increased traffic-related FTHL mortality is greatest along unpaved roads between the rows of SunCatchers, although FTHL on paved roads may also be affected due to increased vehicle frequency and higher speed.

Implementation of Mitigation Measure BIO-8 will minimize the risks of increased traffic fatality and other hazards associated with roads at the IVS project site. These measures include confining vehicular traffic to and from the project site to existing routes of travel, prohibiting cross country vehicle and equipment use outside designated work areas, and imposing a speed limit of 15 miles per hour (mph) on routes within the project site for the life of the project. In addition,

Mitigation Measure BIO-9 would require the presence of Biological Monitors to be on site during construction and to remove FTHLs from harm's way. Similar measures have been applied on past projects and have shown that they reduce effects on wildlife from traffic mortality.

However, although implementation of the identified mitigation measures would reduce the severity of affects on the FTHL from traffic activities, the IVS project is likely to adversely affect FTHL.

Collisions and Electrocution

Birds and bats are known to collide with communication towers, transmission lines, and other elevated structures. The tallest structures at the plant site would be the assembly building, which would be approximately 78 ft tall. All other structures, except for the transmission line support structures, are 50 ft or less in height. Two types of transmission line towers are proposed for use in the IVS project. The 71-ft H-frame towers would be placed at the undercrossing of the existing 500-kilovolt (kV) transmission line, whereas the double-circuit lattice steel towers and/or steel poles (at a height of 90 to 110 ft), would be used elsewhere. These structures at the IVS project site are unlikely to pose a collision risk because they are shorter than those typically associated with bird collision events and do not require guy wires. The number of birds that use native habitat in the project area would be even lower after the solar fields are built as the patchy habitat would only attract birds that are adapted to living under disturbed conditions and in proximity to development. Because the evaporation ponds create an attractive nuisance, to decrease the collision and electrocution risk for birds, the evaporation ponds will be located away from the transmission towers. This project design feature has been incorporated as Mitigation Measure BIO-13.

Large raptors such as golden eagles (*Aquila chrysaetos*) can be electrocuted by transmission lines when a bird's wings simultaneously contact two conductors of different phases, or a conductor and a ground. This happens most frequently when a bird attempts to perch on a structure with insufficient clearance between these elements. The proposed transmission lines would be 230 kV. To minimize risk of electrocution, it is recommended that "raptor-friendly" construction design be used for the transmission line. This would include the conductor wire spacing to be greater than the wingspans of large birds to help prevent electrocution as described in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (APLIC 2006).

Implementation of the identified mitigation measures would reduce the severity of the IVS project's potential electrocution or collisions effects on large raptors in the project area. Therefore, the IVS project is not likely to adversely affect raptors in regards to this issue.

Lighting

Lighting plays a significant role in collision risk with tall towers because lights can attract nocturnal migrant songbirds. In addition, major bird kill events have been reported at lighted communications towers, with most kills from towers higher than 300 ft. IVS project operations would require onsite nighttime lighting for safety and security, which can disturb nocturnal wildlife. To reduce offsite lighting effects to wildlife, the applicant has proposed the lighting at the IVS project facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded and lights would be directed onsite so that light or glare would be minimized. Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting is not required for normal operation, safety, or security; this would allow these areas to remain dark most of the time thereby minimizing the amount of lighting potentially visible offsite. The measures are described in Mitigation Measure VIS-2. The IVS project is not likely to adversely affect wildlife in regards to new lighting sources in the project area.

Noise

Noise from construction activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the project area. This is considered to be a direct but temporary effect. Many bird species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could disturb nesting birds and other wildlife and adversely affect nesting and other activities. The BLM sensitive wildlife species most likely to be affected by noise are the burrowing owl and FTHL.

As discussed in Section 4.10, Noise and Vibration, a maximum construction noise level of 74 dBA L_{dn} is estimated to occur at a distance of 3,300 ft from the acoustic center of the construction activity (the Main Services Complex). This noise level is expected to attenuate to 58 dBA L_{eq} or less at the closest sensitive receptor 3,300 ft west of the project site boundary. The loudest noise likely to occur with IVS project construction is created by the operation of construction equipment. Depending on the type of equipment used, the noise produced can vary from 77 dBA to 90 dBA at 50 ft from the noise source. To minimize noise levels from project equipment, the applicant has proposed various noise-reducing features, such as mufflers on internal combustion engines, air-inlet silencers, shrouds, or shields, which have been incorporated into Mitigation Measure NOISE-6. Similar measures have been applied on past projects and have shown that they are effective in minimizing noise effects on wildlife. The IVS project is not likely to adversely affect wildlife in regards to construction noise in the project area.

Dust

Direct temporary effects associated with disturbance of the soil's surface caused by construction traffic and other activities would result in increased wind erosion of the soil. Aeolian transport of dust and sand can result in the degradation of soil and vegetation over a widening area. Dust can have deleterious physiological effects on plants and may affect their productivity and nutritional qualities. The destruction of plants and soil crusts by windblown sand and dust exacerbates the erodibility of the soil and accelerates the loss of nutrients.

Soil erosion from construction activities and vehicle activity, which affects vegetation and soil properties, could have an adverse affect on both foraging and burrowing potential for FTHL. The applicant has proposed the use of Soiltac™ as a soil binder in areas where vehicular traffic is anticipated. The effects of increased dust and other construction impacts can be minimized with implementation of Mitigation Measure BIO-8. Measures to minimize dust effects in Mitigation Measure BIO-8 include minimizing vegetation and soil disturbance, limiting the speed limit to 15 mph for vehicular traffic, and applying water to dirt roads. Similar measures have been applied on past projects and have shown that they are effective in minimizing dust effects. It is anticipated that dust effects associated with the operation of the IVS project would be similar to those identified for the construction phase of the IVS project. The IVS project is not likely to adversely affect wildlife in regards to construction and operational dust generation in the project area.

Noxious Weeds

The IVS project may have direct and indirect permanent effects on noxious weeds. Construction and operational activities could further spread weeds already present in the project vicinity, including Sahara mustard, red brome, and Mediterranean schismus. The spread of invasive plants is a major threat to biological resources in the Colorado Desert because non-native plants can displace native plants, increase the threat of wildfire, and supplant wildlife foods that are important to herbivorous species. The BLM requires a Noxious Weed Management Plan as the spread of invasive plants could destroy wildlife habitat and forage, threaten endangered species and native plants, and increase soil erosion and groundwater loss. The Federal government initially recognized the threat caused by invasive plants and established the Federal Noxious Weed Act of 1974 (United States Code 2801 et seq.; 88 Statute 2148) to control the spread of noxious weeds. Federal and state agencies entered into a Memorandum of Understanding (MOU) titled "The Agreement on Biological Diversity" to further the intent of the Federal Noxious Weed Act in 1991. The goal for all parties that entered into the MOU is to minimize the populations of undesirable and noxious plants and to enhance ecosystem natural biodiversity. As a result of the MOU, the management of undesirable plants on Federal and State lands is to be coordinated.

To avoid and minimize the spread of existing weeds and the introduction of new ones, an active weed management strategy and control methods must be implemented. The applicant has proposed a Noxious Weed Management Plan to avoid and minimize the spread of noxious weeds which has been incorporated them into Mitigation Measure BIO-18. The Noxious Weed Management Plan includes discussion of weeds targeted for eradication or control and a variety of weed control measures such as establishing weed wash stations for construction vehicles, rapid implementation of control measures to ensure early detection and eradication for noxious weed invasions, and revegetation of disturbed areas with weed free native seed mix. The Noxious Weed Management Plan also includes on-going management to reduce or eliminate the spread of weeds during operation from facilities including dirt roads. The Corps considers this measure necessary to ensure the function and services of the avoided waters of the U.S. are protected from noxious weed impacts.

Construction and operational activities and related soil disturbance could introduce new noxious weeds to lands adjacent to the IVS project plant site and its linear facilities, resulting in indirect permanent effects. As previously stated, to avoid and minimize the spread of existing weeds and the introduction of new ones, an active weed management strategy and control methods must be implemented. With implementation of the identified mitigation measures, the IVS project is not likely to adversely affect vegetation communities and wildlife habitat in regards to the introduction of noxious weeds in the project area.

Applicant-Proposed Modifications

The applicant-proposed modifications to shift the transmission line, change the hydrogen storage system, and use an alternative water supply for construction and initial operations would not affect biological resources differently than analyzed above for the IVS project. However, the water line alignment was modified slightly to follow the Evan Hewes Highway ROW where feasible to avoid sensitive resources including as many known cultural resources as possible. As a result, two segments of the new alignment fall outside areas previously surveyed for biological resources. Although the shifted segments of the waterline alignment are outside areas surveyed for biological resources for the analysis described above for the original IVS project, the applicant conducted additional general biological resources and botanical surveys for the areas where the line shifted. Those surveys did not detect any special interest plant species in the area for the proposed realignments. Additional FTHL surveys were also conducted along the proposed waterline realignments. Those survey data show that FTHL were not observed along the realigned segments of the water pipeline. As a result, based on the FTHL surveys conducted along the proposed waterline realignments, the realignments will not result in adverse effects to FTHL. The realignments of the water pipeline are relatively minor and the results of the biological resources analysis of those realignments are that no adverse effects to

biological resources are anticipated to occur as a result of the realignments. There were no substantive differences in the resources observed on the realigned segments of the pipeline compared to the alignment analyzed above for the original IVS project. In summary, given that the overall design and function of the realigned waterline for the IVS project are essentially the same as what was evaluated for the waterline in the original IVS project, it is expected that the environmental consequences associated with the proposed waterline alignment modifications would be similar to those identified for the waterline as evaluated for the original IVS project.

Project Closure/Decommissioning Effects

Vegetation

No additional adverse effects impacts are expected to occur to special-status vegetation communities from decommissioning/plant closure activity as the removal of vegetation communities would have already occurred with the construction and operation of the IVS project. Closure and decommissioning would require additional construction vehicles and some surface disturbance associated with the removal of project facilities and structures. Closure and decommissioning activities would be subject to the BLM regulations and standards existing at the time of the closure and decommissioning activities. The applicant would notify the BLM and coordinate its closure and decommissioning activities with the BLM at that time. However, if additional effects on vegetation communities are identified as a result of decommissioning/plant closure activities, Mitigation Measures BIO-08 and BIO-18 would be implemented. Therefore, although the IVS project would affect vegetation communities, this action is not likely to adversely affect vegetation communities with implementation of the identified mitigation measures.

United States Army Corps of Engineers Waters of the United States and California Department of Fish and Game Jurisdictional Streambeds

Permanent effects to the ephemeral streams would have already occurred during the construction of the IVS project. The underground electrical collection system, the hydrogen distribution system, and a 428-ft length of the reclaimed waterline in the ephemeral streams would be removed during decommissioning/plant closure. It is anticipated that after the removal of all structures, the ephemeral streams would be recontoured to the original condition. The ephemeral streams would be restored by replanting with native vegetation and maintenance for a minimum of five years. Monitoring and success criteria would need to be function-based,

scientifically defensible, explicit, and measurable. These measures would be incorporated into the Decommissioning and Reclamation Plan required by Mitigation Measure BIO-20.

The reclaimed water pipeline along Evan Hewes Highway is anticipated to remain in place if the plant is decommissioned, therefore, no new effects are expected from decommissioning/plant closure activities for the pipeline. The IVS project is not likely to adversely affect Corps jurisdictional waters of the U.S. or CDFG jurisdictional streambeds during the decommissioning or closure activities associated with the IVS project.

Special-Status Plants

No effects are expected to occur for special-status plants from decommissioning/plant closure activity as none are expected to be present after construction and operation of the power plant. Special-status plant surveys would be conducted prior to decommissioning/plant closure activity. Should any special-status plants occur on the site, avoidance measures described in Mitigation Measure BIO-19 would be implemented. With implementation of the identified mitigation measure, the IVS project is not likely to adversely affect special-status plant species during decommissioning or closure activities.

Raptors and Migratory/Special-Status Bird Species

The IVS project site does not provide nesting habitat for the golden eagle (*Aquila chrysaetos*). The IVS project site does contain marginal to suitable foraging habitat for golden eagle. The loss of potential golden eagle foraging habitat from implementation of the IVS project would not result in the loss of individual golden eagle, nor is it anticipated to result in adverse effects on golden eagle populations.

The IVS project site does not include any golden eagle nesting habitat, golden eagle nests, golden eagle breeding territory, or golden eagle communal roosts. It is not known if the IVS project site functions as a golden eagle migratory corridor; however, the IVS project would not adversely affect golden eagle migratory patterns.

Construction and operation of the power plant would have eliminated nesting and foraging habitat for many migratory/special-status birds, though western burrowing owls could exist near the periphery of the plant site. Any burrowing owls nesting on the plant site could be directly affected by decommissioning/plant closure activities. Burrowing owl adults, eggs or young could be crushed or entombed, and nesting and foraging activities would be directly and indirectly affected by decommissioning/plant closure activities. To avoid potential effects to burrowing owls that might be nesting within the impact area, surveys would be conducted on the plant site using methods recommended by the CBOC prior to decommissioning/plant closure activities. To

avoid and offset effects to burrowing owls, passive removal would be used. Passive removal involves encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are at least 150 ft from the impact zone and that are within or contiguous to a minimum of 6.5 ac of foraging habitat for each pair of relocated owls. Passive relocation of owls is only implemented during the non-breeding season unless a qualified biologist can verify through non-invasive methods that egg laying/incubation has not begun or juveniles are foraging independently and able to fly. The unoccupied burrows would be collapsed in accordance with CDFG-approved guidelines. Ground-disturbing activities would occur outside the burrowing owl breeding season (February 1 through August 30) with clearance surveys prior to each phase of decommissioning/project closure activity.

In addition, monitoring of burrowing owl burrows within 500 ft of decommissioning/plant closure activities would be conducted. Mitigation Measure BIO-16 requires a temporary noise barrier shall be placed to reduce noise levels near burrows should nesting burrowing owls be within 500 ft of decommissioning/plant closure activities. With implementation of the identified mitigation measure, the IVS project is not likely to adversely affect raptors and migratory or special-status bird species during decommissioning or closure activities.

Special-Status Mammals

Construction and operation of the power plant could result in the elimination of denning and foraging habitat for desert kit fox and American badger. The exclusionary fencing of the plant site would prevent Peninsular bighorn sheep entering the site. However, the site represents a small fraction of the total available habitat within the region for these species. Therefore, no adverse effects are expected from decommissioning/plant closure activities to desert kit fox, badger, and Peninsular bighorn sheep.

Flat-Tailed Horned Lizard

The potential for FTHLs to occur on the plant site is low due to the continual operations activities conducted prior to decommissioning/plant closure. However, should the FTHL be present, decommissioning/plant closure activities could result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Other direct effects could include individual FTHLs being crushed or entombed in their burrows, collection or vandalism, disruption of FTHL behavior during decommissioning/plant closure activities, and disturbance by noise or vibrations from the heavy equipment.

Measures from the issuance of a Conference Opinion from the USFWS (or Biological Opinion if the FTHL are Federally listed) would be incorporated into Mitigation Measure BIO-9, which

identifies the FTHL removal protocol that would be utilized. In addition, Mitigation Measures BIO-11 would require the Designated Biologist to verify for the BLM that all FTHL avoidance, minimization, and compensatory measures have been implemented.

Although implementation of the identified mitigation measures would reduce the severity of affects on the FTHL, the IVS project is likely to adversely affect FTHL during decommissioning or closure activities.

Avian Predators

The removal of structures such as buildings, transmission towers, and SunCatchers would eliminate perching, roosting, and nesting sites for avian predators of FTHL. Therefore, no adverse effects associated with this issue are expected from decommissioning/plant closure activities.

Other Predators

The decommissioning/plant closure activities would remove sources of food waste and water ponding from mirror washing and dust suppression operational activities that would attract predators of FTHL. Therefore, no adverse effects associated with this issue are anticipated to occur from decommissioning/plant closure activities.

Evaporation Ponds

It is anticipated that the evaporation ponds would be removed as part of the decommissioning/ plant closure activities for the IVS project. Any recontouring that would occur with the remediation of the evaporation ponds would be required to implement Mitigation Measure BIO-8. With the implementation of Mitigation Measure BIO-8, no adverse effects would occur from decommissioning/plant closure activities.

Increased Risk from Roads/Traffic

Vehicle traffic associated with the decommissioning/plant closure activity is anticipated to be similar to that identified for construction activities associated with the IVS project. Decommissioning activities would involve the removal of structures and infrastructure on the project site, resulting in an increase in the risk of injuring or killing FTHL and other wildlife.

The decommissioning of the IVS project would require the use of construction equipment and construction personnel traveling to and from the project area. The potential for increased traffic-related FTHL mortality is greatest along unpaved roads in between the rows of SunCatchers,

although FTHL on paved roads may also be affected due to increased vehicle frequency and higher speed.

Implementation of Mitigation Measure BIO-8 will minimize the risks of increased traffic fatality and other hazards associated with roads at the IVS project site. These measures include confining vehicular traffic to and from the project site to existing routes of travel and prohibiting cross country vehicle and equipment use outside designated work areas for the life of the project. In addition, Mitigation Measure BIO-9 would remove FTHLs to the maximum extent practicable during construction. Similar measures have been applied on past projects and have shown that they reduce effects on wildlife from traffic mortality. Although implementation of the identified mitigation measures would reduce the severity of affects on the FTHL, the IVS project is likely to adversely affect FTHL during decommissioning or closure activities.

Collisions and Electrocution

The removal of transmission towers will eliminate collision and electrocution hazards to birds and bats. Therefore, no adverse effects associated with this issue would occur from the decommissioning or plant closure activities.

Lighting

The decommissioning/plant closure activities would result in the removal of lighting infrastructure from the project site. No adverse effects are expected to occur from the decommissioning of the IVS project.

Noise

Noise from decommissioning/project closure activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the project site. Many bird species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from the closure activities could disturb breeding or nesting birds and other wildlife and adversely affect nesting and other activities. The wildlife species most likely to be affected by noise are the burrowing owl, FTHL, Peninsular bighorn sheep, loggerhead shrike, and Le Conte's thrasher.

The effects from decommissioning/project closure activities would be similar to construction activities, with the loudest noise created by the operation of the equipment. Mitigation Measure NOISE-6 includes various noise-reducing features, such as mufflers on internal combustion engines, air-inlet silencers, shrouds, or shields. Similar measures have been applied on past projects and have shown that they are effective in minimizing noise effects impacts on wildlife.

Therefore, the IVS project is not likely to adversely affect wildlife in regards to noise associated with decommissioning or closure activities in the project area.

Dust

Disturbance of the soil surface caused by decommissioning/project closure traffic and other activities would result in increased wind erosion of the soil. Aeolian transport of dust and sand can result in the degradation of soil and vegetation over a widening area. Dust can have deleterious physiological effects on plants and may affect their productivity and nutritional qualities. The destruction of plants and soil crusts by windblown sand and dust exacerbates the erodibility of the soil and accelerates the loss of nutrients. Soil erosion from decommissioning/ project closure activities and vehicle activity would affect vegetation and soil properties. Mitigation Measure BIO-8 includes minimizing vegetation and soil disturbance, limiting the speed limit to 15 mph for vehicular traffic, and applying water to dirt roads. The applicant has proposed the use of Soiltac™ as a soil binder in areas where vehicular traffic is anticipated. Similar measures have been applied on past projects and have shown that they are effective in minimizing dust impacts. Therefore, the IVS project is not likely to adversely affect wildlife in regards to dust generated from decommission or closure activities in the project area.

Noxious Weeds

The water that was originally used during plant operations would no longer be available for the propagation of noxious weeds. However, decommissioning/project closure activities and associated soil disturbance could introduce new noxious weeds to lands adjacent to the IVS project plant site and could further spread weeds already present in the project vicinity. Mitigation Measure BIO-18 serves to avoid and minimize the spread of noxious weeds. The Noxious Weed Management Plan includes a discussion of weeds targeted for eradication or control and a variety of weed control measures such as establishing weed wash stations for vehicles, rapid implementation of control measures to ensure early detection and eradication for noxious weed invasions, and revegetation of disturbed areas with weed free native seed mixes. Implementation of Mitigation Measure BIO-18 would reduce potential effects associated with the spread of noxious weeds. With implementation of the identified mitigation measure, the IVS project is not likely to adversely affect vegetation communities and wildlife habitat in regards to the introduction of noxious weeds in the project area during decommission and closure activities.

Applicant-Proposed Modifications

The applicant-proposed modifications to the transmission line, the water pipeline, the hydrogen storage system, and the alternative water supply during construction and initial operations would not result in changes in the impacts on biological resources during decommissioning. This is because these project features would be decommissioned and removed similar to the decommissioning and removal of project features as evaluated for the original IVS project.

4.3.4.2 709 MW Alternative: Agency Preferred Alternative

Direct effects are those effects that result from a project and occur at the same time and place. Indirect effects are caused by the IVS project, but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the project. The potential effects discussed in this analysis are those most likely to be associated with construction and operation of the IVS project as described in the previous section.

Impact analyses typically characterize effects to plant communities as temporary or permanent, with a permanent effect referring to areas that are paved or otherwise precluded from restoration to a pre-project state. In the desert ecosystems, permanent effects reflect the slow recovery rates of its plant communities. Natural recovery rates from disturbance in these systems depend on the nature and severity of the effect. For example, creosote bushes can re-sprout a full canopy within five years after damage from heavy vehicle traffic, but more severe damage involving vegetation removal and soil disturbance can take from 50 to 300 years for partial recovery; complete ecosystem recovery may require over 3,000 years. In this analysis, an effect is considered temporary only if there is evidence to indicate that pre-disturbance levels of biomass, cover, density, community structure, and soil characteristics could be achieved within 5 years.

The Agency Preferred Alternative would result in biological impacts similar to those described in the previous section, except at a slightly reduced amount, because of the slight reduction in the area disturbed on site and in the number of SunCatchers. In addition, this alternative specifically reduces impact to aquatic resources by placing less SunCatchers in the primary desert streambeds on the IVS project site. The measures identified for the IVS project would also apply to the Agency Preferred Alternative.

The short- and long-term impacts of the four applicant-proposed modifications related to biological resources would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.3.4.3 300 MW Alternative

The 300 MW Alternative would provide the same facilities and project components as Phase 1 of the 750 MW IVS project. Compared to the IVS project, the area would be reduced to a 2,577-ac project site on the southwest part of the original project site and would consist of 12,000 SunCatchers, generating 300 MW. The substation would be reduced to 300 MW capacity; however, the linear transmission line and water pipeline routes would remain the same.

The general setting and existing conditions for the 300 MW Alternative would be similar to the conditions for the IVS project although the land requirements would be proportionately reduced to reflect the smaller project size. For the 300 MW Alternative, all the ephemeral streams except one have connections to Coyote Wash north of the site. The one ephemeral stream is along the southern edge on the east side of the project site and connects to other ephemeral streams which flow northeast toward the Westside Main Canal.

The 300 MW Alternative would permanently affect a total of 2,577 ac of Sonoran creosote bush scrub habitat including the OHV and dirt roads. Mitigation for impacts to vegetation communities resulting from the 300 MW Alternative would be the same as mitigation proposed under the IVS project (i.e., Mitigation Measures BIO-8, BIO-10, BIO-18, and BIO-19).

As with the IVS project, the 300 MW Alternative could result in potential effects to individual FTHL, as well as permanent loss of approximately 2,577 ac of FTHL habitat. Similar to the IVS project, other potential impacts to FTHL resulting from the 300 MW Alternative include increased risk of predation, increased road kill hazard from construction and operational traffic, fragmentation of habitat, and loss of connectivity. The mitigation compensation for effects to FTHL habitat on the plant site would be reduced to 2,577 ac at a 1:1 mitigation ratio.

The off-site transmission line compensation for impacts to FTHL habitat would remain the same as the IVS project. Additional mitigation for effects to FTHL would be the same as those for the IVS project and include Mitigation Measures BIO-8, BIO-9, BIO-10, and BIO-11.

Similar to the IVS project, the ephemeral streams would be affected directly and indirectly by construction and operation of the SunCatchers and associated infrastructure as described earlier in the section discussing waters of the U.S. and CDFG jurisdictional streambed effects. However, the total permanent and temporary effects would be decreased under the 300 MW Alternative due to the reduction in project acreage.

For the plant site, permanent effects to waters of the U.S. and CDFG jurisdictional streambeds would be reduced to 63 ac versus the IVS project's 165 ac of permanent effects. Temporary effects to waters of the U.S. and CDFG jurisdictional streambeds would be 5 ac for the 300 MW Alternative, the same as under the IVS project. Under the 300 MW Alternative, approximately

109,376 lf of jurisdictional waters would be permanently affected and 5,116 lf of jurisdictional waters would be temporarily affected on the project site. Mitigation for effects to waters of the U.S. and CDFG jurisdictional streambeds resulting from the 300 MW Alternative would be similar to mitigation proposed under the IVS project (i.e., Mitigation Measures BIO-8 and BIO-17).

While there would be an overall decrease in permanent acreage effects to waters of the U.S. and CDFG jurisdictional streambeds, 6 of the 8 primary drainages would be directly affected by the development of the 300 MW Alternative. This would cause the disruption of the physical (e.g., hydrological and sediment transport), chemical, and biological functions and processes of the ephemeral streams. The use of ephemeral streams as a movement corridor for wildlife would still be disrupted under the 300 MW Alternative.

Although the 300 MW Alternative would result in reduced effects to American badger and desert kit fox habitat compared to the IVS project (from 6063.1 ac to 2,577 ac), effects to these species due to loss and fragmentation of habitat and loss of foraging grounds would still occur. In addition, crushing or entombing these animals during construction could potentially occur. Mitigation for these effects to the American badger and desert kit fox impacts have been incorporated into Mitigation Measure BIO-15. Impacts to wildlife, including western burrowing owl, California horned lark, Le Conte's thrasher, or other special-status species under the 300 MW Alternative would be reduced as compared to the IVS project due to the reduction in the amount of Sonoran creosote scrub habitat that would be removed. However, the loss of nests, eggs, or young of these bird species could still occur. Under the 300 MW Alternative, the loss of breeding and foraging habitat on the site as well as disturbance of nesting and foraging activities near the site and linear facilities would also still occur. Mitigation for these effects would be through the implementation of Mitigation Measures BIO-8 and BIO-14. Potential effects to burrowing owls would be further mitigated by Mitigation Measure BIO-16.

Several special-status plant species have the potential to occur within the project area, although none were observed within the project area. The 300 MW Alternative could potentially result in direct or indirect effects to special-status plant species from construction activities and fragmentation of habitat. Mitigation for these potential effects would be similar to those identified for the IVS project (i.e., Mitigation Measures BIO-18 and BIO-20).

The effects of evaporation ponds, bird collisions and electrocution would remain the same under the 300 MW Alternative as under the IVS project. It is anticipated that two evaporation ponds would still be needed at the plant site even though the amount of water required to clean the SunCatcher mirrors would be reduced. Plant operations would cycle one pond to fill with reverse osmosis (RO) water for a year and then evaporate the following year. The second pond will be on an alternate schedule so there is always a pond available for receiving RO water and

another to allow evaporation of RO water. Mitigation for effects associated with this would be the same as mitigation under the IVS project (i.e., Mitigation Measures BIO-8 and BIO-13).

Effects from an increase in road usage and traffic levels would be proportionately reduced with the smaller project size. Mitigation for effects associated with this would be the same as mitigation under the IVS project (i.e., Mitigation Measure BIO-8).

The short- and long-term impacts of the four applicant-proposed modifications related to biological resources would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.3.4.4 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would prohibit permanent effects within 10 primary drainages located within the IVS project site boundary. The Drainage Avoidance #1 Alternative would have the same outer project boundary as the IVS project, but would prohibit installation of permanent structures within the ephemeral streams, thereby reducing the developed area from 6,063.1 ac to 4,690 ac. This reduction in area would result in the reduction of generation capacity from 750 MW under the IVS project to 632 MW (84 percent of the proposed generation capacity). Rather than installation of 30,000 SunCatchers as identified under the IVS project, 25,000 SunCatchers would be installed.

The Drainage Avoidance #1 Alternative would affect 4,690 ac of Sonoran creosote bush scrub habitat compared to the IVS project, which impacts 6,063.1 ac of Sonoran creosote bush scrub habitat. Mitigation for effects to vegetation communities resulting from the Drainage Avoidance #1 Alternative would be the same as mitigation under the IVS project.

The compensation approach for effects to FTHL habitat under the Drainage Avoidance #1 Alternative for the plant site would remain the same as identified for the IVS project (6,063.1 ac at a 1:1 mitigation ratio). The off-site transmission line compensation for effects to FTHL habitat under the Drainage Avoidance #1 Alternative would also remain the same as identified for the IVS project. Other potential effects to FTHL resulting from the Drainage Avoidance #1 Alternative would be similar to the IVS project. These potential effects include increased risk of predation, increased road kill hazards from construction and operational traffic, fragmentation of habitat, and loss of connectivity.

As previously stated, compensation for effects to vegetation communities and FTHL would be the same as those identified for the IVS project and are Mitigation Measures BIO-8, BIO-10, BIO-11, BIO-18, and BIO-19.

Under the Drainage Avoidance #1 Alternative, 10 primary ephemeral washes would not be directly affected by operation of the SunCatchers and associated infrastructure as described earlier in the section discussing waters of the U.S. and CDFG jurisdictional streambed effects**.** However, site grading/recontouring, construction of roads, Arizona crossings, bank stabilization features (i.e., rip-rap, retaining walls, gabions), and storm drain outfall structures would still be constructed under the Drainage Avoidance #1 Alternative and would affect the ephemeral streams. These effects would be the same as identified for the IVS project.

Overall, the Drainage Avoidance #1 Alternative would result in a substantial decrease in permanent effects to waters of the U.S. and CDFG jurisdictional streambeds (from 165 ac to 48 ac) and a decrease in temporary effects (from 5 ac to no impacts). As a result, mitigation for effects to waters of the U.S. and CDFG jurisdictional streambeds would decrease compared to the IVS project. The use of ephemeral streams as a movement corridor for wildlife would not be disrupted in the Drainage Avoidance #1 Alternative.

Mitigation for impacts to waters of the U.S. and CDFG jurisdictional streambeds resulting from the Drainage Avoidance #1 Alternative would be similar to mitigation identified for the IVS project. These include Mitigation Measures BIO-8 and BIO-17.

Under the Drainage Avoidance #1 Alternative, the amount of Sonoran creosote scrub habitat affected would be less when compared to the IVS project. Because less habitat would be affected, impacts to western burrowing owl, loggerhead shrike, California horned lark, Le Conte's thrasher, or other special-status birds who use this habitat would be slightly reduced under the Drainage Avoidance #1 Alternative when compared to the IVS project. However, the loss of nests, eggs, or young could still potentially occur under the Drainage Avoidance #1 Alternative. Similar to the IVS project, the loss of breeding and foraging habitat as well as disturbance of nesting and foraging activities near the site and linear facilities would still occur under the Drainage Avoidance #1 Alternative.

Mitigation for these impacts would be the same as those identified for the IVS project. These include Mitigation Measures BIO-8 and BIO-14 which would avoid these potentially significant effects to nesting birds. Potential effects to burrowing owls would be further mitigated by Mitigation Measure BIO-16.

Several special-status plant species have the potential to occur within the project area, although none were observed within the project area. The Drainage Avoidance #1 Alternative could potentially result in direct or indirect effects to special-status plant species from construction and fragmentation of habitat. Mitigation for these potential effects would be similar to those identified for the IVS project. These include Mitigation Measures BIO-18 and BIO-19.

The effects of evaporation ponds, bird collisions and electrocution would remain the same those identified for the IVS project because the transmission line would not change with the Drainage Avoidance #1 Alternative. BLM assumes that two evaporation ponds would still be needed at the plant site although the need for water to clean the SunCatcher mirrors would be reduced under the Drainage Avoidance #1 Alternative. Plant operations would cycle one evaporation pond to fill with RO water for a year and then evaporate the following year. The second evaporation pond will be on an alternate schedule so there is always an evaporation pond available for receiving RO water and another to allow evaporation of RO water. Mitigation for effects associated with the evaporation ponds would be the same as mitigation identified for the IVS project. These include Mitigation Measures BIO-8 and BIO-13.

Under the Drainage Avoidance #1 Alternative, the effects from roads and traffic would be reduced with the decrease in the number of SunCatchers. Mitigation for effects associated with these issues would be the same as mitigation identified for the IVS project. This includes Mitigation Measure BIO-8.

The short- and long-term impacts of the four applicant-proposed modifications related to biological resources would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.3.4.5 Drainage Avoidance #2 Alternative

The Drainage Avoidance #2 Alternative would eliminate development in the easternmost and westernmost parts of the IVS project site, where the largest drainage complexes are located. The Drainage Avoidance #2 Alternative would reduce the overall size of the project site by approximately 50 percent (from 6,063.1 ac to 3,153 ac). It also would reduce the generation capacity from 750 to 423 MW (retaining only about 32 percent of the number of SunCatchers). In the Drainage Avoidance #2 Alternative, permanent structures would be allowed within all ephemeral streams inside the revised, smaller project site boundary.

The Drainage Avoidance #2 Alternative would permanently affect 3,153 ac of Sonoran creosote bush scrub compared to the IVS project, which would affect 6,063.1 ac of Sonoran creosote bush scrub habitat. Mitigation for effects to vegetation communities resulting from the Drainage Avoidance #2 Alternative would be the same as mitigation identified for the IVS project. These include Mitigation Measures BIO-8, BIO-10, BIO-18, and BIO-19.

As with the IVS project, the Drainage Avoidance #2 Alternative could result in potential affects to individual FTHL and the permanent loss of approximately 3,153 ac of FTHL habitat. Other

potential effects to FTHL resulting from the Drainage Avoidance #2 Alternative would be similar to those identified for the IVS project. These potential effects include increased risk of predation, increased road kill hazards from construction and operational traffic, fragmentation of habitat, and loss of connectivity.

The mitigation compensation for effects to FTHL habitat on the plant site would be reduced to 3,153 ac at a 1:1 mitigation ratio. The off-site transmission line compensation for effects to FTHL habitat would remain the same as that identified for the IVS project. Mitigation for effects to FTHL would be the same as those identified for the IVS project. These include Mitigation Measures BIO-8, BIO-9, BIO-10, and BIO-11.

Under the Drainage Avoidance #2 Alternative, only the central part of the IVS project site would be developed. The Drainage Avoidance #2 Alternative would avoid three primary and three secondary ephemeral streams at the west end of the IVS project site and three primary and several secondary ephemeral streams at the east end of the IVS project site**.** The ephemeral streams in the central part of the project site would be affected directly and indirectly by construction and operation of the SunCatchers and associated infrastructure as described earlier in the section discussing waters of the U.S. and CDFG jurisdictional streambed effects.

The Drainage Avoidance #2 Alternative would result in 71 ac of permanent effects and 1 ac of temporary effects to waters of the U.S. and CDFG jurisdictional streambeds. When compared to the IVS project (which would result in 165 ac of permanent effects and 5 ac of temporary effects to waters of the U.S. and CDFG jurisdictional streambeds), there would be a substantial decrease in effects under the Drainage Avoidance #2 Alternative. Mitigation for effects to waters of the U.S. and CDFG jurisdictional streambeds resulting from the Drainage Avoidance #2 Alternative would be the same as those recommended for the IVS project. These include Mitigation Measures BIO-8 and BIO-17).

Although there would be a decrease in acreage effects to wildlife habitat, the use of ephemeral streams as a movement corridor for wildlife in the central part of the site would still be disrupted under the Drainage Avoidance #2 Alternative.

The Drainage Avoidance #2 Alternative would result in reduced effects on American badger and desert kit fox habitat compared to the IVS project (from 6063.1 to 3,153 ac). Effects to these species would result from the loss and fragmentation of habitat and foraging grounds. In addition, crushing or entombing these animals during construction could potentially occur. Mitigation for these effects would be the same as that identified for the IVS project (i.e., Mitigation Measure BIO-15).

As previously stated, the Drainage Avoidance #2 Alternative would result in a reduction of Sonoran creosote scrub habitat that would be affected. Because the amount of habitat affected is reduced, effects to western burrowing owl, loggerhead shrike, California horned lark, Le Conte's thrasher, or other special-status birds that use this habitat would also be reduced under the Drainage Avoidance #2 Alternative compared to the IVS project. However, the loss of nests, eggs, or young could potentially occur under the Drainage Avoidance #2 Alternative. In addition, loss of breeding and foraging habitat as well as disturbance of nesting and foraging activities near the site and linear facilities would still occur.

Mitigation for these effects would be the same as for the IVS project. These include Mitigation Measures BIO-8 and BIO-14 which would avoid potentially adverse effects to nesting birds. In addition, potential effects to burrowing owls would be further mitigated by Mitigation Measure BIO-16.

Several special-status plant species have the potential to occur within the project area, although none were observed within the project area. The Drainage Avoidance #2 Alternative could potentially result in direct or indirect effects to special-status plant species from construction and fragmentation of habitat. Mitigation for these potential effects would be similar to those identified for the IVS project. These include Mitigation Measures BIO-18 and BIO-19.

The effects of evaporation ponds, bird collisions and electrocution would remain the same as the IVS project because the transmission line would not change with the Drainage Avoidance #2 Alternative. The BLM assumes that two evaporation ponds would still be needed at the plant site even though the need for water to clean the SunCatcher mirrors would be reduced under the Drainage Avoidance #2 Alternative. Plant operations would cycle one evaporation pond to fill with RO water for a year and then evaporate the following year. The second evaporation pond will be on an alternate schedule so there is always an evaporation pond available for receiving RO water and another to allow evaporation of RO water. Mitigation for effects associated with the evaporation ponds would be the same as mitigation identified for the IVS project. These include Mitigation Measures BIO-8 and BIO-13.

The effects from roads and traffic would also be reduced under the Drainage Avoidance #2 Alternative with the decrease in project acreage. Mitigation for effects associated with these issues would be the same as mitigation identified for the IVS project. This includes Mitigation Measure BIO-8.

The short- and long-term impacts of the four applicant-proposed modifications related to biological resources would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.3.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the proposed IVS project would not be approved by the BLM and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site. BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition. No new structures or facilities would be constructed or operated on the site and there would be no new ground disturbance. As a result, none of the effects to biological resources resulting from construction or operation of the IVS project would occur. No effects to special-status plants and wildlife species would occur and no effects to desert habitat would occur. However, the land on which the project is proposed would become available to other uses that are consistent with the CDCA Plan. This may include another solar project requiring a land use plan amendment. In addition, in the absence of this project, other renewable energy projects may be constructed in other locations to meet State and Federal mandates. The construction and operation of those projects could have similar effects on biological resources in other locations.

4.3.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the IVS project would not be approved by the BLM. In addition, the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no future solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition. No new structures or facilities constructed or operated on the site and no new ground disturbance would occur. As a result, the biological resources of the site are not expected to change noticeably from existing conditions. Therefore, this No Action Alternative would not result in effects to biological resources. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates. Those projects would have similar effects on biological resources in other locations.

4.3.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the IVS project would not be approved by BLM. However, BLM would amend the CDCA Plan to allow for other solar projects on the site. Because the CDCA Plan would be amended, it is possible the site would be developed with the same or a different solar technology. As a result, effects on biological resources would result from the construction and operation of another solar technology project. It is anticipated that the construction and operation of another solar technology project on site would result in similar biological effects identified for the IVS project. These would likely include effects to special-status plants and wildlife and to desert habitat. Although different solar technologies require different amounts of grading, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in biological resource effects similar to the effects identified for the IVS project.

4.3.5 Cumulative Effects

The cumulative study area and cumulative projects considered in this analysis were described in detail earlier in Section 2.10, Overview of the Cumulative Impacts Analysis.

The geographic area considered for cumulative impacts on biological resources is FTHL habitat in California. The historical range of the FTHL in California encompassed approximately 1.8 to 2.2 million ac mainly in Imperial County, but also in central Riverside and eastern San Diego counties, but is now reduced to approximately 50 percent of its historical range.

Approximately 50 percent of the historical range of FTHL has been destroyed mainly by agricultural and urban development. Agricultural practices, particularly irrigation, have altered some FTHL habitat to such a degree to be unsuitable for the species. The agricultural and urban development has also affected other wildlife and native plants by reducing native habitat. Other projects and activities that have reduced the range of FTHL in the Imperial Valley include the United States Gypsum Corporation (Plaster City) processing plant north of the IVS project site along Evan Hewes Highway; sand and gravel operations north of Evan Hewes Highway, 5 mi west of Ocotillo, and east of the project site; OHV use at the Plaster City Open OHV Area north of Evan Hewes Highway and limited use on designated routes on the IVS project site; intensive agricultural production and urban development east of the project site; and former sand and gravel operations on the project site in the past, which has been subsequently reclaimed. Eight mi south of the project site, a fence at the United States–Mexico border is currently under construction. That border fence would eliminate the illegal drive-through traffic, thus lessening impacts to FTHL along the border. However, the large scale habitat loss

associated with the currently proposed projects in the area negates FTHL population gains in the region. In this context, the potential of the IVS project to contribute to cumulative effects loss, degradation, and fragmentation of habitat, including loss of connectivity for desert plants and wildlife, including FTHL and other special-status species is assessed.

Biological resources are expected to be affected by reasonably foreseeable future projects development and energy projects as discussed in Section 2.10, Overview of the Cumulative Impacts Analysis. These projects, which are located in FTHL habitat, include all the future foreseeable projects in the Plaster City area listed in Table 2-10 and the following proposed renewable energy projects:

- Bethel Solar Hybrid Power Plant is a proposed 49.4 MW hybrid solar thermal and biomass facility in Seeley.
- Mt. Signal Solar Power Station is a proposed 49.4 MW hybrid solar thermal and biomass facility 8 mi southwest of El Centro.
- TelStar Energies, LLC, is a proposed 300 MW wind energy project west of the IVS project site in Ocotillo Wells.
- Orni 18, LLC, Geothermal Power Plant is a proposed 49.9 MW geothermal facility in Brawley.

Proposed solar and wind energy projects have the potential to further reduce and degrade native plant and animal populations, in particular special-status species such as FTHL.

Most of the cumulative projects, including the projects listed above and the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to biological resources less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects and the types of biological resources on and in the vicinity of the sites for those projects. As a result, the IVS project, when considered in conjunction with those other cumulative projects, is expected to contribute only a small amount to potential short-term cumulative impacts during project construction and decommissioning and to contribute to substantial long-term adverse effects related to biological resources, as discussed in the following sections.

4.3.5.1 Construction Cumulative Effects

The construction of the IVS project is expected to result in short term adverse effects related to construction activities. It is expected that some of the cumulative projects described above which are not yet built may be under construction the same time as the IVS project. As a result, there may be substantial short term cumulative effects during construction of the IVS project and other cumulative projects related to biological resources.

The IVS project would be expected to contribute only a small amount to the possible short term cumulative effects related to biological resources because the proposed mitigation measures described below would minimize and offset the contributions of the IVS project to the cumulative loss of habitat for native plant communities and wildlife, including special-status species. Mitigation Measure BIO-10 requires the applicant to pay for the acquisition of 6,619.9 ac of suitable habitat for FTHL. This habitat would be connected to other suitable habitat for other special-status species, and would offset any habitat loss associated with the IVS project. Mitigation Measures BIO-16 requires protection and passive relocation for burrowing owls and BIO-12 (the Raven Management and Monitoring Plan) includes measures that would address the cumulative regional increases in raven predation on FTHL. Mitigation Measure BIO-19 requires pre-construction surveys and a special-status plant protection plan. Mitigation Measure BIO-17 requires that the effects to the ephemeral streams be mitigated by offsetting cumulative losses to waters of the U.S. and CDFG jurisdictional streambeds. The contribution of the IVS project to cumulative effects will be less than considerable with appropriate levels of compensatory mitigation, when Mitigation Measures BIO-10 and BIO-17 are applied. Similarly, the contribution of the IVS project to the combined effect of the cumulative projects in the FTHL habitat can be mitigated with Mitigation Measures BIO-10 and BIO-17.

4.3.5.2 Operational Cumulative Effects

The operation of the IVS project is expected to result in long term adverse effects related to biological resources. It is expected that some of the cumulative projects described above may be operational at the same time as the IVS project. As a result, there may be substantial long term effects during operation of those cumulative projects related to biological resources.

4.3.5.3 Decommissioning Cumulative Effects

The decommissioning of the IVS project is expected to result in adverse effects related to biological resources similar to construction effects. It is unlikely that the construction or decommissioning of any of the cumulative projects would occur concurrently with the decommissioning of this project, because the decommissioning is not expected to occur for

approximately 40 years. As a result, there may not be cumulative effects related to biological resources during decommissioning of the IVS project. As a result, the effects of the decommissioning of the IVS project would not be expected to contribute to cumulative effects related to biological resources. This is due to the biological resources having already been affected by the initial construction and operation of the project. Mitigation Measure BIO-20 would require a Decommissioning and Reclamation Plan for restoration of the native habitat to the site.

4.3.6 Mitigation, Project Design Features, and Other Measures

Mitigation measures described here are solutions to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action;

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

(5) Compensating for the impact by replacing or providing substitute resources or environments.

The following mitigation measures have been identified for the Agency Preferred Alternative and the IVS project.

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) and BLM's Authorized Officer for approval in consultation with CDFG and USFWS. The Designated Biologist must meet the following minimum qualifications:

- Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

- Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and

- At least one year of field experience with biological resources found in or near the project area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM and BLM's Authorized Officer, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any project-related site disturbance activities. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site. If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM and BLM's Authorized Officer at least ten working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM and BLM's Authorized Officer to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM and BLM's Authorized Officer for consideration.

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Authorized Officer, and CPM. The Designated Biologist Duties shall include the following:

- Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

- Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;

- Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
- Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
- Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
- Notify the project owner, BLM's Authorized Officer and the CPM of any non-compliance with any biological resources condition of certification;
- Respond directly to inquiries of BLM's Authorized Officer and the CPM regarding biological resource issues;
- Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report;
- Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits; and
- Maintain the ability to be in regular, direct communication with representatives of BLM's Authorized Officer, CDFG, USFWS, and CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Database.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the BLM's Authorized Officer and the CPM copies of all written reports and summaries that document construction activities that have the potential to affect biological resources. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries

in the Annual Compliance Report unless their duties cease, as approved by BLM's Authorized Officer and the CPM.

BIO-3 The project owner's BLM and CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitors to BLM's Authorized Officer and the CPM for approval. The resume shall demonstrate, to the satisfaction of BLM's Authorized Officer and the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks. Specifically, the Biological Monitors shall have experience and are capable of conducting FTHL field monitoring, have sufficient education and field experience to understand FTHL biology, to be able to identify FTHL and desert horned lizards, and their scat, and to be able to identify and follow FTHL tracks where applicable.

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRMIMP, WEAP, and all permits. In addition, Biological Monitor(s) shall take the CDFG and BLM's FTHL training and have their current letter of approval from CDFG.

Verification: The project owner shall submit the specified information to BLM's Authorized Officer and the CPM for approval at least 30 days prior to the start of any project-related site disturbance activities. The Designated Biologist shall submit a written statement to BLM's Authorized Officer and the CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to BLM's Authorized Officer and the CPM for approval at least ten days prior to their first day of monitoring activities.

BIO-4 The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities. The Designated Biologist shall remain the contact for the project owner, BLM's Authorized Officer, and the CPM.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Authorized Officer, and the CPM copies of all written reports and summaries that document biological resources activities, including those conducted or monitored by Biological Monitors. If actions may affect biological resources during operation a Biological Monitor, under the supervision of the

Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by BLM's Authorized Officer and the CPM.

BIO-5 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification.

If required by the Designated Biologist and Biological Monitor(s) the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

- Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
- Inform the project owner and the construction/operation manager when to resume activities; and
- Notify BLM's Authorized Officer and the CPM if there is a halt of any activities and advise the BLM's Authorized Officer and the CPM of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the lead Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Authorized Officer and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify BLM's Authorized Officer and the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure would be made by BLM's Authorized Officer and the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by BLM's Authorized Officer and the CPM

that coordination with other agencies would require additional time before a determination can be made.

BIO-6 The project owner shall develop and implement an IVS project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from BLM's Authorized Officer, USFWS, CDFG, and the CPM. The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. The WEAP shall:

- Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting electronic media and written material, including wallet-sized cards with summary information on special-status species and sensitive biological resources, is made available to all participants;
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, explain the reasons for protecting these resources, and the function of flagging in designating sensitive resources and authorized work areas;
- Place special emphasis on FTHL, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection and status, penalties for violations, reporting requirements, and protection measures;
- Include a discussion of fire prevention measures to be implemented by workers during project activities; request workers to dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;
- Present the meaning of various temporary and permanent habitat protection measures;
- Identify whom to contact if there are further comments and questions about the material discussed in the program; and

- Include a training acknowledgment form to be signed by each worker indicating that they received the WEAP training and shall abide by the guidelines.
- The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any project-related site disturbance activities, the project owner shall provide to BLM's Authorized Officer, and the CPM a copy of the draft WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least ten days prior to site and related facilities mobilization, the project owner shall submit two copies of the BLM- and CPM-approved final WEAP.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least six months after the start of commercial operation.

Throughout the life of the project, the worker education program shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attend the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Authorized Officer and the CMP upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training. During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

BIO-7 The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and submit two copies of the proposed BRMIMP to BLM's Authorized Officer and the CPM (for review and approval) and shall implement the measures identified in the approved BRMIMP.

The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Raven Management Plan, the USFWS Biological Opinion, Burrowing Owl Mitigation and Monitoring Plan, and the Noxious Weed Management Plan, and the Closure Plan and BLM's Record of Decision. The BRMIMP shall be prepared in consultation with the Designated Biologist and shall and shall include the following:

- All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
- All biological resources conditions of certification identified as necessary to avoid or mitigate impacts identified in the Environmental Impact Statement;
- All biological resource mitigation, monitoring and compliance measures required in Federal agency terms and conditions, such as those provided in the USFWS Biological Opinion/Conferencing Opinion and the Federal Clean Water Act (CWA) Section 404 permit;
- All biological resource mitigation, monitoring, and compliance measures required in State agency terms and conditions, such as those provided in the permits or agreements with CDFG;
- All sensitive biological resources to be affected, avoided, or mitigated by project construction, operation, and closure;
- All required mitigation measures for each sensitive biological resource;
- A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
- A Frac-Out Contingency Plan approved by Corps, BLM, CDFG, and the CPM prior to commencement of construction of the reclaimed water pipeline for horizontal directional drilling under the waterways;
- All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
- Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of

project construction. Provide planned timing of aerial photography and a description of why times were chosen. Provide a final accounting of the before/after acreages and a determination of whether additional habitat compensation is necessary in the Construction Termination Report;

- Duration for each type of monitoring and a description of monitoring methodologies and frequency;
- Performance standards to be used to help decide if/when proposed mitigation and conditions are or are not successful;
- All performance standards and remedial measures to be implemented if performance standards are not met;
- A discussion of biological resources-related facility closure measures including a description of funding mechanism(s); and
- A process for proposing plan modifications to the BLM and appropriate agencies for review and approval.

Verification: The project owner shall submit the BRMIMP to the BLM's Authorized Officer and the CPM at least 60 days prior to start of any project-related site disturbance activities. The BRMIMP shall contain all of the required measures included in all biological conditions of certification. No ground disturbance may occur prior to approval of the final BRMIMP by BLM's Authorized Officer and the CPM.

The BLM's Authorized Officer and the CPM, in consultation with other appropriate agencies, would determine the BRMIMP's acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Authorized Officer and the CPM within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within at least ten days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to BLM's Authorized Officer and the CPM.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain BLM's Authorized Officer and CPM approval. Any changes to the approved BRMIMP

must also be approved by BLM's Authorized Officer and the CPM in consultation with appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures (construction activities that were monitored, species observed) would be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

BIO-8 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize effects to biological resources during construction and operation:

- The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities. Spoils shall be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor. To the extent possible, disturbance of shrubs and surface soils due to stockpiling shall be minimized. All disturbances, vehicles and equipment shall be confined to the flagged areas. To the extent possible, surface disturbance shall be timed to minimize mortality to FTHL.

- The area of disturbance of vegetation and soils shall be the minimum required for the project. Clearing of vegetation and grading shall be minimized. Whenever possible, rather than clearing vegetation and grading the ROW, equipment and vehicles shall use existing surfaces or previously disturbed areas. Where grading is necessary, surface soils shall be stock-piled and replaced following construction to facilitate habitat restoration.

- To the extent possible, existing roads shall be used for travel and equipment storage. New and existing roads that are planned for construction, widening or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads (e.g. new spur roads associated with both

transmission line options) or the construction zone, the route would be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

- Where feasible and desirable, in the judgment of the lead agency, newly created access routes shall be restricted by constructing barricades, erecting fences with locked gates at road intersections, and/or by posting signs. In these cases, the project proponent shall maintain, including monitoring, all control structures and facilities for the life of the project and until habitat restoration is complete.

- Vehicular traffic during project construction and operation shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 15 miles per hour on the project site.

- Transmission lines, access roads, pulling sites, storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources.

- Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power* Lines (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.

- Road surfacing and sealants as well as soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

- Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.

- Parking and storage shall occur where FTHL removal activities have been conducted.

- At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores and other excavations) have been inspected for wildlife prior to backfilling and then backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 slope at the ends to provide wildlife escape ramps, or covered to completely prevent wildlife access. All trenches, bores and other excavations outside the

permanently fenced area shall be inspected each morning and periodically throughout and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a FTHL or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual to a safe location.

- During construction, examine areas of active surface disturbance periodically—at least hourly when surface temperatures exceed 29°C (85°F) for the presence of FTHL.

- Any construction pipe, culvert, or similar structure or materials with a diameter greater than three inches, stored less than eight inches aboveground for one or more nights, would be inspected for wildlife before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks.

- Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract FTHL predators to construction sites. During construction, a Biological Monitor shall patrol these areas to ensure water related to construction, operations, and maintenance does not puddle and attract common ravens, and other wildlife to the site, and shall make recommendations for reduced water application rates where necessary.

- All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil would be properly contained and disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

- During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife, or bring pets to the project site. Animal roadkills on the project site would be reported by the on-site biologists and promptly removed to

discourage scavenger activity. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.

- The project owner shall implement the following Best Management Practices to prevent the spread and propagation of noxious weeds:
- Limit the amount of any vegetation and/or ground disturbance to the absolute minimum, and limit ingress and egress to defined routes;
- Prevent spread of non-native plants via vehicular sources by implementing methods of vehicle cleaning for vehicles coming and going from construction sites. Earth-moving equipment shall be cleaned prior to transport to the construction site. Sediment accumulated from the washing would be shoveled out daily, placed in a sealed container, disposed in an approved landfill; and
- Only weed-free straw, hay bales and seed shall be used for erosion control and sediment barrier installations.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures would be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

BIO-9 The IVS project includes the following conservation measures and/or design features that will be implemented to avoid, minimize, and offset potential adverse effects to the FTHL. These measures were developed and coordinated with the BLM, CEC, and the applicant and based on information in the project's Biological Assessment, this FEIS, and supplemental material provided during the consultation process. Conservation measures will be implemented during the project construction phase and during long-term operations and maintenance of the project. This FEIS includes additional measures to offset project impacts on rare and sensitive species; refer to Measures BIO-1 through BIO-8 and BIO-10 through BIO-20, which will be implemented to further reduce impacts to biological resources on the IVS project site.

(1) Prior to ground disturbing activities, an individual shall be designated as Designated Biologist[1] (i.e., field contact representative); the Designated Biologist shall be employed by the Applicant for the life of the project. The Designated Biologist shall have the authority to ensure compliance with these conservation measures and will be the primary agency contact dealing with these measures. The Designated Biologist shall have the authority and responsibility to halt activities that are in violation of these conservation measures. A detailed list of responsibilities for the Designated Biologist is listed in measures BIO-2 and BIO-11 of the draft SA/EIS. To avoid and minimize impacts to the FTHL, the Designated Biologist and/or biological monitor(s) shall:

- Notify BLM's Authorized Officer (i.e., BLM field manager, El Centro), the Energy Commission CPM, and the Service (i.e., Carlsbad Fish & Wildlife Office) at least 14 calendar days before initiating ground-disturbing activities.

- Immediately notify BLM's Authorized Officer, the CPM, and the Service in writing if the applicant is not in compliance with any conservation measure, including but not limited to any actual or anticipated failure to implement conservation measures within the time periods specified.

- Be present during construction (e.g., grubbing, grading, SunCatcher installation) and operations and maintenance activities that take place in FTHL habitat to avoid or minimize take of FTHL. Activities include, but are not limited to, ensuring compliance with all impact avoidance and minimization measures, monitoring for FTHLs and removing lizards from harm's way, and checking avoidance areas (e.g., ephemeral streams) to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these avoidance zones.

[1] A qualified Designated Biologist must have (1) a bachelor's degree with an emphasis in ecology, natural resource management, or related science; (2) three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society (3) previous experience with applying the terms and conditions of a biological opinion; and, (4) the appropriate permit and/or training if conducting focused or protocol surveys for listed or proposed species.

- At the end of each work day, inspect all potential wildlife pitfalls (trenches, bores and other excavations) for wildlife and then backfill. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 slope at the ends to provide wildlife escape ramps, or covered to completely prevent wildlife access.

- Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to BLM's Authorized Officer and the CPM.

- During construction, examine areas of active surface disturbance periodically—at least hourly when surface temperatures exceed 29°C (85°F)—for the presence of FTHL.

- No later than January 31 of every year the Project remains in operation, provide the CPM, BLM's Authorized Officer, the Service, CDFG, and the FTHL ICC an annual FTHL Status Report, which shall include, at a minimum: (1) a general description of the status of the project site and construction activities, including actual or projected completion dates, if known; (2) a copy of the table in the Project's biological monitoring report (see Measure BIO-7) with notes showing the current implementation status of each conservation measure; (3) an assessment of the effectiveness of each completed or partially completed measure in avoiding and minimizing project impacts; (4) completed Horned Lizard Observation Data Sheets and a Project Reporting Form from the Flat-tailed Horned Lizard Rangewide Management Strategy (FTHL ICC 2003); (5) a summary of information regarding the numbers of captured, relocated, and dead FTHLs; and (6) recommendations on how conservation measures might be changed to more effectively avoid, minimize, and offset future project impacts on the FTHL.

(2) Biological Monitor(s) shall assist the Designated Biologist in conducting surveys and in monitoring of mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities. The Biological Monitor(s) shall have experience conducting FTHL field monitoring, have sufficient education and field experience to understand FTHL biology, be able to identify FTHL scat, and be able to identify and follow FTHL tracks. The Designated Biologist shall submit the resume, at least three references,

and contact information of the proposed Biological Monitors to the BLM, CEC, CDFG, and the Service for approval.

(3) Prior to Project initiation, a Worker Environmental Awareness Program (WEAP) shall be developed and implemented, and will be available in both English and Spanish. Wallet-sized cards summarizing this information shall be provided to all construction, operation, and maintenance personnel. The education program shall include the following aspects at a minimum:

- Biology and status of the FTHL.
- Protection measures designed to reduce potential impacts to the species.
- Reporting procedures to be used if a FTHL is encountered in the field.
- Driving procedures and techniques, for commuting to, and driving on, the Project site, to reduce mortality of FTHL on roads.

(4) The Applicant will fund and implement a Before and After Impact Study to determine if FTHLs persist after construction. The study design will be reviewed and approved by the BLM, CDFG, ICC and the Service prior to ground-disturbing activities. Temporary FTHL barrier fencing shall be installed along the main construction access road, east of the Project site. FTHL barrier fencing shall be built per specifications listed in Appendix 7 of the Strategy to prevent FTHLs from entering these areas during construction. Barrier fencing shall be inspected daily by the Designated Biologist or biological monitor(s) to ensure the fence sustains its effectiveness as a lizard-proof barrier. If FTHLs are encountered within the fence, the Designated Biologist or biological monitor(s) shall remove the lizards per conservation measure #8 below. Fencing shall be removed upon completion of project construction and/or access road is no longer used as a primary road.

(5) FTHLs will be removed from harm's way during all construction activities. FTHL removal will be conducted by two or more biological monitors when construction activities are being conducted in suitable FTHL habitat. FTHL removal shall be conducted by experienced biological monitors approved by the BLM, Service, and CDFG. Removal surveys shall also include:

- Accurate records maintained by biological monitors for each relocated FTHL, including sex, snout-vent length, weight, air temperature, location, date, and time of capture and release, a close-up photo of the lizard, and a photo of the habitat where the lizard was first encountered. A sample of the lizard scat shall be collected, if possible. A Horned Lizard Observation Data Sheet and a Project Reporting Form, per Appendix 8 of the Strategy, shall be completed. This information shall be included in the annual FTHL Status Report, per conservation measure #1.

(6) During operations and maintenance, the Designated Biologist or biological monitor(s) shall evaluate and implement the best measures to reduce FTHL mortality along access and maintenance roads, particularly during the FTHL active season (March 1 through September 30). These measures may include reduced driving speeds, biological monitor escorts, or temporary fencing at designated locations. Implementation of these measures would be based on FTHL activity levels, the best professional judgment of the Designated Biologist, and site-specific road utilization. FTHL found on access/maintenance roads will be relocated based on sub-measure 7, below.

(7) The removal of FTHLs out of harm's way shall include relocation to nearby suitable habitat in low-impact (e.g., away from roads and SunCatchers) areas of the Project site. Relocated FTHLs shall be placed in the shade of a large shrub in undisturbed habitat. If surface temperatures in the sun are less that 75°F or exceed 100°F, the Designated Biologist or biological monitor, if authorized, shall hold the FTHL for later release. Initially, captured FTHLs shall be held in a cloth bag, cooler, or other appropriate clean, dry container from which the lizard cannot escape. Lizards shall be held at temperatures between 75°F and 90°F and shall not be exposed to direct sunlight. Release shall occur as soon as possible after capture and during daylight hours. The Designated Biologist or biological monitor shall be allowed some judgment and discretion when relocating lizards to maximize survival of FTHLs found in the Project area. Persons that handle FTHLs shall first obtain all necessary permits and authorization from the CDFG. If the species is listed, only persons authorized by both CDFG and the Service under the auspices of this biological opinion shall be permitted to handle FTHLs.

(8) To the maximum extent practicable, grading in FTHL habitat will be conducted during the active season, which is defined as March 1 through September 30 or if ground temperatures are between 75°F and 100°F. If grading cannot be conducted during this time, any FTHLs found shall be removed to low-impact areas (see above) where suitable burrowing habitat exists, e.g., sandy substrates and shrub cover.

(9) To compensate for loss of FTHL habitat, the Applicant shall contribute to the National Fish and Wildlife Foundation (NFWF) Account. The BLM may use the compensation funds to acquire or restore FTHL habitat within and/or contiguous to the existing FTHL Management Areas (MA) in coordination with the FTHL Interagency Coordinating Committee (ICC). Responsibilities for habitat acquisition and management of the compensation lands are delegated to BLM. If habitat disturbance exceeds that described in this analysis, the project owner shall be responsible for additional in-lieu fees for habitat acquisition and management of additional compensation lands or additional funds required to compensate for any additional habitat disturbances.

(10) Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested Practices for Avian Protection on Power Lines (APLIC 2006) and Mitigating Bird Collisions with Power Lines (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.

(11) The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities. Spoils shall be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor. To the extent possible, disturbance of shrubs and surface soils due to stockpiling shall be minimized. All disturbances, vehicles, and equipment shall be confined to the flagged areas. To the extent possible, surface disturbance shall be timed to minimize mortality to FTHL (See measure #9).

(12) Temporarily disturbed areas associated with water pipeline and transmission line construction and staging areas, shall be revegetated according to a Habitat Restoration Plan (HRP) approved by the BLM, CEC, CDFG, and Service. The HRP must be approved in writing by the above-listed agencies prior to the initiation of any vegetation disturbing activities.

Restoration involves recontouring the land, replacing the topsoil (if it was collected), planting seed and/or container stock, and maintaining (i.e., weeding, replacement planting, supplemental watering, etc.) and monitoring the restored area for a period of five years (or less if the restoration meets all success criteria). Components of the HRP shall include, at a minimum:

- The incorporation of Desert Bioregion Revegetation/Restoration Guidance measures. These measures generally include alleviating soil compaction, returning the surface to its original contour, pitting or imprinting the surface to allow small areas where seeds and rain water can be captured, planting seedlings that have acquired the necessary root mass to survive without watering, planting seedlings in the spring with herbivory cages, broadcasting locally collected seed immediately prior to the rainy season, and covering the seeds with mulch.

(13) The Applicant shall install exclusionary fencing around the evaporation ponds and cover the evaporation ponds with 1.5-inch mesh netting designed to exclude birds and other wildlife from drinking or landing on the water of the ponds. The netted ponds shall be monitored regularly to verify that the netting remains intact, is fulfilling its function in excluding birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife. The ponds shall include a visual deterrent in addition to the netting, and the ponds shall be designed such that the netting will never contact the water.

(14) The Applicant will use water for construction, operation, maintenance, and decommissioning (e.g., truck washing, dust suppression, SunCatcher washing, landscaping, etc.) in a manner that does not result in water ponding. During construction, the biological monitor(s) shall patrol these areas to ensure water does not puddle and attract common ravens, and other wildlife to the site, and shall make recommendations for reduced water application rates where necessary.

(15) The Applicant will prepare and implement a Raven Control Plan, approved by the BLM, CEC, CDFG, and Service, for the entire project site. The raven control plan will identify the purpose of conducting raven control and include, at a minimum, training on how to identify raven nests and how to determine whether a nest belongs to a raven or a raptor species; describe the seasonal limitations on disturbing nesting raptors; describe raven control

methods to be employed (e.g. perching and nesting deterrents); and describe procedures for documenting the activities on an annual basis.

(16) The Applicant shall implement a Noxious Weed Management Plan that shall be subject to review and approval by the BLM, Service, CDFG, and the Energy Commission staff. In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction, the final Noxious Weed Management Plan shall include at a minimum:

- A pre-construction weed inventory that includes a survey of the entire project site, for weed populations that: (1) are considered by the Imperial County Agriculture Commissioner as being a priority for control and (2) aid and promote the spread of wildfires (such as cheatgrass [*Bromus tectorum*], Saharan mustard [*Brassica tournefortii*] and medusa head [*Taeniatherum caput-medusae*]). These populations will be mapped and described according to density and area covered. These plant species will be treated prior to construction or at a time when treatments will be most effective based on phenology according to control methods and practices for invasive weed populations designed in consultation with the Imperial County Agriculture Commissioner's Office and the California Invasive Plant Council (Cal-IPC), as appropriate.

- For areas directly impacted by the Project, a pre-construction weed inventory will be conducted for those weed populations rated 'High' or 'Moderate' for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC 2006). These weed species will be treated prior to construction or at a time when treatments will be most effective based on phenology according to control methods and practices for invasive weed populations designed in consultation with Cal- IPC.

- Weed control treatments will include all legally permitted chemical, manual, and mechanical methods applied with the authorization of the Imperial County Agriculture Commissioner. The application of herbicides will be in compliance with all State and Federal laws and regulations under the prescription of a Pest Control Advisor (PCA) and implemented by a Licensed Qualified Applicator. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the Imperial County Agriculture Commissioner. The timing of the

weed control treatment will be determined for each plant species in consultation with the PCA, the Imperial County Agriculture Commissioner, and Cal-IPC with the goal of controlling populations before they start producing seeds.

- Debris (glass, metal, etc.) associated with SunCatcher fields shall not be allowed to accumulate under SunCatchers. Any debris found, will be immediately removed and appropriately disposed or recycled.
- For the lifespan of the project (i.e., as long as the project is physically present), long term measures to control the introduction and spread of noxious weeds in the project area will be taken as follows:
    - The survey areas described above would be surveyed annually to monitor previously-identified and treated populations and to identify new invasive weed populations. The treatment of weeds will occur on a minimum annual basis, unless otherwise approved by the PCA, the Imperial County Agriculture Commissioner, and Cal-IPC.
    - During project construction, all seeds and straw materials will be certified weed free, and all gravel and fill material will be certified weed free by the Imperial County Agriculture Commissioner's Office.
    - During project construction, vehicles and all equipment will be washed (including wheels, undercarriages, and bumpers) at an off-site washing facility (e.g., a car wash or truck wash) immediately before project construction begins and prior to returning to project construction should equipment be used in a different construction area. In addition, tools such as chainsaws, hand clippers, pruners, etc. will be washed at an off-site washing facility immediately before project construction begins and prior to returning to project construction should tools be used in a different construction area. Vehicles, tools, and equipment will be washed at an off-site washing facility should these vehicles, tools, and equipment have been used in an area where invasive plants have been mapped during the pre-construction weed control inventory and as directed by the Designated Biologist, prior to entering a project area free of populations of invasive plants (as determined by the pre-construction weed control inventory). All washing will take place where rinse water is collected and disposed of in either a sanitary

sewer or landfill; an effort will be made to use wash facilities that use recycled water. A written daily log will be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log will include the signature of a responsible staff member. Logs will be available to the CEC, BLM, CDFG, the Service, and Designated Biologist for inspection at any time.

Verification: The verification methodology will be established in cooperation with the agencies on issuance of the Authorization to Proceed, if approved. At a minimum, a report shall be prepared by the Designated Biologist monthly describing how the mitigation measures described above have been satisfied thus far in the project's schedule of activities. The report shall include the FTHL relocation information, description of capture and release locations of any FTHL encountered, and other relevant information needed to demonstrate compliance with the measures described above.

BIO-10 To fully mitigate for habitat loss and potential take of FTHL, in lieu of the project owner acquiring compensation lands, shall deposit into the NFWF renewable energy accounts a monetary equivalent for 6,619.9 acres of land suitable for these species, at a cost of no less than $5,717,028.34 (see Table 4-27 for the breakdown of costs) to replace the affected acreage. These compensation funds will be used to acquire, protect, or restore FTHL habitat within and contiguous with the FTHL Management Areas (MA) in coordination with the FTHL Interagency Coordinating Committee (ICC). Responsibilities for habitat acquisition and management of the compensation lands are delegated to BLM. If habitat disturbance exceeds that described in this analysis, the project owner shall be responsible for additional in-lieu fees for habitat acquisition and management of additional compensation lands or additional funds required to compensate for any additional habitat disturbances. Additional funds shall be based on the fair market value of compensation lands at the time of construction to acquire habitat. The acquisition and management of compensation lands shall include the following elements:

Selection Criteria for Compensation Lands. The compensation lands selected for acquisition should:

- Be within in holdings of the nearest Management Area (MA);
- Be in the Colorado Desert;

- Provide moderate to good quality habitat for FTHL with capacity to regenerate naturally when disturbances are removed, though poor quality habitat is acceptable near protected FTHL habitats;
- Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected by a public resource agency or a non-governmental organization dedicated to habitat preservation; and
- Be connected to lands currently occupied by FTHL, ideally with populations that are stable, recovering, or likely to recover;

Other approved uses of the compensation funds should acquisition opportunities be exhausted:

- Transfer funds to other MAs to purchase FTHL habitat, especially habitat within or contiguous with MAs that are threatened with imminent impacts;
- Construct and maintain fences and signs around MAs to prevent off-highway vehicles (OHV) from entering and degrading FTHL habitat. In addition, these fences could be designed to physically prevent FTHLs from leaving the MAs and encountering nearby roads; and
- Restore degraded FTHL habitat within or contiguous with MAs.

Prior to ground-disturbing project activities, the project owner would provide compensation funds for impacts to FTHL habitat in the amount of no less than $5,717,028.34 to BLM. Proof of payment must be submitted to the CPM and BLM's Authorized Officer prior to commencement of project disturbance. These compensation amounts were calculated as follows (see Table 4-27 for a calculation of costs):

- Land acquisition costs for compensation lands, calculated at no less than $500/acre for 6,619.9 acres: $3,309,950.00 minimum;
- Pre-acquisition Liability Survey (PALS) at no less than $2,500/parcel (approximately 40 acres/parcel): $413,743.75 minimum;
- Appraisal at no less than $3,000/parcel: $458,908.50 minimum;

- Costs of enhancing and restoring FTHL compensation lands and minor cleanups calculated at no less than $25/acre for 6,589 acres: $165,497.50 minimum;
- BLM direct costs for realty staff and operations, calculated at no less than 15%: $458,908.50 minimum; and
- BLM Denver Business Center, (standard BLM-wide charge to cover costs to implement project that cannot be directly tracked) calculated at no less than 17.1%: $834,852.14 minimum.

Verification: The project owner must provide proof of FTHL habitat compensation payment at least 30 days prior to ground disturbing project activities to BLM's Authorized Officer and the CPM.

Within 90 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM verification that disturbance to Sonoran creosote scrub habitat did not exceed 6,619.9 acres, and that construction activities at the plant site and along the transmission line and reclaimed water pipeline alignment did not result in impacts to Sonoran creosote scrub habitat adjacent to work areas. If habitat disturbance exceeded that described in this analysis, the CPM and BLM's Authorized Officer would notify the project owner of any additional funds required to compensate for any additional habitat disturbances at the adjusted market value at the time of construction to acquire and manage habitat. Payment for any additional funds must be made within 30 days of notification by the CMP and BLM's Authorized Officer.

BIO-11 The project owner shall provide Energy Commission staff, BLM, CDFG, USFWS, and Corps representatives with reasonable access to the project site and mitigation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission staff, CDFG, USFWS, Corps, and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The project owner shall hold the Designated Biologist, the Energy Commission staff, CDFG, USFWS, Corps, and BLM harmless for any costs the project owner incurs in complying with the management measures, including stop work orders issued by the BLM's Authorized Officer, or the Designated Biologist. The Designated Biologist shall do all of the following:

- Notify BLM's Authorized Officer and the CPM at least 14 calendar days before initiating ground-disturbing activities.

- Immediately notify BLM's Authorized Officer and the CPM in writing if the project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification.

- Remain on site daily along with the Biological Monitoring team members while grubbing and grading are taking place to avoid or minimize take of special-status species and to check for compliance with all impact avoidance and minimization measures.

- Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed for each phase and submit a monthly compliance report to BLM's Authorized Officer and the CPM.

- No later than January 31 of every year the IVS project facility remains in operation, provide the CPM, BLM's Authorized Officer, USFWS, CDFG, and the FTHL ICC an annual FTHL Status Report, which shall include, at a minimum: (1) a general description of the status of the project site and construction activities, including actual or projected completion dates, if known; (2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; (3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts; (4) completed Horned Lizard Observation Data Sheet Sheets and a Project Reporting Form from the *Flat-tailed Horned Lizard Rangewide Management Strategy* (FTHL ICC 2003); (5) a summary of information regarding information from the Biological Monitors on the FTHL, and other wildlife, on the site; and (6) other relevant information associated with the IVS project.

- Ensure that all observations of FTHL and their sign during construction project activities are reported to the Designated Biologist for inclusion in the next monthly compliance report submitted to BLM's Authorized Officer and the CPM.

- No later than 45 days after the initial production of energy in the project's equipment, provide BLM's Authorized Officer and the CPM a FTHL Mitigation

Report that shall include, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of FTHLs; 3) information about other project impacts on the FTHL; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the FTHL; and 7) any other pertinent information, including the level of take of the FTHL associated with the project.

Verification: Every month, the project owner shall deliver to BLM's Authorized Officer, the CPM, CDFG, Corps, and USFWS via FAX or electronic communication a written report from the Designated Biologist describing all reported incidents of a sighting, injury, kill, or relocation of a listed species, identifying who was notified, and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to BLM's Authorized Officer, the CPM, CDFG, Corps, and USFWS.

BIO-12 The project owner shall implement a Raven Monitoring, Management, and Control Plan that is consistent with the most current USFWS-approved raven management guidelines, and which meets the approval of the USFWS, CDFG, and BLM, and Energy Commission staff. The draft Raven Monitoring, Management, and Control Plan submitted by the applicant (SES 2009f) shall provide the basis for the final plan, subject to review and revisions from the BLM, USFWS, and CDFG, and the Energy Commission staff.

Verification: At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the BLM's Authorized Officer, the CPM, USFWS, and CDFG with the final version of the Raven Monitoring, Management, and Control Plan that has been reviewed and approved by USFWS, CDFG, and BLM's Authorized Officer . The BLM would determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Raven Monitoring, Management, and Control Plan must be made only after consultation with the BLM, Energy Commission staff, USFWS, and CDFG. The project owner shall notify BLM's Authorized Officer and the CPM no less than five working days before implementing any BLM- and CPM-approved modifications to the Raven Monitoring, Management, and Control Plan.

Within 30 days after completion of project construction, the project owner shall provide to BLM's Authorized Officer and the CPM for review and approval, a written report identifying which items of the Raven Monitoring, Management, and Control Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

BIO-13 The project owner shall install exclusionary fencing around the evaporation ponds and cover the evaporation ponds prior to any discharge with 1.5-inch mesh netting designed to exclude birds and other wildlife from drinking or landing on the water of the ponds. The netted ponds shall be monitored regularly to verify that the netting remains intact, is fulfilling its function in excluding birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife. The ponds shall include a visual deterrent in addition to the netting, and the pond shall be designed such that the netting will never contact the water. Monitoring of the evaporation ponds shall include the following:

- The Designated Biologist or Biological Monitor shall regularly survey the ponds at least once per month starting with the first month of operation of the evaporation ponds. The purpose of the surveys shall be to determine if the netted ponds are effective in excluding birds, and to determine if the nets pose an entrapment hazard to birds and wildlife. Surveys shall be of sufficient duration and intensity to provide an accurate assessment of bird and wildlife use of the ponds during all seasons. Surveyors shall be experienced with bird identification and survey techniques. Operations staff at the IVS project site shall also report finding any dead birds or other wildlife at the evaporation ponds to the Designated Biologist within one day of the detection of the carcass. The Designated Biologist shall report any bird or other wildlife deaths or entanglements within two days of the discovery to the BLM's Authorized Officer, CPM, CDFG, and USFWS.

- If dead or entangled birds are detected, the Designated Biologist shall take immediate action to correct the source of mortality or entanglement. The Designated Biologist shall make immediate efforts to contact and consult the BLM's Authorized Officer, CPM, CDFG, and USFWS by phone and electronic communications prior to taking remedial action upon detection of the problem, but the inability to reach these parties shall not delay taking action

that would, in the judgment of the Designated Biologist, prevent further mortality of birds or other wildlife at the evaporation ponds.

- If after 12 consecutive monthly site visits no bird or wildlife deaths or entanglements are detected by or reported to the Designated Biologist, monitoring can be reduced to quarterly visits.

- If after 12 consecutive quarterly site visits no bird or wildlife deaths or entanglements are detected by or reported to the Designated Biologist, the site visits can be reduced to two surveys per years, during spring and fall migration.

Verification: No less than 30 days prior to operation of the evaporation ponds the project owner shall provide to the BLM's and CPM's Authorized Officer as-built drawings and photographs of the ponds indicating that the bird exclusion netting has been installed. The Designated Biologist shall submit annual monitoring reports to the BLM's Authorized Officer, CPM, CDFG, and USFWS describing the dates, durations and results of site visits conducted at the evaporation ponds. The annual reports shall fully describe any bird or wildlife death or entanglements detected during the site visits or at any other time, and shall describe actions taken to remedy these problems. The report shall be submitted to the BLM's Authorized Officer, CPM, CDFG, and USFWS no later than January 31st of every year for the life of the project.

BIO-14 Where practicable, ground-disturbing activities would be conducted outside the bird nesting season (February 1 through July 31). Pre-construction nest surveys shall be conducted if construction activities would occur from February 1 through July 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

- Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site and linear facilities;

- At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys needs to be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;

- If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG, USFWS, and BLM) and monitoring plan shall be developed. Nest locations shall be mapped and submitted, along with a weekly report stating the survey results, to BLM's Authorized Officer and the CPM; and

- The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made.

Verification: At least 10 days prior to the start of any project-related ground disturbance activities or construction equipment staging, the project owner shall provide BLM's Authorized Officer and the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor (s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest. Additional copies shall be provided to CDFG and USFWS.

BIO-15 To avoid direct impacts to American badgers and desert kit fox, pre-construction surveys shall be conducted for these species concurrent with the FTHL relocation efforts. Surveys for badgers and kit fox shall be conducted as described below:

- Biological Monitors shall perform pre-construction surveys for badger and kit fox dens for any areas subject to disturbance from construction no less than 30 days prior to the start of initial ground disturbance activities, including areas within 250 feet of all project facilities, utility corridors, and access roads. If dens are detected each den would be classified as inactive, potentially active, or definitely active.

- Inactive dens that would be directly affected by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox. Potentially and definitely active dens would be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If not tracks are observed in the tracking medium or no photos are

taken of the target species after three nights, the den would be excavated and backfilled by hand. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied, it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den.

Verification: The project owner shall submit a report to BLM's Authorized Officer, the CPM and CDFG at least 30 days prior to the start of any project-related site disturbance activities that describes when badger and kit fox surveys were completed, field observations, implemented mitigation measures, and the results of the mitigation.

BIO-16 The project owner shall implement the following measures to avoid and offset impacts to burrowing owls:

- Complete a pre-construction survey for burrowing owls for any areas subject to disturbance from construction no less than 30 days prior to the start of initial ground disturbance activities. If burrowing owls are present within 500 feet of the project site or linear facilities, then the CDFG burrowing owl guidelines (CDFG 1995) shall be implemented.
- Monitor burrowing owl pairs within 500 feet of any activities that exceed ambient noise and/or vibration levels.
- Establish a 500-foot set back from any active burrow and construct additional noise/visual barriers (e.g., haystacks or plywood fencing) to shield the active burrow from construction activities. Post signs (in both English and Spanish) designating presence of sensitive area.
- Passively relocate all owls occupying burrows that would be temporarily or permanently affected by the project and implement the following CDFG take avoidance measures:
    - Occupied burrows shall not be disturbed during the nesting season (February 1–August 31) unless a qualified biologist can verify through non-invasive methods that egg laying/incubation has not begun or juveniles are foraging independently and able to fly;

  - A qualified biologist must relocate owls, confirm that owls have left burrows prior to ground-disturbing activities, and monitor the burrows. Once evacuation is confirmed, the biologist should hand excavate burrows and then fill burrows to prevent reoccupation; and
  - Relocation of owls shall be approved by and conducted in consultation with CDFG and BLM's Authorized Officer.

- Submit a Burrowing Owl Mitigation and Monitoring Plan to BLM's Authorized Officer, the CPM, and CDFG for review and approval prior to relocation of owls (and incorporate it into the project's BRMIMP) as well as a construction termination report with results to CDFG, BLM's Authorized Officer, and the CPM 30 days after completing owl relocation and monitoring and at least 30 days prior to the start of commercial operation.

Verification: The project owner shall submit a report to CDFG, USFWS, and BLM's Authorized Officer, and the CMP at least 30 days prior to the start of any project-related site disturbance activities that describes when surveys were completed, observations, mitigation measures, and the results of the mitigation. If burrowing owls are to be protected on site or relocated, the project owner shall coordinate with and report to CDFG, USFWS, BLM, and Energy Commission staff on these proposed activities in a Burrowing Owl Monitoring and Mitigation Plan. Within 30 days after completion of owl relocation and monitoring, and the start of ground disturbance or at least 90 days prior to the sale of power, the project owner shall provide to the CDFG, BLM's Authorized Officer, and CPM a written construction termination report identifying how measures have been completed.

BIO-17 **CDFG Jurisdictional Streambeds and Corps Jurisdictional Waters of the U.S.** The project owner would compensate for impacts to CDFG jurisdictional streambeds and to Corps jurisdictional waters of the U.S.

- **Acquire Off-Site Desert Ephemeral Streams:** For the purposes of the CDFG Lake and Streambed Agreement requirements, compensation land purchased in Sonoran creosote scrub habitat would include ephemeral streams with at least 312 acres of CDFG jurisdictional streambeds, mitigated at a 1:1 ratio. The terms and conditions of this acquisition or easement of the desert ephemeral streams mitigation lands shall meet the following criteria: (1) include at least 312 acres of CDFG jurisdictional streambeds; (2) be characterized by similar soil permeability, hydrological and biological

functions as the affected ephemeral streams; and (3) located in the Colorado Desert. The compensation lands shall have equal or greater acreage than the CDFG jurisdictional streambeds affected by the IVS project. The acquisition of CDFG jurisdictional streambeds can be included with the FTHL mitigation lands for only one year under the FTHL mitigation requirements. After one year, the acquisition of any remaining ephemeral stream acreage (up to a total of at least 312 acres), would be acquired or mitigated by enhancement, rehabilitation, or re-establishment of ephemeral streams independent of the FTHL mitigation. Acquired mitigation lands shall be approved by the BLM and CPM in consultation with CDFG.

- **Security for Implementation of Mitigation:** A security in the form of an irrevocable letter of credit, pledged savings account, or certificate of deposit for the amount of all mitigation measures pursuant to this condition of certification shall be submitted to, and approved by the CPM, in consultation with CDFG, prior to commencing project activities within areas of CDFG jurisdiction. This amount shall be based on a cost estimate produced by a PAR or PAR-like process, which shall be submitted to CDFG for review and to the CPM for approval within 60 days prior to commencing project activities within areas of CDFG jurisdiction. The security shall be approved by the CDFG's legal advisors, prior to its execution, and shall allow the CDFG at its discretion to recover funds immediately if the CPM, in consultation with CDFG determines there has been a default.

- **Preparation of a Management Plan:** The project owner shall submit to the CMP and CDFG, a draft Management Plan that reflects site-specific enhancement measures for the ephemeral streams on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the ephemeral streams and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. No later than 12 months after publication of the Energy Commission Decision the project owner shall submit a final Management Plan for review and approval to the CDFG.

- **Right of Access and Review for Compliance Monitoring:** The CDFG and CMP reserve the right to enter the project site at any time to ensure compliance with these conditions. The project owner herein grants to the CPM and CDFG employees and/or their representatives the right to enter the project site at any time, to ensure compliance with the terms and conditions and/or to

determine the impacts of storm events, maintenance activities, or other actions that might affect the restoration and revegetation efforts. The CPM and CDFG may, at their discretion, review relevant documents maintained by the operator, interview the operator's employees and agents, inspect the work site, and take other actions to assess compliance with or effectiveness of mitigation measures.

- **Notification:** The project owner shall notify the CPM and CDFG in writing, at least five days prior to initiation of project activities in CDFG jurisdictional areas as noted and at least five days prior to completion of project activities in CDFG jurisdictional areas. The project owner shall notify the CPM and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of a proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM and CDFG no later than seven days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the notifying change of conditions report shall be included in the annual reports.

  - **Biological Conditions:** a change in biological conditions includes, but is not limited to, the following: (1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or (2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

  - **Physical Conditions:** a change in physical conditions includes, but is not limited to, the following: (1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; (2) the movement of a river or stream channel to a different location; (3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or (4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

- **Legal Conditions:** a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California.

- **Code of Regulations:** The project owner shall provide a copy of the Lake Streambed Impact Minimization and Compensation Measures to all contractors, subcontractors, and the Applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from another agency upon demand. The CDFG reserves the right to issue a stop work order after giving notice to the project owner , if the CDFG, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:

  - The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;

  - New information becomes available that was not known to it in preparing the terms and conditions;

  - The project or project activities as described in the Final Environmental Impact Statement (FEIS) have changed; or

  - The conditions affecting biological resources changed or the BLM's Authorized Officer, in consultation with CDFG or Corps, determines that project activities would result in a substantial adverse effect on the environment.

- **Best Management Practices:** The applicant shall also comply with the following conditions:

  - The owner shall minimize road building, construction activities, and vegetation clearing within ephemeral streams to the extent feasible.

  - The project owner shall not allow water containing mud, silt or other pollutants from grading, aggregate washing, or other activities to enter a lake or flowing stream or be placed in locations that may be subjected to high storm flows.

- The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the operator to ensure compliance.
- Spoil sites shall not be located within ephemeral streams or locations that may be subjected to high storm flows, where spoil shall be washed back into an ephemeral stream or lake.
- Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to vegetation or wildlife resources, resulting from project-related activities shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter an ephemeral stream or lake, by project owner or any party working under contract or with the permission of the project owner shall be removed immediately.
- No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction, or associated activity of whatever nature shall be allowed to enter into or placed where it may be washed by rainfall or runoff into, waters of the State.
- When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any ephemeral stream.
- No equipment maintenance shall be done within 150 feet of any ephemeral streams where petroleum products or other pollutants from the equipment may enter these areas under any flow.
- The project owner must have a Frac-Out Contingency Plan approved by CDFG and the CPM prior to commencement of construction of the reclaimed water pipeline for horizontal directional drilling under the waterways.

Any other requirements stated in the Lake and Streambed Agreement not listed above would be adhered to by the project owner. Should project conditions change and impacts to bed, bank, or channel occur on any of the water ways along the reclaimed water pipeline route, a revised Lake and Streambed

Application must be submitted to CDFG prior to construction. At that time, impacts will be assessed and an appropriate mitigation shall be determined.

Corps Jurisdictional Waters of the U.S.: Originally, the Corps indicated that, depending on the impacts and proposed mitigation type, the minimum mitigation required would be 2:1 ratio for unavoidable impacts, with up to half (1:1 ratio) of the mitigation dedicated to preservation and the other half to enhancement or restoration within the Salton Sea watershed. At this time, the Corps is directing the mitigation planning effort to enhance Carrizo Creek. This creek is west/northwest of the IVS project site in Anza Borrego State Park. Carrizo Creek was chosen by the Corps in coordination with CSP because of its proximity to the IVS project site, its current protected status as a State Park, and because its within known PBS populations. The IVS project site is in the HUC 8 Salton Sea Watershed with ephemeral streams that are tributary to either Coyote Wash or the Westside Main Canal prior to flowing into the Salton Sea. Carrizo Creek is in the HUC 8 Carrizo Creek watershed directly to the north, draining into San Felipe Creek and then to the Salton Sea.

In coordination with the Corps and CSP, the applicant is required to prepare a draft enhancement plan that will cover approximately 25 linear mi of Carrizo Creek from its headwaters downstream through Carrizo Marsh. In development of the enhancement plan, the applicant is required use the California Rapid Assessment Method (CRAM) to assess the existing and potential post-enhancement conditions of Carrizo Creek, update the course scale tamarisk (*Tamarix* spp.) infestation mapping provided by CSP, and prepare the plan in accordance with the Corps and EPA Final Mitigation Rule (33 CFR Parts 325 and 332 [40 CFR Part 230]). The enhancement plan must at a minimum include methods for the initial removal of tamarisk and other noxious weeds, retreatment methods, limited native replanting of honey and screw bean mesquite trees (*Prosopis glandulosa* and *P. pubescens*, respectively) and arrow weed (*Pluchea sericea*), monitoring and reporting protocols, performance standards, adaptive management strategy, and a mechanism for long-term management. The Corps is unlikely to require the applicant to enhance the entire 25 mi reach of Carrizo Creek and Carrizo Marsh to mitigate project related on-site direct and indirect impacts. The Corps mitigation requirement will likely be on the order of a 3:1 to 5:1 ratio depending on the enhancement plan and benefits to the functions and services of Carrizo Creek relative to the impacts on-site. It is the Corps expectation that the applicant will initiate the first phase of the enhancement effort equal to their final mitigation requirements and that the remainder will be

incorporated into an in-lieu fee program or implemented by the CSP through grant funding. The Corps, CDFG, and USFWS mitigation area may overlap for waters of the U.S., streambeds, and PBS. The project owner would follow mitigation requirements stated in the Clean Water Act 404 permit issued by the Corps.

Verification: No less than 90 days prior to acquisition of the parcel(s) containing no less than 312 acres of CDFG jurisdictional streambeds, the project owner, or a third-party approved by the CPM, in consultation with CDFG, shall submit a formal acquisition proposal to the CPM and CDFG describing the parcel(s) intended for purchase.

Draft agreements to delegate land acquisition to CDFG or an approved third party and agreements to manage compensation lands shall be submitted to CDFG for review and approval prior to land acquisition. Such agreements shall be mutually approved and executed at least 60 days prior to start of any project-related ground disturbance activities. The project owner shall provide written verification to the CDFG and CPM that the compensation lands have been acquired and recorded in favor of the approved recipient(s). Alternatively, before beginning project ground-disturbing activities, the project owner shall provide Security in accordance with this condition. Within 90 days after the land purchase, as determined by the date on the title, the project owner shall provide the CDFG and CPM with a management plan for review and approval for the compensation lands and associated funds.

No fewer than 30 days prior to the start of work potentially affecting CDFG jurisdictional streambeds, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM that the above best management practices will be implemented and provide a discussion of work in CDFG jurisdictional streambeds Compliance Reports for the duration of the project.

This proposed condition of certification will need to be altered as precise details of the required mitigation for impacts to waters of the U.S. and CDFG jurisdictional streambeds along the proposed reclaimed water line and to waters of the U.S. on the proposed project site are not yet determined. When recommendations for a Lake and Streambed Alteration Permit and the Federal Clean Water Act Section 404(b)(1) Alternatives Analysis are completed, Mitigation Measure BIO-17 will be updated to reflect the mitigation requirements by the Corps and CDFG.

BIO-18 The project owner shall implement a Noxious Weed Management Plan that meets the approval of the BLM. The draft Noxious Weed Management Plan submitted by the applicant (SES 2009e) shall provide the basis for the final plan, subject to review and revisions from BLM, USFWS, Corps, and CDFG. In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction and operation, the final Noxious Weed Management Plan shall include at least the following Best Management Practices to prevent the spread and propagation of noxious weeds:

- Limit the size of any vegetation and/or ground disturbance to the absolute minimum, and limit ingress and egress to defined routes.
- Maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.
- Reestablish vegetation quickly on disturbed sites with native seed mixes.
- Monitoring and rapid implementation of control measures to ensure early detection and eradication for weed invasions.
- Use only weed-free straw or hay bales used for sediment barrier installations, and weed-free seed.
- Reclamation and revegetation shall occur on all temporarily disturbed areas, including pipelines, transmission lines, and staging areas.
- Control weeds in areas where irrigation and mirror washing take place.

Verification: At least 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide the BLM's Authorized Officer and the CPM with the final version of the Noxious Weed Management Plan that has been reviewed and approved by BLM, USFWS, and CDFG. BLM's Authorized Officer and the CPM would determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Noxious Weed Management Plan shall be made only after consultation BLM, USFWS, and CDFG. The project owner shall notify the BLM's Authorized Officer no less than five working days before implementing any BLM - and CPM-approved modifications to the Noxious Weed Management Plan.

Within 30 days after completion of project construction, the project owner shall provide to the BLM's Authorized Officer and the CPM for review and approval, a

written report identifying which items of the Noxious Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding. A summary report on noxious weed management on the project site shall be submitted in the Annual Compliance Report during plant operations.

BIO-19 To avoid impacts to State and Federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate or California Native Plant Society List 1A, 1B, 2, 3, or 4 plants that might occur on the IVS project site or along the proposed transmission line and proposed reclaimed water pipeline alignments, pre-construction surveys shall be conducted in these areas in spring and fall 2010. If special-status plant species are detected within 100 feet of the project footprint, a qualified botanist shall prepare a Sensitive Plant Protection Plan to be implemented to avoid direct and indirect impacts. The project owner shall implement the following measures:

- **Pre-Construction Floristic Surveys:** A qualified botanist shall conduct floristic surveys on the IVS project site and along linear facilities in all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. Surveys shall be conducted within 100 feet of all surface-disturbing activities at the appropriate time of year and according to guidelines from the BLM (2009), California Department of Fish and Game (CDFG 2009b) and the California Native Plant Society (CNPS 2001).

- **Special-Status Plant Protection Plan:** If special-status plant species are detected during pre-construction surveys, a qualified botanist shall prepare a Sensitive Plant Protection Plan (Plan). Populations of rare plants shall be flagged and mapped prior to any ground disturbance. Where possible the owner shall modify the placement of structures, access roads, laydown areas, and other ground-disturbing activities in order to avoid the plants. The Plan shall include measures for avoiding direct impacts and accidental impacts during construction by identifying the plant occurrence location and establishing an appropriately sized buffer. The Plan shall also include measures to avoid indirect impacts including: sedimentation from adjacent disturbed soils; alterations of the site hydrology from changes in the ephemeral stream patterns; dust deposition; and displacement or degradation of the habitat from the introduction and spread of noxious weeds. The Plan

shall also include a discussion of monitoring and reporting requirements during and after construction.

- Prior to any ground disturbance, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance including human trampling, erosion, and dust. The size of the buffer would depend upon the proposed use of the immediately adjacent lands, and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by the Designated Biologist. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the USFWS, CDFG, BLM, and CPM.

- Impacts to non-listed plant species (i.e., CNPS List 1, 2, 3, and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other BLM-approved methods. If project activities would result in loss of any of the known individuals within an existing population of non-listed special-status plant species, the project owner shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio. The BLM may reduce this ratio depending on the sensitivity of the plant. The preserved habitat shall be occupied by the plant species affected, and be of superior or similar habitat quality to the affected areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist.

- **State or Federally Listed Plant Species:** If impacts to listed plants are determined to be unavoidable, the USFWS shall be consulted for authorization, through the context of a Biological Opinion, and/or the CDFG shall be consulted for authorization through an Incidental Take Permit. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the USFWS and/or CDFG before impacts are authorized.

- **Agency Notification and Avoidance:** If State or Federally listed plant species are detected during the pre-construction floristic surveys, BLM's

Authorized Officer, the CPM, USFWS, and CDFG shall be notified in writing no more than 15 days from detection of the plants.

- **Review and Submittal of Plan:** The project owner shall submit to the USFWS, BLM's Authorized Officer, and CDFG a draft Sensitive Plant Protection Plan. Prior to any ground-disturbing activities within 100 feet of the sensitive plant occurrences detected during the pre-construction floristic surveys, the project owner shall submit to BLM's Authorized Officer and the CPM a final Plan that reflects review and approval by BLM in consultation with CDFG and USFWS.

Verification: The project owner shall submit two reports: (1) no later than July 31, 2010 describing the results of the spring floristic surveys and, (2) October 31, 2010 describing the results of the fall floristic surveys conducted on the IVS project power plant site and along the proposed transmission line and reclaimed water pipeline alignments. The report shall be submitted to BLM's Authorized Officer, the CPM, USFWS, and CDFG and shall describe qualifications of the surveyor, survey methods, dates and times, a discussion of visits to reference sites, figures depicting the area(s) surveyed, figures depicting the locations of any special-status plants observed, and a list of all plant species detected.

If special-status plant species were detected during the 2010 surveys the project owner shall submit to BLM's Authorized Officer, the CPM, USFWS, and CDFG a Sensitive Plant Protection Plan (Plan) at least 60 days prior to the start of any ground-disturbing activities. The BLM's Authorized Officer and the CPM would determine the Plan's acceptability in consultation with BLM , CDFG, and USFWS within 15 days of receipt of the Plan. Any modifications to the approved Plan shall be made only after approval by BLM in consultation with CDFG and USFWS. The project owner shall notify BLM's Authorized Officer and the CPM no fewer than five working days before implementing any BLM - and CPM-approved modifications to the Plan.

Within 30 days after completion of construction, the project owner shall provide to BLM's Authorized Officer, the CPM, USFWS, and CDFG a construction termination report discussing how mitigation measures described in the Plan were implemented.

BIO-20 Upon project closure the project owner shall implement a final Decommissioning and Reclamation Plan to remove all structures from the project site and fill from waters of the U.S. and restore the natural topography, hydrology and

vegetation/wildlife habitat. The Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities, and shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from BLM's Authorized Officer and the CPM in consultation with USFWS, Corps, and CDFG.

Verification: No less than 30 days from publication of the Energy Commission Decision or the Record of Decision, whichever comes first, the project owner shall provide to BLM's Authorized Officer and the CPM a draft Decommissioning and Reclamation Plan. No more than 60 days prior to start of any project-related ground disturbance activities, the project owner shall provide BLM's Authorized Officer and the CPM with the final version of a Decommissioning and Reclamation Plan that has been reviewed and approved by BLM's Authorized Officer and the CPM, in consolation with USFWS, and CDFG. All modifications to the approved Channel Decommissioning Plan shall be made only after approval from BLM's Authorized Officer and the CPM, in consultation with USFWS, Corps, and CDFG.

No more that 60 days prior to initiating project-related ground disturbance activities the project owner shall provide financial assurances to BLM's Authorized Officer and the CPM to guarantee that an adequate level of funding will be available to implement measures described in the Decommissioning and Reclamation Plan.

4.3.7 Summary of Impacts

Table 4-28 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to biological resources.

As shown in Table 4-28, even with implementation of Measures BIO-1 through BIO-20, the IVS project and the other Build Alternatives will result in unavoidable adverse impacts to the FTHL and may affect PBS forage habitat availability. The implementation of Measures BIO-1 through BIO-20 is anticipated to reduce the severity of impacts to other biological resources to the point that those impacts are not considered adverse.

Table 4-28 Summary of Biological Resources Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	• Permanent loss of vegetation communities • Permanent loss of waters of the U.S. and CDFG jurisdictional streambeds • Potential loss of some special-status plant species • Affects on raptors, migratory, and special-status bird species • Take of burrowing mammals • Potential effects on Peninsular bighorn sheep • Take of FTHL • Potential harm to birds from total dissolved solids in evaporation ponds • Attraction to ponds will increase risk of avian collisions with transmission towers • Introduction of noxious weed seed to the project site	• Minimization of vegetation community removal • Funding to BLM for acquisition of 6,619.9 acres of equivalent lands to offset impacts to vegetation communities and suitable for FTHL • Acquisition and preservation of lands with nonwetland waters of the U.S. to be preserved at 1:1 (preservation: impacts) and enhancement, restoration, creation of nonwetland Waters of the U.S. at 2:1(enhancement/restoration/creation: impacts). CDFG will require acquisition and preservation at 1:1 for impacts to CDFG jurisdictional streambeds. • If special-status plant species can not be avoided during construction, required mitigation will be replacement at 2:1 • Avoidance of impacts to vegetation communities to the greatest extent feasible, measures to protect nesting birds, measures to reduce/eliminate risk of bird electrocution, and passive relocation for western burrowing owls. • Passive relocation of American badger and desert kit fox. • Fencing of project site to exclude	Unavoidable adverse impacts to the FTHL individually and on a cumulative basis. No other unavoidable adverse impacts.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
		Peninsular bighorn sheep • Exclusionary netting/mesh on evaporation ponds will eliminate risk of bird mortality from ingesting toxic/hypersaline waters • Evaporation ponds located away from transmission towers • Noxious weed management measures during construction **Construction Measures** *BIO-1:* Designated biologist *BIO-2:* Construction monitoring *BIO-3:* FTHL special biologist *BIO-4:* Construction monitors *BIO-5:* Construction measure compliance *BIO-6:* Biological monitoring, construction crew training and compliance *BIO-8:* Biological Mitigation Plan implementation and monitoring *BIO-9:* FTHL Management Strategy *BIO-14:* Bird nesting period avoidance and surveys *BIO15:* American badgers and desert kit fox, pre-construction surveys and avoidance *BIO-16:* Burrowing owl pre-construction surveys and avoidance *BIO-19:* State and Federally listed species pre-	

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
		construction surveys and mitigation strategy **Operations Measures** *BIO-7:* Biological Resources Mitigation Plan *BIO-8:* Biological Mitigation Plan implementation and monitoring *BIO-10:* FTHL habitat loss compensation *BIO-11:* Regulatory agency personnel site access for compliance monitoring *BIO-12:* Raven Monitoring and Control Plan *BIO-13:* Evaporation pond wildlife exclusionary measures *BIO-17:* Jurisdictional wetlands compensation *BIO-18:* Noxious Weed Management Plan *BIO-20:* Decommissioning and Reclamation Plan	
709 MW Alternative: Agency Preferred Alternative	Slightly fewer impacts than the IVS project because slightly fewer acres on the site would be affected.	Same as the IVS project.	Same as the IVS project.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Potentially the same or similar impacts as the IVS project and the Agency Preferred Alternative because the site could be developed in a solar use.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: BLM = United States Bureau of Land Management; CDCA Plan = California Desert Conservation Area Plan; CDFG = California Department of Fish and Game; FTHL = flat-tailed horned lizard; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way; U.S. = United States.

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4.4 Climate Change

On April 2, 2007, the United States Supreme Court found that greenhouse gases (GHGs) are pollutants that must be covered by the Federal Clean Air Act (CAA). In response, on September 30, 2009, the United States Environmental Protection Agency (EPA) proposed to apply Prevention of Significant Deterioration (PSD) requirements to facilities whose carbon dioxide (CO_2)-equivalent emissions exceed 25,000 tons per year. The Council on Environmental Quality (CEQ) published draft guidance on February 18, 2010 for Federal agencies to improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for Federal actions under the National Environmental Policy Act (NEPA). The following analysis presents information on GHG emissions related to electricity generation, evaluates potential emissions from the Imperial Valley Solar (IVS) project, and describes the applicable GHG standards and requirements.

4.4.1 Methodology

The analysis of GHGs is a much different analysis than the analysis of criteria pollutants for several reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or nonattainment is based on daily exceedances of applicable ambient air quality standards (AAQS). Further, several ambient AAQS are based on relatively short-term exposure effects on human health (e.g., 1-hour and 8-hour). Because the half-life of CO_2 is approximately 100 years, for example, the effects of GHGs are longer-term, affecting global climate over a relatively long time frame. As a result, GHG effects are evaluated over a longer time frame than a single day.

The CEQ proposes that agencies should consider the direct and indirect GHG emissions from the action in scoping and, to the extent that scoping indicates that GHG emissions warrant consideration by the decision-maker, quantify and disclose those emissions in the environmental document (40 Code of Federal Regulations [CFR] 1508.25). In assessing direct emissions, an agency should look at the consequences of actions over which it has control or authority (Public Citizen, 541 U.S. at 768). When a proposed Federal action meets an applicable threshold for quantification and reporting, as discussed above, the CEQ proposes that the agency should also consider mitigation measures and reasonable alternatives to reduce proposed action-related GHG emissions. Analysis of emissions sources should take account of all phases and elements of the proposed action over its expected life, subject to reasonable limits based on feasibility and practicality. For proposed actions evaluated in an Environmental Impact Statement (EIS), Federal agencies typically describe their consideration of the energy

requirements of a proposed action and the conservation potential of its alternatives (40 CFR 1502.16(e)). Within this description of energy requirements and conservation opportunities, agencies should evaluate GHG emissions associated with energy use and mitigation opportunities and use this as a point of comparison between reasonable alternatives.

The CEQ further proposes that when scoping the impact of climate change on the proposal for agency action, the sensitivity, location, and timeframe of a proposed action will determine the degree to which consideration of these predictions or projections is warranted. As with analysis of any other present or future environment or resource condition, the observed and projected effects of climate change that warrant consideration are most appropriately described as part of the current and future state of the proposed action's affected environment (40 CFR 1502.15). Based on that description of climate change effects that warrant consideration, the agency may assess the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. Such effects may include, but are not limited to, effects on the environment, on public health and safety, and on vulnerable populations who are more likely to be adversely affected by climate change. The final analysis documents an agency's assessment of the effects of the actions considered, including alternatives, on the affected environment.

4.4.2 Applicable Regulations, Plans, and Policies/Management Goals

The Federal, State, and local laws and policies listed in Table 4-29 pertain to the control and mitigation of greenhouse gas emissions.

4.4.3 Proposed Action and Alternatives: Direct and Indirect Impacts

Direct GHG emissions are those from project area sources, such as landscaping and maintenance of proposed land uses, and mobile sources, such as project-generated vehicle trips associated with on-site facilities and visitors/deliveries to the project site. Indirect GHG emissions are those from off-site stationary sources associated with water and energy consumption.

Generation of electricity can produce GHG with the criteria air pollutants that have been traditionally regulated under the Federal and State CAAs. For fossil fuel-fired power plants, GHG emissions primarily include CO_2, with much smaller amounts of nitrous oxide (N_2O) and methane (CH_4, often from unburned natural gas). For solar energy generation projects, the stationary source GHG emissions are much smaller than for fossil fuel-fired power plants.

Table 4-29 Climate Change Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Mandatory Reporting of GHGs	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 $MTCO_2e$ emissions per year.
State	
California Global Warming Solutions Act of 2006, AB 32 (Statutes 2006; Chapter 488; Health and Safety Code Sections 38500 et seq.)	This act requires the ARB to enact standards that will reduce GHG emissions to 1990 levels by 2020. Electricity production facilities are regulated by the ARB.
Title 17 CCR, Subchapter 10, Article 2, Sections 95100 et seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006.
Title 20, CCR, Section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	These regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a GHG emission standard of 0.5 $MTCO_2$/MWh or 1,100 lbs CO_2/MWh.
EO S-13-08	Directs a number of State agencies to address California's vulnerability to sea level rise caused by climate change.

Table Sources: United States Environmental Protection Agency (EPA) website: http://www.epa.gov/climatechange/initiatives/index.html (accessed 6/3/2010), and California Air Resources Board (ARB) website: http://www.arb.ca.gov/cc/cc.htm (accessed 6/3/2010).

Table Key: AB = Assembly Bill; CCR = California Code of Regulations; CO_2/MWh = carbon dioxide per megawatt-hour; CPUC = California Public Utilities Commission; EO = Executive Order; GHG = greenhouse gas; lbs = pounds; $MTCO_2e$ = metric tons of carbon dioxide equivalent; $MTCO_2$/MWh = metric ton of carbon dioxide per megawatt-hour.

Mobile sources for solar energy generation projects are likely to also be less than for fossil fuel-fired power plants as there will not be any fuel transport needed, but the site maintenance and worker transport vehicle use is likely to be similar. Section 4.2, Air Quality, discusses the mirror washing operations and associated vehicle use in detail, along with measures to minimize the associated vehicle emissions. Other sources of GHG emissions include sulfur hexafluoride (SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented in this analysis as some of the compounds have very high global warming potential.

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four

applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is provided in Appendix B, the Determination of NEPA Adequacy (DNA).

4.4.3.1 IVS Project: 750 MW Alternative

Construction Impacts

Construction of industrial facilities such as power plants requires coordination of substantial amounts of equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include GHGs. Construction of the IVS project would generate GHG emissions. To date, there is no study that quantitatively assesses all the GHG emissions associated with each phase of the construction of an individual development or project.

Overall, the following activities associated with the IVS project could directly or indirectly contribute to the generation of GHG emissions:

- **Removal of Vegetation:** The net removal of vegetation for construction results in a loss of the carbon sequestration in plants. However, planting of replacement vegetation would result in additional carbon sequestration and would minimize the carbon footprint of the IVS project.

- **Construction Activities:** During construction of the IVS project, GHGs would be emitted through the operation of construction equipment and from worker and vendor vehicles, each of which typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment.

- **Water Use:** California's water conveyance system is energy-intensive. Preliminary estimates indicate that the total energy used to pump and treat this water exceeds 6.5 percent of the total electricity used in the State per year.[1]

[1] California Energy Commission (CEC), 2004. Water Energy Use in California (online information sheet) Sacramento, CA, August 24. Website: energy.ca.gov/pier/iaw/industry/water.html. Accessed July 24, 2007.

- **Solid Waste Disposal:** Solid waste generated by construction of the project could contribute to GHG emissions in a variety of ways. Landfilling and other methods of disposal use energy for transporting and managing the waste, and they produce additional GHGs to varying degrees. Landfilling, the most common waste management practice, results in the release of CH_4 from the anaerobic decomposition of organic materials. CH_4 is 25 times more potent a GHG than CO_2. However, landfill CH_4 can also be a source of energy. In addition, many materials in landfills do not decompose fully, and the carbon that remains is sequestered in the landfill and not released into the atmosphere.

- **Motor Vehicle Use:** Transportation associated with the proposed project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips and heavy-duty construction equipment.

The estimated GHG emissions for a peak construction day for the IVS project are provided in Table 4-30.

Table 4-30 Estimated Construction GHG Emissions for the IVS Project

Construction Equipment	CO_2 Emission Rates (lbs/day)	CH_4 Emission Rates (lbs/day)	CO_2e Emission Rates (lbs/day)
Motor Grader	4,200	0.47	4,200
Wheeled Dozer	7,700	0.94	7,700
Loader/Backhoe	2,100	0.27	2,100
Scraper	4,200	0.44	4,200
Miscellaneous	3,900	0.28	3,900
Mechanic Truck	29	0.0016	29
Fuel Truck	14	0.00082	14
Foreman Truck	14	0.00082	14
Water Truck	170	0.0095	170
Worker Commute	1,300	0.093	1,300
Total Daily	**24,000**	**2.5**	**24,000**

Table Source: LSA Associates, Inc. (June 2010).

Table Key: CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; lbs/day = pounds per day.

These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. While construction will result in a slight increase in GHG emissions during construction, it is anticipated that any increase in GHG emissions due to

construction will be offset by the net reduction in GHG emissions from a solar power plant replacing non-renewable energy power plants.

The construction-related GHG emission sources described above would remain the same with the applicant proposed modifications with the exception of the emissions associated with trucking water from the Dan Boyer Water Company well to the IVS project site for construction and initial operations. It is anticipated that water trucked to the construction site would require an additional 13 round trips a day between the well and the IVS project site. The capacity of each truck is 7,000 gallons (gal). Each truck would travel approximately 7 miles (mi) one-way (14 mi round trip). The estimated GHG emissions from all construction activities with water delivery via truck were estimated. The water truck trips would generate a small amount of the total construction-related GHG emissions, as shown in Table 4-31. As shown the GHG emissions associated with the water truck deliveries would represent only a small amount of GHG emissions during project construction.

Table 4-31 Estimated Entire Construction Period GHG Emissions (MT)

Entire Construction Period GHG Emissions	CO_2	CH_4	N_2O	CO_2e
Total of Other Source Emissions	18,399.22	2.96	0.99	18,766.68
Total Emissions from Water Delivery Trucks	434.44	0.01	0.01	438.09
Total Entire Construction Period GHG Emissions	**18,833.66**	**2.97**	**1.00**	**19,204.77**
% Water Supply Emissions of Total Emissions	2.3%	0.3%	1.0%	2.3%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from construction equipment, construction trucks, worker vehicles, security vehicles and SunCatcher delivery trucks.

Table Key: CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; MT = metric tones; N_2O = nitrous oxide.

The other three applicant-proposed modifications (transmission line, water line, and hydrogen storage) would require construction very similar to the construction for the IVS project as originally proposed for those project components. Therefore, the construction-related GHG emissions of those three applicant-proposed modifications would be the same as under the original IVS project.

Operations Impacts

Operation of the IVS project would cause GHG emissions from the facility maintenance fleet and employee trips, emergency fire pump engine, and sulfur hexafluoride emissions from new electrical component equipment. The IVS project, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard

requirements of California Senate Bill (SB) 1368 (Chapter 11, Greenhouse Gases Emission Performance Standard, Article 1, Section 2903(b)(1)).

The ARB has promulgated regulations for mandatory GHG emission reporting to comply with the California Global Warming Solutions Act of 2006. The IVS project, which will generate electricity entirely from solar power, is exempt from the mandatory GHG emission reporting requirements for electricity generating facilities (California Code of Regulations [CCR] Title 17, Section 95101(c)(1)). However, the IVS project may be subject to future reporting requirements and GHG reductions or trading requirements as additional State and/or Federal GHG regulations are developed and implemented.

The estimated operations GHG emissions for the IVS project are shown in Table 4-32. Operation of the IVS project would result in GHG emissions from the facility maintenance fleet and employee trips, emergency fire pump engine, and sulfur hexafluoride emissions from new electrical component equipment.

Table 4-32 Estimated Operating GHG Emissions for the IVS Project

Operating Emissions	Annual MT CO_2 Equivalent ($MTCO_2e$) (Table Note 1)
On-site Combustion (Table Note 2)	1,043
Off-site Total (Table Note 2)	673
Equipment Leakage (SF_6)	272
Total Project GHG Emissions – MTCO2e (Table Note 3)	**1,988**
Facility MWh per year c	1,620,000
Facility GHG Performance ($MTCO_2e$/MWh)	0.00123

Table Sources: SA/DEIS Appendix AIR-1, William Walters, P.E.

Table Note 1: One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

Table Note 2: The vast majority of the CO_2e emissions, over 99%, is CO_2 from these two emission sources.

Table Note 3: Approximately a 25% capacity factor.

Table 4-32 shows what the operation of the IVS project, as permitted, could potentially emit in GHG on an annual basis. As shown, all the GHG emissions are converted to CO_2 equivalent and totaled. Electricity generation GHG emissions are generally dominated by CO_2 emissions from carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled. For the IVS project, the primary fuel, solar energy, is GHG free, but there would still be direct and indirect gasoline and diesel fuel use in the maintenance vehicles, offsite delivery vehicles, staff and employee vehicles, and the two diesel-fueled emergency engines. An additional source of GHG emissions for the IVS project is SF_6 from electrical equipment leakage.

The IVS project is estimated to emit, directly from primary and secondary emission sources, nearly 2,000 metric tonnes of CO_2 equivalent GHG emissions per year. The IVS project, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368. In summary, the IVS project has an estimated GHG emission rate of 0.00123 $MTCO_2e$/MWh, well below the Greenhouse Gas Emission Performance Standard of 0.500 $MTCO_2$/MWh.

While it is expected that this project will generate some GHG, 0.00123 $MTCO_2e$/MWh is a very small rate compared to non-renewable energy power plants. For instance coal power plants typically generate 0.96 $MTCO_2e$/MWh, and gas power plants typically generate 0.60 $MTCO_2e$/MWh.[1]

The operational emission sources described above would remain the same with the applicant-proposed modifications with the exception of the emissions associated with trucking water to the site for initial operation. That water will be delivered to the IVS site by 7 daily truck round trips with each water truck carrying 7,000 gal. Each truck would travel approximately 7 mi one-way (14 mi round trip). For calculating operations GHG emissions under the worst-case truck transport option, the analysis assumed that 7 truck round trips would be made each day, 7 days a week. The total operation GHG emissions were estimated including the delivery of water via truck. The water truck trips would represent a small amount of the total operations-related GHG emissions as shown in Table 4-33.

Table 4-33 Estimated Annual Maximum Operational GHG Emissions (MT/yr)

Annual Maximum Operational GHG Emissions	CO_2	CH_4	N_2O	SF_6	CO_2e
Total of Other Source Emissions	1,647.80	0.52	0.19	0.01	1,987.70
Total Emissions from Water Delivery Trucks	70.18	0.00	0.00	–	70.77
Total Annual Maximum Operational GHG Emissions	**1,717.88**	**0.52**	**0.19**	**0.01**	**2,058.47**
% Water Supply Emissions of Total Emissions	4.1%	0.00%	0.00%	–	3.4%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table General Note: Other source emissions are emissions from the diesel generator, maintenance and security vehicles and equipment, worker vehicles, visitor cars, delivery trucks, emission leakage from proposed circuit breakers and other transmission system equipment.

Table Key: CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; MT/yr = metric tones per year; N_2O = nitrous oxide; SF_6 = sulfur hexafluoride.

[1] US Energy Information Administration website, *Carbon Dioxide Emissions from the Generation of Electric Power in the United States*, July 2000, http://www.eia.doe.gov/electricity/page/co2_report/co2report.html, accessed June 3, 2010.

The other three applicant-proposed modifications (transmission line, water line, and hydrogen storage) would result in operations very similar to the operation of the IVS project as originally proposed for those project components. Therefore, the operations-related air quality impacts of those three applicant-proposed modifications would be the same as under the original IVS project.

Summary

While the IVS project would emit some GHG emissions, the contribution to the system build out of renewable resources to meet the goals of the Renewable Portfolio Standard (RPS) in California would result in a net cumulative reduction of energy generation and GHG emissions from new and existing fossil-fired electricity resources. Electricity is produced by operation of inter-connected generation resources. Operation of one power plant, like the IVS project, affects all other power plants in the interconnected system. The operation of the IVS project would affect the overall electricity system operation and GHG emissions in several ways:

- The IVS project would provide low-GHG, renewable generation.
- The IVS project would facilitate to some degree the replacement of high GHG emitting (e.g., out-of-state coal) electricity generation that must be phased out to meet the State's 2006 Emissions Performance Standard.
- The IVS project could facilitate to some extent the replacement of generation provided by aging fossil-fired power plants that use once-through cooling.

These system impacts would result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Therefore, the IVS project would contribute to a cumulative overall reduction in GHG emissions from power plants, would not worsen current conditions, and would not result in impacts that are cumulatively significant.

4.4.3.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative would result in GHG emissions during construction and operation very similar to those described in the previous section for the IVS project because the Agency Preferred Alternative would disturb nearly the same amount of land and would operate about 40 less SunCatchers. The Agency Preferred Alternative would also result in very similar benefits related to providing low-GHG renewable energy, and facilitating to some degree the replacement of high GHG emitting electricity generation that must be phased out in the future to meet the State's 2006 Emissions Performance Standard.

The short- and long-term GHG emission effects of the four applicant-proposed modifications would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to the four proposed modifications.

4.4.3.3 300 MW Alternative

The 300 MW Alternative would consist of 12,000 SunCatchers with a net generating capacity of approximately 300 MW occupying approximately 2,600 acres of land. The 300 MW Alternative would be the same as Phase 1 of the IVS project. Therefore, the peak daily construction emissions for the 300 MW Alternative are expected to be the same as for the IVS project. The 300 MW Alternative would be approximately 40 percent of the size of the IVS project and, therefore, the operational emissions for 300 MW Alternative would be expected to be approximately 40 percent of those for the IVS project. Table 4-34 shows the estimated operational emissions for the 300 MW Alternative.

Table 4-34 Estimated Operating GHG Emissions for the 300 MW Alternative

Operating Emissions	Annual MT CO_2 Equivalent ($MTCO_2e$) (Table Note 1)
Onsite Combustion (Table Note 2)	417
Offsite Total (Table Note 2)	269
Equipment Leakage (SF_6)	109
Total Project GHG Emissions – MTCO2e (Table Note 2)	**795**
Facility MWh per year (Table Note 3)	648,000
Facility GHG Performance ($MTCO_2e$/MWh)	0.00123

Table Sources: SA/DEIS Appendix AIR-1, William Walters, P.E.

Table Note 1: One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

Table Note 2: The vast majority of the CO_2e emissions, over 99%, is CO_2 from these two emission sources.

Table Note 3: Approximately a 25% capacity factor.

The short- and long-term GHG effects of the four applicant-proposed modifications would be similar under the 300 MW Alternative to the effects described earlier for the IVS project because this alternative would result in similar construction and operation activities compared to the IVS project relative to the four proposed modifications.

4.4.3.4 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would consist of 25,290 SunCatchers with a net generating capacity of approximately 632 MW occupying the entire IVS project site but avoiding placement of SunCatchers in the primary drainages on the site. The peak daily construction emissions for the Drainage Avoidance #1 Alternative are expected to be the same as for the IVS project. The Drainage Avoidance #1 Alternative is approximately 84 percent the size of the IVS project and, therefore, the operational emissions for the Drainage Avoidance #1 Alternative are expected to be approximately 84 percent of those shown for the IVS project 1. Table 4-35 shows the estimated operation GHG emissions for the Drainage Avoidance #1 Alternative.

Table 4-35 Estimated Operating GHG Emissions for the Drainage Avoidance #1 Alternative

Operating Emissions	Annual MT CO_2 Equivalent ($MTCO_2e$) (Table Note 1)
Onsite Combustion (Table Note 2)	879
Offsite Total (Table Note 2)	567
Equipment Leakage (SF_6)	229
Total Project GHG Emissions – MTCO2e (Table Note 2)	**1,675**
Facility MWh per year (Table Note 3)	1,365,000
Facility GHG Performance ($MTCO_2e$/MWh)	0.00123

Table Sources: SA/DEIS Appendix AIR-1, William Walters, P.E.

Table Note 1: One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

Table Note 2: The vast majority of the CO_2e emissions, over 99%, is CO_2 from these two emission sources.

Table Note 3: Approximately a 25% capacity factor.

The short- and long-term air quality impacts of the four applicant-proposed modifications would be similar under the Drainage Avoidance #1 Alternative to the effects described earlier for the IVS project because this alternative would result in similar construction and operation activities compared to the IVS project relative to the four proposed modifications.

4.4.3.5 Drainage Avoidance #2 Alternative

The Drainage Avoidance #2 Alternative would consist of 16,915 SunCatchers with a net generating capacity of approximately 423 MW occupying only the central part of the IVS project site, and avoiding the major drainages east and west of that central part of the site. The peak daily construction emissions for the Drainage Avoidance #2 Alternative are expected to be the same as for the IVS project. The Drainage Avoidance #2 Alternative is approximately 56 percent the size of the IVS project and, therefore, the operation emissions for the Drainage Avoidance

#2 Alternative are expected to be approximately 56 percent of those shown for the IVS project. Table 4-36 shows the operational emissions for the Drainage Avoidance #2 Alternative.

Table 4-36 Estimated Operating GHG Gas Emissions for the Drainage Avoidance #2 Alternative

Operating Emissions	Annual MT CO_2 Equivalent ($MTCO_2e$) (Table Note 1)
Onsite Combustion (Table Note 2)	879
Offsite Total (Table Note 2)	567
Equipment Leakage (SF_6)	229
Total Project GHG Emissions – MTCO2e (Table Note 2)	**1,675**
Facility MWh per year (Table Note 3)	1,365,000
Facility GHG Performance ($MTCO_2e$/MWh)	0.00123

Table Sources: SA/DEIS Appendix AIR-1, William Walters, P.E.

Table Note 1: One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

Table Note 2: The vast majority of the CO_2e emissions, over 99%, is CO_2 from these two emission sources.

Table Note 3: Approximately a 25% capacity factor.

The short- and long-term air quality impacts of the four applicant-proposed modifications would be similar under the Drainage Avoidance #2 Alternative to the effects described earlier for the IVS project because this alternative would result in similar construction and operation activities compared to the IVS project relative to the four proposed modifications.

4.4.3.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the right-of-way (ROW) grant for the proposed IVS project would not be approved by the BLM and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

The results of this No Action Alternative would be:

- The impacts of the IVS project would not occur. However, the land on which the IVS project is proposed would become available to other uses that are consistent with BLM's CDCA Plan.

- The benefits of the IVS project in displacing fossil fuel fired generation and reducing associated GHG emissions from gas-fired generation would not occur. State and Federal laws support the increased use of renewable power generation.

If the IVS project is not approved, renewable projects would likely be developed on other sites in Imperial County, the Mojave Desert, or in adjacent states as developers strive to provide renewable power that complies with utility requirements and State/Federal mandates. For example, there are two large wind projects proposed on BLM land within a few miles of the IVS project site in addition to large wind projects proposed in Mexico, south of the IVS project site. In addition, there are seven large solar projects proposed on BLM land within the area served by the BLM El Centro Field Office. There are currently 70 applications for solar projects covering 611,692 acres pending with BLM in the California Desert District.

It is expected that this No Action Alternative will result in similar levels of GHG emissions to the IVS project, because similar solar or other renewable energy power plants could be built in other locations.

4.4.3.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the GHG emissions from the site, including carbon uptake, are not expected to change noticeably from existing conditions and, as such, this No Action Alternative would not result in the GHG benefits that would occur under the IVS project. However, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would be expected to result in similar beneficial GHGs in other locations.

4.4.3.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, GHG emissions would result from the construction and operation of the solar technology and would likely be similar to the GHG emissions under the IVS project. Different solar technologies require different amounts of construction and operations maintenance; however, it is expected that all the technologies would provide the more significant benefit, like the IVS project, of displacing fossil fuel fired generation and reducing associated GHG emissions. As such, this No Action Alternative could result in GHG benefits similar to those under the IVS project.

4.4.4 Cumulative Impacts

Since 1970, the CEQ has construed the term "…major Federal actions significantly affecting the quality of the human environment…" as requiring the consideration of the "...overall, cumulative impact of the action proposed (and of further actions contemplated)." (35 Federal Register 7390, 7391 [1970]). "Cumulative impact" is defined in CEQ's National Environmental Policy Act (NEPA) regulations as the "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" 40 CFR 1508.7. The purpose of cumulative effects analysis is to document agency consideration of the context and intensity of the effects of a proposal for agency action, particularly whether the action is related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)). After such documentation, the dual purposes of NEPA will be satisfied.

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for climate change are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis.

The GHG assessment discussed in this section is a cumulative impact assessment and the findings described in this section are cumulative impact findings. The IVS project alone would not be sufficient to change global climate, but would emit GHG and, therefore, was analyzed as

a potential contributor to a cumulative impact in the context of existing GHG regulatory requirements and GHG energy policies. It is expected that the cumulative affect of the IVS project will be to reduce the total GHG emissions, because it reduces the need for traditional power plants and reduces the demand for fossil fuels.

4.4.5 Mitigation, Project Design Features, and Other Measures

No measures related to GHG emissions are proposed because the IVS project would result in beneficial GHG impacts. The project owner would have to comply with any future applicable GHG regulations formulated by the ARB or the EPA, such as GHG reporting or emissions cap and trade markets.

4.4.6 Summary of Impacts

Table 4-37 summarizes the direct, indirect, short-term, long-term, and cumulative adverse and beneficial effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to GHG emissions.

As shown in Table 4-37, there would be no unavoidable adverse impacts related to GHG emissions under the IVS project, the Agency Preferred Alternative, and the other Build Alternatives.

4.4.7 Potential Effects of Climate Change on the IVS Project

“Adaptation strategies” refer to how to plan for the effects of climate change and strengthen or protect from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the infrastructure in various ways, such as damaging buildings by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a Statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

Table 4-37 Summary of Climate Change Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Generation of GHG emissions during construction and operation of the SunCatchers. Beneficial effect in replacing high GHG emitting electricity generation with a lower greenhouse emission renewable energy source.	None. Possible need to comply with any future GHG regulations.	None.
709 MW Alternative: Agency Preferred Alternative	Generation of slightly lower GHG emissions during construction and operations than the IVS project. Beneficial cumulative effect in replacing high GHG emitting electricity generation with a lower greenhouse emission renewable energy source.	Same as the IVS project.	None.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under	Same as the IVS project and the Agency Preferred Alternative.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
	this Alternative.		
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No GHG emissions or beneficial effects on the project site.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No GHG emissions or beneficial effects on the project site.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Could potentially result in GHG emissions and GHG reduction benefits similar to the IVS project and the Agency Preferred Alternative.	None specified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; GHG = greenhouse gas; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

On November 14, 2008, Governor Schwarzenegger signed Executive Order (EO) S-13-08 which directed a number of State agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency [now the Natural Resources Agency, (CNRA)], through the interagency Climate Action Team, was directed to coordinate with local, regional, State, and Federal public and private entities to develop a State Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across State agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, the CNRA was directed to request the National Academy of Sciences to prepare a Sea Level Rise Assessment Report by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- Relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- The range of uncertainty in selected sea level rise projections;
- A synthesis of existing information on projected sea level rise impacts to State infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- A discussion of future research needs regarding sea level rise for California.

EO S-13-08 also directed the California Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system and economy of the State.

Prior to the release of the final Sea Level Rise Assessment Report, all State agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding the next five years (through 2013), or are routine maintenance projects as of the date of EO S 13 08 may, but are not required to, consider these planning guidelines. Sea level rise estimates should also be used in conjunction with information regarding local uplift and

subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (EO S-13-08 allows some exceptions to this planning requirement.)

The IVS project is not mandated to consider sea level rise because of the distance of the project site from the Pacific Ocean.

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4.5 Cultural and Paleontological Resources

4.5.1 Methodology

As presented in Section 3.5, Cultural Resources, the United States Bureau of Land Management (BLM) has authorized a consultant under permit with the BLM to conduct specific identification efforts for the proposed Imperial Valley Solar (IVS) project, including a review of the existing literature and records, cultural resources surveys, ethnographic studies, and geomorphological studies to identify historic properties that might be located within the project Area of Potential Effects (APE). URS Corporation (URS) and AECOM have been permitted to complete all of the investigations necessary to identify and evaluate cultural resources located in the APE for both direct and indirect effects.

As discussed in Section 3.5, archaeological surveys as part of the Class III inventory of the APE identified 459 cultural resources. Evaluations regarding the eligibility of the 459 resources in the APE for listing in the National Register of Historic Places (National Register) have not yet been completed.

Additionally, the designated Juan Bautista de Anza National Historic Trail (Anza Trail) corridor is partially within the APE. BLM has directed the applicant to perform a review of the pertinent historic documents and satellite imagery analyses to assess the physical presence, if any, of this historic trail in the APE.

4.5.2 Definition of Resources

The descriptions of the classes of resources are as follows:

- **Habitation:** Site has, at a minimum, flaked stone tools and evidence of food processing and fire-affected rock/hearths. Site contains a wide variety of artifacts and materials. Habitation sites in the IVS project area may include flakes, tools, groundstone, ceramics, fire-affected rocks, midden, rock features (domestic and storage), and human remains.

- **Temporary Camp:** Flaked stone tools, evidence of food processing, and fire-affected rock/hearths.

- **Long-term:** Multiple artifact categories, evidence of use of fire, and midden.
- **Resource Extraction/Processing:** Site contains artifacts associated with specific resource extraction or processing activities. Processing/extraction sites in the IVS project area include:
    - **Plant Processing:** Associated artifacts include groundstone, manos, metates, pestles, bedrock storage facilities, and bedrock milling features. Groundstone was also used to process fish, small animals, pigments, and for hide-tanning. Flaked lithics were also used for cutting/harvesting plants prior to grinding or for preparing vegetal construction materials.
    - **Animal Processing:** Associated artifacts include lithics, fish traps, and faunal bone.
    - **Lithic Reduction:** Associated artifacts include lithic tools, flakes, debitage, cores, and blanks.
    - **Lithic Processing:** Evidence of heat treatment. Associated artifacts include flakes, debitage, and cores.
    - **Groundstone Production:** Associated artifacts or features include sandstone and granite outcrops, basalt boulders, etc.
- **Travel:** Trails/footpaths, including trail markers.
- **Rock Features:** Cairns, rock alignments, rock rings, and cleared circles.
- **Traditional Cultural Property:** A traditional cultural property is defined generally as property that is important to a living group or community because of its association with cultural practices or beliefs that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. It is a place that may figure in important community traditions or in culturally important activities, such as traditional gathering areas, prayer sites, or sacred/ceremonial locations. These sites may or may not contain features, artifacts, or physical evidence, but are usually identified through consultation. A traditional cultural property may be eligible for inclusion in the National Register.
- **Other:** All other sites that do not fit into the above categories, including ceramics.

Site classes for historical archaeological resources are:

- **Habitation:** In addition to food-related refuse, sites that contain evidence of domestic activity. Features may include tent pads, cleared areas, campfire rings, and foundations or other evidence of more than casual use.
- **Historic Refuse:** Sites that contain primary or secondary refuse deposits or concentrations of debris.
    - **Food Containers:** Primarily cans
    - **Beverage Containers:** Bottles and cans
    - **Mixed Domestic:** In addition to food and beverage containers, a variety of materials including such items as crockery, glassware, buttons, wire, toys, etc.
    - **Construction:** Cement, milled lumber, nails, paint, tile, etc.
    - **Target Practice:** Shell casings, fragmentary.
- **Gravel Extraction/Mining:** Indicated by scraping scars, rock piles, and access roads.
- **Surveying:** Trash piles associated with surveying activities and historic survey markers.
- **Transportation:** A linear feature designed to facilitate the transportation of people:
    - **Roads:** Unpaved.
    - **Trails:** Wagon trails and footpaths.
- **Military:** Any site associated with military activities.
- **Rock Features:** Cairns, rock alignments, and rock rings.
- **Other:** All other sites that do not fit into the above categories.

When the functional site classes are applied to the built environment resources, the list is shorter and the only class that overlaps with the archaeological resource classes is habitation. Site classes for built-environment resources are:

- **Habitation:** Residential buildings.
- **Industrial:** Processing or manufacturing plant.
- **Transportation:** A linear feature designed to facilitate the transportation of people:
  - **Roads:** Paved.
  - **Railroads:** With intact crossties and rails.
- **Water Conveyance:** Any feature or device constructed to transport water over a distance (e.g., irrigation canals, ditches, flumes, pipes).

4.5.3 Applicable Regulations, Plans, and Policies/Management Goals

4.5.3.1 Evaluation of Historical Significance Under the National Environmental Policy Act

The National Environmental Policy Act (NEPA) established national policy for the protection and enhancement of the environment. Part of the function of the Federal government in protecting the environment is to "…preserve important historic, cultural, and natural aspects of our national heritage." Cultural resources need not be determined eligible for the National Register as in the National Historic Preservation Act (NHPA) of 1966 (as amended) to receive consideration under NEPA. NEPA is implemented by regulations of the Council on Environmental Quality, 40 Code of Federal Regulations (CFR) 1500–1508. NEPA provides for public participation in the consideration of cultural resources issues, among others, during agency decision-making.

4.5.3.2 Evaluation of Historical Significance Under Section 106 (Eligibility of Cultural Resources for Inclusion in the National Register of Historic Places)

The Federal government has developed laws and regulations intended to protect cultural resources that may be affected by actions undertaken, regulated, or funded by Federal agencies. Cultural resources are considered during Federal undertakings chiefly under Section 106 of the NHPA of 1966 (as amended) through one of its implementing regulations, 36 CFR 800, Protection of Historic Properties, as amended. Properties of traditional religious and

cultural importance to Native Americans are considered under Section 101(d)(6)(A) of the NHPA.

Section 106 of the NHPA (16 United States Code [USC] 470f) requires Federal agencies to consider the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR Part 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed and mitigation measures are proposed to resolve effects. Significant cultural resources (historic properties) are those resources that are listed in or are eligible for listing on the National Register per the criteria listed at 36 CFR 60.4 and are presented in the following subsection.

The NHPA established the ACHP and State Historic Preservation Officers (SHPO) to assist Federal and State officials regarding matters related to historic preservation. As mentioned above, the administering agency, the ACHP, has authored regulations implementing Section 106 that are provided in 36 CFR Part 800, *Protection of Historic Properties* (revised effective August 5, 2004). 36 CFR Part 800 provides detailed procedures, called the Section 106 process, by which the assessment of impacts on archaeological and historical resources, as required by the NHPA, is implemented.

Given that the IVS project site is on lands managed by BLM and the United States Army Corps of Engineers (Corps) and requires authorization by the BLM and the Corps, the proposed action is considered an undertaking and therefore must comply with the NHPA and implementing regulations. NEPA addresses compliance with the NHPA and the required environmental documentation for a proposed Federal action; however, project compliance with NEPA does not mean the project is in compliance with the NHPA.

According to the NHPA, three steps are required for compliance: (1) identification of significant resources that may be affected by an undertaking; (2) assessment of project impacts on those resources; and (3) development and implementation of mitigation measures to offset or eliminate adverse impacts. All three steps require consultation with interested Native American tribes, local governments, and other interested parties.

4.5.3.3 Identification and National Register of Historic Places Evaluation

36 CFR Part 800.3 discusses the consultation process. Section 800.4 sets out the steps the ACHP must follow to identify historic properties. 36 CFR Part 800.4(c)(1) outlines the process for National Register eligibility determinations.

The Historic Sites, Buildings and Antiquities Act of 1935 required the survey, documentation, and maintenance of historic and archaeological sites in an effort to determine which resources commemorate and illustrate the history and prehistory of the United States. The NHPA expanded that legislation and assigned the responsibility for carrying out this policy to the United States National Park Service (NPS). Per NPS regulations, 36 CFR Part 60.4, and guidance published by the NPS, *National Register Bulletin, Number 15, How to Apply the National Register Criteria for Evaluation,* different types of values embodied in districts, sites, buildings, structures, and objects are recognized. These values fall into the following categories:

(1) **Associate Value (Criteria A and B):** Properties significant for their association with or linkage to events (Criterion A) or persons (Criterion B) important in the past.

(2) **Design or Construction Value (Criterion C):** Properties significant as representatives of the human-made expression of culture or technology.

(3) **Information Value (Criterion D):** Properties significant for their ability to yield important information about prehistory or history.

The quality of *significance* in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess *integrity* of location, design, setting, materials, workmanship, feeling, and association. Cultural resources that are determined eligible for listing in the National Register, along with SHPO concurrence, are termed “historic properties” under Section 106 and are afforded the same protection as sites listed in the National Register.

4.5.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid

impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.5.4.1 Definition of Direct and Indirect Impacts

Direct and Indirect Effects Under the National Environmental Policy Act

Direct effects under NEPA are those "…which are caused by the [proposed or alternative] action and [which] occur at the same time and place" (40 CFR Section 1508.8(a)). Indirect effects are those "…which are caused by the [proposed or alternative] action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR Section 1508.8(b)).

Direct and Indirect Effects Under Section 106

The Section 106 regulation narrows the range of direct effects and broadens the range of indirect effects relative to the definitions of the same terms under NEPA. The regulatory definition of "effect," pursuant to 36 CFR Section 800.16(i), is: "…means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the [National Register]." In practice, a direct effect under Section 106 is limited to the direct physical disturbance of a historic property. Effects that are immediate but not physical in character (e.g., visual intrusion, auditory, and atmospheric effects) and reasonably foreseeable effects that may occur at some point subsequent to the implementation of the proposed undertaking are referred to in the Section 106 process as indirect effects.

National Register of Historic Places Determination of Eligibility

It is the BLM's intent to render preliminary determinations of eligibility on resources prior to the Record of Decision (ROD) and provide opportunity for consulting parties and the public to comment on the agency's determinations prior to submitting final determinations to the SHPO for review and comment. Determinations that the BLM may render are based on cultural resources documentation and recommendations that are currently under review and have not necessarily been accepted or approved by the BLM. For a limited number of cultural resources, primarily archaeological sites limited to their potential to yield significant information on prehistory or history, the BLM may treat those sites as eligible for the National Register for project management purposes and either direct that additional testing be conducted for purposes of evaluation or that adverse effects to the property be resolved pursuant to the prescriptions of the Historic Properties Treatment Plan (HPTP).

Assessment of Impacts

The specific assessment of the potential impacts of the IVS project and the other Alternatives is based on the three following observations:

(1) Whereas testing has not been completed, based on surface observations and ongoing consultation a subset of sites will qualify for the National Register as being significant cultural resources.

(2) Given the high quantity and density of cultural resources present, cultural resources cannot be completely avoided by project construction.

(3) The potential exists for buried archaeological deposits.

4.5.4.2 Significant Effects Under the National Environmental Policy Act

Significant effects under NEPA require considerations of both context and intensity (40 CFR Section 1508.27) as follows:

(1) **Context:** This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(2) **Intensity:** This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

(a) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

(b) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

(3) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(4) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

(5) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register or may cause loss or destruction of significant scientific, cultural, or historical resources.

(6) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

4.5.4.3 Adverse Effects Under Section 106

In accordance with 36 CFR Part 800.5 of the ACHP's implementing regulations, which describes criteria for adverse effects, impacts on cultural resources are considered significant if one or more of the following conditions would result from implementation of the proposed Federal action:

(1) An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining the type of effect, alteration to features of a property's location, setting, or use may be relevant, depending on the property's significant characteristics, and should be considered.

(2) An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

(a) Physical destruction, damage, or alteration of all or part of the property;

(b) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

(c) Introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting;

(d) Neglect of the property, resulting in its deterioration or destruction; or

(e) Transfer, lease, or sale of the property.

Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. A formal effect finding under Section 106 relates to the proposed or alternative action as a whole rather than relating to individual resources.

4.5.4.4 IVS Project: 750 MW Alternative

Cultural Resources

Table 4-38 summarizes the number of known cultural resources within the boundaries of the site for the 750-megawatt (MW) Alternative (the proposed IVS project). Those sites are described briefly in Appendix I, Archaeological and Built Sites within the Area of Potential Effects for Each Build Alternative**.**

Regarding impacts and the IVS project:

- Whereas 378 resources are present, the IVS project avoids known locations of habitation sites with human remains.

Based on the information and analysis available to date, the IVS project is anticipated to have the following effects/impacts related to cultural resources:

(1) Significant effect per NEPA.

(2) Adverse effect per Section 106 of the NHPA.

Mitigation is discussed in Section 4.5.6, Mitigation, Project Design Features, and Other Measures.

Table 4-38 Summary of Cultural Resources Impacted by the Alternatives

Alternative	Number of Cultural Resources Potentially Impacted	Effect Under NEPA	Effect Under Section 106 of the NHPA
Agency Preferred Alternative	359	Significant	Adverse
IVS Project	378	Significant	Adverse
300 MW Alternative	168	Significant	Adverse
Drainage Avoidance #1 Alternative	320	Significant	Adverse
Drainage Avoidance #2 Alternative	154	Significant	Adverse
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No impact	No impact	No impact
No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No impact	No impact	No impact
No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Potentially the same as the Agency Preferred Alternative or the IVS project	Significant	Adverse

Table Key: CDCA = California Desert Conservation Area; IVS = Imperial Valley Solar; MW = megawatt; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; ROW = right-of-way.

The applicant-proposed modifications to shift the transmission line, change the hydrogen storage system, and use an alternative water supply for construction and initial operations would not affect cultural resources differently than analyzed above for the IVS project. However, the water line alignment was modified slightly to follow the Evan Hewes Highway ROW where feasible to avoid sensitive resources including as many known cultural resources as possible. Those areas were the subject of archeological study. The results of that work are provided in the draft final Class III Inventory (June 2010). The survey corridor for the realigned water line includes approximately 80 ac. By locating the waterline closing to the Evan Hewes Highway ROW, a greater amount of the waterline alignment would be placed in already disturbed areas, avoiding areas that may be more sensitive for biological and cultural resources. As a result, the waterline realignment would avoid seven known cultural resources not avoided by the original IVS project.

Paleontological Resources

The paleontological formations on the IVS project site that have moderate to high sensitivity could be adversely affected during construction as a result of disturbance by grading or construction activities; unauthorized, unmonitored excavations; unauthorized collection of fossil

materials; dislodging of fossils from their preserved environment (fossils out of context); and/or physical damage to fossil specimens. Measures PAL-1 through PAL-7, provided later in this section, are intended to ensure that the paleontological resource impacts during construction of the IVS project would not be adverse.

No impacts to paleontological resources are anticipated during the operation of the IVS project.

The applicant-proposed modifications would be in the same areas and formations as described above for the IVS project and the construction of those modifications would result in impacts to paleontological resources similar to the impacts described above for the IVS project. These modifications would not result in impacts to paleontological resources during operations.

4.5.4.5 709 MW Alternative: Agency Preferred Alternative

Cultural Resources

Table 4-38 summarizes the number of known cultural resources within the boundaries of the site for the Agency Preferred Alternative. Those sites are described briefly in Appendix I**.**

Regarding impacts and the Agency Preferred Alternative:

- Whereas 359 resources are present, the Agency Preferred Alternative avoids known locations of habitation sites with human remains.
- This Agency Preferred Alternative will avoid part of the historic corridor of the Anza Trail.

Based on the information and analysis available to date, the Agency Preferred Alternative is anticipated to have the following effects/impacts related to cultural resources:

(1) Significant effect per NEPA.

(2) Adverse effect per Section 106 of the NHPA.

Mitigation is discussed in Section 4.5.6, Mitigation, Project Design Features, and Other Measures.

The short- and long-term impacts of the four applicant-proposed modifications related to cultural resources would be the same under the Agency Preferred Alternative as described earlier for

the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

Paleontological Resources

The construction of the Agency Preferred Alternative would result in the same impacts to paleontological resources as described above for the IVS project because the total area disturbed is very similar for the two alternatives. Measures PAL-1 through PAL-7 would apply to the Agency Preferred Alternative and are intended to ensure that the paleontological resource impacts that may occur during the construction of this alternative would not be adverse.

The short- and long-term impacts of the four applicant-proposed modifications related to paleontological resources would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.5.4.6 300 MW Alternative

Cultural Resources

Table 4-38 summarizes the number of known cultural resources within the boundaries of the site for the 300 MW Alternative. Those sites are described briefly in Appendix I.

Regarding impacts and the 300 MW Alternative:

- Whereas 168 resources are present, the 300 MW Alternative avoids known locations of habitation sites with human remains.
- The 300 MW Alternative will avoid part of the historic corridor of the Anza Trail.

Based on the information and analysis available to date, the 300 MW Alternative is anticipated to have the following effects/impacts related to cultural resources:

(1) Significant effect per NEPA.

(2) Adverse effect per Section 106 of the NHPA.

Mitigation is discussed in Section 4.5.6, Mitigation, Project Design Features, and Other Measures.

The short- and long-term impacts of the four applicant-proposed modifications related to cultural resources would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

Paleontological Resources

Although the area of disturbance for the 300 MW Alternative is smaller than for the IVS project, the potential for impacts to paleontological resources under the 300 MW Alternative would be the same as those described for the IVS project due to the presence of geological units with moderate to high paleontological sensitivity on the site. Measures PAL-1 through PAL-7 are intended to ensure that paleontological resource impacts that may occur during the construction of the 300 MW Alternative would not be adverse.

No impacts to paleontological resources are anticipated during the operation of the 300 MW Alternative.

The short- and long-term impacts of the four applicant-proposed modifications related to paleontological resources would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.5.4.7 Drainage Avoidance #1 Alternative

Cultural Resources

Table 4-38 summarizes the number of known cultural resources within the boundaries of the site for the Drainage Avoidance #1 Alternative. Those sites are described briefly in Appendix I.

Regarding impacts and the Drainage Avoidance #1 Alternative:

- Whereas 320 resources are present, the Drainage Avoidance #1 Alternative avoids known locations of habitation sites with human remains.
- The Drainage Avoidance #1 Alternative will avoid part of the historic corridor of the Anza Trail.

Based on the information and analysis available to date, the Drainage Avoidance #1 Alternative is anticipated to have the following effects/impacts related to cultural resources:

(1) Significant effect per NEPA.

(2) Adverse effect per Section 106 of the NHPA.

Mitigation is discussed in Section 4.5.6, Mitigation, Project Design Features, and Other Measures.

The short- and long-term impacts of the four applicant-proposed modifications related to cultural resources would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

Paleontological Resources

The area of disturbance for the Drainage Avoidance #1 Alternative is similar to the IVS project. Therefore, the potential for impacts to paleontological resources under the Drainage Avoidance #1 Alternative would be the same as those described for the IVS project due to the presence of geological units with moderate to high paleontological sensitivity on the site. Measures PAL-1 through PAL-7 are intended to ensure that paleontological resource impacts that may occur during the construction of the Drainage Avoidance #1 Alternative would not be adverse.

No impacts to paleontological resources are anticipated during operation of the Drainage Avoidance #1 Alternative.

The short- and long-term impacts of the four applicant-proposed modifications related to paleontological resources would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.5.4.8 Drainage Avoidance #2 Alternative

Cultural Resources

Table 4-38 summarizes the number of known cultural resources within the boundaries of the site for the Drainage Avoidance #2 Alternative. Those sites are described briefly in Appendix I.

Regarding impacts and the Drainage Avoidance #2 Alternative:

- Whereas 154 resources are present, the Drainage Avoidance #2 Alternative avoids known locations of habitation sites with human remains.
- The Drainage Avoidance #2 Alternative will avoid part of the historic corridor of the Anza Trail.

Based on the information and analysis available to date, the Drainage Avoidance #2 Alternative is anticipated to have the following effects/impacts related to cultural resources:

(1) Significant effect per NEPA.

(2) Adverse effect per Section 106 of the NHPA.

Mitigation is discussed in Section 4.5.6, Mitigation, Project Design Features, and Other Measures.

The short- and long-term impacts of the four applicant-proposed modifications related to cultural resources would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

Paleontological Resources

Although the area of disturbance for the Drainage Avoidance #2 Alternative is smaller than under the IVS project, the potential for impacts to paleontological resources under the Drainage Avoidance #2 Alternative would be the same as those described for the IVS project due to the presence of geological units with moderate to high paleontological sensitivity on the site. Measures PAL-1 through PAL-7 are intended to ensure that the paleontological resource impacts during construction of Drainage Avoidance #2 Alternative would not be adverse.

No impacts to paleontological resources are anticipated during the operation of Drainage Avoidance #2 Alternative.

The short- and long-term impacts of the four applicant-proposed modifications related to paleontological resources would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.5.4.9 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the right-of-way (ROW) grant or amend the *California Desert Conservation Area Plan* (CDCA Plan), and existing conditions on the site would continue into the future. Therefore, there will be no project-related impacts to cultural and paleontological resources under this No Action Alternative.

4.5.4.10 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to prohibit solar on the site in the future. Existing conditions on the site would continue into the future under this No Action Alternative. Therefore, there will be no project-related impacts to cultural and paleontological resources under this alternative.

4.5.4.11 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to allow other solar on the site in the future. Therefore, the site could be developed by other solar projects in the future, which would be expected to result in impacts to cultural and paleontological resources that would be similar to those expected from the IVS project.

4.5.5 Cumulative Impacts

4.5.5.1 Cumulative Impacts Under the National Environmental Policy Act

Under NEPA, a cumulative impact is the "…impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Section 1508.7). Cumulatively significant

impacts are taken into consideration as an aspect of the intensity of a significant effect (40 CFR Section 1508.27(b)(7).

4.5.5.2 Cumulative Effects Under Section 106

The Section 106 regulation makes explicit reference to cumulative effects only in the context of a discussion of the criteria of adverse effect (36 CFR Section 800.5(a)(1)). Cumulative effects related to cultural resources are largely undifferentiated under Section 106 as an aspect of the potential effects of an undertaking. Such effects are enumerated and resolved in conjunction with the consideration of direct and indirect effects.

Cumulative Projects

The cumulative projects and study area considered in this analysis for cultural resources were described in detail earlier in Section 2.10, Overview of the Cumulative Impacts Analysis. As described in that section, the overall geographic area considered for cumulative impacts is the Plaster City area.

In general, cultural and paleontological resources in the geographic area have been significantly impacted by past and currently approved projects and may be significantly impacted by reasonably foreseeable projects as follows:

(1) Because cultural and paleontological resources are nonrenewable, the removal or destruction of any resource results in a significant net loss of resources.

(2) Existing development in the Plaster City area and the surrounding areas has resulted in, and future development is likely to result in, the removal or destruction of cultural and paleontological resources, which has resulted in a significant net loss of resources in these areas.

4.5.5.3 IVS Project: 750 MW Alternative

Construction Impacts

The construction of the IVS project is expected to result in permanent adverse impacts related to the removal and/or destruction of cultural and paleontological resources on the project site during ground disturbance and other construction activities. It is also expected that the construction of some or all of the foreseeable cumulative projects that are not yet built may also

result in permanent adverse impacts as a result of the removal and/or destruction of cultural and paleontological resources on the sites for those projects. As a result, the construction of the IVS project and other foreseeable cumulative projects will contribute to permanent long-term adverse impacts as a result of the removal and/or destruction of resources on those sites and an overall net reduction in cultural and paleontological resources in the area.

Operation Impacts

During operation of the IVS project, cultural and paleontological resources on and in the immediate vicinity of the project site may experience increased vandalism as a result of improved access to the site, illegal collection of artifacts/fossils, and/or destruction of resources by vehicles traveling on the site. Similar impacts may also occur as a result of some or all of the cumulative projects as more people come into this area who are associated with those new land uses. As a result, in the long term, the IVS project and other cumulative projects may contribute to a cumulative adverse impact on cultural and paleontological resources as a result of increased access to the area and the potential for increased vandalism, illegal collection of artifacts, and/or destruction of resources during operation-related activities.

Decommissioning

The decommissioning of the IVS project may result in adverse impacts to cultural and paleontological resources as a result of ground disturbance, increased vandalism, illegal collection of artifacts/fossils, and/or destruction of resources by vehicles traveling on the site or during demolition and removal of the project facilities. Similar impacts are not anticipated as a result of most of the other cumulative projects because the removal of those land uses may not result in increased vandalism, illegal collection of artifacts/fossils, and/or destruction of resources by vehicles traveling on those sites or during demolition and removal of those land uses. As a result, decommissioning the IVS project is not anticipated to contribute to a cumulative adverse impact on cultural and paleontological resources beyond the contribution that would occur as a result of the construction and operation of the IVS project.

4.5.5.4 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative would contribute to impacts to cultural and paleontological resources during construction, operations, and decommissioning similar to the IVS project, except that slightly less land on the project site would be disturbed under the Agency Preferred Alternative than under the IVS project, as described above.

4.5.5.5 300 MW Alternative

The 300 MW Alternative would contribute to impacts to cultural and paleontological resources during construction, operations, and decommissioning similar to the IVS project, except that less land on the project site would be disturbed under the 300 MW Alternative than under the IVS project.

4.5.5.6 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would contribute to impacts to cultural and paleontological resources during construction, operations, and decommissioning similar to the IVS project, except that less land on the project site would be disturbed under the Drainage Avoidance #1 Alternative than under the IVS project.

4.5.5.7 Drainage Avoidance #2 Alternative

The Drainage Avoidance #2 Alternative would contribute to impacts to cultural and paleontological resources during construction, operations, and decommissioning similar to the IVS project, except that less land on the project site would be disturbed under the Drainage Avoidance #2 Alternative than under the IVS project.

4.5.5.8 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Because this No Action Alternative would not result in impacts to cultural and paleontological resources, it would not contribute to cumulative adverse impacts to those types of resources.

4.5.5.9 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Because this No Action Alternative would not result in impacts to cultural and paleontological resources, it would not contribute to cumulative adverse impacts to those types of resources.

4.5.5.10 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Because this No Action Alternative could result in impacts to cultural and paleontological resources similar to the IVS project and the Agency Preferred Alternative, it could contribute to cumulative adverse impacts to the types of resources similar to those Alternatives.

4.5.6 Mitigation, Project Design Features, and Other Measures

4.5.6.1 Resolving Significant Effects

Mitigation under NEPA includes proposals that avoid or minimize any potential significant effects of a proposed or alternative action on the quality of the human environment (40 CFR Section 1502.1, 1505.2(c)). The definition of mitigation in the NEPA regulation includes the development of measures that would avoid, minimize, or rectify significant effects, progressively reduce or eliminate such effects over time, or provide compensation for such effects (40 CFR Section 1508.20).

The Section 106 process directs the resolution of adverse effects through the development of proposals to avoid, minimize, or otherwise mitigate such effects (36 CFR Section 800.6(a)).

4.5.6.2 Programmatic Agreement

In accordance with 36 CFR Part 800.14(b), Programmatic Agreement (PA) documents are used for the resolution of adverse effects for complex project situations and when effects on historic properties (resources eligible for or listed in the National Register) cannot be fully determined prior to approval of an undertaking. The BLM is preparing a PA in consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), the Corps, the California Energy Commission (CEC), other Consulting Parties, and interested Native American tribes (including Tribal governments as part of government-to-government consultation). The PA will govern the continued identification and evaluation of historic properties (eligible for the National Register) as well as the resolution of any effects that may result from this proposed undertaking should the project be permitted. Historic properties are significant prehistoric and historic cultural resources as determined by the BLM in application of the National Register criteria per 36 CFR Part 60.4.

As a result of the anticipated impacts of the IVS project on cultural resources and the large geographic area in the APE, a PA with the ACHP, Corps, CEC, SHPO, other Consulting Parties,

and interested Native American tribes (government-to-government consultation) is necessary. The contacts with Indian Tribes and Tribal organizations as part of the government-to-government consultation for the IVS project are summarized in Appendix F, Government-to-Government Consultation.

Treatment plans regarding historic properties and historical resources that cannot be avoided by project construction will be developed in consultation with the Corps, CEC, SHPO, other Consulting Parties, and interested Native American tribes (government-to-government consultation) as stipulated in the PA. When the PA is fully executed, the IVS project will have fulfilled the requirements of the NHPA.

The BLM initiated formal consultation with the ACHP and the SHPO on the development of a PA for the IVS project on August 25, 2009. The ACHP replied on September 22, 2009, that they would participate in consultation on the project. Due to the presence in the APE of jurisdictional waters as defined by Section 404 of the Clean Water Act, the Corps was also invited into consultation on the development of the PA in that they may use it to comply with Section 106 of the NHPA for actions they may take regarding the project. The Corps and NPS have agreed to participate and will participate as a Signatory and Concurring Party, respectively. Other formal Consulting Parties to the PA at this time include the NPS, National Trust for Historic Preservation, the Anza Society, the California Unions for Reliable Energy, and the Sacred Sites International Foundation, as organizations, and Edie Harmon and Greg Smestad, Ph.D., as individuals. The BLM has been informally consulting with many individuals and organizations on this project.

The following Native American tribes or tribal organizations have also been invited to be Consulting Parties to the PA:

- Campo Kumeyaay Nation
- Cocopah Indian Tribe
- Quechan Indian Tribe
- Ewiiaapaayp Band of Kumeyaay Indians
- Jamul Indian Village
- Kwaaymii Laguna Band of Indians
- La Posta Band of Kumeyaay Indians

- Manzanita Band of Kumeyaay Indians
- San Pasqual Band of Diegueño Indians
- Santa Ysabel Band of Diegueño Indians
- Ah-Mut Pipa Foundation

Additional tribes may become consulting parties at any time there is a request to participate.

A Draft PA is currently in development and has been sent out to the Consulting Parties for their review and comment. The Draft PA is included as Appendix G, Draft Programmatic Agreement, in this FEIS. The ROD will include the executed PA.

Implementation of Measures CUP-1 through CUP-11, subject to the consultation process for the development of the Programmatic Agreement, would reduce or resolve adverse effects due to project construction for the Agency Preferred Alternative, the IVS project, the 300 MW Alternative, the Drainage Avoidance #1 Alternative, and the Drainage Avoidance #2 Alternative. These measures would reduce impacts through avoidance, evaluation, and treatment as presented in the mitigation measures below. It should be noted that archaeological testing for National Register of Historic Places (National Register)/California Register of Historical Resources (California Register) eligibility evaluation is destructive. Resource avoidance is always preferred where possible.

Specific treatments to resolve effects that are developed by the consulting parties to the PA would be stipulated in the HPTP that would tier from the PA. Because specific treatments are being developed and consultation with all interested parties is ongoing, there is no absolute commitment to specific treatment measures until they are finalized.

CUP-1 **Identify and evaluate cultural resources in final Area of Potential Effects (APE).** The Applicant shall provide sufficient technical data to enable the United States Bureau of Land Management (BLM) to properly evaluate the significance of all potentially affected cultural resources. Cultural resources data collection shall be conducted by professionals meeting the Secretary's Standards and in accordance with those Standards, to provide recommendations with regard to their eligibility for the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or local registers. Preliminary determinations of National Register eligibility will be made by the BLM, in consultation with the California Energy Commission (CEC) and other appropriate consulting parties, Native American tribes, and the State Historic Preservation Officer (SHPO).

CUP-2 **Avoid and protect potentially significant resources.**Where feasible, potentially register-eligible resources and register-eligible resources shall be protected from direct project impacts by project redesign. Complete avoidance of impacts to such resources shall be the preferred protection strategy. Avoidance of direct physical effects is the preferred treatment measure for historic properties to which Native American tribes attach sacred or religious significance, or for properties that have cultural significance as a traditional cultural property. The BLM would achieve this preferred treatment by conditioning the right-of-way (ROW) grant to exclude those historic properties, or lands from the project. On the basis of preliminary National Register eligibility assessments or previous determinations of resource eligibility, the BLM and CEC, in consultation with the SHPO, may request the relocation of the project area where relocation would avoid or reduce damage to cultural resource values.

Where the BLM and CEC, in consultation with the Applicant, decide that potentially National Register-eligible and/or California Register-eligible cultural resources cannot be protected from direct impacts by project redesign, or that avoidance is not feasible, the Applicant shall undertake additional studies needed by the BLM to evaluate the resources' National Register and/or California Register eligibility and to recommend further mitigative treatment. The nature and extent of this evaluation shall be determined by the BLM in consultation with the consulting parties and shall be based upon final project engineering specifications. Evaluations will be based on surface remains, subsurface testing, archival and ethnographic resources, and in the framework of the historic context and important research questions of the project area. Results of those evaluation studies and recommendations for mitigation of project effects shall be incorporated into a Historic Properties Treatment Plan (HPTP).

All potentially National Register-eligible and/or California Register-eligible resources that will not be affected by direct impacts, but are within 100 feet of direct impact areas, will be designated as Environmentally Sensitive Areas (ESAs) to ensure that construction activities do not encroach onsite peripheries. Protective fencing, or other markers (after approval by CEC/BLM), shall be erected and maintained to protect ESAs from inadvertent trespass for the duration of construction in the vicinity. ESAs shall not be identified specifically as cultural resources. A monitoring program shall be developed as part of a HPTP and implemented by the Applicant to ensure the effectiveness of ESA protection.

CUP-3 **Develop and implement HPTPs.**Upon approval of the inventory report and the National Register and California Register eligibility evaluations, the Applicant

shall prepare and submit for approval an HPTP for register-eligible cultural resources to avoid or mitigate identified potential impacts. Treatment of cultural resources shall follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act and other appropriate State and local regulations, as explained in Stipulation IV of the Draft Programmatic Agreement. Avoidance, recordation, and data recovery will be used as mitigation alternatives. Avoidance and protection shall be the preferred strategy. The HPTP shall be submitted to the BLM for review and approval. As part of the HPTP, the Applicant shall prepare a research design and a scope of work for data recovery or additional treatment of National Register-eligible and/or California Register-eligible sites that cannot be avoided and to resolve effects.

The HPTP shall define and map all known National Register-eligible and/or California Eligible-eligible properties in or within 50 feet of all project APEs and shall identify the cultural values that contribute to their National Register and/or California Register eligibility. The HPTP shall also detail how National Register-eligible and/or California Register-eligible properties will be marked and protected as ESAs during construction. The HPTP shall also define any additional areas that are considered to be of high-sensitivity for discovery of buried register-eligible cultural resources, including burials, cremations, or sacred features. This sensitivity evaluation shall be conducted by an archaeologist who meets the Secretary's Standards and who takes into account geomorphic setting and surrounding distributions of archaeological deposits. The HPTP shall detail provisions for monitoring construction in these high-sensitivity areas. It shall also detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, and assessing register-eligibility in the event that unknown cultural resources are discovered during construction. For all unanticipated cultural resource discoveries, the HPTP shall detail the methods, consultation procedures, and timelines for assessing register-eligibility, formulating a mitigation plan, and implementing treatment. Mitigation and treatment plans for unanticipated discoveries shall be approved by the BLM, CEC, and the SHPO prior to implementation.

The HPTP shall include provisions for analysis of data in a regional context, reporting of results within 1 year of completion of field studies, curation of artifacts (except from private land) and data (maps, field notes, archival materials, recordings, reports, photographs, and analysts' data) at a facility that is approved by BLM, and dissemination of reports to local and State repositories,

libraries, and interested professionals. The BLM will retain ownership of artifacts collected from BLM managed lands. The Applicant shall attempt to gain permission for artifacts from privately held land to be curated with the other project collections. The HPTP shall specify that archaeologists and other discipline specialists conducting the studies meet the Secretary's Standards (per 36 Code of Federal Regulations [CFR] 61).

CUP-4 **Conduct data recovery or other actions to resolve adverse effects.** If National Register-eligible and/or California Register-eligible resources, as determined by the BLM and SHPO, cannot be protected from direct impacts of the proposed project, data-recovery investigations or other mitigation shall be conducted by the Applicant to reduce adverse effects to the characteristics of each property that contribute to its National Register and/or California Register eligibility. For sites eligible under Criterion (d), significant data could be recovered through excavation and analysis. For properties eligible under Criteria (a), (b), or (c), mitigation may include but is not limited to historical documentation, photography, collection of oral histories, architectural or engineering documentation, preparation of a scholarly work, or some form of public awareness or interpretation. Data gathered during the evaluation phase studies and the research design element of the HPTP shall guide plans and data thresholds for data recovery; treatment will be based on the resource's research potential beyond that realized during resource recordation and evaluation studies. If data recovery is necessary, sampling for data-recovery excavations will follow standard statistical sampling methods, but sampling will be confined, as much as possible, to the direct impact area. Data-recovery methods, sample sizes, and procedures shall be detailed in the HPTP and implemented by the Applicant only after approval by the BLM. Construction work within 100 feet of cultural resources that require data-recovery fieldwork shall not begin until authorized by the BLM to ensure that impacts to known significant archaeological deposits are adequately resolved.

A description of alternative treatments to resolve adverse effects that are not data recovery may include (but are not limited to):

(1) Placement of construction in parts of historic properties that do not contribute to the qualities that make the resource eligible for the National Register;

(2) Deeding cemetery areas into open space in perpetuity and providing the necessary long-term protection measures;

(3) Public interpretation including the preparation of a public version of the cultural resources studies and/or education materials for local schools;

(4) Access by Native American tribes to traditional areas on the project site after the project has been constructed;

(5) Support by applicant to cultural centers in the preparation of interpretive displays; and

(6) Consideration of other off-site mitigation.

CUP-5 **Monitor construction at known ESAs.**The Applicant shall implement full-time archaeological monitoring by a professional archaeologist during ground-disturbing activities at all cultural resource ESAs. These locations and their protection boundaries shall be defined and mapped in the HPTP. Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of historical and prehistoric resources that could be encountered within the project, and under direct supervision of a principal archaeologist. The qualifications of the principal archaeologist and archaeological monitors shall be approved by the BLM.

A Native American monitor may be required at culturally sensitive locations specified by the BLM following government-to-government consultation with Native American tribes. The monitoring plan in the HPTP shall indicate the locations where Native American monitors will be required. The Applicant shall retain and schedule any required Native American monitors.

Compliance with and effectiveness of any cultural resources monitoring required by an HPTP shall be documented by the Applicant in a monthly report to be submitted to the BLM for the duration of project construction. In the event that cultural resources are not properly protected by ESAs, all project work in the immediate vicinity shall be diverted to a buffer distance determined by the archaeological monitor until authorization to resume work has been granted by the BLM and CEC.

The Applicant shall notify the BLM of any damage to cultural resource ESAs. If such damage occurs, the Applicant shall consult with the BLM to mitigate damages and to increase effectiveness of ESAs. At the discretion of the BLM and CEC, such mitigation may include, but not be limited to, modification of protective measures, refinement of monitoring protocols, data-recovery investigations or payment of compensatory damages in the form of non-

destructive cultural resources studies or protection within or outside the license area, at the discretion of the BLM.

CUP-6 **Train construction personnel.** All construction personnel shall be trained regarding the recognition of possible buried cultural remains and protection of all cultural resources, including prehistoric and historic resources during construction, prior to the initiation of construction or ground-disturbing activities. The Applicant shall complete training for all construction personnel and retain documentation showing when training of personnel was completed. Training shall inform all construction personnel of the procedures to be followed upon the discovery of archaeological materials, including Native American burials. Training shall inform all construction personnel that ESAs must be avoided and that travel and construction activity must be confined to designated roads and areas. All personnel shall be instructed that unauthorized collection or disturbance of artifacts or other cultural materials on or off the ROW by the Applicant, his representatives, or employees will not be allowed. Violators will be subject to prosecution under the appropriate State and federal laws and violations will be grounds for removal from the project. Unauthorized resource collection or disturbance may constitute grounds for the issuance of a stop work order. The following issues shall be addressed in training or in preparation for construction:

(1) All construction contracts shall require construction personnel to attend training so they are aware of the potential for inadvertently exposing buried archaeological deposits, their responsibility to avoid and protect all cultural resources, and the penalties for collection, vandalism, or inadvertent destruction of cultural resources.

(2) The Applicant shall provide training for supervisory construction personnel describing the potential for exposing cultural resources, the location of any potential ESA, and procedures and notifications required in the event of discoveries by project personnel or archaeological monitors. Supervisors shall also be briefed on the consequences of intentional or inadvertent damage to cultural resources. Supervisory personnel shall enforce restrictions on collection or disturbance of artifacts or other cultural resources.

CUP-7 **Properly treat human remains.** All locations of known Native American human remains shall be avoided through project design and shall be protected by designation as ESAs. The Applicant shall follow all State and federal laws, statutes, and regulations that govern the treatment of human remains (see Stipulation VI of the Draft Programmatic Agreement). The Applicant shall assist

and support the BLM in all required Section 106, government to-government and Native American Graves Protection and Repatriation Act (NAGPRA) consultations with Native Americans, agencies and commissions, and consulting parties as requested by the BLM. The Applicant shall comply with and implement all required actions and studies that result from such consultations. If human remains are discovered during construction, all work shall be diverted from the area of the discovery and the BLM authorized officer shall be informed immediately. Avoidance and protection of inadvertent discoveries which contain human remains shall be the preferred protection strategy with complete avoidance of impacts to such resources protected from direct project impacts by project redesign. The Applicant shall follow all State and federal laws, statutes, and regulations that govern the treatment of human remains. The Applicant shall comply with and implement all required actions and studies that result from such consultations, as directed by the BLM.

CUP-8 **Monitor construction in areas of high sensitivity for buried resources.**The Applicant shall implement archaeological monitoring by a professional archaeologist during subsurface construction disturbance at all locations identified in the HPTP as highly sensitive for buried prehistoric or historical archaeological sites or Native American human remains. These locations and their protection boundaries shall be defined and mapped in the HPTP. Intermittent monitoring may occur in areas of moderate archaeological sensitivity at the discretion of the BLM and CEC. Upon discovery of potential buried cultural materials by archaeologists or construction personnel, or damage to an ESA, work in the immediate area of the find shall be diverted and the BLM Authorized Officer or his/her designee shall be notified immediately. Once the find has been inspected and a preliminary assessment made, the Applicant's archaeologist will consult with the BLM, as appropriate, to make the necessary plans for evaluation and treatment of the find(s) or mitigation of adverse effects to ESAs, in accordance with the Secretary's Standards, and as specified in the HPTP.

CUP-9 **Continue consultation with Native American and other traditional groups.** The Applicant shall provide assistance to the BLM, as requested by the BLM, to continue required government to-government consultation with interested Native American tribes and individuals (Executive Memorandum of April 29, 1994 and Section 106 of the National Historic Preservation Act) and other traditional groups to assess or mitigate the impact of the approved project on traditional cultural properties or other resources of Native American concern, such as sacred sites and landscapes, or areas of traditional plant gathering for food,

medicine, basket weaving, or ceremonial uses. As directed by the BLM, the Applicant shall undertake required treatments, studies, or other actions that result from such consultation. Actions that are required during or after construction shall be defined, detailed, and scheduled in the HPTP and implemented by the Applicant.

CUP-10 **Protect and monitor National Register-eligible and/or California Register-eligible properties.** The Applicant shall design and implement a long-term management plan to protect National Register-eligible and/or California Register-eligible sites from direct impacts of project operation and maintenance and from indirect impacts (such as erosion and access) that could result from the presence of the project. The plan shall be developed in consultation with the BLM and other consulting parties to design measures that will be effective against project maintenance impacts, such as vegetation clearing and road and tower maintenance, and project-related vehicular impacts. The plan shall also include protective measures for National Register-eligible and/or California Register-eligible properties within the transmission line corridor or main project area that may experience operational and access impacts as a result of the project. Measures considered shall include restrictive fencing or gates, permanent access road closures, signage, stabilization of potential erosive areas, site capping, site patrols, and interpretive/educational programs, or other measures that will be effective for protecting National Register-eligible and/or California Register-eligible properties. The plan shall be property specific and shall include provisions for monitoring and reporting its effectiveness and for addressing inadequacies or failures that result in damage to National Register-eligible and/or California Register-eligible properties.

Monitoring of sites selected during consultation with BLM shall be conducted annually by a professional archaeologist for a minimum period of 5 years. Monitoring shall include inspection of all site loci and defined surface features, documented by photographs from fixed photo monitoring stations and written observations. A monitoring report shall be submitted to the BLM within 1 month following the annual resource monitoring. The report shall indicate any properties that have been affected by erosion or vehicle or maintenance impacts. For properties that have been impacted, the Applicant shall provide recommendations for mitigating impacts and for improving protective measures. After 5 years of resource monitoring, the BLM will evaluate the effectiveness of the protective measures and the monitoring program. Based on that evaluation, the BLM or CEC may require that the Applicant revise or refine the protective

measures, or alter the monitoring protocol or schedule. If the BLM does not authorize alteration of the monitoring protocol or schedule, those shall remain in effect for the duration of project operation.

If the annual monitoring program identifies adverse effects to National Register-eligible and/or California Register-eligible properties from operation or long-term presence of the project, or if, at any time, the Applicant, BLM or CEC become aware of such adverse effects, the Applicant shall notify the BLM immediately and implement additional protective measures, as directed by the BLM. At the discretion of the BLM such measures may include, but not be limited to, refinement of monitoring protocols, data-recovery investigations, or payment of compensatory damages in the form of nondestructive cultural resources studies or protection.

CUP-11 **Complete identification efforts for the Anza Trail and Coordinate Mitigation Efforts.** Mitigation measures developed for the Juan Bautista de Anza National Historic Trail (Anza Trail) and outlined in the Programmatic Agreement shall provide for additional investigations throughout the project site to try to define the location of the Anza Trail or whether any archaeological evidence remains. These methods include but are not limited to the use of imaging technology to try to identify a primary path for the Anza Trail. Where archaeological data recovery is used as a mitigation measure to resolve effects to historic properties, the investigations should provide special attention to identifying artifacts or faunal remains that may have been left behind by the Anza party. Coordination is also required with other mitigation measures for effects to the recreation trail and viewshed, which may include installation of interpretive displays at the project site or other known trail sites outside the project area, the development of visitor overlooks, and the creation of audio/driving interpretive materials.

4.5.6.3 Mitigation for Paleontological Resources

PAL-1 The project owner shall provide BLM's Authorized Officer and the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resources Supervisor (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain BLM's Authorized Officer and CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified Paleontological Resource Monitors

(PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to BLM's Authorized Officer and the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of BLM's Authorized Officer and the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by BLM's Authorized Officer and the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

(1) Institutional affiliations, appropriate credentials, and college degree;

(2) Ability to recognize and collect fossils in the field;

(3) Local geological and biostratigraphic expertise;

(4) Proficiency in identifying vertebrate and invertebrate fossils; and

(5) At least 3 years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. PRMs shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

PAL-2 The project owner shall provide to the PRS, BLM's Authorized Officer and the CPM, for approval, maps and drawings showing the footprint of the power plants, construction lay down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests

enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS, BLM's Authorized Officer and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale of 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS, BLM's Authorized Officer and CPM.

If construction of the IVS project proceeds in phases, maps and drawings may be submitted prior to the start of each power plant. A letter identifying the proposed schedule of each project power plant shall be provided to the PRS, BLM's Authorized Officer and CPM. Before work commences on affected power plants, the project owner shall notify the PRS, BLM's Authorized Officer and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week, and until ground disturbance is completed.

PAL-3 If after review of the plans provided pursuant to PAL-2, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted, the project owner shall ensure that the PRS prepares, and the project owner submits to BLM's Authorized Officer and the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by BLM's Authorized Officer and the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities, and may be modified with BLM's Authorized Officer and CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, BLM's Authorized Officer and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 1995) and shall include, but not be limited, to the following:

(1) Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;

(2) Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;

(3) A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

(4) An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

(5) A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

(6) A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

(7) A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

(8) Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

(9) Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation, and how they will be met, and the name and phone number of the contact person at the institution; and

(10) A copy of the paleontological conditions of certification.

PAL-4 If after review of the plans provided pursuant to PAL-2, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted then, prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly BLM Authorized Officer- and CPM-approved training for the following workers: project managers, construction supervisors, foremen and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving BLM Authorized Officer- and CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off, for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to BLM's Authorized Officer and CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

(1) A discussion of applicable laws and penalties under the law;

(2) Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;

(3) Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

(4) Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

(5) An informational brochure that identifies reporting procedures in the event of a discovery;

(6) A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and

(7) A sticker that shall be placed on hard hats indicating that environmental training has been completed.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of BLM's Authorized Officer and the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

(1) Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to BLM's Authorized Officer and the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to BLM's Authorized Officer and the CPM for review and approval.

(2) The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with BLM's Authorized Officer and the CPM at any time.

(3) The project owner shall ensure that the PRS notifies BLM's Authorized Officer and the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

(4) For any significant paleontological resources encountered, either the project owner or the PRS shall notify BLM's Authorized Officer and the CPM within 24 hours, or Monday morning in the case of a weekend event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontological resource monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by BLM's Authorized Officer and the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information, and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

4.5.7 Summary of Impacts

Table 4-39 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to cultural and paleontological resources.

Table 4-39 Summary of Cultural and Paleontological Resources Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	**Cultural Resources** Adverse effect on historic properties. **Paleontological Resources** Adverse impacts during construction to formations with moderate to high sensitivity.	**Cultural Resources** • Identify and evaluate cultural resources in the final APE. • Avoid and protect potentially significant resources. • Develop and implement HPTPs. • Conduct data recovery or other actions to resolve adverse effects. • Monitor construction at known ESAs. • Train construction personnel. • Properly treat human remains. • Monitor construction in areas of high sensitivity for buried resources. • Continue consultation with Native American and other traditional groups. • Protect and monitor National Register-eligible and/or California Register-eligible properties. • Complete identification efforts for the Anza Trail and coordinate mitigation efforts. **Paleontological Resources** *PAL-1:* PRS for mitigation monitoring *PAL-2:* Project maps and construction scheduling information to the PRS. *PAL-3:* PRMMP.	Unavoidable adverse impacts after mitigation to cultural resources as a result of the loss of resources. No unavoidable adverse impacts after mitigation to paleontological resources.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
		PAL-4: Worker training. *PAL-5:* Construction monitoring. *PAL-6:* Implementation of all components of the PRMMP. *PAL-7:* Paleontological Resources Report.	
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	Same as the IVS project.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No effect on historic properties and paleontological resources.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No effect on historic properties and paleontological resources.	None.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Potentially the same impacts on historic resources and paleontological resources as the IVS project covering the entire site.	None specified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: APE = Area of Potential Effects; California Register = California Register of Historical Resources; CDCA Plan = California Desert Conservation Area Plan; ESA = Environmentally Sensitive Area; HPTP = Historic Properties Treatment Plan; IVS = Imperial Valley Solar; MW = megawatts; National Register = National Register of Historic Places; PRMMP = Paleontological Resources Monitoring and Mitigation Plan; PRS = Paleontological Resource Specialist; ROW = right-of-way.

The likelihood of avoiding impacts to all the resources eligible for the National Register for the Build Alternatives is very remote. Although those impacts can be substantially mitigated, not all impacts can be 100 percent mitigated. Therefore, the Agency Preferred Alternative and the other Build Alternatives will result in adverse Impacts to cultural resources after mitigation.

Locally, paleontological resources have been documented in Quaternary alluvium, colluvium, lakebed sediments, and in sedimentary units of the Palm Springs Formation, all of which underlie the IVS site in the near surface. Potential impacts to paleontological resources would be mitigated through worker training and monitoring by qualified paleontologists, as required by Measures PAL-1 through PAL-7. Based on implementation of those measures, no adverse impacts would occur to paleontological resources under the Agency Preferred Alternative, the IVS project, or the other Build Alternatives.

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4.6 Fire and Fuels Management

4.6.1 Methodology

The potential for fire risks on the IVS project site was assessed based on the physical components of the project and the potential for wildland fires on the site. Because the IVS project would increase activity on the site and provide new structures and activities on the site, potential impacts related to wildland fire risks were assessed based on:

(1) Increased potential for ignition sources on the IVS site as a result of greater activity on the site during construction, operation (including transmission lines, SunCatchers, and other components and features associated with solar power harnessing and electricity generation), and decommissioning.

(2) Increased fuels on the site for project construction and operation which could increase wildland fire risks on the site.

In addition, the on-site firefighting systems are evaluated, as well as the time needed for off-site local fire departments to respond to a fire emergency at the IVS project site.

4.6.2 Definition of Resource

Areas proposed for development have the potential for elevating the potential for fire. Therefore, the fire risk resources for development are defined as the structures and operations of the IVS project and the vegetation on the site itself which could be at risk for wildland fires.

A wildland fire is a noncontrolled fire in an area where vegetation is the primary source of fuel for the fire. For a wildland fire to occur two things must be present: adequate fuel and an ignition source. Fuel is defined as the means for a fire to burn. The native vegetation of the region consists of Sonoran creosote bush scrub, a low-growing desert land cover-type characteristic throughout the Sonoran Desert and typical of the Colorado Desert as a whole, characterized by sparse, low-growing scrub, often interspersed with Ocotillo cacti. This vegetation is the only existing fuel source on the IVS project site. Due to the aridity of the climate, the ability of additional vegetation based fuels to populate the IVS project site is extremely limited unless an additional water source is provided to support the growth of that vegetation.

4.6.3 Applicable Regulations, Plans, and Policies/Management Goals

Two types of resources could be at potential risk for fire and/or providing fuels for fires. One type is the new structures that would be constructed on the IVS project site. The other type is the nature of the operations with project structures and native vegetation proximity to each other. While both types are heavily regulated, the structural risk is addressed through the required compliance with applicable fire codes and regulations concerning structures. The second type is plan and monitoring based.

As discussed in Section 3.6, Fire and Fuels Management, there are numerous Federal, State and local laws, ordinances, regulations, and standards (LORS) relevant to fire management and control which were listed and described in Table 3-12. Those LORS are listed briefly below:

- Federal Wildland Fire Management Policy
- National Fire Plan (NFP) – Nonregulatory
- 2007 Edition of California Fire Code and all applicable National Fire Protection Association (NFPA) standards (24 California Code of Regulations [CCR] Part 9)
- California Health and Safety Code
- California Fire Plan (2000)
- California Public Utilities Commission General Order 95: Rules for Overhead Transmission Line Construction (2006)
- California Department of Forestry and Fire Protection (CAL FIRE)
- County of Imperial Codified Ordinances Section 820.0100

An additional requirement for the IVS project is for the development and implementation of a Fire Prevention Plan consistent with 8 CCR Section 3221 to specifically address operations fire prevention. The Fire Prevention Plan for the IVS project would include:

- Determine the general project-specific program requirements
- Determine and conduct a fire hazard inventory, including ignition sources and mitigation
- Develop good housekeeping practices and proper materials storage

- Establish employee alarms and/or communication system(s)
- Provide portable fire extinguishers at appropriate site locations
- Locate fixed firefighting equipment in suitable areas
- Specify fire control requirements and procedures
- Establish proper flammable and combustible liquid storage facilities
- Identify the location and use of flammable and combustible liquids
- Provide proper dispensing and determine disposal requirements for flammable liquids
- Establish and determine training and instruction requirements and programs; and
- Identify contacts for information on plan contents.

4.6.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.6.4.1 IVS Project: 750 MW Alternative

The solar power plant provided in the IVS project would present a unique work environment that includes a solar field in the high desert. As discussed earlier, the potential for additional fire fuel on the IVS project site would be changed by the introduction of a new source of water on the site. Specifically, the IVS project would require the use of water to wash the mirrors on the SunCatchers. The presence of the water and the additional shading provided by the SunCatchers could encourage the growth of additional vegetation on the site which could become fuel in the event of a structure fire or an ignition source in the vegetation. Therefore, the

areas under the solar arrays must be kept free from weeds; herbicides would be applied as necessary. To further reduce the wildland fire risk on the IVS project site, the project includes removal of all vegetation in the vicinity of the solar power towers, the substation, and administration areas, and during regular maintenance of the solar field. The access road along the perimeter fence line would also serve as a fire break.

During construction and operation of the IVS project there is the potential for small fires, major structural fires, and wild fires. Electrical sparks; the combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, insulating fluid at the project power plant switchyard or flammable liquids; explosions; and overheated equipment may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely at the power plant or other project buildings. Fires and explosions of natural gas or other flammable gases or liquids are typically rare. Compliance with all LORS related to fire prevention and control would be adequate to ensure protection from all fire hazards associated with the IVS project.

The IVS project would rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system would provide 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 El Centro Fire Department (EFD).

During construction, portable fire extinguishers would be located and maintained throughout the site. Fire prevention and related safety procedures and training would also be implemented.

The IVS project would meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended NFPA standards (including Standard 850, which addresses fire protection at electric generating plants), and all Cal-OSHA requirements. Fire suppression elements on the IVS project site would include both fixed and portable fire extinguishing systems.

The fire protection system would be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water would be stored in the 175,000-gallon demineralized water storage facility on the site. This water would be on site for two purposes: for use in washing the mirrors and for fire suppression. A diesel-run fire water pump would increase the water pressure to the level required to serve all fire fighting systems on the site. A number of protective measures included in the IVS project would help reduce the potential for harm to plant personnel and damage to facilities in the event of a fire. These include removal of all vegetation in the vicinity of the solar power towers, the substation, and the administration areas, and the access road along the perimeter fence lines serving as a fire break.

In addition to the fixed fire protection system, smoke detectors, flame detectors, high-temperature detectors, appropriate class of service portable extinguishers, and fire hydrants would be located throughout the site and the facility structures at code-approved intervals. These systems are standard requirements of the California Fire Code and NFPA and would supply adequate fire protection.

Measures WORKER SAFETY-1 and WORKER SAFETY-2 include the preparation and implementation of several plans to maximize fire protection and prevention and worker protection and safety.

The applicant-proposed modifications to the transmission line and the water line will not result in differences in impacts related to fire and fuels management compared to the IVS project as described above. This is because these proposed modifications would be designed and function the same as the transmission line and water line evaluated for the original IVS project.

The applicant-proposed modifications to the hydrogen storage system are similar to the on-site hydrogen storage evaluated for the original IVS project. As a result, this proposed modification is not anticipated to result in impacts related to fire and fuels management different than identified above for the original IVS project.

The applicant-proposed modification to use an alternative water supply for construction and initial operations would extract water from an existing off-site well and transport that water to the IVS project site by truck. The driveway and well area on the well site are relatively clear of vegetation and do not appear to be a major source of potential fuel. The trucks would travel on existing paved roads between the well site and the IVS project site. Therefore, the alternative water supply is not expected to result in impacts related to fire and fuels management different than those described above for the original IVS project.

4.6.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative and the IVS project would result in development on nearly the same amount and areas on the site, and nearly identical construction, operations, and decommissioning activities. The Agency Preferred Alternative would also include the same fire prevention and protection features as the IVS project. It would result in fire risks and impacts very similar to those described in the following section for the IVS project.

As described below for the IVS project, compliance with all LORS would be adequate to ensure protection from fire hazards associated with the Agency Preferred Alternative. The Agency Preferred Alternative also includes Measures WORKER SAFETY-1 and WORKER SAFETY-2.

The short- and long-term impacts of the four applicant-proposed modifications related to fire and fuels management would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.6.4.3 300 MW Alternative

The 300-Megawatt (MW) Alternative would have fire and fuel risks and impacts similar to those described above for the IVS project. However, because the 300 MW Alternative would be less acreage than the IVS project, a reduced area would be potentially subject to increases in native vegetation as a fuel source compared to the IVS project.

As described for the IVS project, compliance with all LORS would be adequate to ensure protection from fire hazards associated with the 300 MW Alternative. The Agency Preferred Alternative also includes Measures WORKER SAFETY-1 and WORKER SAFETY-2.

The short- and long-term impacts of the four applicant-proposed modifications related to fire and fuels management would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.6.4.4 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would have similar impacts and measures as those described for the IVS project related to fire and fuel risks because it would cover nearly the same acreage on the site and would have nearly the same facilities and structures as the IVS project.

As described for the IVS project, compliance with all LORS would be adequate to ensure protection from fire hazards associated with the Drainage Avoidance #1 Alternative. This Alternative also includes Measures WORKER SAFETY-1 and WORKER SAFETY-2.

The short- and long-term impacts of the four applicant-proposed modifications related to fire and fuels management would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.6.4.5 Drainage Avoidance #2 Alternative

The Drainage Avoidance #2 Alternative would have similar impacts and measures as those described for the IVS project related to fire and fuel risks but at a reduced level because it would on a much smaller site and would have a reduced number of facilities and structures compared to the IVS project.

As described for the IVS project, compliance with all LORS would be adequate to ensure protection from fire hazards associated with the Drainage Avoidance #2 Alternative. The Drainage Avoidance #2 Alternative also includes Measures WORKER SAFETY-1 and WORKER SAFETY-2.

The short- and long-term impacts of the four applicant-proposed modifications related to fire and fuels management would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.6.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the right-of-way (ROW) grant and would not amend the *California Desert Conservation Area Plan* (CDCA Plan, 1980 as amended). As a result, no solar energy project would be constructed on the IVS site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, no impacts related to fire and fuel risks associated with construction and operation of any of the solar project Build Alternatives would occur. However, the site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts related to fire and fuel risks similar to the IVS project, in other locations.

4.6.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to make the site unavailable for future solar development. As a result, no solar

energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, this No Action Alternative would not result in impacts related to fire and fuel risks associated with construction and operation of a Build Alternative. However, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts related to fire and fuel risks similar to the IVS project, in other locations.

4.6.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant but would amend the CDCA Plan to allow for other solar projects on the site. Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts related to fire and fuel risks would result from the construction and operation of that solar technology and would likely be similar to the impacts related to fire and fuel risks under the IVS project. As such, this No Action Alternative could result in impacts related to fire and fuel risks similar to the impacts under the IVS project.

4.6.5 Cumulative Impacts

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for fire and fuels management are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis.

The construction and operation of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives were reviewed to determine if they could contribute to a cumulative adverse impact on the fire and emergency service capabilities of the EFD. It was determined through review of the plans, application of the LORS, and the measures applicable to these Alternatives, that they would not contribute to cumulative adverse impacts to existing fire protection and prevention services because they would result in only a minor increase in demand for these services.

The potential risk of added fire fuels on the site is localized and would not contribute to a cumulative fire and fuels issue for the area because measures are included in the IVS project,

the Agency Preferred Alternative, and the other Build Alternatives to ensure that the growth of additional fuels on the project site is regularly checked and controlled.

4.6.6 Mitigation, Project Design Features, and Other Measures

WORKER SAFETY-1 The project owner shall submit to BLM's authorized officer and the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program
- A Construction Exposure Monitoring Program
- A Construction Injury and Illness Prevention Program
- A Construction Emergency Action Plan
- A Construction Fire Prevention Plan

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to BLM's authorized officer and the CPM for review and approval concerning compliance of the program with all applicable Safety Orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the El Centro Fire Department for review and comment prior to submittal to the BLM's authorized officer and CPM for approval.

WORKER SAFETY-2 The project owner shall submit to BLM's authorized officer and the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan
- An Emergency Action Plan
- Hazardous Materials Management Program

- Fire Prevention Program (8 CCR Section 3221)
- Personal Protective Equipment Program (8 CCR Sections 3401 3411)

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to BLM's authorized officer and the CPM for review and approval concerning compliance of the program with all applicable Safety Orders. The Operation Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the El Centro Fire Department for review and comment.

4.6.7 Summary of Impacts

Table 4-40 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to fire and fuels management. As shown, based on compliance with the applicable LORS and Measures WORKER SAFETY-1 and WORKER SAFETY-2, the Agency Preferred Alternative, the IVS project, and the other Build Alternatives would not result in unavoidable adverse impacts related to fire and fuel risks.

Table 4-40 Summary of Fire and Fuels Management Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Potential for increases in fuel from vegetation; and fires during construction and operation.	WORKER-1: Project Construction Safety and Health Program WORKER-2: Project Operations Safety and Health Program	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	None.
300 MW Alternative	Reduced risk compared to the IVS project and the Agency Preferred Alternative due to the reduced size of the project.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #1 Alternative	Reduced risk compared to the IVS project and the Agency Preferred Alternative due to the reduced size of the project.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Reduced risk compared to the IVS project and the Agency Preferred Alternative due to the reduced size of the project.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Possibly similar to the Agency Preferred Alternative and the IVS project.	None specified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.7 Geology, Soils, Topography, Mineral Resources, and Seismic

4.7.1 Methodology

The potential effects of the Imperial Valley Solar (IVS) project on the geology, soils, topography, mineral resources, and seismic environment were assessed based on the following considerations:

- Located on or near the trace of a known active fault or an area characterized by surface rupture that might be related to a fault;
- Increase the potential for human injury or economic loss from earthquake, liquefaction, slope failure, or other geologic hazards;
- Damage or degrade an important geologic feature or landmark;
- Result in substantial soil erosion of loss of topsoil;
- Be located on unstable strata or soil that would become unstable as a result of the project, potentially resulting in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; or
- Be located on expansive soil creating substantial risk to life or property.

The potential risk of indirect impacts affecting geology and mineral resources from development of the IVS project uses a high-to-low scale. The following definitions of high, medium, and low were used in assessing the potential risk of indirect impacts from the proposed action:

- **High:** If there would be substantial impacts related to the criteria listed above
- **Medium:** If there would be moderate impacts related to the criteria listed above
- **Low:** If there would be minor or no impacts related to the criteria listed above.

4.7.2 Definition of Resource

Geology is the study of the earth, the materials of which it is made, the structure of those materials, and the processes acting on them. The California Desert Conservation Area (CDCA) is one of the most diverse geologic regions in the United States. As discussed in Section 3.7, Geology, Soils, Topography, Mineral Resources, and Seismic, the IVS project site is in the Colorado Desert physiographic province. The Colorado Desert physiographic province is a low-lying barren desert basin, as much as 245 feet (ft) below sea level, and is dominated by the Salton Sea. The province is a depressed block between active branches of alluvium-covered San Andreas Fault with the southern extension of the Mojave Desert on the east. It is characterized by the ancient beach lines and silt deposits of extinct Lake Cahuilla.

Resources within the greater CDCA include important mineral and energy resources such as geothermal, gas oil, uranium, and thorium. Forty-six mineral commodities plus geothermal resources and carbon dioxide are known to exist in the CDCA. As a result, the BLM makes land available for the development of Federal mining resources consistent with Section 2 of the Mining and Mineral Policy Act of 1970 and Section 102(a)(7), (8), and (12) of Federal Land Policy and Management Act of 1976 (FLPMA). In addition, consistent with those laws, the BLM makes certain that reclamation of disturbed lands takes place. The IVS project site is not in an designated Mineral Resource Zone (MRZ) and no economically viable mineral deposits are known to be present within the boundary of the IVS site.

4.7.3 Applicable Regulations, Plans, and Policies/Management Goals

The management goals of the *California Desert Conservation Area Plan* (CDCA Plan, 1980, as amended) Geology, Energy, and Mineral Resources Element are:

(1) Within the multiple-use management framework, assure the availability of known mineral resource lands for exploration and development

(2) Encourage the development of mineral resources in a manner which satisfies the national and local needs and provides for economically and environmentally sound exploration, extraction, and reclamation process.

(3) Develop a mineral resource inventory, geology-energy-minerals database, and professional, technical, and managerial staff knowledgeable in mineral exploration and development.

4.7.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.7.4.1 IVS Project: 750 MW Alternative

Ground Motion and Surface Fault Rupture

As with all of southern California, the IVS project site is subject to strong ground motion resulting from earthquakes on nearby faults. Ground shaking represents the main geological hazards at the site. Several faults in the vicinity of the IVS project site are capable of producing strong ground motion, including the Laguna Salada, Elsinore (Coyote Mountains), and San Jacinto (Superstition Mountain) faults. There is a known fault located within the project site and, therefore, there is also potential for impacts to the project site from ground motion and fault rupture. With the implementation of proper geotechnical engineering design, in accordance with Measures GEO-1 and GEO-2, the potential for adverse impacts associated with ground motion and fault rupture impacts should be minimal. Seismic testing will be conducted on the site to provide site-specific seismic data for incorporation in the final project design. This would ensure compliance with applicable LORS and would reduce any potential risk associated with seismic ground motion to a negligible level.

Liquefaction

The reported deep groundwater table (greater than 50 ft below ground surface [bgs]) below the IVS project site would indicate no potential for liquefaction at the site. Standard penetration testing (blowcounts) conducted for the project indicates strata beneath the site are also generally too dense to liquefy. Measure GEO-1 addresses the potential for liquefaction potential on the IVS site.

Local Subsidence

The project geotechnical investigation indicates the alluvial deposits underlying the site are generally at a medium-dense to very dense consistency and, therefore, are considered unlikely to support site-wide subsidence due to foundation loading. Due to relatively recent fissuring and subsidence along the trace of the Dixieland Fault a geologist or engineer experienced in recognition and examination of faults and fissures should be available during trenching performed during construction of the IVS project ancillary facilities, particularly the water supply pipeline, to document any potential near-surface soil anomalies and facilitate any necessary changes in design. With proper geotechnical engineering design, in accordance with Measures GEO-1 and GEO-2, the potential for localized foundation subsidence should be minimal.

Expansive Soil

The alluvium, colluvium, and lakebed deposits which form most of the site subsurface are not considered to be expansive. However, claystone members in the Palm Springs Formation may be expansive if exposed to moisture. An inspector experienced in recognition of clay rich soils should be onsite during excavation of building foundations to implement appropriate measures in areas of clay rich soils, if they are encountered. Proper routine, geotechnical mitigation of any expansive clay soils consistent with the requirements of Measure GEO-1 would provide adequate project performance and a minimal project impact related to expansive soil.

Mineral Resources

The IVS project site is not in a designated MRZ and no economically viable mineral deposits are known to be present within the site boundary. Therefore, the IVS project will not impact any designated MRZ or economically viable mineral deposits.

Laws, Ordinances, Regulations, and Standards

Federal, state, and local/county LORS applicable to this IVS project were detailed in Section 3.7. The IVS project would comply with all applicable LORS related to geology and mineral resources.

Applicant-Proposed Modifications

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in impacts related to geology, soils, topography, minerals, and seismic compared to the IVS project as described above. This is because these proposed

modifications would be designed, function, and be in the same locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in impacts related to geology, soils, topography, minerals, and seismic compared to the IVS project because this modification will not result in structures or activities which could be adversely impacted by or adversely impact geotechnical conditions in the area.

4.7.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative will result in effects related to geology, soils, topography, mineral resources, and the seismic environment and the applicable laws, ordinances, regulations, and standards (LORS) similar to the effects described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the geology and seismic effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project. The measures described in the following section to address adverse geology and seismic related impacts of the IVS project would also apply to the Agency Preferred Alternative.

The short- and long-term impacts of the four applicant-proposed modifications related to geology, soils, topography, minerals, and seismic would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.7.4.3 300 MW Alternative

The 300 MW Alternative would be on the same part of the IVS project site as Phase 1 of the IVS project. It would consist of 12,000 SunCatchers with a net generating capacity of approximately 300 MW occupying approximately 2,600 ac of land. The conversion of those 2,600 ac of land to support the 300 MW Alternative would result in the same potential for impacts related to geology, topography, mineral resources, and the seismic environment as described above for the IVS project. GEO-1 and GEO-2 would be applicable to the 300 MW Alternative and would reduce the potential impacts of this alternative related to geological and mineral resources to less than substantial levels.

The short- and long-term impacts of the four applicant-proposed modifications related to geology, soils, topography, minerals, and seismic would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.7.4.4 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would cover approximately the same part and amount of the site as the IVS project. The conversion of 4,690 ac of land to support the Drainage Avoidance #1 Alternative would result in the same potential for impacts related to geology, topography, mineral resources, and the seismic environment as described above for the IVS project. GEO-1 and GEO-2 would be applicable to the Drainage Avoidance #1 Alternative and would reduce the potential impacts of this alternative related to geological and mineral resources to less than substantial levels.

The short- and long-term impacts of the four applicant-proposed modifications related to geology, soils, topography, minerals, and seismic would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.7.4.5 Drainage Avoidance #2 Alternative

Drainage Avoidance #2 Alternative would cover less of the site than the IVS project. The conversion of 3,153 ac of land to support the Drainage Avoidance #2 Alternative would result in the same potential for impacts related to geology, topography, mineral resources, and the seismic environment as described above for the IVS project. GEO-1 and GEO-2 would be applicable to the Drainage Avoidance #2 Alternative and would reduce the potential impacts of this alternative related to geological and mineral resources to less than substantial levels.

The short- and long-term impacts of the four applicant-proposed modifications related to geology, soils, topography, minerals, and seismic would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.7.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the right-of-way (ROW) grant for the IVS project would not be approved by the BLM, and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the IVS site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, the geology and seismic-related impacts of the IVS project would not occur, including the conversion of 6,500 ac of land from desert environment to energy production use.

The IVS project site would become available to other uses that are consistent with the CDCA Plan under this No Action Alternative. In addition, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would potentially result in impacts on geological and mineral resources in other locations similar to the IVS project.

4.7.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to prohibit other solar projects on the site. As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the IVS site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, the geology and seismic-related impacts of the IVS project would not occur at the IVS site, including the conversion of 6,500 ac of land from desert environment to energy production use.

The IVS project site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would potentially have impacts on geological and mineral resources in other locations similar to the IVS project.

4.7.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the IVS project site available for future solar development. As a result, the IVS project would not proceed. However, the site would be available for other solar projects, which could result in impacts to geological and mineral impacts similar to the IVS project.

4.7.5 Cumulative Impacts

As described in Section 2.10, Overview of the Cumulative Impacts Analysis, the geographic area considered for cumulative impacts on geology is, essentially, the western half of the Colorado Desert geomorphic province of extreme south-central California, bordering Mexico. There are no geological hazards with potential cumulative effects in this study area, other than regional subsidence from groundwater withdrawal. Because groundwater withdrawal will not occur on the IVS project site, the IVS project would not contribute to a cumulative adverse impact related to regional subsidence as a result of groundwater withdrawal.

The IVS project, the Agency Preferred Alternative, and the other Build Alternatives include the use of private well water under an existing permit to extract that water. As a result, these alternatives will not withdraw more water than allowed under that existing permit and, therefore, will not contribute to a cumulative adverse impacts related to regional subsidence as a result of groundwater withdrawal.

4.7.6 Mitigation, Project Design Features, and Other Measures

GEO-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the

above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEO-2 The project owner shall submit to the CBO for review and approval the following:

(1) Design of the proposed drainage structures and the grading plan;

(2) An erosion and sedimentation control plan;

(3) Related calculations and specifications, signed and stamped by the responsible civil engineer; and

(4) Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

4.7.7 Summary of Impacts

Table 4-41 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to geology, soils, topography, mineral resources, and seismic. As shown, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will be able to comply with LORS applicable to geology, mineral resources, and the seismic environment. The design and construction of these alternatives should not be adversely affected by or adversely affect the geology, mineral resources, and the seismic environment.

Table 4-41 Summary of Geology, Soils, Topography, Mineral Resources, and Seismic Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Potential effects to project structures associated with seismic ground motion, liquefaction, local subsidence, and expansive soil. No impacts related to mineral resources and Mineral Resources Zones. No contribution to regional subsidence,	*GEO-1:* compliance with building codes and regulations. *GEO-2:* design of drainage structures, grading plan, erosion and sedimentation plan; and soils, geotechnical, or foundation plans.	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	None.
300 MW Alternative	Similar to the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #1 Alternative	Similar to the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Similar to the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No impacts related associated with seismic ground motion, liquefaction, local subsidence, expansive soil, mineral resources. and Mineral Resources Zones.	None.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No impacts related associated with seismic ground motion, liquefaction, local subsidence, expansive soil, mineral resources. and Mineral Resources Zones.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Impacts potentially similar to the Agency Preferred Alternative and the IVS project	None specified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.8 Grazing, and Wild Horses and Burros

4.8.1 Methodology

Environmental consequences would occur in the event that the Imperial Valley Solar (IVS) project would interfere with existing and/or potential grazing activities, or be inconsistent with the *California Desert Conservation Area Plan* (CDCA Plan) (1980, as amended) policies or other laws, ordinances, regulations, and standards (LORS) related to grazing and wild horses and burros on lands under the jurisdiction of the United States Bureau of Land Management (BLM).

4.8.2 Definition of Resources

4.8.2.1 Grazing (Rangelands)

As discussed in Section 3.8, Grazing, and Wild Horses and Burros, the CDCA Plan identifies three types of potential grazing ranges: perennial, ephemeral, and ephemeral/perennial. There are none of these types of grazing lands and forage characteristics on the IVS project site.

4.8.2.2 Wild Horses and Burros

As discussed in Section 3.8, the BLM estimates that nearly 37,000 wild horses and burros roam on BLM-managed rangelands in 10 western states. No wild horses or burros are currently known to be using or traversing the IVS project site. Additionally, the IVS project site has not been known as an area that has been substantially used by wild horses or burros in the past.

4.8.3 Applicable Regulations, Plans, and Policies/Management Goals

4.8.3.1 Grazing (Rangelands)

As discussed in detail in Section 3.8, the following regulations and plans are applicable to the management of grazing lands and wild horses and burros by the BLM:

- Public Rangelands Improvement Act of 1978 (PRIA)
- CDCA Plan Livestock Grazing Element
- Taylor Grazing Act

4.8.3.2 Wild Horses and Burros

As discussed in detail in Section 3.8, the following regulations and plans are applicable to the management of wild horses and burros by the BLM:

- Wild Free-Roaming Horses and Burros Act of 1971
- CDCA Plan Wild Horse and Burro Element

4.8.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.8.4.1 IVS Project: 750 MW Alternative

Grazing (Rangelands)

As discussed in Section 3.8, there are no allotments of rangeland on, adjacent to, or in the immediate vicinity of the IVS project site. Therefore, no conversion of rangeland would occur as a result of the IVS project, and no rangeland would be adversely affected by construction or operation of the IVS project. The site does not possess the characteristics of the different range types identified in the CDCA Plan; therefore, the IVS project would not interfere with potential grazing allotments. The project site is not included within a Public Rangelands Improvement Act (PRIA) inventory for public rangeland; therefore, PRIA does not apply to the site.

The four applicant-proposed modifications are not on or in the immediate vicinity of any rangeland allotments, rangeland as designated in the CDCA Plan, or in a PRIA inventory for public rangeland. Therefore, these modifications will not result in impacts related to grazing lands.

Wild Horses and Burros

There are no designated HAs or HMAs on, adjacent to, or in the immediate vicinity of the IVS project site. The Chocolate-Mule Mountains HMA and the Picacho HA are the nearest to the project site, at approximately 58 mi east of the IVS project site. In addition, following construction, fencing around the site would keep any wild horses or burros outside the project site and away from the project facilities and structures. Therefore, the IVS project would not interfere with BLM management of any HMA or HA, or conflict with the management goals established in the CDCA Plan Wild Horse and Burro Element. Similarly, the IVS project does not pose any conflicts with the intent and goals of the Wild Free-Roaming Horses and Burros Act (1971) because the site is not identified as an area for the management, control and protection of wild horses and/or burros by the Federal government.

The four applicant-proposed modifications are not on or in the immediate vicinity of any designated HAs or HMAs, and would not conflict with BLM management of any HA or HMA, any goals in the CDCA Plan, or the Wild Free-Roaming Horses and Burros Act. Therefore, these modifications will not result in impacts related to wild horses and burros.

4.8.4.2 709 MW Alternative: Agency Preferred Alternative

Grazing (Rangelands)

As discussed in Section 3.8, there are no allotments of rangeland on, adjacent to, or in the immediate vicinity of the IVS project site. Therefore, no conversion of rangeland would occur as a result of the Agency Preferred Alternative, and no rangeland would be adversely affected by construction or operation of the Agency Preferred Alternative. The site does not possess the characteristics of the different range types identified in the CDCA Plan; therefore, the Agency Preferred Alternative project would not interfere with potential grazing allotments. The IVS project site is not included within a PRIA inventory for public rangeland; therefore, PRIA does not apply to the site.

Similar to the IVS project described above, the four applicant-proposed modifications will not result in adverse impacts to grazing resources. This is because there are no grazing land

resources on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

Wild Horses and Burros

There are no designated Herd Areas (HAs) or Herd Management Areas (HMAs) on, adjacent to, or in the immediate vicinity of the IVS project site. The Chocolate-Mule Mountains HMA and the Picacho HA are the nearest to the project site, at approximately 58 miles (mi) east of the site in Imperial County near the California-Arizona border. In addition, following construction, fencing around the site would keep any wild horses or burros outside the project site and away from the project facilities and structures. Therefore, the Agency Preferred Alternative would not interfere with BLM management of any HMA or HA, or conflict with the management goals established in the CDCA Plan Wild Horse and Burro Element. Similarly, the Agency Preferred Alternative does not pose any conflicts with the intent and goals of the Wild Free-Roaming Horses and Burros Act (1971) because the site is not identified as an area for the management, control and protection of wild horses and/or burros by the Federal government.

Similar to the IVS project described above, the four applicant-proposed modifications will not result in adverse impacts to wild horses and burros. This is because there are no wild horses or burros on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

4.8.4.3 300 MW Alternative

Grazing (Rangelands)

Similar to the IVS project, the 300-megawatt (MW) Alternative would be consistent with applicable Federal acts and policies as well as the management goals established within the CDCA Plan Grazing Element, and would not affect any designated grazing lands.

Similar to the IVS project described above, the four applicant-proposed modifications under the 300 MW Alternative will not result in adverse impacts to grazing resources. This is because there are no grazing land resources on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

Wild Horses and Burros

Similar to the IVS project, the 300 MW Alternative would be consistent with applicable Federal acts and policies as well as the management goals established in the CDCA Plan Wild Horse and Burro Element. In addition, there are no designated HMAs or HAs on, adjacent to, or in the immediate vicinity of the site for the 300 MW Alternative.

Similar to the IVS project described above, the four applicant-proposed modifications under the 300 MW Alternative will not result in adverse impacts to wild horses and burros. This is because there are no wild horses or burros on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

4.8.4.4 Drainage Avoidance #1 Alternative

Grazing (Rangelands)

Similar to the IVS project, Drainage Avoidance #1 Alternative would be consistent with applicable Federal acts and policies as well as the management goals established within the CDCA Plan Grazing Element, and would not affect any designated grazing lands.

Similar to the IVS project described above, the four applicant-proposed modifications under the Drainage Avoidance #1 Alternative will not result in adverse impacts to grazing resources. This is because there are no grazing land resources on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

Wild Horses and Burros

Similar to the IVS project, Drainage Avoidance #1 Alternative would be consistent with applicable Federal acts and policies as well as the management goals established in the CDCA Plan Wild Horse and Burro Element. In addition, there are no designated HMAs or HAs on, adjacent to, or in the immediate vicinity of the site for the Drainage Avoidance #1 Alternative.

Similar to the IVS project described above, the four applicant-proposed modifications under the Drainage Avoidance #1 Alternative will not result in adverse impacts to wild horses and burros. This is because there are no wild horses or burros on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

4.8.4.5 Drainage Avoidance #2 Alternative

Grazing (Rangelands)

Similar to the IVS project, Drainage Avoidance #2 Alternative would be consistent with applicable Federal acts and policies as well as the management goals established within the CDCA Plan Grazing Element, and would not affect any designated grazing lands.

Similar to the IVS project described above, the four applicant-proposed modifications under the Drainage Avoidance #2 Alternative will not result in adverse impacts to grazing resources. This is because there are no grazing land resources on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

Wild Horses and Burros

Similar to the IVS project, Drainage Avoidance #2 Alternative would be consistent with applicable Federal acts and policies, as well as the management goals established in the CDCA Plan Wild Horse and Burro Element. In addition, there are no designated HMAs or HAs on, adjacent to, or in the immediate vicinity of the site for the Drainage Avoidance #2 Alternative.

Similar to the IVS project described above, the four applicant-proposed modifications under the Drainage Avoidance #2 Alternative will not result in adverse impacts to wild horses and burros. This is because there are no wild horses or burros on or in the immediate vicinity of the IVS project site and the proposed modifications would result in construction and operation activities similar to the original IVS project relative to those four proposed modifications.

4.8.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the IVS project would not be approved by the BLM, and the BLM would not execute a right-of-way (ROW) agreement or amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing CDCA Plan's management goals and policies.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. The land on which the project is proposed would become available for other

uses, but not for solar energy generation. In addition, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet Federal and State mandates, and those projects could have similar or greater impacts than the IVS project related to grazing and wild horses and burros in other locations.

4.8.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the IVS project would not be approved by the BLM and the BLM would not execute a ROW grant for the IVS project. In addition, the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the CDCA Plan's management goals and policies.

Because the CDCA Plan would be amended to make the area unavailable for future solar development under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, and the conversion of 6,140 acres (ac) of BLM-managed land as a result of the IVS project would not occur. Off-highway vehicle (OHV) and recreational users would continue to be able to use the site as it currently exists. As a result, the use of the site is not expected to change noticeably from existing conditions under this No Action Alternative. However, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects may have similar or greater impacts than the IVS project related to grazing and wild horses and burros in other locations.

4.8.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the IVS project would not be approved by the BLM and the BLM would not execute a ROW grant for the IVS project. The BLM would amend the CDCA Plan to allow for other solar projects on the project site. As a result, it is possible that another solar energy project with the same or different technology could be constructed on the project site under this No Action Alternative. Different solar technologies require the use of different amounts of land; however, it is expected that all solar technologies would require the use of large amounts of the site. As a result, construction and operation of the solar technology would likely result in the conversion of 6,140 ac of land. As such, this No Action Alternative could result in the conversion of 6,140 ac of land similar to that under the proposed project.

4.8.5 Cumulative Impacts

Because the IVS project will not affect grazing lands, wild horses and burros, it will not contribute to cumulative impacts to these resources.

4.8.6 Mitigation, Project Design Features, and Other Measures

Because the IVS project would not result in impacts related to grazing, wild horses, and burros, no mitigation measure is required.

4.8.7 Summary of Impacts

Table 4-42 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to grazing, wild horses, and burros. As shown, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in any unavoidable adverse impacts related to grazing, wild horses, and burros.

Table 4-42 Summary of Grazing, and Wild Horses and Burros Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	No impacts to grazing or rangelands, designated Herd Areas or Herd Management Areas, wild horses and burros, or conflicts with the CDCA Plan Wild Horse and Burro Element. No contribution to cumulative impacts related to wild horses and burros.	None required.	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	None required.	None.
300 MW Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
Drainage Avoidance #1 Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
Drainage Avoidance #2 Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.9 Land Use and Corridor Analysis

4.9.1 Methodology

The Imperial Valley Solar (IVS) project site is within the California Desert Conservation Area Plan (CDCA Plan) Multiple-Use Class L (Limited Use). Table 1 (Multiple Use Class Guidelines) of the CDCA Plan states that "… electrical generation plants may be allowed …" within the Limited Use designation. Specifically, wind and solar electrical generating facilities "… may be allowed after NEPA requirements are met." It should be noted that electrical generating facilities using nuclear and/or fossil fuels are not allowed within the Limited Use Designation. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not already identified in the CDCA Plan be considered through the Plan Amendment process. The Plan Amendment is the first component of the IVS project action. The right-of-way (ROW) grant application for the IVS project, the second component of the proposed action, would be allowed only after the applicable National Environmental Policy Act (NEPA) requirements for the project are met and the CDCA Plan is amended.

In terms of land use, the following considerations were analyzed in determining the potential environmental consequences of the IVS project:

- The Plan Amendment process would be completed in compliance with the Federal Land Policy and Management Act (FLPMA), NEPA, and all other relevant Federal law, Executive Orders, and management policies of the BLM;
- The Plan Amendment process would include an Environmental Impact Statement (EIS) (i.e., this BLM EIS) to comply with NEPA standards;
- Where existing planning decisions are still valid, those decisions may remain unchanged and be incorporated into the new Plan Amendment;
- The Plan Amendment would recognize valid existing rights;
- Native American Tribal consultations would be conducted in accordance with policy, and Tribal concerns would be given due consideration. The Plan Amendment process would include the consideration of any impacts on Indian trust assets (refer to Section 7, Native American Consultation, Concerns, and Values);

- Consultation with the State Office of Historic Preservation (SHPO) would be conducted throughout the plan amendment process; and
- Consultation with the United States Fish and Wildlife Service (USFWS) would be conducted throughout the plan amendment process.

The CDCA Plan planning criteria (in Chapter 7 of the CDCA Plan) are the constraints and ground rules that guide and direct the development of the Plan Amendment. They ensure that the Plan Amendment is tailored to the identified issues and ensure that unnecessary data collection and analyses are avoided. They focus on the decisions to be made in the Plan Amendment, and will achieve the following:

> "Sites associated with power generation of transmission not identified in the Plan will be considered through the Plan Amendment process."

Because the IVS project facility is not currently identified in the CDCA Plan, an amendment to identify the IVS project in the Plan is one of the two project related actions for the BLM to consider. As specified in Chapter 7, Plan Amendment Process, there are three categories of Plan Amendments, including:

- **Category 1:** For proposed changes that will not result in significant environmental impact or 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 Plan Amendment Decision.

Based on these criteria, approval of the IVS project would require a Category 3 amendment.

As discussed in Chapter 7 in the CDCA Plan, the following determinations framed the methodology in considering amendments to the CDCA:

- Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.
- 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.

- Determine the environmental effects of granting and/or implementing the applicant's request.
- Consider the economic and social impacts of granting and/or implementing the applicant's request.
- 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.
- 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.

Further, the Decision Criteria to be used for approval or disapproval of the proposed amendment require that the following determinations be made by the BLM Desert District Manager:

- The proposed amendment is in accordance with applicable laws and regulations;
- The proposed amendment will provide for the immediate and future management, use, development, and protection of the public lands within the CDCA.

Finally, 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:

- Minimize the number of separate rights-of-way by utilizing existing rights-of-way as a basis for planning corridors;
- Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables;
- Provide alternative corridors to be considered during processing of applications;
- Avoid sensitive resources wherever possible;
- Conform to local plans whenever possible;
- Consider wilderness values and be consistent with final wilderness recommendations;

- Complete the delivery systems network;
- Consider ongoing projects for which decisions have been made; and
- Consider corridor networks which take into account power needs and alternative fuel resources.

4.9.2 Definition of Resource

The land use resource is defined by its designation as Limited Use:

> "Multiple-Use Class L (Limited Use) protects sensitive, natural, scenic, ecological, and cultural resources values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished."

The CDCA Plan states that "… electrical generation plants may be allowed …" within the Limited Use designation. Specifically, wind and solar electrical generating facilities "… may be allowed after NEPA requirements are met." It should be noted that electrical generating facilities using nuclear and/or fossil fuels are not allowed within the Limited Use designation.

4.9.3 Applicable Regulations, Plans and Policies/Management Goals

The project's relationship with the applicable laws, ordinances, regulations, and standards (LORS) is discussed in Table 4-43.

Table 4-43 Land Use Laws, Ordinances, Regulations, and Standards Compliance

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Federal			
Federal Land Policy and Management Act, 1976 – 43 CFR 1600, Sec. 501. [43 U.S.C. 1761]	(a) The Secretary, with respect to the public lands … are authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands for: (4) systems for generation, transmission, and distribution of electric energy	YES	The FLPMA authorizes the issuance of a right-of-way grant for electrical generation facilities and transmission lines. In addition, based on staff's review of the Federal Power Act, the requirements would not be applicable to the IVS project as they are not related to renewable resources, and are otherwise related to administrative procedures. Therefore, the IVS project would be in compliance with this policy.
Bureau of Land Management – California Desert Conservation Area (CDCA) Plan (BLM 1980)	**Chapter 2 – Multiple-Use Classes** MULTIPLE-USE CLASS GUIDELINES MULTIPLE-USE CLASS L Limited Use **6. Electrical Generation Facilities** – Wind/solar may be allowed – Geothermal electric generation may be allowed. – Nuclear and fossil fuel are not allowed **7. Transmission Facilities.** New gas, electric, and water facilities and cables for interstate communication may be allowed only within designated corridors (see Energy Production and Utility Corridors Element). NEPA requirements will be met. [#5,85]	YES (with BLM's project-specific CDCA Plan Amendment)	Approximately 6,140 acres of the IVS project site are administered by the BLM and are managed under multiple use Class L (Limited Use) categories in conformance with the CDCA Plan. The IVS project consists of an electrical generating facility, a transmission line, a waterline, and ancillary facilities. As such, development of the IVS project is an allowed use under the Multiple-Use Class Guidelines. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a project-specific CDCA Plan amendment along with

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			the ROW grant for the IVS project. Upon BLM's amendment of the CDCA plan for the IVS project, the IVS project would be fully compliant with the CDCA Plan. This Environmental Impact Statement (EIS) acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.
	Addendum B: Interim Management Guidelines **Chapter III. Guidelines for Specific Activities** **Lands Actions – Disposal, Rights-of-Way, Access and Withdrawals** **2. Rights-of-Way:** Existing rights-of-way may be renewed if they are still being used for their authorized purpose. New rights-of-way may be approved only for temporary uses that satisfy the non-impairment criteria. **3. Right-of-Way Corridors:** Right-of-way corridors may be designated on lands under wilderness review.	YES	The non-impairment standard, directs that "until Congress has determined otherwise" the lands under review be managed so as not to impair their suitability as wilderness (CRS 2004). As the IVS project would not traverse an established Wilderness Area, the project would be in compliance with this guideline of the CDCA Plan.
Federal Wilderness Act, 16 U.S.C. § 1131-1136	(a) Establishment; Congressional declaration of policy; wilderness areas; administration for public use and enjoyment, protection, preservation… provisions for designation as wilderness areas In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and	YES	The non-impairment standard directs that "… until Congress has determined otherwise …" the lands under review will be managed so as not to impair their suitability as Wilderness Areas. Because the IVS project would not traverse an established Wilderness Area and, therefore, would not impair a Wilderness Area, the project would be consistent

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.		with this guideline.
Yuha Desert Management Plan IV. Goals, Planned Actions, and Implementation	**G. Energy Development** **I. Utilities** **Goal:** Reduce impacts from electrical transmission lines and access roads. **1. Action:** Close most access roads to general public use (see Figures 11 and 14) and sign these closed.	YES	Approximately 7 miles of the proposed 10.3-mile transmission line would be constructed within the existing utility corridor of the Southwest Powerlink transmission line through the Yuha Desert ACEC. The remaining transmission line would be constructed within the boundaries of the IVS project site. Therefore, collocating the proposed transmission lines within, or adjacent to, existing utility corridors, would help minimize impacts. In addition, according to the applicant, all access to the IVS project site would be closed to the general public through controlled gates. Therefore, the IVS project would be consistent with the Yuha Desert Management Plan.

Table Source: Staff Assessment/Draft Environmental Impact Statement (2010).

4.9.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives (including the two Land Use Plan Amendment Alternatives) are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.9.4.1 IVS Project: 750 MW Alternative

CDCA Amendment

The following is a response to each of the required determination, design criteria and decision criteria as listed in Section 4.9.1, Methodology, and Chapter 7 of the CDCA Plan.

Required Determinations

(1) Determine if the request has been properly submitted and if any law or regulation prohibits granting the requested amendment.

(a) The applicant's request for a ROW was properly submitted, and this Final Environmental Impact Statement (FEIS) acts as the mechanism for evaluating and disclosing environmental impacts associated with that applications. 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.

(a) The CDCA Plan does not currently identify any sites as solar generating facilities. Therefore, there is no other location within the CDCA which could serve as an alternative location without requiring a Plan Amendment. The IVS project does not require a change in the Multiple-Use Class classification for any area within the CDCA.

(3) Determine the environmental affects of granting and/or implementing the applicant's request.

(a) This FEIS acts as the mechanism for evaluating the environmental effects of approving the CDCA Plan Amendment and the ROW grant application.

(4) Consider the economic and social impacts of granting and/or implementing the applicant's request.

(a) This FEIS acts 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.

(a) A Notice of Intent (NOI) to amend the CDCA Plan was published in the Federal Register October 17, 2008, Vol. 73, No. 202 Fed. Reg.61902 61903. The U.S. Environmental Protection Agency provided comments during the 30 day NOI scoping period. In accordance with the NOI, issues identified during the scoping period are placed in the comment categories below.

(6) Issues to be resolved in the plan amendment:

(a) Several comments were received with concerns over the loss of open space and recreational lands if the plan was amended to allow industrial use. These comments are being resolved by being considered within this FEIS.

(7) Issues to be resolved through policy or administrative action:

(a) All other comments received addressed specific environmental impacts and mitigation measures that each commenter requested be analyzed in the FEIS. These comments are being resolved by being considered within this FEIS.

(8) Issues beyond the scope of this plan amendment:

(a) No comments were received which were outside of the scope of this Plan Amendment.

(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.

(a) The balance between resource use and resource protection is evaluated within the FEIS. 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 the use of renewable energy resources, and through Title V of FLPMA, the BLM is authorized to grant rights-of-way 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 solar generating facilities within Multiple-Use Class L. The purpose of the FEIS is to identify resources which may be adversely impacted by approval of the IVS 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.

WECO-Designated Routes Alignment Adjustments

In addition to the determinations listed above for the CDCA amendment, the *Western Colorado Desert Routes of Travel Designations* (WECO) designated routes will also be affected by the IVS project, which would require closure of the routes on the IVS project site. As discussed in Chapter 2, 10 designated Open Routes traverse the IVS project site. There are three classifications for the off-highway vehicle (OHV) routes according to the CDCA Plan, "open," "closed," or "limited" for motor vehicle use. All the routes on the IVS site are classified as Open Routes. Open Routes are defined as follows:

> "Access on route by motorized vehicles is allowed. Special uses with potential for resource damage or significant conflict with other use may require specific authorization." (Route Designations, Motorized Vehicle Access, pp. 77, CDCA Plan, 1980 (as amended)).

The 10 Open Routes follow established dirt roads/trails on the site and are described briefly in Table 4-44.

All of the Open Routes on site will be closed to public access and redesignated as "Closed" as a result of the IVS project. These closures would affect the OHV recreational opportunities in the area. Because the IVS project would result in closure of OHV access routes on the IVS site, it would result in adverse impacts to existing and planned recreation opportunities on the IVS project site as envisioned in the CDCA Plan and the WECO amendment.

Table 4-44 Open Routes on the IVS Project Site

Route ID No.	Location
T670246	North/south from west of Plaster City quarry to intersect with T6700254 and then turns west to intersect with T670251
T670247	Parallel along San Diego Metropolitan Transit System rail track on northwest side of site then deviates south and returns to parallel track
T670248	Perimeter route for most of site connecting with T670247 and intersecting numerous routes
T670251	West side of site running northwest to south east connecting with T670247 and T670246
T670254	Small connector route on south side of site between T670246 and T670254
T670255	Follows diagonal across site from northwest to southeast under the Southwest Powerlink transmission line
T670256	Roughly parallel to T670255 connecting T670246 and T670248
T670260	Short route from middle of southern edge to northeast terminating local wash
T670345	Connector route on southeast side of site roughly paralleling transmission line connecting T670256 and T670248
T670350	On east boundary of site intersecting route T670248

Table Source: BLM Website for Western Colorado Desert Routes of Travel Designations (WECO), http://www.blm.gov/ca/news/pdfs/weco_2002/WECO%20Route%20List-Final_1201.pdf, Table of Open, Limited and Closed Routes

Conformance of ROW Application with Decision Criteria (BLM)

(1) Minimize the number of separate rights-of-way by using existing rights-of-way as a basis for planning corridors:

(a) The IVS project assists in minimizing the number of separate rights-of-way by being proposed largely within existing Corridor N. Electrical transmission associated with the IVS project will occur within these existing corridors.

(2) Encourage joint-use of corridors for transmission lines, canals, pipelines, and cables:

(a) Placement of the IVS project within existing Corridor N maximizes the joint-use of this corridor for electrical transmission.

(3) Provide alternative corridors to be considered during processing of applications:

(a) This decision criterion is not applicable to the IVS project. Placement of the proposed facility adjacent to existing corridors does not require designation of alternative corridors to support the IVS project.

(4) Avoid sensitive resources wherever possible:

(a) The extent to which the IVS project has been located and designed to avoid sensitive resources is addressed throughout the FEIS. BLM and other Federal regulations that restrict the placement of proposed facilities, such as the presence of designated Wilderness Areas or Desert Wildlife Management Areas 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 modified in consideration of mineral resources. The alternatives analysis considered whether the purpose and need of the IVS project could be achieved in another location, but with a lesser effect on sensitive resources.

(5) Conform to local plans whenever possible:

(a) The extent to which the IVS project conforms to local plans is addressed within the Land Use section of the FEIS. The IVS project is in conformance with the Imperial County General Plan.

(6) Consider wilderness values and be consistent with final wilderness recommendations:

(a) The IVS project is not located within a designated Wilderness Area or Wilderness Study Area.

(7) Complete the delivery systems network:

(a) This decision criterion is not applicable to the IVS project.

(8) Consider ongoing projects for which decisions have been made:

(a) This decision criterion is not applicable to the IVS project. Approval of the IVS 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:

(a) This decision criterion is not applicable to the IVS project. The IVS project does not involve the consideration of an addition to or modification of the corridor network. However, it does use facilities located in Corridor N, which were designed with consideration of both power needs and locations of alternative fuel resources.

Analysis of the consistency of the IVS project with applicable Federal LORS is presented in Table 4-43. The IVS project would be consistent with applicable Federal land use LORS. With BLM's issuance of a project-specific CDCA Plan Amendment, the IVS project would fully comply with the Plan. Therefore, impacts associated with compliance with Federal land use LORS would not be significant.

Because solar power facilities are an allowable use of the land as it is classified in the CDCA Plan, the proposed action does not conflict with the Plan. However, Chapter 3, "Energy Production and Utility Corridors Element" of the Plan also requires that newly proposed power facilities that are not already identified in the Plan be considered through the Plan Amendment process. The proposed facility is not currently identified within the Plan, and therefore a Plan Amendment is required to include the facility as a recognized element within the Plan.

The Plan states that solar power facilities may be allowed within Limited Use areas after NEPA requirements are met. This EIS acts as the mechanism for complying with those NEPA requirements.

The Implementation section of the Energy Production and Utility Corridors Element of the CDCA Plan lists a number of Category 3 amendments that have been approved since adoption of the Plan in 1980. An additional amendment is proposed to be added to this section of the Plan, and would read "Permission granted to construct solar energy facility (proposed IVS project)."

The utility and energy corridor(s) are intended to provide sufficient room for the siting of large scale, long distance transport of goods and services, such as electricity, natural gas, petroleum products, telecommunications, and water. Recently, this corridor was used in the siting of the Sunrise Powerlink, which will parallel the existing Southwest Powerlink transmission line.

Within the immediate vicinity of the IVS project site and in Utility Corridor CDCA N, 368 115-238, additional capacity is available for future and currently unproposed projects. The right-of-way availability in this area is in four main locations: the Evan Hewes Highway and San Diego & Arizona Railroad Company/Union Pacific Railroad transportation corridor; the I-8 transportation corridor; the Southwest Powerlink Corridor; and the area between Dunaway Road and the eastern project boundary.

Based on the above analysis, there are no competing uses currently proposed for the IVS project site. Joint use of CDCA N, 368 115-238 is adequate to accommodate the IVS project, ancillary facilities, and current authorized but, as yet, unbuilt and pending projects. As designed, the project is situated such that current and future uses can be accommodated within the designated corridor CDCA N, 368 115-238. The IVS project would not result in any conflicts or impacts on the corridors.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in impacts related to the CDCA Plan, the WECO-designated routes, conformance of the ROW application with the decision criteria, and the applicable land use LORS compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in impacts related to these land use parameters because this modification will not result in any changes in land use or impacts to any WECO corridors off the IVS project site.

4.9.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative would result in effects related to consistency with the CDCA Plan and the applicable LORS and adverse impacts on the Open Routes similar to those effects described in the following section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the land use effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project.

The impacts of the four applicant-proposed modifications related to land use parameters would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.9.4.3 300 MW Alternative

Similar to the IVS project, the 300 MW Alternative would be consistent with applicable Federal land use LORS as shown in Table 4-43. With BLM's issuance of a project-specific CDCA Plan Amendment, the 300 MW Alternative would fully comply with the CDCA Plan. Impacts to the Open Routes would be slightly less than the IVS project. Because there would be a smaller area of development associated with the 300 MW Alternative, fewer Open Routes would require closure.

The impacts of the four applicant-proposed modifications related to land use parameters would be the same under the 300 MW Alternative as described earlier for the IVS project because this

alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.9.4.4 Drainage Avoidance #1 Alternative

Analysis of the IVS project's consistency with applicable Federal, State, and local land use LORS is presented in Table 4-43, which would also apply to the Drainage Avoidance #1 Alternative. Similar to the IVS project, with BLM's issuance of a project-specific CDCA Plan Amendment, the Drainage Avoidance #1 Alternative would be consistent with applicable land use LORS. Impacts to the Open Routes would be similar to the IVS project.

The impacts of the four applicant-proposed modifications related to land use parameters would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.9.4.5 Drainage Avoidance #2 Alternative

Analysis of the IVS project's consistency with applicable Federal, State, and local land use LORS is presented in Table 4-43, which would also apply to the Drainage Avoidance #2 Alternative. Similar to the IVS project, with BLM's issuance of a project-specific CDCA Plan Amendment, the Drainage Avoidance #2 Alternative would be consistent with applicable Federal land use LORS. Impacts to the Open Routes would be similar to the IVS project.

The impacts of the four applicant-proposed modifications related to land use parameters would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.9.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the IVS project would not be approved by the BLM, and BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, the land use-related impacts of IVS project would not occur at the site, including the conversion of 6,140 acres of land and any resulting impacts to existing uses, including recreational uses. Additionally, a site-specific land use plan amendment would not be required. Under this No Action Alternative, the Open Routes would not require closure and all Open Routes would remain as they currently exist. However, the land on which the project is proposed would remain available for other uses that are consistent with BLM's land use plan, potentially including another solar project requiring a land use plan amendment. In addition, in the absence of this project, other renewable energy projects may be constructed elsewhere to meet Federal mandates, and those projects would have similar impacts in other locations.

4.9.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this Land Use Plan Amendment Alternative – No Action Alternative, the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, and the conversion of 6,140 acres of land as a result of the IVS project would not occur. OHV users and recreationists would continue to be able to use the lands affected by the IVS project as is occurring under existing conditions. As a result, the use of the site is not expected to change noticeably from existing conditions and, as such, this No Action Alternative would not result in impacts from the conversion of 6,140 acres of land at the project site. Under this No Action Alternative, the Open Routes would not require closure and all Open Routes would remain as they currently exist. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.9.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this Land Use Plan Amendment Alternative – No Action Alternative, the IVS project would not be approved by the BLM and BLM would amend the CDCA Plan to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site under this No Action Alternative.

Because the CDCA Plan would be amended under this No Action Alternative, it is possible that the site would be developed with the same or a different solar technology. Different solar technologies require the use of different amounts of land; however, it is expected that all solar technologies would require the use of large amount of the site. As a result, construction and operation of the solar technology would likely result in the conversion of 6,140 acres of land and would create impacts to existing land uses, including recreational users. As such, this No Action Alternative could result in the conversion of 6,140 acres of land similar to under the IVS project, and result in impacts similar to the IVS project. It is expected that impacts to the Open Routes would be similar to the IVS project. The Open Routes on the IVS project site would require closure.

4.9.5 Cumulative Impacts

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for land use are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis.

Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to land use parameters less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects. Nonetheless, it is anticipated that the potential combined development of approximately 1 million acres of land in the southern California desert and the IVS project cumulatively would result in adverse effects on BLM lands and open lands that support recreational resources. Although the development of renewable resources in compliance with Federal and State mandates is important and required, the conversion of thousands of acres of open space (including areas with high soil quality and agricultural resources) would result in an unavoidable adverse impact. In general, the land conversion impacts to these lands would preclude numerous existing or other future land uses including recreation, wilderness,

rangeland, and open space, and would also result in an unavoidable adverse cumulative impact.

4.9.6 Mitigation, Project Design Features, and Other Measures

No mitigation, project design features, or other measures are required.

4.9.7 Summary of Impacts

Table 4-45 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to land use parameters.

As shown in Table 4-45, the following unavoidable adverse land use impacts would occur if the IVS project was implemented and would occur to a slightly lesser extent if the Agency Preferred Alternative or one of the other three Build Alternatives was implemented:

- The conversion of 6,500 acres of land to support the project components and activities would directly disrupt current recreational activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of these lands.
- Because the IVS project would result in closure of OHV access routes on the IVS project site, it would result in adverse to recreation opportunities on the IVS site as envisioned in the CDCA Plan and the WECO amendment.
- Cumulative impacts to approximately 1 million acres of land in the southern California desert would all combine to result in adverse effects on recreational resources and would result in a significant and unavoidable impact. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in Southern California would occur mostly in undeveloped desert lands or areas of rural development, and therefore, would not create physical divisions of established residential communities. Nonetheless, approximately 1 million acres of land are proposed for solar and wind energy development in the southern California desert lands. The conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore, result in a significant cumulative impact.

Table 4-45 Summary of Land Use Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	The IVS project would impact planned land uses as designated in the CDCA Plan (1980 as amended) and designated Open Routes. The conversion of 6,500 ac of land would constrain the existing recreational uses on site and would result in adverse effects on recreational users of these lands. Approximately 1 million acres of land are proposed for solar and wind energy development in the Southern California desert lands. The conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore, result in an adverse cumulative impact.	*LAND-1:* Legal parcel creation through Subdivision Map Act Amendment of the CDCA Plan to allow this solar project on the site. Revision to the designated Open Routes on the project site.	The IVS project would result in unavoidable adverse impacts related to the conversion of 6,500 ac of land and recreational users of these lands; reduced OHV access routes and recreational opportunities on the site as envisioned in the CDCA Plan and the WECO amendment. The IVS project, with other solar and wind energy development in the Southern California desert, would contribute to a cumulative adverse impacts related to he conversion of those lands.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	Same as the IVS project.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Not determined, but could be potentially similar to the impacts under the Agency Preferred Alternative and the IVS project.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way; WECO = Western Colorado Desert Routes of Travel Designations.

4.10 Noise and Vibration

The purpose of this analysis is to identify and examine the likely noise and vibration impacts that could result from the construction and operation of the Imperial Valley Solar (IVS) project and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS) and to avoid substantial adverse noise or vibration impacts.

4.10.1 Methodology

A potential for a substantial noise impact exists where the noise of the project plus the background exceeds the background by 5 A-weighted decibels (dBA) or more at the nearest sensitive receptor. A change in level of at least 5 dBA is required before any noticeable change in community response would be expected.

It is considered reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting would not be substantial and an increase of more than 10 dBA would be substantial. An increase between 5 and 10 dBA should be considered adverse, but may be either substantial or not substantial, depending on the particular circumstances of the case.

Factors to be considered in determining if an adverse noise impact is substantial include:

- The resulting combined noise level;[1]
- The duration and frequency of the noise;
- The number of people affected;
- The land use designation of the affected receptor sites; and
- Public concern or controversy expressed at workshops or hearings or in correspondence.

[1] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely not be substantial.

Noise impacts due to construction activities are usually not considered to be substantial if:

- The construction activity is temporary;
- Use of heavy equipment and noisy activities are limited to daytime hours; and
- All industry-standard noise abatement measures are implemented for noise-producing equipment.

Noise Appendix A in the SA/DEIS provides additional detailed discussion on the methodology for assessing potential noise and vibration impacts.

4.10.2 Definition of Resource

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

4.10.2.1 Compliance with Laws, Ordinances, Regulations, and Standards

Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. To allow for the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances.

The noise impacts on the nearest sensitive receptors during construction of the IVS project were estimated. Assembly and installation of the Sun Catchers is expected to be performed in blocks around the site with additional, more substantial structural construction taking place at the Main Services Complex in the center of the site. The estimated noise resulting from construction of the collector block closest to the Painted Gorge receptor northwest of the IVS project site boundary would be no more than 66 dBA at that receptor. Similarly, noise resulting from the construction of the collector blocks closest to ML1 and ML5 would be no more than 62 dBA and 56 dBA at ML1 and ML5, respectively. A maximum construction noise level of 74 dBA L_{eq} is estimated to occur at a distance of 3,300 ft from the acoustic center of the construction activity (at the Main Services Complex) for all other project construction (such as roads and buildings) and attenuate to no more than 58 dBA L_{eq} at Painted Gorge, and 56 dBA L_{eq} at ML1and ML5. Overall construction noise would, therefore, be no more than 67 dBA at the Painted Gorge location, 63 dBA at location ML1, and 59 dBA at location ML5. A comparison of the construction

noise estimates at the identified receptors to measured ambient conditions is summarized in Table 4-46.

Table 4-46 Predicted Power Plant Construction Noise Impacts

Receptor	Highest Construction Noise Level (dBA L_{eq})	Measured Existing Ambient (dBA L_{eq})	Cumulative (dBA L_{eq})	Change (dBA)
ML1 – Southwest Residence	63	49 daytime	63 daytime	+14 daytime
ML5 – Northeast Residence	59	56 daytime	61 daytime	+5 daytime
Painted Gorge Residences	67	49 daytime	67 daytime	+18 daytime

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: dBA = A-weighted decibels; L_{eq} = equivalent continuous sound level.

The Imperial County General Plan Noise Element limits noise levels at residential receptors to no more than 75 dBA L_{eq}. The General Plan also limits noisy construction to daytime hours. Noisy construction work would be allowed only during the daytime hours of 7:00 a.m. to 7:00 p.m. on weekdays, 9:00 a.m. to 5:00 p.m. on Saturdays, and not at all on Sundays. To ensure that these hours are, in fact, enforced, Measure NOISE-6 is proposed. Compliance with NOISE-6 would insure that the noise impacts of the IVS project construction activities would comply with the local noise LORS.

Noise modeling was conducted to determine the operations related noise impacts of the IVS project on sensitive receptors. As seen in Table 4-47, the operational noise level of the IVS project at the nearest sensitive receptor would be no more than 52 dBA CNEL, which complies with the noise level limits specified in the Imperial County General Plan Noise Element.

Table 4-47 Plant Operating Noise Laws, Ordinances, Regulations, and Standards Compliance

Receptor	LORS	LORS Limit	Projected Noise Level (CNEL)
ML1	Imperial County General Plan Noise Element	60 dBA CNEL daytime	50 dBA
ML5	Imperial County General Plan Noise Element	60 dBA CNEL daytime	48 dBA
Painted Gorge	Imperial County General Plan Noise Element	60 dBA CNEL daytime	52 dBA

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: CNEL = Community Noise Equivalent Level; dBA = A-weighted decibels; LORS = laws, ordinances, regulations, and standards

4.10.3 Proposed Action and Alternatives: Direct and Indirect Impacts

Noise impacts associated with a project can be created by short-term construction activities and by normal long-term operation, such as the operation of a power plant. The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would cause substantial adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.10.3.1 IVS Project: 750 MW Alternative

Construction Impacts

Power Plant Site

To evaluate construction noise impacts, the projected noise levels were compared to the ambient noise levels. Because construction noise typically varies continually with time, it is most appropriately measured by, and compared to, the L_{eq} (energy average) metric.

The construction of the IVS project would take place in two phases over a period of 40 months, which is longer than the 12 to 16 month construction period of a traditional power plant. However, the construction of the IVS project would be conducted modularly, each module taking approximately 4 months to construct. Thus, maximum construction noise would occur during the construction of the module closest to the receptor for 4 months and would decrease as construction activity moved on to the next module, further from the receptor. Construction for the IVS project would still result in a temporary noise impact.

Aggregate construction noise may be expected to reach levels as high as 67 dBA L_{eq} at the nearest sensitive receptor, the residences at Painted Gorge Road, for a period of approximately 4 months; an increase of 18 dBA during daytime hours (see Table 4-48). Such an increase represents nearly a quadrupling of noise level at the receptor and would generally be considered a substantial adverse impact. The projected construction noise levels, however, are most likely conservative, calculated from manufacturers' estimated data and engine power sound generation formulae; actual noise levels may be less than predicted. Because the noisiest construction work would be restricted to daytime hours, it would be noticeable, but tolerable, at the nearest sensitive residential receptors. Because the maximum construction noise would be temporary and limited to daytime hours, the noise impacts due to construction activity are not substantial.

Table 4-48 Pile Driving Noise Impacts

Receptor	Pile Driving Noise Level (dBA L_{eq})	Daytime Ambient Noise Level (dBA L_{eq})	Cumulative Level (dBA)	Change (dBA)
ML1	64	49	64	+15
ML5	58	56	60	+4
Painted Gorge Road	68	49	68	+19

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: dBA = A-weighted decibels; L_{eq} = equivalent continuous sound level.

If the construction noise should annoy nearby residents, Measures NOISE-1 and NOISE-2 are proposed, which would establish a Notification Process to make nearby residents aware of the project, and a Noise Complaint Process that requires the applicant to resolve any problems caused by noise from the IVS project.

Linear Facilities

The water supply pipeline and transmission lines in the IVS project would extend outside the site boundary and would pass relatively close to two sensitive receptors, ML6 and ML9. While the construction noise levels for these linear features would be noticeable, construction on these features would proceed rapidly, so no particular area would be exposed to that construction noise for more than a few days.

Pile Driving

The potential noise impacts of pile driving were analyzed in the event pile driving is determined to be necessary during the construction of the IVS project. If pile driving is required, the noise

from this operation could be expected to reach 104 dBA at a distance of 50 ft from the pile driver. The noise level of the pile driving is projected to reach the Painted Gorge residences, the nearest residential receptor. Adding the construction noise effects to the existing daytime ambient level of 49 dBA L_{eq} would produce 68 dBA, an increase of 19 dBA over ambient noise levels as shown in Table 4-48. While this would produce a noticeable impact, limiting pile driving to daytime hours, in conjunction with its temporary nature, would result in impacts expected to be tolerable to residents. Measure NOISE-6 is proposed to ensure that pile driving noise, should it occur, would be limited to daytime hours.

Vibration

The only construction operation likely to produce vibration that could be perceived off site would be pile driving, should it be employed. Vibration attenuates rapidly; it is likely that no vibration would be perceptible at any appreciable distance from the IVS project site. Therefore, there would be no substantial impacts from construction vibration.

Worker Effects

There are LORS that would specifically protect construction workers from noise impacts. To ensure that construction workers are adequately protected, Measure NOISE-3 is proposed.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in construction noise impacts compared to the IVS project as described above. This is because these proposed modifications would be constructed in essentially the same locations as these facilities were evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in construction noise impacts because this project feature does not require any construction activities.

Operation Impacts

The primary noise sources during operation of the IVS project would be the reciprocating Stirling Engines (including generator, cooling fan and air compressor) on the SunCatchers, the step-up transformers, and the new on-site substation. Power plant noise is unique. Essentially, a power plant operates as a steady, continuous, broadband noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level.

In many cases, a power plant is intended to operate around the clock for much of the year. As a solar thermal generating facility, the IVS project would operate only during the daytime hours, typically 15 hours per day during the summer (with fewer hours during the fall, winter, and spring), when sufficient solar insulation is available.

The projected operations related noise of the IVS project was compared to the applicable LORS. In addition, any increase in noise levels at sensitive receptors was evaluated to identify any substantially adverse impacts.

Power Plant Site

Typically, daytime ambient noise consists of both intermittent and constant noises. The noise that stands out during this time is best represented by the average noise level, or L_{eq}. The daytime noise environment in the vicinity of the IVS project site consists of both intermittent and constant noises. The project's daytime operational noise levels were compared to the daytime ambient L_{eq} levels at the nearby noise-sensitive receptors. As seen in Table 4-49, power plant noise levels are predicted to be less than 52 dBA CNEL (45 dBA L_{eq}) at all sensitive receptors during daytime operation of the IVS project.

Table 4-49 Power Plant Noise Impacts at Nearest Sensitive Receptors

Location	Power Plant Noise Level (dBA L_{eq})	Ambient Noise Level (dBA L_{eq})	Cumulative Noise Level (dBA)	Change from Ambient Level (dBA)
ML1	43	49	50	+1
ML5	41	56	56	+0
Painted Gorge	45	49	50	+1

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: dBA = A-weighted decibels; dBA L_{eq} = equivalent continuous sound level.

When the projected plant noise level is added to the daytime ambient value, the noise level with the project is higher than the ambient value at the Painted Gorge residences and location ML1 by an inaudible amount as shown in Table 4-49 and the same as the ambient level at ML5. No change in ambient noise at any sensitive receptor at night would result from plant operation.

Tonal Noise

One possible source of disturbance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. To avoid the creation of annoying tonal (pure-tone) noises, the noise emissions of

various power plant features can be balanced during plant design. To ensure that tonal noises do not cause annoyance, Measure NOISE-4 is proposed.

Linear Facilities

Noise effects from the electrical interconnection line typically would not extend beyond the right-of-way easement of the line and would thus be inaudible to nearby sensitive receptors.

Vibration

Vibration from an operating power plant could be transmitted two ways: through the ground (ground-borne vibration) and through the air (airborne vibration).

The IVS project would consist of the solar dish generators, the operating components of each consisting of a relatively small reciprocating engine, cooling fans and air compressor. All these pieces of equipment must be carefully balanced to operate. Given the layout of the project features on the project site, any ground-borne vibration from the IVS project operations would likely be undetectable by any receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves and can rattle the walls of lightweight structures. None of the IVS project equipment is likely to produce low frequency noise. Therefore, it is highly unlikely that the IVS project operations would cause perceptible airborne vibration effects.

Worker Effects

Plant operating and maintenance workers must be protected from operations-related noise hazards as required by the applicable LORS. To ensure that plant operation and maintenance workers are adequately protected, Measure NOISE-5 is proposed.

The applicant proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in operations noise impacts compared to the IVS project as described above. This is because these proposed modifications would be operated in essentially the same locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in substantial operations noise because the individual truck trips would result in only minor increases in noise levels along the travel route from the well site to the IVS site. These minor increases would be temporary as each truck passes and would not be expected to be an adverse impact.

Facility Closure

In the future, on closure of the IVS project, all operational noise would cease, and no further adverse noise impacts from operation of the IVS project would occur. The remaining potential temporary noise source would be associated with the dismantling of the structures and equipment and any site restoration work that may be performed. Because this type of noise would be similar to that occurring during construction, it can be treated similarly. That is, noisy decommissioning work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that are in existence at that time would apply.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in noise impacts during decommissioning compared to the IVS project as described above. This is because these proposed modifications would be decommissioned and removed essentially the same as these facilities were evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in decommissioning noise impacts because when this water supply is no longer needed, the truck trips will cease and there will be no demolition associated with the termination of the use of the alternative water source.

4.10.3.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative would result in short- and long-term noise impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the noise effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project. The measures described in the following section to address adverse short- and long-term noise impacts of the IVS project would also apply to the Agency Preferred Alternative.

The impacts of the four applicant-proposed modifications related to noise during construction, operations, and decommissioning would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

4.10.3.3 300 MW Alternative

Because the 300 MW Alternative would result in less construction generally at greater distances from sensitive receptors than the IVS project, it is expected that, like the IVS project, this alternative can be built and operated in compliance with all applicable noise and vibration LORS and the same measures described for the IVS project.

Given the distributive nature of the operational noise produced by the IVS project technology, the 300 MW Alternative would most likely correspond to lower operational noise impacts at noise receptors east of the project site. Operational noise impacts at the receptors west of the project site would likely be the same as for the IVS project. The noise impacts of the 300 MW Alternative would not be greater than the noise impacts from the IVS project, which, as discussed above, are not substantial.

The impacts of the four applicant-proposed modifications related to noise during construction, operations, and decommissioning would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

4.10.3.4 Drainage Avoidance #1 Alternative

Because the Drainage Avoidance #1 Alternative would result in less construction but at approximately the same distances from sensitive receptors as the IVS project, it is expected that, like the IVS project, this Alternative can be built and operated in compliance with all applicable noise and vibration LORS and the same Measures described for the IVS project.

Given the distributive nature of the operational noise produced by the IVS project technology, the Drainage Avoidance #1 Alternative would likely result in operational noise impacts at sensitive receptors similar to the noise levels under the IVS project because the project site boundaries would be the same for the IVS project and this Alternative. The noise impacts of the Drainage Avoidance #1 Alternative would not be greater than the noise impacts for the IVS project, which, as discussed above, are not substantial.

The impacts of the four applicant-proposed modifications related to noise during construction, operations, and decommissioning would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

4.10.3.5 Drainage Avoidance #2 Alternative

Because Drainage Avoidance #2 Alternative would result in less construction but at approximately the same distances from sensitive receptors as the IVS project, it is expected that, like the IVS project, this Alternative can be built and operated in compliance with all applicable noise and vibration LORS and the same Measures described for the IVS project.

Given the distributive nature of the operational noise produced by the IVS project technology, the Drainage Avoidance #2 Alternative would likely result in operational noise impacts at sensitive receptors similar to the noise levels under the IVS project because the project site boundaries would be the same for the IVS project and this Alternative. The noise impacts of the Drainage Avoidance #2 Alternative would not be greater than the noise impacts for the IVS project, which, as discussed above, are not substantial.

The impacts of the four applicant-proposed modifications related to noise during construction, operations, and decommissioning would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

4.10.3.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the right-of-way (ROW) grant and would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan (1980, as amended).

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the construction and operation noise-related impacts of the IVS project would not occur on or in the vicinity of the IVS project site. However, the IVS project site would become available to other uses that are consistent with BLM's land use plan. In addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations

4.10.3.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain with the existing ambient noise from its existing condition. Ambient noise of the site is not expected to change noticeably from existing conditions and, as such, this No Action Alternative would not result in impacts from any increase in noise at the project site. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.10.3.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. Different solar technologies use different machinery during construction and would create different ambient noise levels during operation; however, it is expected all technologies would require the use of large construction vehicles that would create unwanted noise during construction and some intermittent noise during operations. However, as with the IVS project, it is expected that solar technologies would result in only minor increases in ambient noises during operation. As such, this No Action Alternative could result in an impact from increased ambient noise during construction and operation similar to under the IVS project.

4.10.4 Cumulative Impacts

The geographic scope for considering cumulative noise impacts on sensitive receptors for this project consists of the region immediately surrounding those receptors identified in the project application. Any existing cumulative noise conditions are included in the existing ambient noise survey conducted at the sensitive receptors. There are no future foreseeable projects near

enough to IVS project site to contribute to cumulative adverse noise impacts. Projects further than the immediate vicinity of the IVS project site, whether renewable or otherwise, would be outside the geographic scope of the consideration of noise impacts of the IVS project and therefore would not contribute to cumulative noise impacts on or in the vicinity of the IVS project site.

4.10.5 Mitigation, Project Design Features, and Other Measures

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within 2 mi of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project and include that telephone number in the above notice. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: Prior to ground disturbance, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE-2 **Noise Complaint Process:** Throughout the construction and operation of the IVS project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (provided at the end of this section), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;

- Take all feasible measures to reduce the noise at its source if the noise is project related; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts, and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 5 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the noise control program and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE-4 **Noise Restrictions:**Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 24 hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. If the results from the survey indicate that the project noise levels are in excess of 45 dBA L_{eq} at the residence at 1510 Painted Gorge Road, additional measures shall be implemented to reduce noise to a level of compliance with this limit.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the report will be

a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-5 Following the project's first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations Sections 5095–5099 and Title 29, Code of Federal Regulations Section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and Federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal/OSHA upon request.

NOISE-6 **Construction Time Restrictions:**Heavy equipment operation and noisy construction work relating to any project features shall be restricted to the times of day delineated below:

- Mondays through Fridays..... 7:00 a.m. to 7:00 p.m.
- Saturdays..... 9:00 a.m. to 5:00 p.m.
- Sundays and Holidays..... No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

4.10.6 Summary of Impacts

Table 4-50 summarizes the direct, indirect, short- and long term-, and cumulative adverse noise effects of the IVS project, the Agency Preferred Alternative, the other build alternatives, and the No Action Alternatives.

As shown in Table 4-50, the IVS project, if built and operated in conformance with the measures described above, would comply with all applicable noise and vibration LORS and would produce no substantial adverse noise impacts on people in the project area, directly, indirectly, or cumulatively.

Table 4-50 Summary of Noise Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Potential short-term adverse impacts during construction. Potential long-term increases in noise levels during operations.	*NOISE-1:* Notice of the initiation of construction and telephone contact information for complaints during construction and the first year of operation. *NOISE-2:* Implementation and documentation of the noise complaint process and the Noise Complaint Resolution Form during construction and operation. *NOISE-3:* Development and implementation of a noise control program during construction. *NOISE-4:* Community noise survey and implementation of measures to meet specific noise restrictions during operations. *NOISE-5:* Occupational noise survey and appropriate mitigation during operations. *NOISE-6:* Construction time restrictions.	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	None.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Same as the Agency Preferred Alternative and IVS project.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

NOISE COMPLAINT RESOLUTION FORM (MEASURE NOISE-2)

Imperial Valley Solar Project
(08-AFC-5)

NOISE COMPLAINT LOG NUMBER: _____

Complainant's Name and Address:

Phone Number: _____

Date Complaint Received: _____

Time Complaint Received: _____

Nature of Noise Complaint:

Definition of Problem after Investigation by Plant Personnel:

Date Complainant First Contacted: _____

Initial Noise Levels at 3 feet from Noise Source: _____ dBA Date: _____

Initial Noise Levels at Complainant's Property: _____ dBA Date: _____

Final Noise Levels at 3 feet from Noise Source: _____ dBA Date: _____

Final Noise Levels at Complainant's Property: _____ dBA Date: _____

Description of Corrective Measures Taken:

Complainant's Signature: _____ Date: _____

Approximate Installed Cost of Corrective Measures: $_____

Date Installation Completed: _____

Date First Letter Sent to Complainant: _____ (copy attached)

Date Final Letter Sent to Complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required.)

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4.11 Public Health and Safety, and Hazardous Materials

4.11.1 Public Health and Safety

The purpose of this analysis is to determine if emissions of toxic air contaminants (TACs) from the Imperial Valley Solar (IVS) project would have the potential to cause substantial adverse public health and safety impacts or to violate standards for public health protection.

4.11.1.1 Methodology

The public health assessment discusses toxic emissions into the air to which the public could be exposed during construction, operation, and decommissioning of the IVS project. Following the release of TACs into the air, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Air pollutants for which no ambient air quality standards have been established are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Because noncriteria pollutants do not have such standards, a health risk assessment (HRA) is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The HRA consists of the following steps:

- Identify the types and amounts of hazardous substances the IVS project could emit to the environment;
- Estimate worst-case concentrations of IVS project emissions in the environment using dispersion modeling;
- Estimate amounts of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact; and
- Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the IVS project would be much lower than the risks estimated by the screening level assessment. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the IVS project;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- Assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

A screening level risk assessment would, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances that could present a health hazard from noninhalation pathways of exposure. When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk.

The risk assessment process for the IVS project addressed two categories of health impacts: chronic (long-term) noncancer effects, and cancer risk (also long-term). Because the only TAC emitted by the IVS project would be diesel particulate from emergency diesel-fueled engines, and because only long-term health effects have been established for diesel particulate, no acute (short-term) health effects are calculated for the IVS project.

Chronic health effects are those that arise as a result of long-term exposure to concentrations of airborne pollutants. The exposure period is considered to be approximately from 12 to 100 percent of a lifetime, or from 8 to 70 years. Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called Reference Exposure Levels (RELs). These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects. These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effects reported in the medical and toxicological literature and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformity with the California Air Pollution Control Officers Association (CAPCOA) guidelines, the HRA assumes the effects of each substance are additive for a given organ system. Other possible mechanisms due to multiple exposures include those cases where the actions may be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of substances, the HRA health could underestimate or overestimate the risks.

For carcinogenic substances, the HRA considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70 year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. Cancer risk is expressed in chances per million and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called potency factors and established by Office of Environmental Health Hazard Assessment [OEHHA]), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks due to IVS project emissions are likely to be considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the IVS project. If the screening analysis predicts no adverse risks, then no further analysis is

required. However, if risks are above the adverse level, then further analysis, using more realistic site-specific assumptions, would be performed to obtain a more accurate assessment of potential public health risks. This methodology is also consistent with United States Environmental Protection Agency (EPA) risk assessment guidelines for public health assessments prepared pursuant to the National Environmental Policy Act (NEPA).

Chronic Noncancer Health Effects

The level of noncancer health effects was evaluated by calculating a hazard index. A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than 1.0 signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance that has the same type of health effect is added to yield a Total Hazard Index. A Total Hazard Index of less than 1.0 indicates that cumulative worst-case exposures are less than the RELs. Under these conditions, health protection from the IVS project is likely to be achieved, even for sensitive members of the population. In such a case, it is presumed that there would be no substantial noncancer project-related public health impacts.

Cancer Risk

This analysis relied on regulations implementing the provisions of Proposition 65, the California Safe Drinking Water and Toxic Enforcement Act of 1986, (Health & Safety Code, Sections 25249.5 et seq.) for guidance to determine a cancer risk adverse level. Title 22, California Code of Regulations Section 12703(b) states that "…the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of 10 in 1 million. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines adverse levels based on the total risk from all cancer-causing chemicals. Thus, the manner in which the adverse level is applied is more conservative (health-protective) than that applied by Proposition 65. The adverse risk level of 10 in 1 million is consistent with the level of significance adopted by many air pollution control districts (APCDs) in California. In general, these APCDs would not approve a project with a cancer risk exceeding 10 in 1 million.

4.11.1.2 Definition of Resource

Public health and safety is concerned with the health of populations in the vicinity of a project.

4.11.1.3 Applicable Regulations, Plans, and Policies/Management Goals

No potential adverse impacts for any receptors, including environmental justice populations were found in the impact analysis. The analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the California Air Resources Board. The assessment is biased toward the protection of public health and takes into account the most sensitive individuals in the population. Using extremely conservative (health-protective) exposure and toxicity assumptions, the analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project—including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions—will not experience any adverse chronic or cancer health risk as a result of that exposure. It is believed that every conservative health-protective assumption called for by state and Federal agencies responsible for establishing methods for analyzing public health impacts was included. The results of that analysis indicate that there would be no direct or cumulative adverse public health and safety impact to any population in the area. Therefore, given the absence of any adverse health impacts, there are no disparate health impacts and there are no environmental justice issues associated with Public Health and Safety.

Construction and operation of the IVS project would be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of Public Health and Safety.

4.11.1.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

IVS Project: 750 MW Alternative

Construction Impacts

Potential risks to public health during construction of the IVS project may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as diesel exhaust from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are discussed in Section 4.2, Air Quality.

Ground disturbance would occur during construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off site through soil erosion, and uncovering buried hazardous substances. A Phase I Environmental Site Assessment conducted for the IVS project site identified no Recognized Environmental Conditions (RECs) on the site per the American Society for Testing and Materials Standards (ASTM) definition. That is, there was no evidence or record of any use, spillage, or disposal of hazardous substances on the site, nor was there any other environmental concern that would require remedial action. One area of potential concern was identified off site, consisting of waste disposal ponds that may have affected soil or groundwater at the IVS project site. In the event that any unexpected contamination is encountered during construction, Measures WASTE-1 through WASTE-8 (which require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil) would ensure that contaminated soil does not affect the public.

The operation of construction equipment would result in air emissions from diesel-fueled engines. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the EPA as hazardous air pollutants and by the California Air Resources Board (ARB) as toxic air contaminants (TACs).

Exposure to diesel exhaust may cause both short- and long-term adverse health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants recommended a chronic REL for diesel exhaust particulate matter of 5 micrograms of diesel particulate matter per cubic meter of air ($\mu g/m^3$) and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$. The Scientific Review Panel (SRP) did not recommend a value for an acute REL because available data in support of such a value was deemed insufficient. On August 27, 1998, ARB listed particulate emissions from diesel-fueled engines as a TAC and approved the SRP's recommendations regarding health effect levels.

Construction of the IVS project is anticipated to take place over a period of 40 months. The estimated worst-case construction emissions are 457 pounds per day (lbs/day) of PM10 and 71 lbs/day of PM2.5. Health risks resulting from construction activities were not estimated due to the short duration of this phase. A quantitative assessment of construction impacts on public health was not conducted because of the distance to the sparsely populated area surrounding the site and because using quantitative risk assessment tools has repeatedly shown that impacts due to construction vehicle diesel emissions are invariably less than substantial even to close-in receptors. In addition, as noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a longer time period, typically from 8 to 70 years.

Additionally, Measures provided in Section 4.2 would reduce the maximum calculated PM10 and PM2.5 emissions. Those Measures include the use of extensive fugitive dust and diesel exhaust control measures. The fugitive dust control measures are assumed to result in 90 percent reductions of those emissions. To further mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, a Measure for the use of ultra-low sulfur diesel fuel and Tier 2 or Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines or the installation of an oxidation catalyst and soot filters on diesel equipment is recommended. Catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both Measures in the range of approximately 85 to 92 percent. Such filters would reduce diesel emissions during construction and reduce any potential for adverse health impacts.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in construction-related health risks compared to the IVS project as described above. This is because these proposed modifications would be constructed in essentially the same manner and locations as these facilities were evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in construction-related health risks because this project feature does not require any construction activities.

Operation Impacts

Emissions Sources

The only stationary source of emissions during operation of the IVS project would be 1 emergency diesel generator which would be operated once a week for about 15 minutes. Mobile sources would have included diesel vehicles for washing the mirrors and other on-site maintenance vehicles. However, to reduce public health impacts during operation of the IVS project, the applicant proposes to use an electric fire water pump instead of a diesel pump, electric or hybrid vehicles instead of diesel or gasoline vehicles for mirror washing and other maintenance purposing, and reducing the number of trips and miles traveled during operations. Therefore, the only TAC that would be emitted from IVS stationary and mobile sources would be diesel particulate matter from the emergency generator.

Emissions Levels

The HRA for the IVS project as originally proposed (including 2 diesel emergency engines) resulted in a maximum chronic Hazard Index (HI) of 0.00003 and a worst-case individual cancer risk of 0.01 in 1 million at the location of maximum impact. As Table 4-51 shows, both the chronic hazard index and the cancer risk are below an adverse level, indicating that no long-term adverse health effects are expected as result of the IVS project. Because the results of the original HRA show that no adverse public health effects would occur, the applicant did not revise the HRA to reflect the elimination of the diesel fire water pump in favor of an electric pump. The decrease in TAC emissions due to removal of the diesel-fueled fire water pump would only reduce the projected health impacts which are already found to be not adverse under worst-case conditions.

Table 4-51 Operation Hazard/Risk at Point of Maximum Impact: Applicant Assessment

Type of Hazard/Risk	Hazard Index/Risk	Level	Adverse?
Chronic Noncancer	0.00003	1.0	No
Individual Cancer	0.01 in a million	10.0 in a million	No

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

A quantitative evaluation of the risk assessment results was conducted. The quantitative analysis of facility operations included the following:

- Stack parameters, building parameters, emission rates and locations of sources were obtained from the Application for Certification (AFC) submitted by the applicant to the California Energy Commission (CEC).
- Emissions from the diesel emergency generator were included.
- Used a receptor grid of 10,000 to 10,000 m east and 10,000 to 10,000 m north, at 200 m increments. Also modeled risks at residential and sensitive receptors identified in the AFC, and at the on-site point of maximum impact and the on-site worker.
- Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk.

Atmospheric dispersion modeling was conducted using the CARB/OEHHA Hotspots Analysis and Reporting Program (HARP), Version 1.4a. Screening meteorological data was used, as local meteorological data compatible for use in the HARP ISCST analysis was not provided by the applicant.

The emission factors used in the analysis of cancer risk and hazard for diesel emissions from the emergency generator were obtained from the AFC and are listed below:

- Diesel annual emission rate from emergency generator: ..... 0.14 lb/yr
- Diesel hourly emission rate from emergency generator: ..... 0.01 lb/hr

For cancer risk calculations using the HARP model, the "Derived(Adjusted)Method" was used and for chronic noncancer hazard the "Derived(OEHHA)Method" was used.

The results of that analysis are summarized in Table 4-52 and are compared to the results presented by the applicant for IVS project. The two parcels of private land that are surrounded by the IVS project site would have risks and chronic hazard less than the values determined for the on-site PMI and maximally exposed worker.

Table 4-52 Cancer Risk and Chronic Hazard Index

	PMI (Table Note 1)	MEIR (Table Note 2)	MEIW (Table Note 3)	Sensitive Receptor (Table Note 4
CEC Analysis (emissions from diesel emergency generator only)				
Cancer Risk (per million)	0.23	0.0020	0.046	0.00082
Chronic HI	0.00014	0.0000012	0.00015	0.00000052
Applicant's Analysis (emissions from diesel emergency generator and diesel fire pump)				
Cancer Risk (per million)	0.01	N/A	N/A	N/A
Chronic HI	0.00003	N/A	N/A	N/A

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Note 1: The PMI is located on site.

Table Note 2: Residential is located at a residence approximately 3.7 miles west of the site of the diesel emergency generator

Table Note 3: The MEIW is located on site.

Table Note 4: The sensitive receptor is located at Westside Elementary School, located approximately 8.3 miles east of the site of the diesel emergency generator.

Table Key: HI = Chronic Hazard Index; MEIR = maximum exposed individual resident; MEIW = maximum exposed individual worker; N/A = not addressed; PMI= point of maximum impact determined in staff's analysis.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in operations-related health risks compared to the IVS project as described above. This is because these proposed modifications would be operated in essentially the same manner and locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will result in only very minor emissions from the trucks transporting water to the IVS project site. These emissions would be a very small amount of the total emissions for the project operations and, therefore, would not substantially change the operations-related health risks compared to operation of the original IVS project.

Closure and Decommissioning Impacts

Closure of the IVS project (temporary or permanent) would follow a Project Closure Plan prepared by the applicant and designed to minimize public health and environmental impacts. Permanent closure would presumably occur 40 years after the start of operation unless the project remains economically viable past that time. Decommissioning procedures would be consistent with all applicable LORS and would be submitted to the BLM for approval before implementation. Impacts to public health from the closure and decommissioning process would

represent a small fraction of the impacts associated with the construction or operation of the IVS project. Therefore based on this analysis for the construction and operation phases of this project, public health-related impacts from closure and decommissioning of the IVS project would not be adverse.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in health risks during decommissioning compared to the IVS project as described above. This is because these proposed modifications would be decommissioned and removed essentially the same as these facilities were evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in decommissioning health risks because when this water supply is no longer needed, the truck trips will cease and there will be no demolition associated with the termination of the use of the alternative water source.

709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative would result in short- and long-term public health and safety impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the air quality effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project.

The impacts of the four applicant-proposed modifications related to health risks during construction, operations, and decommissioning would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

300 MW Alternative

The types of construction and operation public health and safety impacts under the 300 MW Alternative would be similar to, but substantially less than, the IVS project. Because the IVS project impacts are less than substantial, the impacts of the 300 MW Alternative would also be less than substantial due to the smaller extent of construction disturbance and the smaller number of SunCatchers operated under the 300 MW Alternative.

The impacts of the four applicant-proposed modifications related to health risks during construction, operations, and decommissioning would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

Drainage Avoidance #1 Alternative

The types of construction and operation public health and safety impacts under Drainage Avoidance #1 Alternative would be similar to, but slightly less than, the IVS project. Because the IVS project impacts are less than substantial, the impacts of the Drainage Avoidance #1 Alternative would also be less than substantial due to the slightly smaller extent of construction disturbance and the lower number of SunCatchers operated under the Drainage Avoidance #1 Alternative.

The impacts of the four applicant-proposed modifications related to health risks during construction, operations, and decommissioning would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

Drainage Avoidance #2 Alternative

The types of construction and operation public health and safety impacts under Drainage Avoidance #2 Alternative would be similar to, but less than, the IVS project. Because the IVS project impacts are less than substantial, the impacts of the Drainage Avoidance #2 Alternative would also be less than substantial due to the smaller extent of construction disturbance and the lower number of SunCatchers operated under the Drainage Avoidance #2 Alternative.

The impacts of the four applicant-proposed modifications related to health risks during construction, operations, and decommissioning would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under No Action Alternative, the BLM would not approve the right-of-way (ROW) grant and would not amend the California Desert Conservation Area Plan (CDCA Plan, 1980 as amended). As a result, no solar energy project would be constructed on the IVS project site and

BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the public health and safety effects associated with construction and operation of a Build Alternative would not occur. However, the site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could result in public health and safety effects similar to the IVS project, in other locations.

No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to make the site unavailable for future solar development. As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no soil erosion impacts or impacts to jurisdictional waters. As a result, this No Action Alternative would not result in impacts to public health and safety. However, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have public health and safety impacts similar to the IVS project, in other locations.

No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant but would amend the CDCA Plan to allow for other solar projects on the site. Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, public health and safety impacts would result from the construction and operation of that solar technology and resulting ground disturbance and would likely be similar to the public health and safety impacts under the IVS project. Different solar technologies require different amounts of grading; however, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in public health and safety impacts similar to the impacts under the IVS.

4.11.1.5 Cumulative Impacts

Cumulative impacts can occur if the construction and/or the operation of the IVS project occur concurrently with the construction and/or operation of other cumulative projects. Cumulative impacts would occur locally if the IVS project impacts combine with impacts of other projects in the same air basin. For this cumulative impact analysis, the emissions from construction or operation of the IVS project could potentially combine with emissions from present and reasonably foreseeable projects to result in adverse health effects to the public. Cumulative impacts to public health could occur as a result of implementation of the IVS project on both a local and regional level. The geographic extent for the analysis of local cumulative impacts associated with the IVS project is the Salton Sea Air Basin (SSAB), which contains all of Imperial County and parts of Riverside County.

There are no current or future projects within a 6 mi radius of the IVS project site that could contribute to a public health cumulative impact and no further analysis was conducted. Nevertheless, there is a potential for substantial future development in the project area and throughout the southern California desert region, as indicated by the list of cumulative projects provided in Section 2.10, Overview of the Cumulative Impacts Analysis, which includes several energy-generating projects employing solar or wind technologies.

Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to health risks less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects.

The maximum cancer risk for emissions from the IVS project is 0.23 in 1 million at a point on the IVS project site. The maximum impact location occurs where pollutant concentrations from the IVS project would theoretically be the highest. Even at this location, any substantial change in lifetime risk to any person is not expected and the increase does not represent any real contribution to the average lifetime cancer incidence rate due to all causes (environmental as well as life-style and genetic). Modeled facility-related residential risks are even lower at more distant locations and actual risks are expected to be much lower because the worst-case estimates are based on conservative health-protective assumptions and, therefore, overstate the true magnitude of the risk expected. Therefore, the incremental impact of the additional risk posed by the IVS project is not considered to be individually or cumulatively adverse.

The nature of public health impacts from exposure to materials that could result in negative health effects combined with the vast area over which the future solar and wind development

projects could be built in southeastern California, southern Nevada, and western Arizona, as well as the relative isolation of these projects from sensitive receptors, precludes the potential for impacts of these projects to combine with each other to result in substantial adverse public health and safety impacts. Any emissions from construction of these projects would be dispersed over these areas and would not be expected to result in chronic health problems to sensitive receptors. Operation of the future solar and wind energy projects would result in negligible emissions, mostly related to worker vehicles and maintenance trucks, therefore, operation of these future projects would not result in negative regional health effects.

In summary, the public health and safety impacts of the IVS project would not combine with impacts of past, present, or reasonably foreseeable projects to result in cumulatively considerable local or regional impacts. Therefore, no mitigation is required to address potential cumulative project impacts.

4.11.1.6 Mitigation, Project Design Features, and Other Measures

No mitigation, project design features, or other measures are required for public health and safety.

4.11.1.7 Summary of Impacts

Table 4-53 summarizes the direct, indirect, short-term, long-term, and cumulative adverse health effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives.

As shown in Table 4-53, the construction and operation of the IVS project would not result in any unavoidable adverse impacts related to public health and safety.

4.11.2 Hazardous Materials

The purpose of the analysis in this section is to determine if the IVS project could potentially cause substantial adverse impacts to the public from the use, handling, storage, or transportation of hazardous materials at the proposed project site.

Table 4-53 Summary of Public Health and Safety, and Hazardous Materials Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	During construction, operations, and decommissioning, the IVS project may result in potential risks to public health related to airborne dust; equipment and vehicle emissions; use, handling, storage, and disposal of hazardous materials; and disturbance of contaminated soils. During operations, the IVS project may result in risks associated with the use and storage of quantities of hydrogen on the site, potential spills of hazardous materials, transportation of hazardous materials, seismic ground shaking, and site security.	*HAZ-1:* Use of specified hazardous materials only *HAZ-2:* Hazardous Materials Business Plan *HAZ-3*: Safety Management Plan for delivery of liquid hazardous materials *HAZ-4:* Construction Site Security Plan *HAZ-5:* Operation Security Plan *HAZ-6:* Compliance with all applicable Federal laws and regulations related to hazardous and toxic materials *WASTE-1:* Experienced and qualified professional engineer or geologist for site characterization during (if needed), demolition, excavation, and grading activities *WASTE-2:* Inspection, sampling, and written report when potentially contaminated soil is identified *WASTE-3:* Construction Waste Management Plan *WASTE-4:* Obtain a hazardous waste generator identification number from the United States Environmental Protection Agency *WASTE-5:* Proper notification and documentation of any waste management-	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
		related enforcement action by any local, state, or Federal authority *WASTE-6:* Reuse/recycling plan for at least 50% of construction and demolition materials *WASTE-7:* Operation Waste Management Plan *WASTE-8:* All spills or releases of hazardous substances, hazardous materials, or hazardous waste are properly documented, cleaned up and wastes from the release/spill are properly managed and disposed of	
709 MW Alternative: Agency Preferred Alternative	Impacts similar to but reduced compared to the IVS project because of the reduction in the disturbed area and the number of SunCatchers.	Same as the IVS project.	None.
300 MW Alternative	Impacts similar to the IVS project and the Agency Preferred Alternative, but substantially reduced in magnitude due to the reduced area and number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #1 Alternative	Impacts would be similar to the IVS project and the Preferred Agency Alternative, but reduced in magnitude due to the reduced disturbed area and number of SunCatchers in this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Impacts would be similar to the IVS project and the Preferred Agency Alternative, but reduced in magnitude due to the reduced disturbed area and number of SunCatchers in this Alternative.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Not determined, but could be potentially similar to the impacts under the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.11.2.1 Methodology

For this analysis, the plausible potential loss of containment incidents (spills) for the hazardous materials to be used at the proposed facility was assessed. The worst case plausible event, regardless of cause, was analyzed to see whether the potential impacts and risk to local populations are substantially adverse. Hazardous material handling and use procedures are designed to reduce the likelihood of a spill, to reduce its potential size, and to prevent or reduce the potential migration of a spill off site to the extent that there would not be substantial off-site impacts.

The potential for the transportation, handling, and use of hazardous materials to impact the surrounding area was evaluated. All chemicals and natural gas were evaluated. The analysis examined the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. To accomplish this, the most current acceptable public health exposure levels (both acute and chronic) to protect the public from the effects of an accidental chemical release were used.

To assess the potential of released hazardous materials traveling off site and affecting the public, several aspects of the proposed use of materials at the IVS project were analyzed. It is recognized that some hazardous materials must be used at power plants. Therefore, the analysis focused on the choice and amount of chemicals to be used, the manner in which the chemicals would be used, the manner by which they would be transported to the facility and transferred to facility storage tanks, and the way in which those on-site materials would be stored on site.

The proposed engineering and administrative controls for hazardous materials use were reviewed. Engineering controls are physical or mechanical systems such as storage tanks or automatic shut-off valves that can prevent a spill of hazardous material from occurring, or that can limit the spill to a small amount or confine it to a small area. Administrative controls are rules and procedures that workers must follow to help either prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as either methods of prevention or methods of response and minimization. In both cases, the goal is to prevent a spill from moving off site and harming the public.

The proposed use of hazardous materials for the IVS project was reviewed and evaluated. The assessment followed the following steps:

- **Step 1:** Reviewed the chemicals and amounts proposed for on-site use and determined the need and appropriateness of their use. Only those that are needed and appropriate are allowed to be used. If a safer alternative chemical can be used, its use is recommended or required, depending on the impacts posed.

- **Step 2:** Those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.

- **Step 3:** Measures included in the IVS project to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings, and administrative controls such as worker training and safety management programs.

- **Step 4:** Measures included in the IVS project to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading, and administrative controls such as training emergency response crews.

- **Step 5:** Analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials even with the measures included in the IVS project. When those measures are sufficient, no further mitigation is recommended. If the proposed measures are not sufficient to reduce the potential for adverse impacts to an inconsequential level, additional prevention and response controls are recommended until the potential for causing harm to the public is reduced to an inconsequential level. It is only at this point that a recommendation would be made such that the project be allowed to use hazardous materials.

4.11.2.2 Definition of Resource

Hazardous materials such as mineral and lubricating oils, corrosion inhibitors, herbicides, and acids and bases to control pH would be used on the IVS project site. Hazardous materials used during the construction phase include gasoline, diesel fuel, motor oil, lubricants, and small amounts of solvents and paint. No acutely toxic hazardous materials would be used on site during construction. None of these materials pose a significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical states, and/or their environmental mobility.

4.11.2.3 Applicable Regulations, Plans, and Policies/Management Goals

The potential for impacts due to a simultaneous release of any of the hazardous chemicals from the proposed IVS project was considered along with any other existing or foreseeable nearby facilities. Because of the small amounts of the hazardous chemicals to be stored at the facility, it was determined that there was no possibility of producing an off-site impact. Because of this determination, and the additional fact that there are no nearby facilities using large amounts of hazardous chemicals, there is no possibility that vapor plumes would combine to produce an airborne concentration that would present an adverse risk. Therefore, construction and operation of IVS project would be in compliance with all applicable LORS for both long-term and short-term project impacts in the area of hazardous materials.

4.11.2.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

IVS Project: 750 MW Alternative

Small Quantity Hazardous Materials

In conducting this analysis, it was determined in Steps 1 and 2 that most of the hazardous materials proposed to be used at the IVS project pose minimal potential for off-site impacts because they would be stored in either solid form or in small quantities, have low mobility, low vapor pressure, or low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are discussed briefly below.

During the project construction, the hazardous materials proposed for use include paint, cleaners, solvents, gasoline, diesel fuel, motor oil, welding gases, and lubricants. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved, the infrequent use and hence 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 all have very low volatility and would represent limited off-site hazards, even in larger quantities.

During operations, hazardous chemicals such as cleaning agents, lube oil, sulfuric acid, sodium hydroxide, ammonium hydroxide, diesel fuel and other various chemicals would be used and stored on site and represent limited off-site hazards due to their small quantities, low volatility, and/or low toxicity.

After removing from consideration those chemicals that pose no potential for risk of off-site impact in Steps 1 and 2, the evaluation continued with Steps 3, 4, and 5 to review the remaining hazardous material: hydrogen.

Large Quantity Hazardous Materials

Hydrogen

Hydrogen is used as the working fluid in the Stirling cycle engines. The IVS project includes 30,000 individual engines. The analysis was conducted assuming a worst case release of all the hydrogen on site. It was assumed that a hydrogen release would form a vapor cloud and detonate causing an unconfined vapor cloud explosion. The distance to an overpressure of 1.0 pounds per square inch (psi) was then determined. This is an overpressure that could cause some damage to structures and injury to exposed members of the general population. The maximum distance to this level of impact was estimated to be 0.13 mi. There are no public receptors at this distance and in general such overpressures would be confined to the IVS project site depending on the location of the cloud at detonation. It is nearly impossible to detonate hydrogen in an unconfined cloud and it disperses very rapidly due to its low density relative to air. The release scenarios are very conservative in that a release would almost certainly occur over a period of time resulting in substantial dispersion of the hydrogen while the cloud was forming. Actual experience with hydrogen releases have not resulted in unconfined cloud explosions. It is widely believed that unconfined hydrogen will not detonate without a high explosive initiating event.

The analysis provided is conservative and overestimates both the magnitude and the potential risk of any actual explosion that could occur at the IVS project facility. Therefore, the unconfined hydrogen explosion is not considered plausible and would not likely occur at the IVS project facility. Thus, use of hydrogen at the IVS project facility poses a risk of an on-site fire, but no plausible potential for substantial adverse impact on surrounding populations or the environment.

Measure HAZ-1 would ensure that no hazardous material would be used at the facility except as listed in the AFC and reviewed for appropriateness, unless there is prior approval by the CEC and the BLM. The chemicals and amounts proposed for on-site use were reviewed, and the need and appropriateness of their use were determined. HAZ-1 also requires changes to the allowed list of hazardous materials and their maximum amounts to be approved. Only those that are needed and appropriate would be allowed to be used. If a safer alternative chemical can be used, it is recommended or requires its use, depending on the potential impacts posed. See Table 4-54 for the list of proposed hazardous materials to be used.

Table 4-54 Hazardous Materials Usage and Storage During Operation of the IVS Project

Chemical	Use	Storage Location/Type	State	Storage Quantity
Insulating oil	Electrical equipment	Electrical equipment (contained in transformers and electrical switches)	Liquid	60,000 gal initial fill
Lubricating oil	Stirling Engine/dish drives PCU	Equipment 150 gal recycle tank located in the Maintenance Building	Liquid	40,000 gal initial fill with usage of 21 gal per month
Hydrogen	PCU working fluid	Generated on site and stored in pressure vessel	Gas	33,000 scf
Acetylene	Welding	Cylinders stored in maintenance buildings	Gas	1,000 cubic feet
Oxygen	Welding	Cylinders stored in maintenance buildings	Gas	1,000 cubic feet
Ethylene glycol	PCU Radiator Coolant, antifreeze	PCU radiator in the Maintenance Buildings	Liquid	40,000 gal initial fill with usage of 21 gal per month
Various solvents, detergents, paints, and other cleaners	Building maintenance and equipment cleaning	Three (3) 55 gal drums and 1 gal containers would be stored in the Maintenance Buildings	Liquid	Ten (10) 55 gal drums; Commercial 1 gal containers
Gasoline	Maintenance vehicles	5,000 gal AST at refueling station with containment	Liquid	5,000 gal
Diesel fuel	Firewater pump Maintenance Vehicles	Firewater skid; 5,000 gal AST refueling station with containment	Liquid	100 gal initial fill; 5,000 gal
Sodium hypochlorite 12.5% solution (bleach)	Disinfectant for potable water	Water treatment structure	Liquid	4 gal

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: AST = aboveground storage tank; gal = gallons; IVS = Imperial Valley Solar; PCU = power conversion unit; scf = standard cubic foot.

A Hazardous Materials Business Plan (HMBP) would be prepared and would incorporate state requirements for the handling of hazardous materials. Measure HAZ-2 ensures that the HMBP, which includes the Inventory and Site Map, Emergency Response Plan and Owner/Operator Identification, and Employee Training, would be provided to the Imperial County Department of Toxic Substances Control (ICDTSC) so that the ICDTSC can better prepare emergency response personnel for handling emergencies which could occur at the IVS project facility.

On-site Spill Response

To address spill response, an emergency response plan which includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. would be prepared. Emergency procedures would be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

A Spill Prevention Control and Countermeasure Plan (SPCC) is required by Federal regulations and would be prepared for the petroleum-containing hazardous materials.

The El Centro Fire Department, at 900 South Dogwood, El Centro, would respond to emergencies at the IVS project facility. The response time to an emergency call from the IVS project site is approximately 30 minutes. Given the remote location, the hazardous material response time is acceptable, and the El Centro Fire Department is adequately trained and equipped to respond to an emergency at the IVS project site in a timely manner.

Transportation of Hazardous Materials

Containerized hazardous materials including sulfuric acid, and cleaning chemicals, would be transported to the IVS project facility via truck. While many types of hazardous materials would be transported to the site, previous modeling of spills involving much larger quantities of more toxic materials, aqueous ammonia and 93 percent sulfuric acid which are two hazardous materials that would be used, stored, and transported for the IVS project, has demonstrated that minimal airborne concentrations would occur at short distances from the spill.

During construction and operation of the IVS project, minimal amounts and types of hazardous materials (paint, cleaners, solvents, gasoline, diesel fuel, motor oil, lubricants, sodium hypochlorite, and welding gases in standard-sized cylinders) do not pose a substantial adverse risk of either spills or public impacts along any transportation route. Therefore, a specific transport route is not recommended.

Liquid hazardous materials can be released during a transportation accident, and the extent of their impact in the event of a release would depend on the location of the accident and the rate of vapor dispersion from the surface of the spilled pool. The likelihood of an accidental release during transport is dependent on three factors:

- The skill of the tanker truck driver
- The type of vehicle used for transport
- Accident rates

To address this concern, the risk of an accidental transportation release was evaluated in the IVS project area. The analysis focused on the area after the delivery vehicle leaves I-8 and State Route 98. It is appropriate to rely on the extensive regulatory program that applies to the shipment of hazardous materials on California Highways to ensure safe handling in general transportation (Federal Hazardous Materials Transportation Law 49 USC Section 5101 et seq., the United States Department of Transportation Regulations 49 CFR Subpart H, Section 172 700, and the California Department of Motor Vehicles (DMV) Regulations on Hazardous Cargo). These regulations also address issues of driver competence. In addition, Measure HAZ-3 would require preparation of a Safety Management Plan for delivery of liquid hazardous materials.

Seismic Issues

The possibility exists that an earthquake could cause the failure of a hazardous materials storage tank, the secondary containment system (berms and dikes), and/or electrically controlled valves and pumps. The failure of all these preventive control measures might then result in the release of hazardous materials.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large and small storage tanks at the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while newer tanks sustained lesser damage with displacements and attached line failures. Therefore, an analysis of the codes and standards was conducted, which should be followed to adequately design and build storage tanks and containment areas that could withstand a large earthquake. The impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California, were also reviewed. No hazardous materials storage tanks were impacted by that earthquake. The IVS project facility would be designed and constructed to the applicable standards of the 2007 California Building Code for Seismic Zone 4. Therefore, on the basis of damage experienced from the Northridge earthquake to older tanks and the lack of failures during the Nisqually

earthquake with newer tanks, it is determined that tank failures during seismic events are not likely and do not represent a substantially adverse risk to the public.

Site Security

The IVS project proposes to use hazardous materials which necessitate that special site security measures should be developed and implemented to prevent unauthorized access. To address site security, the EPA published a Chemical Accident Prevention Alert regarding site security, the United States Department of Justice (DOJ) published a special report on Chemical Facility Vulnerability Assessment Methodology, the North American Electric Reliability Corporation (NERC) published Security Guidelines for the Electricity Sector in 2002, and the United States Department of Energy (DOE) published a draft Vulnerability Assessment Methodology for Electric Power Infrastructure in 2002. The energy generation sector is one of 14 areas of critical infrastructure listed by the United States Department of Homeland Security. On April 9, 2007, the Department of Homeland Security published an Interim Final Rule in the Federal Register (6 CFR Part 27) requiring facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures.

To ensure that the IVS project facility or a shipment of hazardous material to that facility is not the target of unauthorized access, HAZ-4 and HAZ-5 are proposed to address construction and operation security plans. These plans would require the implementation of site security measures that are consistent with both the above-referenced documents and applicable CEC and BLM guidelines. The goal of these Measures is to provide the minimum level of security for power plants needed to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for the IVS project is dependent on the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event.

To determine the level of security, the CEC used an internal vulnerability assessment decision matrix modeled after the DOJ Chemical Vulnerability Assessment Methodology, the NERC 2002 guidelines, the DOE VAM-CF model, and the Department of Homeland Security regulations published in the Interim Final Rule. It was determined that the IVS project would fall into the "low vulnerability" category, so certain security measures should be implemented but a individual vulnerability assessment is not required.

These security measures include perimeter fencing and breach detectors, guards (if appropriate), alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach. Site access for vendors would be strictly controlled. Consistent with current state and Federal regulations

governing the transport of hazardous materials, hazardous materials vendors would have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner would be required, through its contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to DOT requirements that hazardous materials vendors prepare and implement security plans per 49 CFR 172.800 and ensure that all hazardous materials drivers are in compliance with personnel background security checks per 49 CFR Part 1572, Subparts A and B. The BLM may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the Department of Homeland Security, DOE, or NERC, after consultation with appropriate law enforcement agencies and the applicant.

Applicant-Proposed Modifications

The applicant-proposed modifications to the transmission line, water line, and the alternative water supply will not in differences in small and large quantity hazardous materials, on-site spill response, transportation of hazardous materials, or seismic issues compared to the IVS project as described above. This is because these proposed modifications would be design, constructed, and operated in essentially the same manner and locations as these facilities were evaluated for the original IVS project.

The applicant-proposed modification to the hydrogen system were evaluated to determine if the effects of that modification were similar to the effects under the original IVS project. The proposed modification to the hydrogen storage system is essentially similar to that analyzed for the original IVS project. The hydrogen storage modification is within the same analysis area, and the geographic and resource conditions are sufficiently similar to those analyzed for the original IVS project.

As described for the original IVS project, an on-site centralized hydrogen gas supply, storage, and distribution system was proposed and evaluated. Modifications proposed to this system for all the IVS project and the other Build Alternatives would require the amount of hydrogen stored for each SunCatcher to be increased from 3.4 to 11 standard cubic feet (scf). To support this increase in hydrogen storage for each SunCatcher, the high pressure supply tanks and low pressure dump tanks at each compressor group would accommodate 29,333 scf and 9,900 scf, respectively. In addition, each of the 30 high pressure tanks that supply hydrogen to the power conversion units within a group of 12 SunCatchers under the current design will have a capacity of 489 scf.

For the original IVS project, a distributed hydrogen system was evaluated. That analysis provided a worst-case scenario release of all the hydrogen on site at the same time. It was assumed that a hydrogen release would form a vapor cloud and detonate causing an

unconfined vapor cloud explosion. The distance to an over pressure of 1.0 pounds per square inch (psi) was then determined. This is an overpressure that could cause some damage to structures and injury to exposed members of the general population. The maximum distance to this level of impact was estimated to be 0.13 mi. There are no public receptors at this distance and in general such overpressures would be confined to the project site depending on the location of the cloud at detonation.

With the increase of hydrogen that would be required under the applicant-proposed modification, the impacts from a hydrogen release would be slightly greater in magnitude. However, results from the additional modeling demonstrated that an accidental release of hydrogen, under conservation worst-case scenario conditions, will not impact the public or environmental receptors in the vicinity of the project site. The impact distance from the point of release from each of the scenarios analyzed is estimated to range from 0.04 to 0.3 mi.

Given that the overall function of the modified on-site hydrogen system is essentially the same as that analyzed for the original IVS project, it is expected that the environmental consequences associated with the proposed hydrogen storage modifications would be similar to those analyzed for the original IVS project. In summary, the applicant proposed modifications to the hydrogen storage system do not result in changes related to hydrogen use and storage or the impacts associated with them compared to the impacts evaluated for original IVS project.

Facility Closure and Decommissioning

The requirements for the handling of hazardous materials remain in effect until such materials are removed from the site, regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner that poses a risk to surrounding populations, BLM would coordinate with the California Office of Emergency Services, El Centro Fire Department, and the California Department of Toxic Substances Control (DTSC) as BLM would be the landowner of the abandoned facility. To ensure that any unacceptable risk to the public is eliminated, funding for such emergency action as well as site removal, rehabilitation, and revegetation activities would be available from a performance bond required of the applicant by BLM.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in hazardous materials impacts during decommissioning compared to the IVS project as described above. This is because these proposed modifications would be decommissioned and removed essentially the same as these facilities were evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in decommissioning impacts related to hazardous materials because when this water supply is no longer needed, the truck trips will cease and there will be no demolition associated with the termination of the use of the alternative water source.

709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative would result in short- and long-term hazardous materials impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the hazardous materials effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project.

The impacts of the four applicant-proposed modifications related to hazardous materials during construction, operations, and decommissioning would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

300 MW Alternative

The types of construction and operation hazardous materials impacts under the 300 MW Alternative would be similar to, but substantially less than, the IVS project. As discussed above, the IVS project impacts analysis considered the worst case, plausible event, and the impacts were found not to be substantial with the incorporation of the identified measures. The impacts of the 300 MW Alternative would be even smaller due to the reduced use, handling, storage, and transport of hazardous materials and the smaller number of SunCatchers under the 300 MW Alternative. Construction and operation risks to workers due to the use of hydrogen would also be reduced under the 300 MW Alternative because of the reduced number of SunCatchers.

The impacts of the four applicant-proposed modifications related to hazardous materials during construction, operations, and decommissioning would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

Drainage Avoidance #1 Alternative

The types of construction and operation hazardous materials impacts under Drainage Avoidance #1 Alternative would be similar to, but slightly less than, the IVS project. As discussed above, the IVS project impacts analysis considered the worst case, plausible event, and the impacts were found not to be substantial with the incorporation of the identified measures. The impacts of the Drainage Avoidance #1 Alternative would be even smaller due to the reduced use, handling, storage, or transport of hazardous materials and the smaller number of SunCatchers under the Drainage Avoidance #1 Alternative. Construction and operation risks to workers due to the use of hydrogen would also be reduced under the Drainage Avoidance #1 Alternative because of the reduced number of SunCatchers.

The impacts of the four applicant-proposed modifications related to hazardous materials during construction, operations, and decommissioning would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

Drainage Avoidance #2 Alternative

The types of construction and operation hazardous materials impacts under Drainage Avoidance #2 Alternative would be similar to, but slightly less than, the IVS project. As discussed above, the IVS project impacts analysis considered the worst case, plausible event, and the impacts were found not to be substantial with the incorporation of the identified measures. The impacts of the Drainage Avoidance #2 Alternative would be even smaller due to the reduced use, handling, storage, or transport of hazardous materials and the smaller number of SunCatchers under the Drainage Avoidance #2 Alternative. Construction and operation risks to workers due to the use of hydrogen would also be reduced under the Drainage Avoidance #2 Alternative because of the reduced number of SunCatchers.

The impacts of the four applicant-proposed modifications related to hazardous materials during construction, operations, and decommissioning would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction, operation, and decommissioning activities similar to the IVS project relative to those four proposed modifications.

No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the ROW grant and would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the IVS

project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, no impacts related to hazardous materials associated with construction and operation of a Build Alternative would occur. However, the site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts related to hazardous materials similar to the IVS project, in other locations.

No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would amend the CDCA Plan to make the site unavailable for future solar development. As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no impacts related to hazardous materials. As a result, this No Action Alternative would not result in impacts related to hazardous materials. However, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts related to hazardous materials similar to the IVS project, in other locations.

No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant but would amend the CDCA Plan to allow for other solar projects on the site. Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts related to hazardous materials would result from the construction and operation of that solar technology and resulting ground disturbance and would likely be similar to those impacts under the IVS project. Different solar technologies require different amounts of grading; however, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in impacts related to hazardous materials similar to the impacts under the IVS.

4.11.2.5 Cumulative Impacts

The geographic area considered for cumulative impacts from the use of hazardous materials is the area within 1 mi of the IVS project site boundary. There is no potential to cause impacts beyond the facility boundary. For this analysis, no other projects are located close enough to the proposed IVS project site to cause cumulative impacts on any surrounding population.

There are no past or currently operating projects in the geographic area that would affect the same area that would be affected by the IVS project facility. There are no reasonably foreseeable future projects in the geographic area that would affect the same area that would be affected by accidental releases at the proposed facility.

Because of the small amounts of the hazardous chemicals to be stored at the IVS project facility, it was determined that there was no possibility of producing an off-site impact. Because of this determination, and the additional fact that there are no nearby facilities using large amounts of hazardous chemicals, there is no possibility that vapor plumes would combine to produce an airborne concentration that would present a substantial cumulative adverse risk.

4.11.2.6 Mitigation, Project Design Features, and Other Measures

HAZ-1 The project owner shall not use any hazardous materials not listed in Table 4-54 or in greater quantities than those identified by chemical name in 6 CFR Part 27 unless approved in advance by the BLM's authorized officer and Compliance Project Manager (CPM).

Verification: The project owner shall provide to BLM's authorized officer and the CPM in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 The project owner shall concurrently provide a Hazardous Materials Business Plan and a Risk Management Plan to the Imperial County Department of Toxic Substances Control, BLM's authorized officer and the CPM for review. After receiving comments from Imperial County, BLM's Authorized Officer and the CPM, the project owner shall reflect all received recommendations in the final documents. If no comments are received from the county within 30 days of submittal, the project owner may proceed with preparation of final documents upon receiving comments from BLM's authorized officer and the CPM. Copies of the final Hazardous Materials Business Plan shall then be provided to the Imperial County Department of Toxic Substances Control for information and to the BLM's authorized officer and CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan to BLM's authorized officer and the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of liquid hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least sixty (60) days prior to the delivery of any liquid hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to BLM's authorized officer and the CPM for review and approval.

HAZ-4 At least thirty (30) days prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to BLM's authorized officer and the CPM for review and approval. The Construction Security Plan shall include the following:

(1) Perimeter security consisting of fencing enclosing the construction area;

(2) Security guards;

(3) Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;

(4) Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;

(5) Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and

(6) Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify BLM's authorized officer and the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-5 The project owner shall prepare a site-specific Security Plan for the operational phase and shall be made available to BLM's authorized officer and the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

(1) Permanent full perimeter fence, at least 8 feet high around the Solar Field;

(2) Main entrance security gate, either hand operable or motorized;

(3) Evacuation procedures;

(4) Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;

(5) Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;

(6) A statement (refer to sample, attachment "A") signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to ascertain the accuracy of employee identity and employment history, and shall be conducted in accordance with state and Federal law regarding security and privacy;

(7) A statement(s) (refer to sample, attachment "B") signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site.

(8) Site access controls for employees, contractors, vendors, and visitors;

(9) Closed Circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the

control room) capable of viewing, at a minimum, the main entrance gate; and

(10) Additional measures to ensure adequate perimeter security consisting of either:

(a) Security guard present 24 hours per day, seven days per week, or

(b) Power plant personnel on site 24 hours per day, seven days per week and all of the following:

1. The CCTV monitoring system required in number 8 above shall include cameras that are able to pan, tilt, and zoom (PTZ), have low-light capability, are recordable, and are able to view 100% of the perimeter fence, the outside entrance to the control room, and the front gate from a monitor in the power plant control room; and

2. Perimeter breach detectors or on-site motion detectors.

The project owner shall fully implement the security plans and obtain BLM's authorized officer and CPM approval of any substantive modifications to the security plans. BLM's authorized officer and the CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components (e.g., transformers, gas lines, compressors, etc.) depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the applicant.

Verification: At least 30 days prior to the initial receipt of hazardous materials on site, the project owner shall notify BLM's authorized officer and the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the Annual Compliance Report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and updated certification statements are appended to the Operations Security Plan. In the Annual Compliance Report, the project owner shall include a statement that the Operations Security Plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-6 The holder (project owner) shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 USC 2601 et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702 799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1 761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b

Verification: A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to BLM's authorized officer and the CPM concurrent with the filing of the reports to the involved Federal agency or State government.

WASTE-1 The Imperial Valley Solar project owner (project owner) shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available for during site characterization (if needed), demolition, excavation, and grading activities, to the CPM and AO for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil and impact public health, safety and the environment.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM and AO for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control or Regional Water Quality Control Board, and the CPM and AO stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and AO and representatives of the Department of Toxic Substances Control or Regional Water Quality Control Board, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the professional engineer or professional geologist to the CPM and AO within five days of their receipt. The project owner shall notify the CPM and AO within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM and AO for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM and AO for approval no less than 30 days prior to the initiation of construction activities at the site.

WASTE-4 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (EPA) prior to generating any hazardous waste during project construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM and AO in the next scheduled Monthly Compliance Report after receipt of the number.

Submittal of the notification and issued number documentation to the CPM and AO is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to EPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM and AO in the next scheduled compliance report.

WASTE-5 Upon notification of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM and AO of any such action taken or proposed against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts, and describe how the violation will be corrected.

Verification: The project owner shall notify the CPM and AO in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-6 The project owner shall provide a reuse/recycling plan for at least 50% of construction and demolition materials prior to any building or demolition, including closure/decommissioning. The project owner shall ensure compliance and shall provide proof of compliance documentation to the CPM and AO, including a recycling and reuse summary report, receipts, and records of measurement. Project mobilization and construction shall not proceed until the CPM and AO issue an approval document.

Verification: At least 60 days prior to the start of any construction or demolition activities, the project owner shall submit a reuse recycling plan to the CPM and AO for review and approval. The project owner shall ensure that project activities are consistent with the approved reuse/recycling plan and provide adequate documentation of the types and volumes of wastes generated, how the wastes were managed, and volumes of wastes diverted. Project mobilization and construction shall not proceed until the CPM and AO issue an approval document. Not later than 60 days after completion of project construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM and AO. The required documentation shall include a recycling and reuse summary report along with all necessary receipts and records of measurement from entities receiving project wastes.

WASTE-7 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the SES Solar Two facility and shall submit the plan to the CPM and AO for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM and AO for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM and AO within 20 days of notification from the CPM and AO that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste

Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-8 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM and AO within 30 days of the date the release was discovered.

4.11.2.7 Summary of Impacts

Table 4-53, provided earlier, summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to hazardous materials.

As shown in Table 4-53, evaluation of the IVS project and the other Build Alternatives with the measures described indicates that hazardous material use, storage, and transportation would not pose a substantial adverse impact on the public. Based on implementation of those measures, the use, storage, and transportation of hazardous materials associated with the IVS project would not present a substantial risk to the public. Therefore, the IVS project would not result in unavoidable adverse impacts related to hazardous materials.

4.12 Recreation

4.12.1 Methodology

The effects of the Imperial Valley Solar (IVS) project on the recreation environment were assessed based on the following considerations:

- Directly or indirectly disrupt recreation activities in established Federal, State, or local recreation areas and/or wilderness areas.
- Substantially reduce the scenic, biological, cultural, geologic, or other important factors that contribute to the value of Federal, State, local, or private recreational facilities or wilderness areas.
- Diminish the enjoyment of existing recreational opportunities.

4.12.2 Definition of Resource

The *California Desert Conservation Area Plan* (CDCA Plan) (BLM, 1980, as amended) recognizes that the California desert is "…a reservoir of open space and as a place for outdoor recreation" (CDCA Plan, BLM, 1980, page 69). The CDCA Plan notes that the diverse landscape of the California desert provides for a variety of physical settings. Further, the CDCA Plan identifies the wide variety of desert recreation uses, ranging from off-road vehicles to outdoor preservationists, and the increasing challenge to accommodate these varied and sometimes competing uses. The project site and surrounding area appear to be primarily used by off-highway vehicle (OHV) enthusiasts.

As discussed in Section 3.12, Recreation, the Juan Bautista de Anza National Historic Trail (Anza Trail) corridor passes through and/or is adjacent to the IVS project site. The trail corridor is an inferred alignment between two historic campsite locations, based on historic journals and maps. According to the United States National Park Service (NPS), the Anza Trail is mapped and identified by the United States Bureau of Land Management (BLM) through signs on designated routes of travel north and south of the project site. The NPS further states that the Anza Trail Corridor follows paved segments of Dunaway Road, which is east of the IVS project site, and along Evan Hewes Highway, which is north of the IVS project site.

4.12.3 Applicable Regulations, Plans, and Policies/Management Goals

The management goals of the CDCA Plan Recreation Element are to:

(1) Provide for a wide range of quality recreation opportunities and experiences emphasizing dispersed undeveloped use.

(2) Provide a minimum of recreation facilities. Those facilities should emphasize resource protection and visitor safety.

(3) Manage recreation use to minimize user conflicts, provide a safe recreation environment, and protect desert resources.

(4) Emphasize the use of public information and educational techniques to increase public awareness, enjoyment, and sensitivity to desert resources.

(5) Adjust management approach to accommodate changing visitor use patterns and preferences.

(6) Encourage the use and enjoyment of desert recreation opportunities by special populations, and provide facilities to meet the needs of those groups.

4.12.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.12.4.1 IVS Project: 750 MW Alternative

Approval of the IVS project would directly remove approximately 6,500 acres (ac), 6,140 ac of which are BLM land, from potential use for recreational opportunities such as OHV use and camping. As noted in Section 3.12, Recreation, ten Open Routes designated by the *Western Colorado Desert Routes of Travel Designations* (WECO) amendment are on the IVS project and

construction laydown sites, and two Open Routes are in the vicinity of the IVS and construction laydown sites. For a detailed discussion on the impacts to the Open Routes on the IVS site, refer to Section 4.9, Land Use. The areas north and west of the IVS project site are available for recreational activities (particularly for OHV), and construction of the IVS project would disrupt a highly active recreational area by closure of the Open Routes through the site.

In addition, according to the Recreation Element of the CDCA Plan, "…lands managed by the Bureau [BLM] are especially significant to recreationists." The conversion of 6,140 ac of public land to support the IVS project components and activities would directly disrupt current recreation activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of these lands by closing designated Open Routes.

The NPS has stated that the IVS project would substantially alter the visual landscape of and around the project area, particularly views from the Anza Trail corridor. Further, the NPS concludes that the IVS project has the potential to degrade the integrity of the historic character of the Anza Trail and its related resources in the vicinity of the IVS project site particularly due to the "scale and visual impacts of the proposed project." As a consequence, the IVS project has the potential to diminish the public's ability to experience and understand the associated historic expedition and the cultural landscape of that period.

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in impacts related to recreation resources compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in impacts related to recreation resources because this modification will not result in any changes in land use or impacts to any recreation resources off the IVS project site.

4.12.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative would result in effects related to recreation and the applicable laws, ordinances, regulations, and standards (LORS) similar to those effects described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the recreation effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS

project. The measure described in the following section to address adverse impacts to the Anza Trail of the IVS project would also apply to the Agency Preferred Alternative.

The impacts of the four applicant-proposed modifications related to recreation resources would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.12.4.3 300 MW Alternative

The 300 MW Alternative would be on the same part of the IVS project site as Phase 1 of the IVS project. It would consist of 12,000 SunCatchers with a net generating capacity of approximately 300 MW occupying approximately 2,600 ac of land. The conversion of those 2,600 ac of land to support the 300 MW Alternative would directly disrupt current recreational activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of these lands. Under the 300 MW Alternative, Open Routes on the northern and western parts of the site could remain open. However, the total adverse effects on recreation under the 300 MW Alternative would be proportionately less than under the IVS project.

As noted above, the NPS has stated that the IVS project would substantially alter the visual landscape, historic character, and related resources on and in the vicinity of the IVS project site. The 300 MW Alternative is west of the inferred trail on and near the IVS project site and potentially would affect the Anza Trail corridor to a lesser degree than under the IVS project.

The impacts of the four applicant-proposed modifications related to recreation resources would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.12.4.4 Drainage Avoidance #1 Alternative

The conversion of 4,690 ac of land to support the components and activities associated with the Drainage Avoidance #1 Alternative would directly disrupt current recreational activities in established Federal recreation areas and would result in adverse effects on recreational users of these lands. This effect would be the same under the IVS project because the site boundary would not change under the Drainage Avoidance #1 Alternative and OHV access to these lands would be restricted.

As noted above, the NPS has stated that the IVS project would substantially alter the visual landscape, historic character, and related resources on and in the vicinity of the IVS project site. The Drainage Avoidance #1 Alternative would be on the same site as the IVS project and would likely result in similar adverse impacts on the Anza Trail corridor compared to the IVS project.

The impacts of the four applicant-proposed modifications related to recreation resources would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.12.4.5 Drainage Avoidance #2 Alternative

The conversion of 3,153 ac of land to support the components and activities associated with the Drainage Avoidance #2 Alternative would directly disrupt current recreational activities in established Federal recreation areas and would result in adverse effects on recreational users of these lands. Under the Drainage Avoidance #2 Alternative, some of the Open Routes on the eastern side of the site could remain open. However, this effect would be less than under the IVS project, because the fenced area would be smaller under the Drainage Avoidance #2 Alternative than under the IVS project.

As noted above, the NPS has stated that the IVS project would substantially alter the visual landscape, historic character, and related resources on and in the vicinity of the IVS project site. The Drainage Avoidance #2 Alternative would be the central part of the IVS project site and would likely result in reduced adverse impacts on the Anza Trail corridor compared to the IVS project because the developed area would be further away from the Anza Trail Corridor.

The impacts of the four applicant-proposed modifications related to recreation resources would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.12.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the right-of-way (ROW) grant for the IVS project would not be approved by the BLM, and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, the recreation-related impacts of the IVS project would not occur at the IVS project site, including the conversion of 6,500 ac of land, closure of Open Routes, and any resulting impacts to recreation uses or the Anza Trail corridor.

The IVS project site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would potentially have similar impacts on recreation resources in other locations.

4.12.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to prohibit other solar projects on the site. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing CDCA Plan.

Because the CDCA Plan would be amended for no solar project on the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, the recreation-related impacts of the IVS project would not occur at the IVS site, including the conversion of 6,500 ac of land, closure of Open Routes, and any resulting impacts to recreation uses or the Anza Trail corridor.

The IVS project site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would potentially have similar impacts on recreation resources in other locations.

4.12.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the ROW grant for the IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the IVS project site available for future solar development. As a result, the IVS project would not proceed. However, the site

would be available for other solar projects, which could result in similar recreation impacts compared to the IVS project.

4.12.5 Cumulative Impacts

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for recreation are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis.

Cumulative impacts to approximately 1,000,000 ac of land in the Southern California desert would result in adverse effects on recreational resources and would result in an unavoidable adverse impact. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in Southern California would occur mostly in undeveloped desert lands or areas of rural development, and therefore would not create physical divisions of established residential communities. Nonetheless, approximately 1,000,000 ac of land are proposed for solar and wind energy development in Southern California desert lands. The conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore result in a cumulative adverse impact.

Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to recreation resources less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects. Nonetheless, it should be noted that it is likely that some of the projects proposed within those 1 million acres will not be developed. Therefore, the actual amount of land that would be developed in renewable energy projects is expected to be less than 1 million acres.

The IVS project and the other Build Alternatives have the potential to diminish the public's ability to experience and understand the associated historic expedition and the cultural landscape of the period that Juan Bautista de Anza experienced. The NPS has stated that the IVS project would substantially alter the visual landscape of and around the IVS project site, particularly views from the Anza Trail corridor. Further, the NPS concludes that the IVS project has the potential to degrade the integrity of the historic character of the Anza Trail and its related resources in the vicinity of the IVS project site, particularly due to the "scale and visual impacts of the proposed project." While this is mostly an impact to the historic context of the Anza Trail, the IVS project and the other Build Alternatives still represent a cumulative change to the visual

and historic context of the Anza Trail. Therefore, the IVS project contributes to a secondary cumulative adverse impact to the recreational experience of the Anza Trail.

4.12.6 Mitigation, Project Design Features, and Other Measures

There are no measures identified to avoid or minimize the impacts of the IVS project related to the conversion of lands used for recreation to nonrecreation uses.

The following measure addresses potential effects of the IVS project on the Anza Trail corridor.

REC-1 **Juan Bautista de Anza National Historic Trail (Anza Trail) Corridor.**As recommended by the United States National Park Service (NPS), a Comprehensive Interpretive Plan for the Anza Trail will be prepared through applicant cooperation and coordination with the United States Bureau of Land Management (BLM) and the NPS. Potential components of this Plan as identified by the NPS could include, but not be limited to the following:

- New Interpretive Facilities
  - Installation of Yuha Well Wayside Exhibit
  - Additional Interpretation at the Anza Trail Overlook
  - Interpretive Exhibit at Plaster City Off-Highway Vehicle (OHV) Open Area
  - Supplement Exhibit at Sunbeam Rest Area on Interstate 8 (I-8)
- Anza Trail-Themed Exhibit at a Local Museum
- Anza Trail Interpretive Brochure
- Increase Accessibility of the BLM Yuha Desert Cultural History Anza Tour
- Re-evaluate and Complete the Anza Recreational Trail
- Historic Campsite Surveys (Archaeological Studies)
- Trail-Wide Mitigation Fund

It is assumed that the resources provided by the applicant that are required to prepare and implement the final Comprehensive Interpretive Plan and its

components would be roughly proportionate to the degree of impact of the IVS project on the Anza Trail.

4.12.7 Summary of Impacts

Table 4-55 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to recreation resources.

As shown in Table 4-55, the following unavoidable adverse impacts to recreation would occur if the IVS project was implemented and to a slightly lesser extent if the Agency Preferred Alternative or one of the other three Build Alternatives were to be implemented:

- The conversion of 6,140 ac of public land to support the project's components and activities would directly disrupt current recreational activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of these lands by closing designated Open Routes.

- Because the IVS project would result in closure of OHV access routes on the IVS project site, the IVS project would result in adverse land use and planning impacts to recreation opportunities on the site as envisioned in the CDCA Plan and the WECO amendment.

- Cumulative impacts to approximately 1,000,000 ac of land in the Southern California desert would result in adverse effects on recreational resources and would result in an unavoidable adverse impact. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in Southern California would occur mostly in undeveloped desert lands or areas of rural development, and therefore would not create physical divisions of established residential communities. Nonetheless, approximately 1,000,000 ac of land are proposed for solar and wind energy development in Southern California desert lands. The conversion of these lands would preclude numerous existing land uses (including recreation, wilderness, rangeland, and open space) and therefore would result in a cumulative adverse impact.

- The IVS project and any of the other Build Alternatives represent a cumulative change to the visual and historic context of the Anza Trail. Therefore, the IVS project contributes to a secondary cumulative adverse impact to the overall recreational experience of the Anza Trail by adding modern development in the viewscape.

Table 4-55 Summary of Recreation Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	• Impacts to OHV Open Routes. • Vicinity impacts to the Anza Trail Corridor historic context. • Cumulative impacts to recreational opportunities in the California desert.	*REC-1:* Comprehensive Interpretive Plan for the Anza Trail	The IVS project would result in unavoidable adverse impacts after mitigation related to: The conversion of over 6,000 ac of land would disrupt current recreational activities in established Federal, State, and local recreation areas which would result in adverse effects on recreational users of these lands. Adverse land use and planning impacts to recreation opportunities on the site as envisioned in the CDCA Plan and the WECO amendment. A cumulative change to the visual and historic context of the Anza Trail to the overall recreational experience of the Anza Trail.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	Same as the IVS project.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
300 MW Alternative	Impacts would be the same as for Phase I of the IVS project on approximately 2,600 ac. Therefore, the impacts would only occur on the west half of the project site and would be reduced accordingly, including reduced adverse impacts on the Anza Trail corridor compared to the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #1 Alternative	The conversion of 4,690 ac of land to support the components and activities associated with this Alternative would disrupt less land than under the IVS project and the Agency Preferred Alternative. The impacts to the Anza Trail would be the same as or similar to the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #2 Alternative	The conversion of 3,153 ac of land to support the components and activities associated with this Alternative would disrupt less land than under the IVS project and the Agency Preferred Alternative. This Alternative would be on the central part of the project site and would likely result in reduced adverse	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
	impacts on the Anza Trail corridor compared to the IVS project and the Agency Preferred Alternative.		
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	The site would be available for other solar projects, which could result recreation impacts similar to those under the IVS project and the Agency Preferred Alternative.	Potentially the same as the IVS project and the Agency Preferred Alternative.	Not determined, but potentially the same as or similar to the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: ac = acres; Anza Trail = Juan Bautista de Anza National Historic Trail; CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; OHV = off-highway vehicle; ROW = right-of-way; WECO = Western Colorado Desert Routes of Travel Designations.

4.13 Socioeconomics and Environmental Justice

This socioeconomics impact analysis evaluates project-induced changes on community services and/or infrastructure, and related community issues such as environmental justice. This section also discusses the estimated beneficial impacts of the construction, operation, and decommissioning of the IVS Project and other related socioeconomic impacts.

4.13.1 Methodology

A socioeconomic analysis looks at beneficial impacts from construction and operation spending, and property and sales taxes, as well as potentially adverse impacts on housing, schools, and public services. To determine whether a project would have adverse impacts, this section analyzes whether the current status of these community services and capacities can absorb the project-related impacts in each of these areas. If the project's impacts could appreciably strain or degrade these services, the project is considered to result in a substantial adverse impact and mitigation is provided to reduce the impact.

In this analysis, a fixed percentage criterion was used for determining the presence of a minority or low-income population for environmental justice. Impacts on housing, schools, emergency medical services, law enforcement, parks and recreation, and cumulative impacts are based on professional judgments or input from local and state agencies. Substantial employment of people coming from regions outside the study area has the potential to create substantial adverse socioeconomic impacts.

The BLM must consider environmental justice in its decision-making process if its actions have an impact on the environment, environmental laws, or policies. Such actions that require environmental justice consideration may include:

- Adopting regulations;
- Enforcing environmental laws or regulations;
- Making discretionary decisions for actions that affect the environment;
- Providing funding for activities affecting the environment; and
- Interacting with the public on environmental issues.

In considering environmental justice in energy siting cases, a demographic screening analysis was used to determine whether a low-income and/or minority population exists within the area potentially affected by the project. The demographic screening is based on information in *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, December 1997) and *Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (United States Environmental Protection Agency, April 1998). The screening process relies on 2000 United States Census data to determine the presence of minority and below-poverty-level populations in the IVS project area.

4.13.2 Definition of Resource

Minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of environmental justice, is identified when the minority population of the potentially affected area is greater than 50 percent of the total population or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis.

4.13.3 Applicable Regulations, Plans, and Policies/Management Goals

Construction, operation, and decommissioning of the proposed IVS Project would not cause, a direct, indirect, or cumulative adverse socioeconomic impact on study area housing, schools, parks and recreation, law enforcement, and emergency services. Socioeconomic impacts of the IVS project would not combine with impacts of any past, present, or reasonably foreseeable local projects to result in cumulatively considerable local impacts. Therefore, there are no socioeconomic environmental justice issues related to this project. The IVS Project, as proposed, is consistent with applicable Socioeconomic LORS provided in Table 3-22. Therefore, construction, operation, and decommissioning of the IVS Project would comply with all applicable Federal and state LORS.

4.13.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four

applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.13.4.1 IVS Project: 750 MW Alternative

Induce Substantial Population Growth

For this analysis, “induce substantial population growth” is defined as workers permanently moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the IVS project would induce population growth, the availability of the local workforce and the population in the region was analyzed. “Local workforce” is defined as Imperial, San Diego, Riverside, and San Bernardino Counties. Construction workers beyond a 2 hour commute (either in- or out-of-state) would likely relocate for the workweek but would return to their primary residences and families on weekends.

The Imperial, San Diego, Riverside, and San Bernardino labor market areas were used for evaluation of construction worker availability and Imperial County was evaluated for community services and infrastructure impacts from construction of the IVS project.

Project construction is expected to occur over a 40 month period. The greatest number of construction workers (peak) would occur in the 7th month of construction. The number of construction workers would range from about 101 in the first month of construction to approximately 731 workers at peak construction. There would be an average of 360 workers per month during construction.

Table 4-56 shows that total labor by skill, in Imperial, San Diego, Riverside, and San Bernardino labor market areas, with annual averages for 2009, is adequate when compared to the IVS project needs. Peak construction activity would employ approximately 731 workers and represents less than 1 percent of the Imperial, San Diego, Riverside, and San Bernardino Counties labor market areas.

Table 4-56 2009 Construction Total Labor by Skill in Imperial, San Diego, Riverside, and San Bernardino Counties

Occupational Title	Annual Average 2009	Maximum Needed Per Month for IVS
Carpenters	55,075	47
Concrete Crews	8,840	46
Electricians	13,980	113
Ironworkers	760	48
Laborers	38,255	142
Miscellaneous Crews	N/A	10
Operators	8,675	86
Plumbers	12,550	26
IVS Technicians	N/A	32
SunCatchers Assemblers	N/A	64
SunCatchers Electricians	13,980	16
SunCatchers Ironworkers	760	32
SunCatchers Laborers	38,255	16
SunCatchers Material Handlers	N/A	16
SunCatchers Operators	8,675	8
SunCatchers Teamsters	32,265	12
SunCatchers Technicians	N/A	32
Teamsters	32,265	60
Technicians	N/A	5

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: IVS = Imperial Valley Solar; N/A = Not Available.

Because the majority of the construction workforce currently resides within Imperial, San Diego, San Bernardino, and Riverside Counties, construction, operation, and decommissioning of the project would have little impact with respect to inducing substantial population growth. For operations, the workforce is modest (164 workers) and most would reside in Imperial, San Diego, San Bernardino, and Riverside Counties. The decommissioning workforce would likely total the peak number of construction workforce. Inducement of substantial population growth either directly or indirectly by the IVS project would not be adverse.

Housing Supply

As shown reported by the California Department of Finance (CD, E 5 Population and Housing Estimates for Cities, Counties and the State, 2001 to 2008, with 2000 Benchmark. Sacramento, California, May 2008), the housing supply in the four-county area is more than adequate should some project construction or operation workers choose to relocate to the area. For example, housing units (single- and multiple-family, and mobile homes) in Imperial County

(unincorporated and incorporated) totaled about 55,600 units with an overall vacancy rate of 11 percent; Riverside County was about 775,000 units with an overall 13 percent vacancy rate; San Bernardino County was about 686,000 units with an overall 12 percent vacancy rate; and San Diego County had about 1,140,000 units with an overall 4.4 percent vacancy rate.

Housing, should it be required for a percentage of the construction and operation workforces, would likely be within a 1- to 2 hour commute of the IVS project site. Therefore, adequate housing exists and no new housing construction would be required. Because of the large labor force within commuting distance of the IVS project site, it is anticipated the majority of construction workers would commute to the site daily from their existing residences. No new housing construction would be required.

Displace Existing Housing and Substantial Numbers of People

The IVS project site is in the eastern section of Imperial County's Ocotillo/Nomirage PA. As cited in the Ocotillo/Nomirage Community Area Plan, "Due to water constraints, it is not anticipated the Ocotillo/Nomirage Community Area will experience a substantial amount of population growth."

Because the IVS project site is predominately Federal land and does not currently contain any housing, it would not displace existing housing. Private lands in the IVS project site are zoned for Open Space use. Few residences are present in the area, and no inhabited residence would be displaced as a result of the IVS project. Therefore, the IVS project would not displace any people or necessitate construction of replacement housing elsewhere.

Result in Substantial Physical Impacts to Government Facilities or Services

As discussed under the individual service subject headings below, the IVS project would not cause substantial impacts to service ratios, response times, or other performance objectives relating to emergency medical services, law enforcement, or schools. Fire protection, including the applicant's proposed on-site Fire Protection and Prevention Plan, is analyzed in Section 4.6, Fire and Fuels.

Emergency Medical Services

The IVS project site is in a remote area in Imperial County. The nearest hospital is El Centro Regional Medical Center, in El Centro, about 15 mi from the site with an estimated 14 minute

response time. Additional emergency medical service would be provided by Pioneers Memorial Healthcare, a full-service facility about 28 mi northeast of the project site in the City of Brawley.

Including emergency services provided by Imperial County Emergency Medical Services (EMS) Area 1 and a full-time fire station and advanced life support ambulance station in Ocotillo, there are seven life-support ambulances in the area with a proposal for additional EMS near the City of Imperial, about 20 mi away. The El Centro Fire Department and the Imperial County Public Health and Emergency Services indicated there is adequate capacity of local EMS to accommodate construction and operation of the IVS project.

The estimated response time for the Ocotillo/Nomirage PA is 10 to 25 minutes. In the event of a life threatening injury, air support would be directed through the Imperial County Sheriff's Department. Air support would be provided by Reach Air, which has major trauma treatment capability. Emergency air lift services can be provided locally in the City of Brawley, in San Diego County, and from as far away as Yuma, Arizona, depending on the availability of emergency air response equipment and crews.

The proposed IVS project safety procedures and employee training would minimize potential unsafe work conditions and the need for outside emergency medical response. The emergency medical services described above would be adequate during construction and operation. Therefore, the IVS project would not require construction of new or physically altered emergency medical facilities.

Law Enforcement

The Imperial County Sheriff's Department would provide police protection and public safety services (traffic and neighborhood police control, emergency calls, and crime prevention) to the IVS project site during construction and operation. The Sheriff's Department has an office in El Centro, 14 mi from the IVS project site. The Sheriff's Department has 229 full time employees with 111 sworn officers and 36 vehicles. Additional response support could be supplied by other patrols in the county and the California Highway Patrol (CHP). The level of crime in the IVS project area is low relative to other locations in Imperial County.

The IVS project is not expected to impact criminal activity, traffic, or crowd control, from a population perspective, because most of the construction labor force would be local. For the operations phase, the total workforce is modest (164 workers), with most coming from the 4-county area within commuting distance of the IVS project site. The IVS project would include appropriate site security measures during construction (fencing) and operation (24 hour site security monitoring in a control room via closed-circuit television and intercom system, security fencing, 24 hour security officers and off-site emergency response teams for after hour

emergencies) which would minimize the potential need for Imperial County Sheriff's Department assistance.

In comparison to residential or commercial uses, power plants do not attract large numbers of people and therefore require little in the way of law enforcement. Because of this and the proposed on-site safety and security measures, the existing law enforcement resources would be adequate to provide services to the IVS project during construction and operation. Therefore, the IVS project would not require new or physically altered law enforcement facilities.

Education

For the 2008 2009 school year, Imperial Unified School District (IUSD) had six schools and a total of 3,602 students in its service area which includes the IVS project site.

The construction workforce from Imperial, San Diego, San Bernardino, and Riverside Counties would be more than adequate to serve construction needs. This workforce would commute either daily or weekly to the site. Due to the commuting habits of construction workers, it is not expected any construction workers would relocate their families to the area. Therefore, the construction of the IVS project would not require construction of new or physically altered school facilities.

A total of 164 workers are needed to operate the IVS project. The operation workforce is expected to come from the surrounding areas and no operation workers are expected to relocate with their families. However, if all 164 operation workers were to relocate to within the IUSD service area, an average family size of 3.32 persons per household (United States Census Bureau, Household and Families, 2000 for Imperial County) would result in the addition of about 217 children to the local schools. Under this worst-case scenario, the IUSD could easily accommodate this number of additional students. Although the IUSD local schools are currently at capacity, the IUSD expects additions to enrollment based on projected growth rates and expected development. The IUSD indicated that it would be able to accommodate growth resulting from the IVS project and other projects at its existing schools. Therefore, operation of the IVS project would not require construction of new or physically altered school facilities.

Like all school districts in the state, the IUSD is entitled to collect school impact fees for new construction within its service area under the California Education Code Section 17620. These fees are based on a project's square feet of industrial space. The Main Services Complex of the IVS project, which would be considered industrial space, would be constructed largely on BLM land, with only a small amount private land affected. Therefore, the provisions of Education Code Section 17620 may apply to the private lands within the IVS project site but not to BLM lands.

Increase the Use of Existing Recreation Facilities

The Imperial County Parks and Recreation Department maintains a variety of community parks, off-road parks, and special activities throughout the County. The community parks amenities include swimming pools, picnic tables, baseball/softball fields, basketball courts, community centers, playgrounds, walking trails, and barbeques.

Given the existing labor force within a 2-hour commuting time of the IVS project site, it is not anticipated that employees would relocate to the immediate area. There are a number and variety of parks in the regional area. The IVS project would not require construction of new parks or substantially increase the use of existing parks. Therefore, the construction and operation workforce for the IVS project would not have a substantial adverse impact on County-owned parks and recreation facilities.

Public Benefits

Noteworthy public benefits of the IVS project include the direct, indirect, and induced impacts of the project. The dollars spent on or resulting from the construction and operation of the IVS project would have a ripple effect on the local economy. This ripple effect is measured by an input-output economic model. The model relies on a series of multipliers to provide estimates of the number of times each dollar of input or direct spending cycles through the economy in terms of indirect and induced output, or additional spending, personal income, and employment.

The IVS project would require workers, supplies, and services for the life of the project. Employees would use salaries and wages to purchase goods and services from other businesses. Those businesses make their own purchases and hire employees, who also spend their salaries and wages throughout the local and regional economy. This effect of indirect (jobs, sales, and income generated) and induced (employees' spending for local goods and services) spending continues with subsequent rounds of additional spending, which is gradually diminished through savings, taxes, and expenditures made outside the area. For this analysis, direct impacts were said to exist if the IVS project resulted in permanent jobs and wages; indirect impacts, if jobs, wages, and sales resulted from project construction; induced impacts, from the spending of wages and salaries on food, housing, and other consumer goods. The economic benefits of the IVS project are shown in Table 4-57.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply will not result in differences in impacts related to socioeconomics compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

Table 4-57 Economic Data and Information

Estimated Project Costs	$1.14 billion
Estimate of Locally Purchased Materials:	
Construction	$2.41 million
Operation (Operation and Maintenance)	$7.4 million annually
Estimated Annual Property Taxes	None – The IVS project is expected to be allowed a 100 percent property tax exemption as part of Section 73 of the California Revenue and Tax Code for solar energy systems. Also, it is primarily on Federal land managed by the BLM which is exempt from local property taxes. Because of AB 1451, if the California property tax exemption for solar energy systems is not renewed when it expires during the 2015–2016 fiscal year, then the project's property tax on private land would be $840,750 annually.
Estimated School Impact Fees	None – the "industrial square footage" of the project would be constructed on Federal land managed by the BLM.
Estimated Direct Employment:	
Construction (average)	360 workers (average per month)
Operation	164 workers
Secondary Impacts (Indirect and Induced)	
Construction	314 workers
	$13,021,074
	$39,815,155
Operation (Phase 2):	
Employment	77 workers
Income	$3,410,893
Output	$9,984,482
Estimated Payroll (three-county area of Imperial, San Diego, and Riverside Counties):	
Construction	$42.1 million total
Operation	$8,924,810 annually
Estimated Sales Taxes:	
Construction	$623,100
Operation	$387,500 annually
Existing Unemployment Rate	25.1% in March 2009 for Imperial County (not seasonally adjusted) and 11.5% in March 2009 for California (not seasonally adjusted)
Percent Minority Population (6 mile radius)	81.27%
Percent Poverty Population (6 mile radius)	11%

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table General Note: Table 4-57 uses 2008 dollars for total project costs. Construction would be for 40 months and the project's life is planned for 40 years. Unemployment information is for Imperial County. Population is for a 6-mile radius from the power plant.

4.13.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alterative would result in short- and long-term socioeconomic impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site and would include the construction and operation of slightly fewer SunCatchers compared to the IVS project. As a result, the socioeconomic effects associated with the construction, operation, and decommissioning of the Agency Preferred Alternative would be very similar to those impacts under the IVS project.

The impacts of the four applicant-proposed modifications related to socioeconomics would be the same under the Agency Preferred Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.13.4.3 300 MW Alternative

Similar to the IVS project, the 300 MW Alternative would not adversely impact socioeconomic resources. With an approximately 60 percent reduction in the project compared to the IVS project, any socioeconomic impact would also be proportionately less. Construction activities would be reduced, resulting in a shorter overall construction schedule, fewer tax benefits to local governments, and less local spending. Similar to the IVS project, no substantial adverse impacts would result from construction and operation of the 300 MW Alternative. The benefits of the IVS project to the local economy would be somewhat reduced due to the smaller scale of the 300 MW Alternative compared to the IVS project.

The impacts of the four applicant-proposed modifications related to socioeconomics would be the same under the 300 MW Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.13.4.4 Drainage Avoidance #1 Alternative

The impacts of the Drainage Avoidance #1 Alternative would be very similar to impacts of the IVS project, but slightly reduced due to the smaller number of SunCatchers under Drainage Avoidance #1 Alternative. Construction activities would be reduced, resulting in a shorter overall construction schedule, fewer tax benefits to local governments, and less local spending. Similar to the IVS project, no substantial adverse impacts would result from construction, operation, or decommissioning of the Drainage Avoidance #1 Alternative. The benefits of the IVS project to

the local economy would be somewhat reduced due to the smaller scale of the project under the Drainage Avoidance #1 Alternative.

The impacts of the four applicant-proposed modifications related to socioeconomics would be the same under the Drainage Avoidance #1 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.13.4.5 Drainage Avoidance #2 Alternative

The impacts of the Drainage Avoidance #2 Alternative would be very similar to impacts of the IVS project, but slightly reduced due to the smaller number of SunCatchers under the Drainage Avoidance #2 Alternative. Construction activities would be reduced, resulting in a shorter overall construction schedule, fewer tax benefits to local governments, and less local spending. Similar to the IVS project, no substantial adverse impacts would result from construction, operation, or decommissioning of the Drainage Avoidance #2 Alternative. The benefits of the IVS project to the local economy would be somewhat reduced due to the smaller scale of the project under the Drainage Avoidance #2 Alternative.

The impacts of the four applicant-proposed modifications related to socioeconomics would be the same under the Drainage Avoidance #2 Alternative as described earlier for the IVS project because this alternative would result in construction and operation activities similar to the IVS project relative to those four proposed modifications.

4.13.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the right-of-way (ROW) grant and would not amend the *California Desert Conservation Area Plan* (CDCA Plan; 1980, as amended). As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing land use designation for the site in the CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, none of the construction or operation benefits of the IVS project would occur under this No Action Alternative. However, the site would become available to other uses that are consistent with the CDCA Plan and those uses may or may not provide the types of benefits

that would occur under a solar Build Alternative. In addition, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects would be expected to have similar impacts in other locations.

4.13.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grant and would also amend the CDCA Plan to make the IVS project site unavailable for future solar development. As a result, no solar energy project would be constructed on the site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because the CDCA Plan would be amended to make the site unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, none of the construction or operation benefits of the IVS project would occur under this No Action Alternative. However, the site would become available to other uses that are consistent with the CDCA Plan and those uses may or may not provide the types of benefits that would occur under a solar Build Alternative. In addition, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects would be expected to have similar impacts in other locations.

4.13.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant but would amend the CDCA Plan to allow for other solar projects on the IVS project site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, socioeconomic impacts and benefits under this No Action Alternative would be similar to the benefits under the IVS project. As such, this No Action Alternative could result in socioeconomic benefits similar to the benefits under the IVS project.

4.13.5 Cumulative Impacts

Cumulative impacts can occur if implementation of the IVS project could combine with those of other local or regional projects. The geographic extent of cumulative impacts related to socioeconomics is Imperial County. This geographic extent is appropriate because socioeconomic factors such as public services and benefits would be within Imperial County. As stated above, the geographic extent for the labor force would be Imperial, San Diego, Riverside, and San Bernardino Counties. The cumulative projects in this area were described in detail in Section 2.10, Overview of the Cumulative Impacts Analysis. Those projects include seven power plant projects with pending applications at the BLM and three other power projects in Imperial County.

Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to socioeconomics less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects.

If all those projects were under construction concurrently, they would require as many as 6,119 construction workers, which represents approximately 2.5 percent of the total construction workforce of 246,545 workers in the El Centro Metropolitan Statistical Area (MSA, in Imperial County), the San Diego-Carlsbad-San Marcos MSA (in San Diego County), and the Riverside-San Bernardino-Ontario MSA (in Riverside and San Bernardino Counties) labor market construction workforce of 246,545. The operational workforce for the cumulative projects is estimated at 760 workers in Imperial County which had an unemployment rate of about 24.5 percent in March 2009 (not seasonally adjusted).

The construction and operation of the cumulative projects and the IVS project could have substantial beneficial public impacts because they would lower the unemployment rate in Imperial County. Other cumulative benefits could include direct impacts of operations and maintenance, payroll, taxes and fees, and associated secondary impacts. In addition, no substantial adverse socioeconomic impacts on housing, schools, emergency medical services, law enforcement, parks and recreation due to an influx of construction or operation workers are anticipated under all the cumulative projects.

As a result, the IVS project is anticipated to contribute to beneficial cumulative socioeconomic effects but would not result in adverse impacts and, therefore, would not contribute to any cumulative adverse socioeconomic impacts in Imperial County.

4.13.6 Mitigation, Project Design Features, and Other Measures

Because the IVS project and the other Build Alternatives will not result in adverse impacts related to socioeconomics, no mitigation, project design features, or other measures are required.

4.13.7 Summary of Impacts

Table 4-58 summarizes the direct, indirect, short- and long term-, and cumulative adverse and beneficial effects of the IVS project, the Agency Preferred Alternative, the other build alternatives, and the No Action Alternatives related to socioeconomics.

As shown in Table 4-58, the construction, operation, and decommissioning of the IVS project would not result in direct, indirect, or cumulative adverse socioeconomic impacts on the study area's housing, schools, parks and recreation, law enforcement, and emergency services.

Table 4-58 Summary of Socioeconomics and Environmental Justice Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	No impacts related to growth, need for new housing, displacement of existing housing and residents, and government facilities and services (emergency medical services, law enforcement, education, recreation facilities). Beneficial effects related to the creation of jobs, and economic effects based on expenditures for the project. Contribution to beneficial cumulative effects but no adverse cumulative effects.	None required.	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	None required.	None.
300 MW Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	None required.	None.
Drainage Avoidance #1 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	None required.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #2 Alternative	Less than under the IVS project and the Agency Preferred Alternative because of the smaller project under this Alternative.	None required.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No impacts to growth and no beneficial effects.	None required.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No impacts to growth and no beneficial effects.	None required.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.14 Special Designations

4.14.1 Methodology

The analysis of the effects of the Imperial Valley Solar (IVS) project must comply with National Environmental Policy Act (NEPA) requirements given the United States Bureau of Land Management (BLM) land jurisdiction related to the proposed project. This analysis focuses on whether the IVS project would conflict with the management goals of any applicable special designations.

In addition, a specific farmland impact analysis model (Land Evaluation and Site Assessment [LESA] Model) was used to determine the potential project impacts on farmlands.

4.14.2 Definition of Resource

The special designations considered in this analysis are:

- Wilderness, Areas of Critical Environmental Concern (ACECs), and Special Areas; and
- Agriculture (Farmland).

These resources are described in the following sections.

Because the IVS project site does not have special designations involving certain resources, they will not be discussed further in this section. These resources are:

- Donated lands
- National Wild and Scenic Rivers
- BLM designated range allotments or pastures for wildlife or livestock
- Designated Wilderness Areas

4.14.2.1 Wilderness, Areas of Critical Environmental Concern, and Special Areas

The Wilderness Act of 1964 provided for the establishment of a National Wilderness Preservation System with areas to be designated from public lands. Public lands administered by the BLM were included for wilderness review under the Federal Land Policy and Management Act (FLPMA) of 1976. The Wilderness Act defines Wilderness Areas as follows:

> "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

ACECs are defined in the *California Desert Conservation Area Plan* (CDCA Plan) (1980, as amended) as follows:

> "An area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards."

The CDCA Plan defines Special Areas as:

> "... areas which possess rare, unique, or unusual qualities of scientific, educational, cultural, or recreational significance..."

4.14.2.2 Agriculture (Farmland)

The Natural Resource Conservation Service (NRCS), as a part of the United States Department of Agriculture, provides the following definitions of "Prime Farmland" and "Farmland of Statewide Importance:"

- **Prime Farmland:** Prime Farmland is farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date. Prime Farmland includes areas that have a developed irrigation water supply that is dependable and of adequate quality and areas that do not have such a supply. Only irrigated areas meet the Prime Farmland criteria.

There are no areas in the IVS project site designated as Prime Farmland; however, the site does include land designated as Prime Farmland if Irrigated.

- **Farmland of Statewide Importance:** Farmland of Statewide Importance is land other than Prime Farmland that has a good combination of physical and chemical characteristics for the production of crops. It must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date. It does not include publicly-owned lands for which there is an adopted policy preventing agricultural use.

There is no Farmland of Statewide Importance on the IVS site.

4.14.3 Applicable Regulations, Plans and Policies/Management Goals

4.14.3.1 Wilderness and Areas of Critical Environmental Concern

The CDCA Plan Wilderness Element management goal has the following objectives:

(1) Until congressional release or designation as Wilderness, provide protection of wilderness values so that those values are not degraded so far as to significantly constrain the recommendation with respect to an area's suitability or nonsuitability for preservation as wilderness.

(2) Provide a wilderness system possessing a variety of opportunities for primitive and unconfined types of recreation, involving a diversity of ecosystems and landforms, geographically distributed throughout the desert.

(3) Manage a wilderness system in an unimpaired state, preserving wilderness values and primitive recreation opportunities, while providing for acceptable use.

For ACECs and Special Areas, the CDCA Plan provides the following management goals:

(1) Identify and protect the significant natural and cultural resources requiring special management attention found on the BLM-administered lands in the CDCA.

(2) Provide for other uses in the designated areas, compatible with the protection and enhancement of the significant natural and cultural resources.

(3) Systematically monitor the preservation of the significant natural and cultural resources on BLM-administered lands, and the compatibility of other allowed uses with these resources.

4.14.3.2 Farmland

Farmland Protection Policy Act, 59 FR 31110

In response to a concern that the Nation's farmland was being converted from actual or potential agricultural use, Congress directed federal agencies to identify and consider the adverse effects of federal programs on the preservation of farmland. (Subtitle I, sections 1539-1549, of Title XV of the Agriculture and Food Act of 1981, Public Law 98-98, 7 U.S.C. 4201-4209.) The Farmland Protection and Preservation Act (FPPA directs federal agencies to consider alternative actions that could lessen adverse effects and assure that federal programs, to the extent practicable, are compatible with state government, local government, and private programs and policies to protect farmland. In order to assist federal agencies in the implementation of the FPPA, section 1541(a) of the Act, 7 U.S.C. 4202(a), the Department of Agriculture (DOA), in cooperation with other departments and agencies of the federal government, were directed to "develop criteria for identifying the effects of Federal programs on the conversion of farmland to nonagricultural uses." These criteria are found at 7 CFR 658.4, 658.5, and 658.7 Section 1542 of the FPPA, 7 U.S.C. 4203, also requires that each department and agency of the Federal Government review its laws, administrative rules, policies and procedures "to determine whether any provision thereof will prevent" the federal entity "from taking appropriate action to comply fully" with the FPPA, and to "develop proposals for action to

bring its programs, authorities, and administrative activities into conformity with the purpose and policy" of the FPPA.

The Federal Farmland Protection Policy Act (FPPA, Subtitle I of Title XV, Sections 1539–1549 of the Agriculture and Food Act of 1981) states the following:

> "The FPPA is intended to minimize the impact [F]ederal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that—to the extent possible—[F]ederal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every 2 years. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land."

Further, Section 658.1 of this Federal statute states the following:

> "As required by Section 1541(b) of the [Farmland Protection Policy] Act, 7 United States Code (USC) 4202(b), Federal agencies are (a) to use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland."

According to the Act, a federal agency is not expressly required to modify any project solely to avoid or minimize the effects of conversion of farmland to nonagricultural uses. However, the Act requires that, before taking or approving any action that would result in conversion of farmland as defined by the FPPA, the federal agency examine the effects of that action using the DOA criteria and, if there are adverse effects, to consider alternatives to lessen those effects. Once the agency has completed this examination, it may proceed with a project that would convert farmland to nonagricultural uses. (59 Fed.Reg.31110 (June 17, 1994).)

The FPPA regulations were promulgated principally to enable federal agencies, with the help of the NRCS, to measure the adverse effects, if any, of their programs and projects on farmland. The NRCS has developed a Farmland Conversion Impact Rating Form, Form AD-1006, for this purpose. A federal agency considering a project on or affecting farmland completes and submits a Form AD-1006 to a local NRCS office. The NRCS determines if the proposed site or sites

contain farmland subject to the FPPA, i.e., farmland that is “prime,” “unique,” or of “statewide or local importance,” as defined by the FPPA. If NRCS determines that the site or sites are not subject to the Act, NRCS returns the form to the agency with that determination noted. However, if NRCS determines that the FPPA applies, NRCS measures the “relative value” of the site or sites as farmland on a scale of 0 to 100, enters this score on the Form AD-1006 and returns the form to the federal agency. At this stage, the agency prepares a site assessment using twelve criteria set forth in the rule. After scoring each of the criteria and arriving at a total site assessment score, up to a maximum of 160 points, the agency adds this site assessment score to the “relative value” score that was supplied by the NRCS on the Form AD-1006. The higher the combined score, the more suitable the site would be for protection as farmland. On the other hand, if a site receives a combined score of less than 160 points, the regulation recommends that it be given only “a minimal level of consideration for protection” and that additional sites do not need to be evaluated as alternatives. A Land Evaluation and Site Assessment (LESA) system was used to evaluate and score the farmlands in lieu of Form AD-1006 for each Build Alternative as allowed by NRCS. The LESA results were included in Appendix ALTS-1 – LESA Model Worksheets in the SA/DEIS. This is explained in greater detail later in Section 4.14.4.1, IVS Project: 750 MW Alternative.

4.14.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.14.4.1 IVS Project: 750 MW Alternative

Wilderness, Areas of Critical Environmental Concern, and Special Areas

The IVS project site is not in or adjacent to any designated Wilderness Area. The Jacumba Mountains Wilderness is approximately 4 miles (mi) southwest of the IVS project site, and the Coyote Mountains Wilderness is approximately 7 mi northwest of the IVS project site. Therefore,

the IVS project would not affect any designated Wilderness Areas or otherwise conflict with the management goals established for Wilderness Areas in the CDCA Plan.

The Yuha Desert ACEC is directly south of Interstate 8 (I-8), and the IVS project site is north of I-8. The CDCA Plan identifies the 40,000-acre (ac) Yuha Desert ACEC as possessing prehistoric/historic and special wildlife values. The proposed IVS project will not take any land from the Yuha Desert ACEC and, because it is across I-8, it is not expected to adversely affect this ACEC in the context of its special land use designation. However, the proposed transmission line would traverse the Yuha Desert ACEC near and parallel to the existing alignment for the Southwest Powerlink transmission line. Resources in this ACEC include cultural and biological resources. Measures to avoid and/or reduce project impacts to these resources are provided in Sections 4.5 and 4.3, respectively.

Other than potential effects to the Juan Bautista de Anza National Historic Trail (Anza Trail) on and immediately adjacent to the IVS project site, the IVS project would not impact the Yuha Desert ACEC. Refer to Sections 3.5, 3.14, 3.16, 4.5, 4.14, and 4.16 for specific discussion regarding the identified values in the Yuha Desert ACEC and how the IVS project may or may not affect those values.

There are no designated Special Areas on or in the vicinity of the IVS project site. Therefore, the IVS project, the Preferred Agency Alternative, the other Build Alternatives, and the No Action Alternatives will not impact any designated Special Areas.

Farmland

Multiple governmental agencies at the Federal, State, and local level have information regarding agricultural lands on and in the vicinity of the IVS project site. The following are the various designations or categorizations of agricultural land on and in the vicinity of the IVS project site:

- **California Department of Conservation (DOC):** Under the Farmland Mapping and Monitoring Program (FMMP) mapping criteria, approximately 30 percent of the IVS project site has been mapped as “Other Land.” The rest of the site has not been surveyed by the DOC.

- **United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS):** As discussed in Section 3.14, 1,931 ac (approximately 30 percent) of the IVS project site have been surveyed by the NRCS. According to the NRCS Web Soil Survey (WSS), approximately 74 percent of the surveyed part of the IVS project site is designated as Farmland of Statewide

Importance and another approximately 25 percent is designated as Prime Farmland if Irrigated.

- **Williamson Act:** None of the IVS project site is under a Williamson Act contract.

The DOC FMMP mapping information is used to analyze impacts to important farmlands (i.e., Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) in the State. The FMMP designation for the IVS project site is "Other Land," which is a designation used for land that is not included in any other mapping category, such as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance.

Analysis of the potential impacts of the IVS project on agricultural land was conducted using the LESA Model. Although not necessarily required by NEPA, the LESA Model is a widely accepted tool that assesses the potential impacts to agricultural lands, particularly in the State of California. LESA is a term used to define an approach for rating the relative quality of land resources based on specific measurable features. The development of the California Agricultural LESA Model is the result of Senate Bill 850 (Statutes 1993, Chapter 812, Section 3) and is intended "…to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process" (Public Resources Code [PRC] Section 21095).

The California Agricultural LESA Model is composed of six different factors. Two "Land Evaluation" (LE) factors are based on measures of soil resource quality. Four "Site Assessment" (SA) factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a level of project impacts, based on the established scoring range.

The LESA Model was used to analyze the IVS project site in accordance with the detailed instructions in the LESA Model Instruction Manual. However, because the entire IVS project site has not been surveyed by the NRCS, the LESA Model score is based only on the surveyed parts of the IVS project site.

The LESA score is based on a scale of 0 to 100. The final LESA score for the IVS project site is 30.95. Because the LESA Model was developed for use in California, it describes the scores in the context of specific thresholds and levels of significance. However, NEPA does not use thresholds and levels of significance in assessing project impacts. Nonetheless, the findings of

the LESA analysis can be used to assess the level of project impacts on agricultural resources under NEPA. Based on the California Agricultural LESA thresholds,[1] a score of 30.95 would not result in adverse effects due to the permanent conversion of 1,931 ac of farmland. As a result, the conversion of agricultural land to nonagricultural uses under the IVS project would not be considered to be an adverse impact under NEPA. The completed LESA Model worksheets for the IVS project are provided in Appendix LU-1 in the Staff Assessment/Draft Environmental Impact Statement (SA/DEIS; 2010).

Further, the IVS project would be consistent with the FPPA in that the proposed project will not result in unnecessary and irreversible conversion of farmland to nonagricultural uses.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply will not result in differences in impacts related to special designations compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

4.14.4.2 709 MW Alternative: Agency Preferred Alternative

Wilderness, Areas of Critical Environmental Concern, and Special Areas

As discussed in the previous section for the IVS project, there are no Wilderness Areas or Special Areas on or in the vicinity of the IVS project site. Therefore, the Agency Preferred Alternative will not result in any impacts to those types of resources.

The transmission line in the Agency Preferred Alternative will cross the Yuha Desert ACEC on the same alignment as under the IVS project. Therefore, the Agency Preferred Alternative would impact the Anza Trail and the Yuha Desert ACEC the same as under the IVS project. The impacts of the Agency Preferred Alternative on biological and cultural resources associated with the Anza Trail and the Yuha Desert ACEC would be mitigated based on the measures provided in Sections 4.5 and 4.3, for cultural and biological resources, respectively.

[1] California LESA Model Scoring Thresholds (DOC 1997, Table 9): 0 to 39 points = Not Considered Significant; 40 to 59 points = Considered Significant (only if LE and SA subscores are each greater than or equal to 20 points); 60 to 79 points = Considered Significant (unless either LE or SA subscore is less than 20 points); 80 to 100 points = Considered Significant.

The applicant proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in impacts related to the Yuha Desert ACEC and the Anza Trail compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

Farmland

As discussed in the previous section for the IVS project, the conversion of designated agricultural land to nonagricultural uses is not considered to be an adverse impact under NEPA. Because the Agency Preferred Alternative would affect nearly the same amount of designated agricultural land, it is also considered not to result in an adverse impact under NEPA.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in impacts related to the conversion of agricultural land to nonagricultural uses compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

4.14.4.3 300 MW Alternative

Wilderness, Areas of Critical Environmental Concern, and Special Areas

The 300 Megawatt (MW) Alternative is proposed for the same site as the IVS project, but using less acreage. As a result, the 300 MW Alternative would also not result in adverse impacts to or conflict with any management goals related to any Wilderness Areas or Special Areas.

The transmission line in the 300 MW Alternative will cross the Yuha Desert ACEC on the same alignment as under the IVS project. Therefore, the 300 MW Alternative would impact the Anza Trail and the Yuha Desert ACEC the same as under the IVS project. The impacts of the 300 MW Alternative on biological and cultural resources associated with the Anza Trail and the Yuha Desert ACEC would be mitigated based on the measures provided in Sections 4.5 and 4.3 for cultural and biological resources, respectively.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in

differences in impacts related to the Yuha Desert ACEC and the Anza Trail compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

Farmland

Because the 300 MW Alternative would use only 2,600 ac (40 percent) of the IVS project site, it would result in conversion of fewer acres of designated agricultural land to nonagricultural uses. Therefore, the 300 MW Alternative would result in reduced impacts to designated farmland compared to the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in impacts related to the conversion of agricultural land to nonagricultural uses compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

4.14.4.4 Drainage Avoidance #1 Alternative

Wilderness, Areas of Critical Environmental Concern, and Special Areas

The Drainage Avoidance #1 Alternative is proposed for the same site as the IVS project, but using less acreage. As a result, the Drainage Avoidance #1 Alternative would also not result in adverse impacts to or in conflict with any management goals related to any Wilderness Areas or Special Areas.

The transmission line in the Drainage Avoidance #1 Alternative will cross the Yuha Desert ACEC on the same alignment as under the IVS project. Therefore, the Drainage Avoidance #1 Alternative would impact the Anza Trail and the Yuha Desert ACEC the same as under the IVS project. The impacts of the Drainage Avoidance #1 Alternative on biological and cultural resources associated with the Anza Trail and the Yuha Desert ACEC would be mitigated based on the measures provided in Sections 4.5 and 4.3 for cultural and biological resources, respectively.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not

result in differences in impacts related to the Yuha Desert ACEC and the Anza Trail compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

Farmland

Because the Drainage Avoidance #1 Alternative would use only 4,690 ac (72 percent) of the IVS project site, it would result in the conversion of fewer acres of designated agricultural land to nonagricultural uses. Therefore, the Drainage Avoidance #1 Alternative would result in reduced impacts to designated farmland compared to the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not result in differences in impacts related to the conversion of agricultural land to nonagricultural uses compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

4.14.4.5 Drainage Avoidance #2 Alternative

Wilderness, Areas of Critical Environmental Concern, and Special Areas

The Drainage Avoidance #2 Alternative is proposed for the same site as the IVS project, but using less acreage. As a result, the Drainage Avoidance #2 Alternative would also not result in adverse impacts to or in conflict with any management goals related to any Wilderness Areas, Special Areas, or ACECs.

The transmission line in the Drainage Avoidance #2 Alternative will cross the Yuha Desert ACEC on the same alignment as under the IVS project. Therefore, this alternative would impact the Anza Trail and the Yuha Desert ACEC the same as under the IVS project. The impacts of the Drainage Avoidance #2 Alternative on biological and cultural resources associated with the Anza Trail and the Yuha Desert ACEC would be mitigated based on the measures provided in Sections 4.5 and 4.3, for cultural and biological resources, respectively.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in differences in impacts related to the Yuha Desert ACEC and the Anza Trail compared

to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

Farmland

Because the Drainage Avoidance #2 Alternative would use only 3,153 ac (49 percent) of the IVS project site, it would result in the conversion of fewer acres of designated agricultural land to nonagricultural uses. Therefore, the Drainage Avoidance #2 Alternative would result in reduced impacts to designated farmland compared to the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in differences in impacts related to the conversion of agricultural land to nonagricultural uses compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and be in the same general locations as these facilities as evaluated for the original IVS project.

4.14.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the proposed IVS project would not be approved by the BLM, and BLM would not execute a right-of-way (ROW) grant or amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing CDCA Plan.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance. As a result, this No Action Alternative would not result in any impacts to Wilderness Areas, Special Areas, ACECs, or designated agricultural lands. Although the IVS project site could be developed in other uses consistent with the CDCA Plan, they would likely not result in impacts related to Wilderness Areas, Special Areas, or ACECs, but those uses could result in the conversion of agricultural land on the IVS project site to nonagricultural uses. In addition, under this No Action Alternative, other renewable energy projects may be developed on other sites to meet State and Federal mandates, and those projects could have similar impacts in other locations.

4.14.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the proposed IVS project would not be approved by the BLM, and the BLM would not execute a ROW grant. However, the BLM would amend the CDCA Plan to prohibit any solar projects on the site. As a result, the site would remain as it currently exists. Because there would be no solar project on the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance, and would continue to be managed consistent with the CDCA Plan. As a result, this No Action Alternative would not impact Wilderness Areas, Special Areas, ACECs, or designated agricultural lands. Although the IVS project site could be developed in other uses consistent with the CDCA Plan under this No Action Alternative, those uses would likely not result in impacts related to Wilderness Areas, Special Areas, or ACECs, but those uses could result in the conversion of agricultural land on the IVS project site to nonagricultural uses. In addition, under this No Action Alternative, other renewable energy projects may be developed on other sites to meet State and Federal mandates, and those projects could have similar impacts in other locations.

4.14.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the proposed IVS project would not be approved by the BLM, and the BLM would not execute a ROW grant. However, the BLM would amend the CDCA Plan to allow future solar projects on the IVS project site. As a result, the site would remain as it currently exists until such time as the BLM receives a ROW grant application for another solar project on the site. Until such time, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no land disturbance, and would continue to be managed consistent with the CDCA Plan. In either case, similar to the IVS project, this No Action Alternative would not result in any impacts to Wilderness Areas, Special Areas, or ACECs, but could result in the conversion of agricultural land on the IVS project site to nonagricultural uses.

4.14.5 Cumulative Impacts

The IVS project, Agency Preferred Alternative, and the other Build Alternatives will all result in the permanent conversion of designated agricultural lands to nonagricultural uses. This is an unavoidable adverse impact of those alternatives. Other projects described in Section 2.10, Overview of the Cumulative Impacts Analysis, would also result in the permanent conversion of

agricultural lands to nonagricultural uses. Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to the conversion of agricultural land to nonagricultural uses less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects. As a result, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will contribute to cumulative unavoidable adverse impacts related to the permanent conversion of agricultural lands to nonagricultural uses.

The IVS project, the Agency Preferred Alternative, and the other Build Alternatives will all result in adverse impacts to the Yuha Desert ACEC and the Anza Trail. The other cumulative projects may result in result in adverse impacts to the Yuha Desert ACEC and/or the Anza Trail, less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects. As a result, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will contribute to cumulative adverse impacts to the Yuha Desert ACEC and the Anza Trail.

Because the IVS project, the Agency Preferred Alternative, and the Build Alternatives would not have impacts on Wilderness Areas or Special Areas, the project would not contribute to cumulative impacts on any resources with these special designations.

4.14.6 Mitigation, Project Design Features, and Other Measures

The IVS project and the other Build Alternatives would not result in impacts to Wilderness Areas or Special Areas. Therefore, no mitigation is required.

The IVS project and the other Build Alternatives will result in adverse impacts to the Yuha Desert ACEC and the Anza Trail. Impacts to biological and cultural resources associated with the Yuha Desert ACEC and the Anza Trail would be mitigated based on the measures provided in Sections 4.3 and 4.5 for biological and cultural resources, respectively.

The IVS project and the other Build Alternatives would result in the conversion of designated agricultural land on the IVS project site to nonagricultural uses. There is no mitigation identified to avoid or minimize this impact.

4.14.7 Summary of Impacts

Table 4-59 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to special designations.

As shown in Table 4-59, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would not result in any unavoidable adverse impacts related to Wilderness Areas, Special Areas, and designated agricultural lands.

Table 4-59 Summary of Special Designations Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	No impacts related to Wilderness Areas, Areas of Environmental Concern or Special Areas. Conversion of designated agricultural land to nonagricultural uses; not considered an adverse impact.	None required.	None.
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	None required.	None.
300 MW Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
Drainage Avoidance #1 Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
Drainage Avoidance #2 Alternative	Same as the IVS project and the Agency Preferred Alternative.	None required.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No impacts related to Wilderness Areas, Areas of Environmental Concern or Special Areas. Would not result in the conversion of less designated agricultural land to nonagricultural uses.	Same as the IVS project and the Agency Preferred Alternative.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No impacts related to Wilderness Areas, Areas of Environmental Concern or Special Areas. Would not result in the conversion of designated agricultural land to nonagricultural uses.	None required.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Not expected to impact Wilderness Areas, Areas of Environmental Concern or Special Areas. May result in the conversion of less designated agricultural land to nonagricultural uses; not considered an adverse impact.	None required.	None.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

4.15 Traffic and Transportation

The direct and indirect impacts of the proposed Imperial Valley Solar (IVS) project on the transportation system in the vicinity of the project site are discussed in this section. The assessment of transportation-related impacts is based on evaluations and technical analysis comparing the pre-IVS project conditions to the post-IVS project conditions.

4.15.1 Methodology

4.15.1.1 Overview

The potential traffic Impacts of the IVS project were assessed for two separate future year scenarios: construction year (2010) and IVS project opening year (2017). The IVS project would generate approximately 10 times more daily traffic during the peak construction period than during operation. Traffic during the decommissioning period would be expected at a level between those during operation and construction, and likely closer to the operation levels.

The existing traffic volumes were increased to account for future growth in background traffic volumes unrelated to the IVS project, based on input from the Imperial County Traffic Engineer and consistent with other studies in the area. Other planned projects in the vicinity of the IVS project site were determined to contribute to both 2010 and 2017 traffic levels; therefore, trips from those planned projects were added to the future traffic volumes for those years.

The direct and indirect impacts of the IVS project are addressed for the modes of travel described in Section 3.15, Traffic and Transportation.

The levels of service (LOSs) applicable to the study area roads are:

- LOS D or better conditions on State of California highways
- LOS C or better conditions on an Imperial County roadways

The National Environmental Policy Act (NEPA) does not provide any standards specific to transportation. This analysis is in accordance with 40 Code of Federal Regulations (CFR) Section 1502.15 for the project effects on traffic and transportation issues. For this analysis, the IVS project was determined to result in adverse traffic impacts if it causes intersection operations to exceed the accepted LOS standards on a State or County road or if it is

incompatible with the applicable laws, ordinances, regulations and standards (LORS) related to traffic and transportation.

4.15.1.2 Construction Impacts

The potential traffic impacts associated with construction of the IVS project were evaluated for construction workforce traffic and construction truck traffic.

To determine the amount of construction workforce vehicle trips to the IVS project site during peak construction, it was assumed that workers would commute alone during the morning and afternoon peak intervals (7 to 9 AM and 4 to 6 PM). The average number of construction workers during the peak one month period was used for that analysis.

Based on regional demographics and the availability of skilled laborers, it is expected that 90 percent of the construction employees would reside in southern California. During construction, it is anticipated that construction workers and technical workers would reside in temporary housing or apartments during the week. The temporary housing is expected to be in the El Centro area.

To reach the IVS project site, it was assumed construction workers traveling from the east and west would primarily use I-8 (65 percent from the east and 15 percent from the west). The remaining trips would use Evan Hewes Highway, with 15 percent traveling from the east and 5 percent traveling from the west. These are reasonable assumptions because they are the most direct routes to the IVS project site.

The total peak construction traffic (workforce and trucks) was estimated per peak hour. The peak construction increase in traffic was compared to existing volumes on the study area roads. The peak hour levels of service (LOS) were compared to existing LOSs.

The analysis of potential construction related impacts also considered the following:

- Impacts on road surfaces
- Impacts relate to parking availability and capacity
- Impacts related to emergency services access
- Impacts related to water, rail, and air traffic facilities and services
- Transport of hazardous materials

4.15.1.3 Operation Impacts

The analysis of the project operations analyzed the same potential types of impacts as for construction impacts, related to the effects of operations related vehicle traffic on the LOS on area roads; parking availability and capacity; emergency services access; water, rail and air traffic facilities and services; and the transport of hazardous materials.

4.15.2 Definition of Resource

The traffic and transportation system evaluated here includes consideration of:

- Paved and unpaved roads of varying classifications on and in the vicinity of the project site as described in detail in Section 3.15, Traffic and Transportation
- Parking availability and capacity
- Emergency services access
- Water, rail, and air traffic
- Transport of hazardous materials

4.15.3 Applicable Regulations, Plans, and Policies/Management Goals

The conformance of the IVS project with the transportation LORS is provided in Table 4-60.

4.15.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

Table 4-60 Traffic and Transportation Laws, Ordinances, Regulations, and Standards Compliance

Applicable LORS	Description
Federal	
Code of Federal Regulations Part 77, Federal Aviation Administration Regulations	Implements standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the FAA of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace. **Consistent:** The IVS project is not located within 20,000 feet of an airport.
Code of Federal Regulations Title 49, Sections 171-177, Sections 350-399 and Appendices A-G	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles who operate on public highways. **Consistent:** Enforcement is conducted by state and local law enforcement agencies, and through state agency licensing and ministerial permitting (e.g., California Department of Motor Vehicles licensing, Caltrans permits), and/or local agency permitting (e.g., County of Imperial). HAZ-3 requires the owner to develop and implement a Safety Management Plan related to hazardous materials.
State	
California Vehicle Code Division 2, Chapter 2.5, Division 6, Chapter 7, Division 13, Chapter 5, Division 14.1, Chapter 1 and 2, Division 14.8, Division 15	Includes regulations pertaining to licensing, size, weight and load of vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials. **Consistent:** Enforcement is provided by state and local law enforcement agencies, and through ministerial state agency licensing and permitting, and/or local agency permitting.
California Streets and Highways Code Division 1 and 2, Chapter 3 and Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits. **Consistent:** Enforcement is provided by state and local law enforcement, and through ministerial state agency licensing and permitting, and/or local agency permitting.
Local	
County of Imperial General Plan Circulation and Scenic Highways Element	Requires that developments contribute positively to the County's transportation network and that negative impacts are reduced. For example, requirements include new developments provide local roads to serve the needs of the development, future construction does not interfere with present and potential highway and right-of-way needs, and

Applicable LORS	Description
	freight loading/unloading does not occur on public roadways. In addition, construction of private streets in developments is allowed. **Consistent:** The IVS project is consistent because it includes paved access to County roadways, provides off-street parking for new development, ensures LOS C conditions or better on the applicable local roads, and provides on-site freight loading/unloading. In addition, the IVS project is consistent as it provides internal (private) roadways for on-site access.

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

4.15.4.1 IVS Project: 750 MW Alternative

Construction Impacts

Traffic Impacts

To determine the amount of construction workforce vehicle trips to the IVS project site during peak construction, it was assumed that workers would commute alone during the morning and afternoon peak intervals (7 to 9 AM and 4 to 6 PM). The average number of construction workers for the IVS project would be approximately 731 during the peak one month period (expected to occur at month seven of the 40 month construction schedule).

The total peak construction traffic (workforce and trucks) for the IVS project would be 758 vehicle trips (731 workers plus 27 trucks) per peak hour. The peak construction increase in traffic would represent a noticeable change when compared to existing conditions, particularly on Dunaway Road between the IVS project site driveway and I-8. Traffic volumes would increase from existing daily traffic volume of 780 vehicles to 2,240 vehicles during the construction year. While the percentage increase is substantial, the road would not be congested because as the road capacity is approximately 10,000 vehicles per day (vpd).

Table 4-61 identifies the expected change in daily traffic volumes on the study area roads during the peak construction period for the IVS project.

Table 4-62 summarizes the level of service (LOS) on the study area road segments in 2010 with and without the IVS project construction traffic.

Table 4-61 Comparison of Construction Year 2010 Traffic on Study Area Roads

Roadway Segment	Existing ADT	2010 ADT w/o Project	2010 ADT with Project	Percent Change Associated with Project
I-8 west of Imperial Highway	15,300	16,830	17,245	3%
I-8 east of Dunaway Road	13,400	14,740	15,940	8%
SR-98 west of Imperial Highway	1,500	1,575	1,590	1%
Imperial Highway: north of SR-98	315	330	365	11%
Evan Hewes Highway east of Imperial Highway	1,250	1,300	1,535	18%
Evan Hewes Highway west of Dunaway Road	515	535	1,170	119%
Dunaway Road: north of I-8 westbound ramps	780	810	2,240	176%

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: ADT = average daily traffic; I-8 = Interstate 8; SR-98 = State Route 98.

Table 4-62 Construction Year (2010) Road Segment Levels of Service

Roadway Segment	Existing ADT	Existing LOS	2010 w/o Project ADT	2010 w/o Project LOS	2010 with Project ADT	2010 with Project LOS
I-8 west of Imperial Highway	15,300	A	16,830	A	17,245	A
I-8 east of Dunaway Road	13,400	A	14,740	A	15,940	A
SR-98 west of Imperial Highway	1,500	A	1,575	A	1,590	A
Imperial Highway north of SR-98	315	A	330	A	365	A
Evan Hewes Highway east of Imperial Highway	1,250	A	1,300	A	1,535	A
Evan Hewes Highway west of Dunaway Road	515	A	535	A	1,170	A
Dunaway Road north of I-8 westbound ramps	780	A	810	A	2,240	B

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: ADT = average daily traffic; I-8 = Interstate 8; LOS = level of service; SR-98 = State Route 98.

While traffic volumes would increase during the construction period, the LOS at the study area intersections and road segments would remain within the accepted LOSs identified by the local jurisdictions. All study area road segments and intersections are expected to operate at LOS C

or better with the IVS project–related construction traffic as shown in Table 4-63. Therefore, impacts from the IVS project–related construction traffic would not be adverse.

The vehicular delay shown in Table 4-63 for each intersection is based on multiple factors, including peak hour traffic volumes, arrival patterns, lane configurations, etc. The outcome of the calculation is based on the volume of each and is reported in seconds per vehicle. In some instances, the delay for the intersection may improve with the addition of traffic volumes, because the outcome is weighted based on the volume of individual movements.

While the construction of the IVS project would not create adverse impacts with respect to traffic congestion, it would create unusual traffic conditions that may be hazardous, such as the delivery of oversized equipment. To mitigate these potential hazards, Measure TRANS-1 requires the development and implementation of a traffic control plan during construction.

Construction of the IVS project would require the use of heavy equipment for the installation of associated systems and structures. Heavy equipment would be used throughout the construction period, including trenching and earthmoving equipment, forklifts, cranes, cement mixers and drilling equipment. However, this heavy equipment would be delivered to the project site by non-IVS project employees and, therefore, has been separately added to the IVS project construction related trip generation. The IVS project construction is expected to require 2,198 truck trips (a truck trip is defined as one one-way trip either to or from the site) per month (24 working days) during the peak month. It has been estimated that 30 percent of those truck trips would arrive/depart during the peak hours of adjacent street traffic.

The IVS project would generate a substantial level of overall traffic and heavy-vehicle traffic during construction. In particular, heavy vehicles have the potential to damage the surfaces of local roads. Measure TRANS-3 requires the applicant to document before/after conditions on local roads and to repair any damage caused by IVS project-related construction vehicle traffic.

Parking Capacity Impacts

Construction parking would be accommodated at the approximately 100 acre laydown area adjacent to the IVS project site. Although the IVS project site is west of Dunaway Road and south of Evan Hewes Highway, the construction parking would be provided on the laydown area immediately east of Dunaway Road. All parking for the construction workforce would be on this off-site, off-street staging area. Workers would be bused across Dunaway Road into the IVS project site. With this off-site construction parking area, the IVS project construction would not result in any parking spill-over to sensitive areas and would not create an adverse impact related to parking.

Table 4-63 Construction Year 2010 Intersection Level of Service Summary

Study Intersection	Existing AM Peak Delay	Existing AM Peak LOS	Existing PM Peak Delay	Existing PM Peak LOS	2010 without Project AM Peak Delay	2010 without Project AM Peak LOS	2010 without Project PM Peak Delay	2010 without Project PM Peak LOS	2010 with Project AM Peak Delay	2010 with Project AM Peak LOS	2010 with Project PM Peak Delay	2010 with Project PM Peak LOS
I-8 WB Ramp/ Imperial Hwy	1.7	A	3.3	A	1.7	A	3.3	A	1.6	A	1.1	A
I-8 EB Ramp/ Imperial Hwy	5.6	A	3.3	A	5.6	A	3.3	A	5.1	A	2.7	A
SR-98/Imperial Hwy	0.7	A	0.8	A	0.9	A	0.8	A	1.3	A	1.6	A
I-8 WB Ramp/ Dunaway Rd	2.5	A	1.9	A	2.6	A	2.1	A	15.3	C	0.2	A
I-8 EB Ramp/ Dunaway Rd	6.9	A	7.4	A	6.9	A	6.9	A	9.6	A	8.8	A

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table General Note: Average delay reported in seconds per vehicle. All study intersections are unsignalized.

Table Key: EB = eastbound; I-8 = Interstate 8; Hwy = Highway; LOS = level of service; Rd = Road; SR-98 = State Route 98; WB = westbound.

Emergency Services Vehicle Access

The environmental review of emergency service vehicle access considers the off-site accessibility by emergency vehicles to the site. Regional access to the IVS project site is adequate given that an emergency vehicle can access the site directly from Evan Hewes Highway or Dunaway Road, with direct access to/from I-8. Emergency vehicles can approach the site from adjacent cities using different routes and would not be barred from access due to a singular problem on a surrounding road. Therefore, the emergency vehicle access for the IVS project during construction is considered adequate.

On-site circulation of emergency vehicles is subject to site plan review by local agencies (Imperial County, in this case) and the standards of the Uniform Fire Code and Uniform Building Code.

Water, Rail, and Air Traffic

Water Traffic

The IVS project site is adjacent to a navigable body of water. Therefore, the IVS project construction would not affect water-related transportation.

Rail Traffic

The IVS project proposes to construct a private crossing of an existing railroad line as part of its primary access. The rail line is controlled by a subsidiary of the San Diego Metropolitan Transit System (MTS) and operated as a private transit system. Therefore, that line is not subject to Public Utilities Commission (PUC) authority. This rail line is currently not providing any service due to needed track repairs and upgrades. However, there is the potential for rail/vehicle conflicts in the future when rail service re-opens.

The applicant has negotiated a lease agreement[1] with the MTS to provide a private crossing "…located west of Plaster City, south of Evan Hewes Highway at Road 2003 along the Desert Line at approximately Milepost 128.5." That agreement requires the applicant to pay an annual license fee, maintain appropriate insurance, and provide the necessary crossing improvements (not specified). Measure TRANS-2 requires the applicant to provide an executed agreement of

[1] Metropolitan Transit System, San Diego. License to place permanent improvements in MTS/SD&AE Right-of-Way. January 7, 2010. MTS Doc #S200-10-424, ADM 160.1. CEC Doc 08-AFC-5.

the above prior to project construction and to obtain approval from the MTS for the permanent form of the railroad crossing.

Air Traffic

The IVS project construction would not include any concentrated heat rejection source, so there would not be any corresponding turbulence impacts to low flying aircraft.

Transport of Hazardous Materials

The construction of the IVS project would involve the transport of hazardous materials to the site. The transport vehicles will be required to follow Federal regulations governing the proper containment vessels and vehicles, including appropriate identification of the nature of the contents.

Delivery to the site would require vehicles to cross a crossing of a railroad line as part of its primary access. Although this rail line is not currently used, should it become active, either the MTS or applicant (via a revised lease agreement) would need to provide the appropriate railroad crossing warning equipment.

In addition to the governing Federal regulations, Measure HAZ-3 requires the applicant to develop and implement a Safety Management Plan for the delivery of hazardous materials. Refer also to Section 4.1, Public Health and Safety, and Hazardous Materials, for additional discussion regarding hazardous materials.

Applicant-Proposed Modifications

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in traffic and transportation impacts during construction compared to the IVS project as described above. This is because these proposed modifications would be designed similarly to, and constructed in the same general locations, as these facilities as evaluated for the original IVS project.

The alternative water source is not anticipated to appreciably change construction-related impacts to traffic and transportation and would be consistent with the analysis for the original IVS project provided earlier.

As noted above in the discussion of the original IVS project, during the peak months in the project construction schedule, the study area will experience short-term increases in traffic associated primarily with construction worker commute and material and equipment delivery

trips. The traffic analysis for the original IVS project evaluated the worst-case project construction scenario by analyzing the peak months where the combined trip total of worker commute and material and equipment delivery trips is highest. The construction trip generation data in Table 4-64 show the trips that would be generated by construction personnel and delivery trucks including trips associated with the alternative water source. As shown in Table 4-64, the additional trips associated with the alternative water supply would represent only a small percent of the daily construction trips on the peak day.

The analysis for the original IVS project showed that the construction-related traffic in 2010 would not adversely impact the LOS on area roads, with the LOS on those road segments at LOS A or B with the project construction traffic included. The construction-related traffic in 2010 would not adversely impact the LOS at area intersections, with the area intersections all operating at LOS A. The addition of the 13 daily truck round trips between the well site and the IVS project site to the area road segments and intersections would not be sufficient to change the LOS at those road segments and intersections from the LOS estimated for the original IVS project. As a result, the truck trips during construction associated with the alternative water source will not adversely affect the LOS, or result in the degradation of operations, on area roads and intersections.

Operation Impacts

Traffic Impacts

Operation of the facility under the IVS project would require a labor force of up to 164 full-time employees. The estimated peak hour trips would be 100 cars and four vanpool vehicles. Additional non-employee trips are also to be expected, such as eight daily visitor trips, deliveries, and other related services. The non-employee IVS project–related trips have been assumed to occur during the peak hours with 24 during the AM peak hour and 14 during the PM peak hour. It was assumed that the geographic location of housing for operational workers would be similar to those of the construction workers, and therefore, they would access the site in a similar spatial pattern.

Trips added by the IVS project during operations would not deteriorate the LOS of the study area roads or intersections. All study area roads and intersections would operate at LOS B or better with the IVS project-related traffic as discussed below. As a result, the traffic impacts of the IVS project operations traffic would not be adverse.

Table 4-64 Project Construction Trip Generation

Vehicle Type	Peak Daily Round Trips	Morning Peak Inbound Trips	Morning Peak Outbound Trips	Total Morning Peak Trips	Evening Peak Inbound Trips	Evening Peak Outbound Trips	Total Evening Peak Trips
Construction Worker Vehicles (Table Note 1)	1,462	731	0	731	0	731	731
Truck Deliveries (Table Note 2)	274	41	0	41	0	41	41
Offsite Water Supply delivery (Table Note 3)	78	24	0	24	0	24	24
Total Trips	**1,814**	**796**	**--**	**796**	**-**	**796**	**796**
Percent Water Supply Trips are of Total Trips	4.3%	3.0%	--	3.0%	--	3.0%	3.0%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table Note 1: Peak workforce was conservatively analyzed at 731 worker trips conservatively assumed to drive alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

Table Note 2: Trucks deliveries shown in the table were adjusted into PCE vehicles (3 PCE per month). 1,099 truck trips per month = 3,297 PCEs divided by 24 working days = 137 PCE one-way trips or 274 round trips per day on average. It was also assumed that 30 percent of the truck delivery trips arrive during the morning peak hour and leave during the evening peak hour while the remaining deliveries (70 percent would arrive and leave during off-peak hours.

Table Note 3: Offsite water supply deliveries shown in the table were adjusted into PCE vehicles (3 PCE per truck). 13 truck trips day = 39 PCE one-way trips or 78 round trips per day during peak construction. It was also assumed that 30 percent of the water supply truck delivery trips arrive during the morning peak hour and leave during the evening peak hour while the remaining deliveries (70 percent) would arrive and leave during off-peak hours.

Table Key: PCE = passenger car equivalent.

Table 4-65 compares the expected traffic volumes during standard IVS project operations to the background traffic volumes on the study area road segments in 2017. As shown, the majority of the IVS project-related operations traffic would use the segment of Evan Hewes Highway west of Dunaway Road. However, the average daily traffic volumes are expected to be relatively low for a road with the characteristics of Evan Hewes Highway. As shown, over one-half of the study area road segments are expected to experience an increase in IVS project-related operations traffic of 1 percent or less.

Table 4-66 summarizes the LOS on the study area road segments during standard operations in 2017. As shown, the study area road segments are expected to operate at the same condition, LOS A, as in existing conditions.

Table 4-67 summarizes the LOS for the study area intersections for existing conditions and 2017 conditions, with and without the IVS project during standard operations.

Parking Capacity

On-site parking for standard operations would be accommodated by a paved employee parking lot. The lot would be in the Administrative, Assembly, and Construction Area on the IVS project site. With the on-site parking for operational employees, the IVS project would not result in any parking spill-over to sensitive areas and would not create an adverse impact related to parking.

Emergency Services Vehicle Access

The regional access to the site is adequate given that an emergency vehicle can access the site directly from Evan Hewes Highway or Dunaway Road, with direct access to/from I-8. Emergency vehicles can approach the site from adjacent cities using different routes and would not be barred from access due to a singular problem on a surrounding road. Therefore, the emergency vehicle access during operation of the IVS project is considered adequate.

On-site circulation of emergency vehicles is subject to site plan review by local agencies (Imperial County, in this case) and the standards of the Uniform Fire Code and Uniform Building Code.

Table 4-65 Comparison of Standard Operations 2017 Traffic on Study Area Roads

Roadway Segment	Existing ADT	2017 ADT without Project	2017 ADT with Project	Percent Change Due to Project
I-8 west of Imperial Highway	15,300	19,510	19,550	< 1%
I-8 east of Dunaway Road	13,400	17.085	17,305	1%
SR-98 west of Imperial Highway	1,500	1,875	1,880	< 1%
Imperial Highway north of SR-98	315	395	400	1%
Evan Hewes Highway east of Imperial Highway	1,250	1,565	1,615	3%
Evan Hewes Highway west of Dunaway Road	515	645	880	36%
Dunaway Road north of I-8 westbound ramps	780	975	1,090	12%

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: ADT = average daily traffic; I-8 = Interstate 8; LOS = level of service; SR-98 = State Route 98

Table 4-66 Standard Operations 2017 Road Segment Levels of Service

Roadway Segment	Existing ADT	Existing LOS	2017 without Project ADT	2017 without Project LOS	2017 with Project ADT	2017 with Project LOS
I-8 west of Imperial Highway	15,300	A	19,510	A	19,550	A
I-8 east of Dunaway Road	13,400	A	17,085	A	17,305	A
SR-98 west of Imperial Highway	1,500	A	1,875	A	1,880	A
Imperial Highway north of SR-98	315	A	395	A	400	A
Evan Hewes Highway east of Imperial Highway	1,250	A	1,565	A	1,615	A
Evan Hewes Highway west of Dunaway Road	515	A	645	A	880	A
Dunaway Road north of I-8 westbound ramps	780	A	975	A	1,090	A

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Key: ADT= average daily traffic; I-8 = Interstate 8; LOS = level of service; SR-98 = State Route 98.

Table 4-67 Standard Operations 2017 Intersection Levels of Service

Study Intersection	Existing AM Peak Delay	Existing AM Peak LOS	Existing PM Peak Delay	Existing PM Peak LOS	2017 without Project AM Peak Delay	2017 without Project AM Peak LOS	2017 without Project PM Peak Delay	2017 without Project PM Peak LOS	2017 with Project AM Peak Delay	2017 with Project AM Peak LOS	2017 with Project PM Peak Delay	2017 with Project PM Peak LOS
I-8 WB Ramp/ Imperial Hwy	1.7	A	3.3	A	1.7	A	2.8	A	1.5	A	2.8	A
I-8 EB Ramp/ Imperial Hwy	5.6	A	3.3	A	5.7	A	3.2	A	6.1	A	3.2	A
SR-98/Imperial Hwy	0.7	A	0.8	A	0.8	A	0.9	A	0.9	A	0.9	A
I-8 WB Ramp/ Dunaway Rd	2.5	A	1.9	A	1.0	A	0.4	A	3.3	A	0.4	A
I-8 EB Ramp/ Dunaway Rd	6.9	A	7.4	A	8.3	A	10.9	B	8.3	A	10.9	B

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table General Note: Average delay reported in seconds per vehicle. All study intersections are unsignalized.

Table Key: EB = eastbound; I-8 = Interstate 8; Hwy = Highway; LOS = level of service; Rd = Road; SR-98 = State Route 98; WB = westbound.

Water, Rail, and Air Traffic

Water Traffic

The IVS project is not adjacent to a navigable body of water. Therefore, the operation of the IVS project would not impact water-related transportation.

Rail Traffic

The IVS project would include a permanent private crossing of an existing railroad track as part of its primary access. With a negotiated lease agreement as required in Measure TRANS-2, the operation of the IVS project would not result in an adverse impact related to this crossing.

Air Traffic

The IVS project would not have any concentrated heat rejection sources during operations, so there would not be any corresponding turbulence impacts to low flying aircraft.

Glare

The relationship between the SunCatcher mirror and the face of the Stirling Engine would change when moving from the stow position, or when responding to cloud cover or to high winds. It is possible that malfunctions in mirror control might reasonably occur, presenting a potential glare or temporary blindness hazard to off-site viewers including motorists or airplane pilots. Measure TRANS-4 addresses this potential adverse impact during operation of the IVS project.

Vapor Plumes

The IVS project has no cooling towers or boilers, so no visible water vapor plumes that could cause a visual impact to motorists would occur during operations.

Transport of Hazardous Materials

The operation of the IVS project would involve the transport of hazardous materials to the site. Transport vehicles will be required to follow Federal regulations governing the proper containment vessels and vehicles, including appropriate identification of the nature of the contents.

Deliveries to the site would require vehicles to cross a private crossing of a railroad track as part of the primary access to the site. This railroad track is currently inactive. Should that railroad track become active, either MTS or the applicant, via a revised lease agreement, would need to provide the appropriate railroad crossing warning equipment.

In addition to the governing Federal regulations, Measure HAZ-3 requires the applicant to develop and implement a Safety Management Plan for the delivery of hazardous materials. Refer also to Section 4.11 for additional discussion regarding hazardous materials.

Applicant-Proposed Modifications

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in traffic and transportation impacts during operations compared to the IVS project as described above. This is because these proposed modifications would be operate and function similarly to, and in the same general locations, as these facilities as evaluated for the original IVS project.

The IVS project is forecast to be fully operational in 2017. As described above for the original IVS project, during operations, the study area will experience minor increases in traffic associated primarily with operation worker commute, operation and maintenance (O&M) trips, and minimal visitor trips. That traffic analysis evaluated the worst-case operations scenario by accounting for all these trips. Table 4-68 shows the anticipated operations trips with the daily round trips associated with the alternative water source added. As shown, the trips associated with the alternative water source represent only a small percent of the daily operations trips. The analysis for the original IVS project showed that the operations-related traffic in 2017 would not adversely impact the LOS on area roads, with the LOS on those road segments at LOS A or B with the project operations traffic included. The operations-related traffic in 2017 would not adversely impact the LOS at area intersections, with the area intersections all operating at LOS A. The addition of the seven daily water truck roundtrips to the area road segments and intersections would not be sufficient to change the LOS at those road segments and intersections from the LOS estimated for the original IVS project operations in 2017. As a result, the operations-related trips for the alternative water source will not adversely affect the LOS, or result in the degradation of operations, on area roads and intersections.

Table 4-68 Project Operations Trip Generation

Vehicle Type	Peak Daily Round Trips	Morning Peak Inbound Trips	Morning Peak Outbound Trips	Total Morning Peak Trips	Evening Peak Inbound Trips	Evening Peak Outbound Trips	Total Evening Peak Trips
Operations	224	112	0	112	0	112	112
Deliveries (Table Note 1)	36	9	5	14	0	4	4
Offsite Water Supply delivery (Table Note 2)	42	6	0	6	0	6	6
Visitors	20	5	5	10	5	5	10
Total Trips	**322**	**132**	**--**	**132**	**--**	**132**	**132**
Percent Water Supply Trips are of Total Trips	13%	4.5%	--	4.5%	--	4.5%	4.5%

Table Source: Supplement to the Imperial Valley Solar (formerly Solar Two) Application for Certification (URS, May 2010) and LSA Associates, Inc. (June 2010).

Table Note 1: Trucks deliveries shown in the table were adjusted into PCE vehicles (3 PCE per month).

Table Note 2: Offsite water supply deliveries shown in the table were adjusted into PCE vehicles (3 PCE per truck). 7 truck trips day = 21 PCE one-way trips or 42 round trips per day during project operation. It was also assumed that 30 percent of the water supply truck delivery trips arrive during the morning peak hour and leave during the evening peak hour while the remaining deliveries (70 percent) would arrive and leave during off-peak hours.

Table Key: PCE = passenger car equivalent.

4.15.4.2 709 MW Alternative: Agency Preferred Alternative

Construction Impacts

The construction of the Agency Preferred Alternative would result in traffic-related construction impacts similar those described in the previous section for the IVS project, at approximately the same levels because the construction levels would be approximately the same for the Agency Preferred Alternative and the IVS project. Measure TRAN-1 would apply to both the IVS project and the Agency Preferred Alternative.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in impacts during construction related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

Operation Impacts

The Agency Preferred Alternative would have a workforce slightly less than would be needed for the IVS project because it has fewer SunCatchers. Therefore, the Agency Preferred Alternative would result in traffic and transportation related impacts similar to, and slightly less than, those described previously for the IVS project. Measures TRAN-2 to TRAN-3 would apply to both the IVS project and the Agency Preferred Alternative.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in impacts during operations related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

4.15.4.3 300 MW Alternative

Construction Impacts

The 300 MW Alternative would provide the same solar generating facilities and features as Phase 1 of the IVS 750 MW project. The 300 MW Alternative is assumed to be constructed with

the same peak workforce as the IVS project and, therefore, would result in the same levels of construction traffic and parking demand as the IVS project. However, these conditions would occur for a shorter period of time given that the 300 MW Alternative would be approximately 40 percent of the size of the IVS project. Like the IVS project, with implementation of the cited measures, the construction related traffic and transportation impacts of the 300 MW Alternative would not be adverse.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in impacts during construction related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

Operation Impacts

The 300 MW Alternative would result in the same types of traffic and transportation impacts as the IVS project. However, those impacts would be less than under the IVS project because the 300 MW Alternative would be approximately 40 percent the size of the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in impacts during operations related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

4.15.4.4 Drainage Avoidance #1 Alternative

Construction Impacts

The Drainage Avoidance #1 Alternative would be constructed with the same peak workforce as the IVS project and, therefore, would result in the same levels of construction traffic and parking demand as the IVS project. However, these conditions would occur for a slightly shorter period of time given that the Drainage Avoidance #1 Alternative would be approximately 84 percent of the size of the IVS project. Like the IVS project, with implementation of cited measures, the traffic and transportation impacts of the Drainage Avoidance #1 Alternative would not be adverse.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not result in differences in impacts during construction related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

Operation Impacts

The Drainage Avoidance #1 Alternative would result in the same types of traffic and transportation impacts as the IVS project. However, those impacts would be slightly less than under the IVS project because the Drainage Avoidance #1 Alternative would be approximately 84 percent the size of the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not result in differences in impacts during operations related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

4.15.4.5 Drainage Avoidance #2 Alternative

Construction Impacts

The Drainage Avoidance #2 Alternative would be constructed with the same peak workforce as the IVS project and, therefore, would result in the same levels of construction traffic and parking demand as the IVS project. However, these conditions would occur for a much shorter period of time given that the Drainage Avoidance #2 Alternative would be approximately 32 percent of the size of the IVS project. Like the IVS project, with implementation of cited measures, the traffic and transportation impacts of the Drainage Avoidance #2 Alternative would not be adverse.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in differences in impacts during construction related to traffic and transportation compared to the IVS project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

Operation Impacts

The Drainage Avoidance #2 Alternative would result in the same types of traffic and transportation impacts as the IVS project. However, those impacts would be slightly less than under the IVS project because the Drainage Avoidance #2 Alternative would be approximately 32 percent the size of the IVS project.

The applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in project as described above. This is because these proposed modifications would be function and be in the same general locations as these facilities as evaluated for the original IVS project.

4.15.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Construction Impacts

Because there would be no amendment to the CDCA Plan and no solar project approved for the IVS project site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the transportation and traffic related impacts of the IVS project would not occur at the site. However, the site would be available for other uses that are consistent with the CDCA Plan. As a result, this No Action Alternative would not result in the impacts to traffic and transportation that would occur under the IVS project. However, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

Operation Impacts

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the transportation and traffic related impacts of the IVS project would not occur at the site. However, the land on which the project is proposed would become available to other uses that are consistent with the CDCA Plan. As a result, this No Action Alternative would not result in the impacts to traffic and transportation that would occur under the IVS project. However, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.15.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Construction Impacts

Because the CDCA Plan would be amended under this No Action Alternative to make the IVS project site unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no increase in traffic. As a result, this No Action Alternative would not result in the impacts to traffic and transportation that would occur under the IVS project. However, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

Operation Impacts

Because the CDCA Plan would be amended under this No Action Alternative to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no increase in traffic. As a result, this No Action Alternative would not result in the impacts to traffic and transportation under the IVS project. As a result, this No Action Alternative would not result in the impacts to traffic and transportation that would occur under the IVS project. However, in the absence of the IVS project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.15.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Construction Impacts

Because the CDCA Plan would be amended under this No Action Alternative, it is possible that the site would be developed with the same or a different solar technology. As a result, the traffic and transportation impacts during construction of that solar project would likely be similar to the transportation and traffic related impacts under the IVS project. As such, this No Action Alternative could result in impacts to traffic and transportation similar to the impacts under the IVS project.

Operation Impacts

Because the CDCA Plan would be amended under this No Action Alternative, it is possible that the site would be developed with the same or a different solar technology. As a result, the traffic and transportation impacts during operation of that solar project would likely be similar to the transportation and traffic related impacts under the IVS project. As such, this No Action Alternative could result in impacts to traffic and transportation similar to the impacts under the IVS project.

4.15.5 Cumulative Impacts

The future year background traffic volumes were estimated based on percent increases provided by Imperial County. Therefore, the future year traffic volumes without the IVS project reflect the potential traffic volumes for existing conditions plus cumulative projects. As a result, the analysis of the traffic conditions with the IVS project reflects cumulative projects. Based on the analysis provided above, the future year traffic conditions with the cumulative projects and the IVS project will not result in adverse traffic impacts on the study area roads or intersections.

4.15.6 Mitigation, Project Design Features, and Other Measures

The IVS project would be consistent with the transportation LORS. The IVS project would result in only minor traffic and transportation effects which would be substantially mitigated based on implementation of the measures provided in this section.

TRANS-1 The IVS project owner shall, in coordination with Imperial County, develop and implement a construction traffic control plan prior to earth moving activities. The plan should include scheduled delivery of heavy equipment and building material deliveries, coordination with the County of Imperial to mitigate any potential adverse traffic impacts from other proposed construction projects that may occur during the construction phase of IVS project, and adequate access for emergency vehicles to the IVS project site.

Specifically, the overall traffic control plan shall include the following:

- Schedule delivery of heavy equipment and building material deliveries, as well as the movement of hazardous materials to the site, including the adjacent lay-down area;

- Coordinate with the Imperial County to mitigate any potential adverse traffic impacts from other proposed construction projects that may occur during the construction phase of the project; and
- Ensure there is adequate access for emergency vehicles at the project site.

The construction traffic control plan shall also include the following for activities of substantial stature:

- Signing, lighting, and traffic control device placement; and
- Temporary travel lane closures and potential need for flaggers.

Verification: At least 60 days prior to start of site mobilization, the project owner shall provide to the County of Imperial for review and comment and the Compliance Project Manager (CPM) for review and approval a copy of the construction traffic control plan.

TRANS-2 Prior to construction, the project owner shall receive the signed agreement from the San Diego Metropolitan Transit System (MTS) regarding the authority to construct the proposed railroad crossing. After the physical improvements are completed to the railroad crossing, the project owner shall receive written approval from the MTS as to the adequacy of the improvements.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall provide the CPM a copy of the executed agreement with MTS regarding the proposed railroad crossing. No more than 3 months after completion of the railroad crossing improvements, the project owner shall provide the CPM with a copy of written approval from MTS regarding the adequacy of the grade crossing improvements.

TRANS-3 Prior to construction, the project owner shall document the existing condition of the primary roadways that will be used by the construction workers and heavy vehicle deliveries (up to 3 miles of the site). Subsequent to construction, the project owner shall document the condition of these same roadways and either directly reconstruct or reimburse the County of Imperial for needed repairs.

Verification: At least 3 months prior to the start of site mobilization, the project owner shall submit a review of existing roadway pavement conditions to Imperial County for review and comment and the CPM for review and approval. This review will include photographs and the analysis of pavement and sub-surface

conditions. The CPM will need to approve the summary of existing pavement conditions prior to the commencement of construction.

No later than 2 months after the end of construction activities, the applicant shall submit an analysis of the roadway pavement conditions to Imperial County for review and comment and the CPM for review and approval. The review will include photographs, the analysis of pavement and sub-surface conditions, and a schedule for repair.

After the repairs are completed, the applicant shall submit a letter to Imperial County and the CPM indicating such repairs are finished and ready for inspection.

TRANS-4 The project owner shall prepare and implement a SunCatcher Mirror Positioning Plan that would avoid the potential for human health and safety and significant visual distractions from solar radiation exposure.

Verification: At least 90 days before the commercial operation of either of the IVS power plants, the project owner shall submit the SunCatcher Mirror Positioning Plan (MPP) to BLM's Authorized Officer and the CPM for review and approval. The project owner shall also submit the plan to California Department of Transportation (Caltrans), California Highway Patrol (CHP), the Federal Aviation Administration (FAA), and Imperial County for review and comment and forward any comments received to BLM's Authorized Officer and the CPM. The Mirror Positioning Plan shall accomplish the following:

(1) Identify the mirror movements and positions (including reasonably possible malfunctions) that could result in possible exposure of observers at various locations including those in aircraft, motorists, pedestrians, and hikers to reflected solar radiation from the mirrors.

(2) Describe within the MPP how programmed SunCatcher operation would avoid the potential for human health and safety hazards attributable to solar radiation at locations of observers where momentary solar radiation exposure might be greater than the Maximum Permissible Exposure of 10 kW/m^2 for a period of 0.25 second or less or where excessive brightness might be hazardous to motorists.

(3) Prepare a monitoring plan that would a) obtain field measurements in response to legitimate complaints; b) verify that the Mirror Positioning Plan would avoid the potential for health and safety hazards, including temporary

or permanent blindness, at locations of possible observers; c) provide requirements and procedures to document, investigate, and resolve legitimate complaints regarding glare or excessive brightness.

(4) The monitoring plan shall be coordinated with the FAA, Caltrans, CHP, and Imperial County and be updated on an annual basis for the first five years and at 2 year intervals after that.

4.15.7 Summary of Impacts

Table 4-69 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to special designations.

As shown in Table 4-69, based on implementation of the measures described above, the IVS project would not result in unavoidable adverse impacts related to traffic and transportation.

Table 4-69 Summary of Traffic Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	Short-term traffic impacts on area roads during construction. Construction of a crossing of existing railroad tracks. Damage to area roads during construction. Potential glare on vehicles on area roads. No impacts related to parking, emergency services vehicle access, water traffic, and air traffic. Will not contribute to cumulative impacts sufficient to result in adverse impacts on study area roads or intersections.	TRANS-1: traffic control plan. TRANS-2: required agreement with railroad owner. TRANS-3: repair or compensation for damaged road surfaces. TRANS-4: SunCatcher Mirror Positioning Plan	None.
709 MW Alternative: Agency Preferred Alternative	Fewer impacts than the IVS project due to the smaller number of SunCatchers.	Same as the IVS project.	None.
300 MW Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #1 Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	No impacts at the project site; potential impacts at sites of other renewable energy projects.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	No impacts at the project site; potential impacts at sites of other renewable energy projects.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Impacts potentially similar to the Agency Preferred Alternative and the IVS project.	None identified.	Not determined.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; ROW = right-of-way.

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4.16 Visual Resources

The analysis in this section evaluates the potential visual impacts of the Imperial Valley Solar (IVS) project; its consistency with applicable Laws, Ordinances, Regulations and Standards (LORS); and conformance with applicable guidelines in the National Environmental Policy Act (NEPA).

To provide a consistent framework for the analysis, a standard visual assessment methodology has been developed by the California Energy Commission (CEC) and applied to a number of siting cases. The analysis in this section is based on a visual resource inventory of the area and the methodology developed by the CEC and used in the Visual Impact Analysis in the Staff Assessment/Draft Environmental Impact Statement (SA/DEIS).

As noted above, the project is evaluated for conformance with applicable LORS. Adopted expressions of local public policy pertaining to visual resources are also given great weight in determining levels of viewer concern. Measures are proposed as needed to reduce or avoid potentially adverse impacts under NEPA, and to ensure LORS conformance, as feasible.

4.16.1 Methodology

The overall objective of the BLM Visual Resource Management (VRM) System is to manage public lands in a manner that will protect the quality of the visual (scenic) values in accordance with Section 102(a)(8) of the Federal Land Policy and Management Act of 1976 (FLPMA). The BLM VRM System is a methodical approach to inventorying and managing scenic resources on the public lands.

Impacts under NEPA are defined in terms of context and intensity. Context means that the significance of an action must be analyzed in several contexts, such as society, the affected region, affected interests, and locale. Intensity refers to the severity of impact, and includes a variety of factors to be considered (40 Code of Federal Regulations [CFR] 1508.27).

Some of the intensity factors potentially relevant to visual impacts include unique characteristics of the geographic area such as proximity to historic or cultural resources, or park lands, the degree of controversy, the degree of uncertainty about possible effects, the degree to which an action may establish a precedent for future actions, and the potential to contribute to cumulatively significant impacts.

4.16.2 Definition of Resource

Visual resources refer to all objects (man-made and natural, moving and stationary) and features (e.g., landforms and water bodies) that are visible on a landscape. These resources contribute to the scenic or visual quality of the landscape, that is, the visual appeal of the landscape.

4.16.3 Applicable Regulations, Plans, and Policies/Management Goals

The BLM's responsibility for managing visual (scenic) resources on public lands is established by law. NEPA requires that measures be taken to "..assure for all Americans…aesthetically pleasing surroundings" and FLPMA states that "…public lands will be managed in a manner which will protect the quality of scenic values of these lands."

The California Desert Protection Act of 1994 and the BLM *California Desert Conservation Area (CDCA) Plan* (1980, as amended) also provide for the protection of visual resources. From the CDCA Plan (United States Department of the Interior BLM 1999):

> "The CDCA has a superb variety of scenic values. The public considers these scenic values a significant resource. The Bureau recognizes these values as a definable resource and an important recreation experience. These visual resources will receive consideration in Bureau of Land Management resource management decisions.
>
> "Many management activities involve alteration of the natural character of the landscape to some degree; the BLM will take the following actions to effectively manage for these activities:
>
> (1) The appropriate levels of management, protection, and rehabilitation on all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple-use class guidelines.
>
> (2) Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using the Bureau's contrast rating process.

Because Imperial County has no land use jurisdiction over public lands managed by the BLM, the Imperial County General Plan and the Imperial County zoning regulations are not applicable to the activities proposed on BLM managed public lands.

4.16.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is provided in Appendix B, Determination of NEPA Adequacy (DNA).

4.16.4.1 IVS Project: 750 MW Project

Direct Operation Impacts

Impacts of Structures on Key Observation Points

View from Plaster City Off-Highway Vehicle Open Area, Looking South (approximately 1.5 miles from site) – Key Observation Point 1

The overall visual sensitivity within this landscape unit is generally considered to be moderately high. The existing scenic quality of this landscape unit ranges from moderate to moderately low. However, viewer concern is considered moderately high due both to high numbers of recreational visitors in the area, and to the location of the setting in the CDCA in general. Viewer exposure is high due to the proximity of the viewers to the IVS project site because many of those viewers would see the project at foreground distance from high-use parts of the Plaster City Off-Highway Vehicle (OHV) Open Area; high due to high numbers of viewers, reaching several thousands during peak weekends; and high due to the generally unobstructed view conditions inherent in the level, open landscape.

Figures 3-7 and 4-1 depict views of the site from a middle-ground distance of roughly 1.5 mi. This is considered to be a reasonably representative viewpoint in this KOP. The range of actual view conditions of visitors in the Open Area would extend from immediate foreground distance to background distance. A substantial number of Plaster City OHV Open Area users, including large groups attending organized races, could view the IVS project from closer distances including, occasionally, foreground (0.5 mi or under) distance. At these nearer distances, the IVS project would appear much more prominent, dominating the view from foreground locations.

From such viewpoints near the IVS project site, views of the Plaster City facility and highway would also be more prominent, compromising the intactness of the landscape.

The project visual contrast in the Plaster City OHV Open Area would range from very strong to moderate, as a function of distance from the IVS project site. As represented in the simulation from KOP 1, at a distance of 1.5 mi, the project contrast would be moderate. The color and texture contrast of the vast rows of SunCatchers with the existing landscape at this distance would be strong, lending a distinctly man-made, industrial character to the view. Form and line contrast, however, would be relatively weak, matching the broad horizontal lines of the level terrain. From some viewpoints, the taller buildings of the Main Services Complex (up to 77 feet tall) could be visible in the middle of the site, exhibiting some vertical form and line contrast and attracting attention. However, these features would generally be dwarfed by the vast scale and dominance of the SunCatcher fields.

The IVS project would exert strong horizontal scale and spatial dominance, occupying a vast expanse of the landscape from this KOP. However, in overall visual scale, dominance would be moderate outside the foreground zone. As depicted in the simulation, the overall proportion of the view occupied by the IVS project would be small compared to the foreground terrain, background mountains, and sky, due to the level terrain and oblique viewing angle.

The IVS project would not physically block scenic views of Signal Mountain or the Jacumba Mountains in the distance from viewpoints beyond immediate foreground distance within the Plaster City OHV Open Area. The project would, however, block such views for viewers on Evan Hewes Highway directly adjacent to the IVS project site.

The overall visual change for viewers in the Plaster City OHV Open Area is considered moderate. From most of the Plaster City OHV Open Area beyond foreground distance of the IVS project, the project would attract attention but would not dominate the existing landscape.

In the context of moderately high overall visual sensitivity, the moderate level of visual change experienced by the majority of Plaster City OHV Open Area viewers (those outside of foreground distance from the project) could be regarded as potentially substantial. However, considering the disturbed character of the Plaster City OHV Open Area terrain and the activity-focused nature of much of the recreation activity that occurs there, the moderate levels of visual change experienced outside the foreground distance zone are adverse but not substantial.

However, for those viewers within foreground distance of the IVS project, including motorists on segments of Evan Hewes Highway adjacent to the project site, the project contrast would be strong, and scenic views of mountains to the south could be blocked. In the context of moderate overall visual sensitivity this could represent a substantial adverse impact. This impact to

foreground viewers, particularly motorists on adjacent foreground segments of highway, is discussed separately under KOP 5, below.

No mitigation is considered necessary outside the foreground distance in the Plaster City OHV Open Area. Measures to address sensitive foreground views are discussed later in Section 4.16.6.

Upper Yuha Desert (Scenic Quality Rating Unit 1) – Key Observation Points 2, 3, 4, 5

View from Nearby Residence on Evan Hewes Highway, Looking Southwest (approximately 1.5 miles) – Key Observation Point 2

As shown on Figures 3-8 and 4-2, KOP 2 represents the view of the nearest residence to the IVS project site, approximately 1.5 mi to the east on Evan Hewes Highway. As such, it is also representative of views from the highway at middle-ground distance. The project visual contrast from this KOP would be similar to that described under KOP 1, above, which is at a similar distance. As represented in the simulation from KOP 2, the project contrast at this distance would be moderate. Color and texture contrast with the existing landscape at this distance would be strong, lending a conspicuous, distinctly man-made character to the view. Form and line contrast, however, would be relatively weak, blending with the broad horizontal lines of the level terrain, and occupying a relatively small proportion of the view due to the level terrain relationship to the viewer and resulting oblique viewing angle.

Similarly, at this distance the IVS project would exert strong horizontal scale and spatial dominance, occupying a vast extent of the landscape. However, in overall visual scale, dominance would be moderate outside the foreground zone, and lower as distance from the project site increase. As depicted in the simulation, the overall proportion of the view occupied by the IVS project would be small compared to the foreground terrain, background mountains, and sky.

The IVS project would not block scenic views within the middle-ground distance zone.

The overall visual change from KOP 2 and similar middle-ground viewpoints is considered moderate. At this distance and under these level terrain relationships, the IVS project would attract attention but would not dominate the existing landscape.

In the context of moderately high overall visual sensitivity, the moderate level of visual change experienced by these residents and motorists on Evan Hewes Highway at distances of over 1 mi would be somewhat adverse but not substantial.

No mitigation is considered necessary at distances of over roughly 1 mi on or along Evan Hewes Highway.

As mentioned previously, impacts to foreground viewers, particularly motorists on adjacent foreground segments of highway, are discussed separately under KOP 5, below.

View from Residence to IVS Project Transmission Line, Looking West (approximately 1 mile) – Key Observation Point 3

As shown on Figures 3-9 and 4-3, KOP 3 represents views of the IVS project transmission line from the nearest residence, at the western edge of the Imperial Valley agricultural area east of the Yuha Desert. The photograph actually appears to have been taken west of the irrigation canal marking the westernmost boundary of the irrigated farmlands in which the residence is located. Consequently, visual exposure to the transmission lines is actually greater than would typically be the case in the agricultural area. On roads and in fields in the irrigated area, views toward the transmission corridor tend to be filtered by the canal levees and occasional vegetation.

As illustrated in the simulation, at this distance the existing Southwest Powerlink transmission lines and towers are evident, though visually subordinate within the view. The line and tower intrude into the skyline of the Jacumba Mountains ridge in the background distance, compromising the existing visual quality in this view. The IVS project transmission line would parallel the existing line and add incrementally to its visual presence. In combination, the vertical form contrast of the two lines would increase to a moderately high level, as would intrusion into the background mountain skyline. The contrast of the combined transmission lines could attract attention and begin to dominate the characteristic landscape.

In the context of moderately low overall visual sensitivity from this and similar locations due to low visual exposure and low viewer numbers, the moderately high level of anticipated visual change of the combined powerlines would not be adverse.

No mitigation is considered necessary from KOP 3 or similar viewpoints along the canal.

View from Town of Ocotillo, Looking West (approximately 4.5 miles) – Key Observation Point 4

As shown in Figures 3-10 and 4-4, KOP 4 is taken from the town of Ocotillo, roughly 4.5 mi west of the IVS project site on I-8, and is representative of I-8 motorists at background distances from the project. A broad overview of the West Mesa and Yuha Desert area is visible from the elevated position of this KOP above the valley floor. However, as depicted in the simulated view, the visibility and prominence of the IVS project at background distances such as this is limited. The project contrast would be due primarily to color and texture contrast; at this distance the mirror reflections would often resemble the surface of a lake. The overall line and form contrast would be very weak due to the oblique viewing angle and low overall visual magnitude within the field of view. Project contrast would be seen, but would not attract attention.

The overall visual sensitivity from I-8 is considered moderately high. However, the low level of overall visual change from I-8 would not be adverse.

No mitigation is considered necessary from KOP 4 or similar viewpoints within the background distance zone.

View from I-8 Near Dunaway Road, Looking Northwest (approximately 0.5 mile) – Key Observation Point 5

As shown on Figures 3-11 and 4-5, KOP 5 represents foreground views, particularly westward views, of the IVS project by motorists on I-8. The precise distance from viewpoint to the IVS project site is not described; however, it appears to be approximately 0.5 mi or near the outer limit of the foreground distance zone. To fully understand the visual effect of the IVS project, however, it is important to recall that for roughly 5.6 mi of site frontage on I-8, the project would be viewed from much closer distances, and would appear much more prominently, with the nearest rows of 38-foot-tall SunCatchers often within a few feet of the edge of I-8.

The view from I-8 facing westward is highly scenic, consisting of relatively intact expanses of the Yuha Desert floor, with low rolling terrain of washes evident in portions of the project frontage, and striking views of the Jacumba and Coyote Mountains at the horizon. The existing Southwest Powerlink transmission line ranges from visually subordinate to dominant in the view according to distance, intruding into the view and compromising visual quality, especially at foreground distance. Nevertheless, the overall visual sensitivity from this viewpoint is moderately high.

As depicted in the simulated view, in near-middle-ground and foreground views from adjacent roads, the IVS project would be strongly dominant and exhibit a high level of visual contrast and overall visual change. This would include roughly 6.5 mi along I-8, and roughly 6 mi along Evan

Hewes Highway. The 38-foot-tall mirror arrays would present strong color, form and line contrast, and exhibit strong spatial dominance, extending for miles. Furthermore, the addition of power lines along the highway would combine with the existing Powerlink line to dominate the foreground view of motorists, particularly for the roughly 1 mi segment where the new line would parallel the highway foreground before turning south to parallel the existing transmission corridor. In combination with the existing transmission line, the project transmission line would increase contrast and dominance of the transmission corridor as viewed from the highway. For an approximately 0.9-mi segment of highway frontage not included in the IVS project site, parts of the project, including the Main Services Complex, could be visible at times, but would often be obscured by high, irregular terrain of washes and low rises in the immediate highway foreground in this area, which have the effect of blocking all views beyond. These segments are limited in length, however. Overall the IVS project would strongly demand attention, could not be overlooked, and would strongly dominate the landscape over more than 6 mi of highway frontage in foreground distance of the project features.

Views of mountains to the north and northwest, including the Coyote Mountains, Superstition Mountain, and Carrizo Mountain, would be largely obstructed to westbound motorists in the vicinity of the IVS project.

In the context of moderately high overall visual sensitivity from I-8, this high level of overall visual change would represent a substantial adverse impact. Other foreground views of the IVS project, from Evan Hewes Highway and the Plaster City OHV Open Area are also considered to have moderately high sensitivity, and would experience similar effects, including strong visual dominance and visual change by the IVS project; and obstruction of views of the mountains. Therefore, all views in the foreground distance zone and the near-middle-ground distance zone to at least 1 mi would experience strong project dominance and visual change, and a substantial adverse visual impact. Measures VIS-4 and VIS-5, provided later in this section, would minimize these impacts to foreground views.

Yuha Desert/Yuha Basin (Scenic Quality Rating Units 2 and 3) – Key Observation Points 6, 7, 8

KOPs 6, 7, and 8 were added to the analysis to portray the range of anticipated visual effects the IVS project would have on sensitive recreational destinations in the Yuha Desert ACEC in the middle-ground distance zone, including extensive segments of the Juan Bautista de Anza National Historic Trail (Anza Trail, Route 274). Simulations were not prepared for these viewpoints. However, the anticipated level of project contrast and dominance from each of these viewpoints is very clear, particularly because the Plaster City facility, which appears in each

view, is an ideal scale and location reference point, and the extent of the IVS project site is very clear from each viewpoint.

KOP 6 is a view from the eastern segment of the Anza Trail near Dunaway Campground at a distance of 0.5 mi from the IVS project site, or within foreground distance (refer to Figures 3-12 through 3-14). From this viewpoint, the IVS project would exhibit high contrast and dominance, becoming the most prominent feature in the view over a vast area. From this KOP, viewers would need to turn their heads to take in the entire IVS project site. The IVS project would not block views of mountains in the background, including Superstition Mountain to the north. However, the project's pronounced contrast in color, texture, and at times, brightness; and its strong spatial dominance would represent a high level of visual change. The IVS project would demand attention, could not be overlooked, and would be dominant in the landscape.

KOP 7 is a view from Overlook Campground on the Anza Trail at a distance of approximately 1 mi, or middle-ground distance as shown on Figure 3-13. Similar to KOP 4, the IVS project would exhibit strong color and texture contrast and strong spatial dominance, becoming the most dominant feature in views to the north. The IVS project would demand attention, could not be overlooked, and would be dominant in the landscape.

In the context of high overall viewer sensitivity in foreground and middle-ground viewpoints in the Yuha Desert ACEC, impacts from KOPs 6, 7, and other segments of the Anza Trail at these distances would be substantial.

KOP 8 is a view from the vicinity of the Yuha Geoglyphs, also along the Anza Trail, at a distance of approximately 3 mi, approaching background distance as shown on Figure 3-14. At this distance, the IVS project would be very evident but would exhibit a moderate degree of contrast. Color and texture contrast could be moderately high, but form and line contrast would be weak due to the level, oblique angle of view and the small part of the field of view occupied by the IVS project. Similarly, the visual dominance of the IVS project would be moderate in scale at this distance.

In the context of high viewer sensitivity, the impacts of the IVS project at this distance would be adverse, but not substantial. Measures provided later in this section would minimize these visual impacts.

From other principal destinations in the Yuha Desert ACEC, such as Yuha Well, fossil shell beds, and segments of the Anza Trail south of the Yuha Geoglyphs, and along Highway 98 and the surrounding areas, the IVS project would not be visible due to intervening terrain of washes and low hills.

Glare and Nighttime Light Impacts

From each of the KOPs discussed above, diffuse reflected light from the SunCatcher mirrors could potentially represent a substantial component of the overall appearance, visual contrast/change, and impact of the IVS project. The contribution of potential glare under most typical conditions was considered in the evaluation of the overall project-related visual change in the impact analysis above. Under most conditions, diffuse reflection would be seen by viewers and appear similar to the reflection of the sky on a lake surface, or at certain times, more intense shimmering glare from brighter diffuse reflection of the sun.

However, under certain circumstances, glare effects could be much more prominent, particularly in early morning hours as seen by westbound motorists; and in the late afternoon near sunset for eastbound motorists on I-8 and Evan Hewes Highway. Glare from diffuse reflection is not considered to represent a hazard or substantial nuisance to aircraft due to distance and potential level of brightness.

Data on anticipated brightness or luminance of the IVS project and the SunCatcher units is not available, but it was estimated that approximately 5 percent of the visible spectrum which is not redirected to the power conversion units (PCU) has the potential to make the SunCatcher mirrors appear as very bright objects. This reflection could be an intrusive and distracting nuisance to motorists under certain conditions but would not produce retinal damage.

All the simulations show a first (outer) row of mirrors exposed to viewers on the highway. The same is true for the mirrors at the ends of the rows of SunCatchers. In the absence of data to the contrary, these vertical mirrors can be expected to be sources of distracting nuisance brightness in the early mornings or late afternoons. In addition, motorists traveling at freeway speeds east or west on I-8 past the north-south-oriented rows of SunCatchers may be exposed to a flicker or stroboscopic effect from the repetitive bright mirrors at the row ends. The potential adverse impact of a flicker effect from fluorescent lamps or from some tunnel lighting installations on some individuals is a well-established phenomenon.

Nighttime light pollution as a result of the IVS project is a concern. A large area around the IVS project site is now largely dark at night, with the exception of the Plaster City facility which is an isolated instance. The pristine, unlit night sky is an important part of the camping experience for many visitors to remote areas such as the campsites in the vicinity of the Anza Trail, some of which are near the IVS project site. Unmitigated night lighting of the IVS project could represent a substantial impact to the experience of campers at these sites.

Night lighting of the Main Services Complex will consist of 400 watt high-pressure sodium lights, with illumination falling to 0.0 foot-candles on the ground a short distance from the facility. Parking and road lighting on the site will consist of full cut-off luminaires to minimize night sky

light pollution. Preliminary photometric studies provided by the applicant depict illumination from these fixtures falling to 0.0 foot-candles a short distance from each roadway intersection.

To ensure these levels of performance, to address potential impacts from construction lighting, and to further minimize potential night lighting impacts to campers in the Yuha Desert ACEC and Anza Trail, Measure VIS-2 has been incorporated in the project. This measure requires that all exterior lighting be designed such that lamps and reflectors are not visible from beyond the IVS project site; lighting does not cause excessive reflected glare; direct lighting does not illuminate the nighttime sky, except for required Federal Aviation Administration (FAA) aircraft safety lighting; and illumination of the IVS project site and the immediate vicinity is minimized.

Applicant Proposed Modifications

The applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in operations related visual, glare, and nighttime lighting impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, operated, and in the same general locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in operations-related visual impacts compared to the IVS project because this modification would not result in any permanent structures on or off the IVS project site and the trucks associated with the alternative water supply would travel on existing roads and would be visible for only a short while as they travel between the well site and the IVS project site.

Project Construction Impacts

In addition to the IVS project site, a 100-ac temporary laydown site east of the project site on Dunaway Road and north of I-8 would be used during project construction.

The laydown area would be visually very prominent within the foreground of Dunaway Road. The form, line, and texture contrast of stored equipment, materials, and disturbed soil would be strong. While the number of viewers on this road is relatively low at most times, during the Plaster City OHV Open Area's periods of peak use, recreational viewer numbers would be high. The laydown area would also adjoin and be prominently visible from I-8 at the northeastern quadrant of the Dunaway Road interchange. The sensitivity of both foreground recreational viewers on Dunaway Road and motorists on I-8 is considered moderately high. The strong contrast of the 100 ac laydown area would be substantial during the approximately 40-month construction period for the IVS project; and could remain substantial for a long time after the completion of construction without adequate post-construction mitigation of the disturbed

vegetation and soil surface. Measure VIS 7 has been incorporated in the IVS project to reduce the temporary visual impacts of the laydown area during construction period and to address the longer term impacts of ground disturbance at the lay-down area through increased set-back of the laydown area from I 8, and re-grading and revegetation with locally native species following project construction.

The potential visual impacts of project grading and construction would be considerable and comparable to those of the IVS project itself. Grading would result in strong color contrast from soil surface disturbance. Project construction would include a highly industrial scene of assembly and installation of the SunCatcher units. These impacts are considered substantial and unavoidable, but would cease on the completion of the construction of the IVS project.

The construction of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in construction related visual, glare, and nighttime lighting impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed and in the same general locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in construction-related visual impacts compared to the IVS project because this modification will not result in the construction of any structures or facilities on or off the IVS project site.

Indirect Impacts

By substantially lowering the prevailing visual quality of the local viewshed in the Yuha Desert/western Salton Trough, the IVS project could have the indirect effect of encouraging additional subsequent development of similar character in the area. Because the relatively intact existing landscape would appear highly compromised after introduction of the IVS project, the incremental additional impacts of other future projects could appear to be less substantial than if they were occurring in the current, intact landscape without the IVS project.

Impacts of Project Closure and Decommissioning

Permanent closure of the IVS project would require a contingency/decommissioning plan to ensure compliance with applicable laws, ordinances, regulations, and standards (LORS), removal of equipment and shutdown procedures, site restoration, potential decommissioning alternatives, and the costs and source of funds associated with decommissioning activities.

The removal of the IVS project facilities would leave a very prominent visual impact over the entire site due to color contrast created between graded or disturbed soil areas and undisturbed

areas on and around the project site. This color contrast is due particularly to the dark color element contributed by normal scrub vegetation cover, and the typical dark desert pavement surface that characterizes large portions of the site and vicinity. After decommissioning, the site would resemble the most disturbed parts of the Plaster City OHV Open Area to the north. At present, despite some evidence of surface disturbance from past OHV use on the site, the site does not resemble the Plaster City OHV Open Area but retains a predominantly natural character. However, unlike the Open Area, the disturbed area after decommissioning would be highly visible to motorists on I-8. Revegetation of desert areas is difficult but has been implemented by the BLM El Centro Field Office with success over time. Therefore, visual recovery from land disturbance after closure and decommissioning of the IVS project could occur, although only over a long period of time, with implementation of an active and comprehensive revegetation program.

4.16.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative will result in short- and long-term visual impacts very similar to the impacts described in the previous section for the IVS project. This is because the Agency Preferred Alternative would be constructed on approximately the same number of acres on the site, avoiding drainages in the internal part of the site. As a result, views of the site from outside viewpoints will be very similar to the views of the site under the IVS project. The same measures described in the following section to address adverse visual impacts of the IVS project would also apply to the Agency Preferred Alternative.

The construction and operation of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in visual, glare, and nighttime lighting impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and in the same general locations and approximately the same overall site size as the facilities evaluated for the original IVS project.

4.16.4.3 300 MW Alternative

The setting for the 300-Megawatt (MW) Alternative would be approximately 2,600 ac or 40 percent of the IVS project site. The land affected by the 300 MW Alternative would be on the west part of the IVS project site, on land under the jurisdiction of the BLM.

Direct Operation Impacts

Impacts of Structures on Key Observation Points

View from Plaster City Off-highway Vehicle Open Area/West Mesa, Looking South (approximately 1.5 miles from the site) – Key Observation Point 1

As shown on Figures 3-7 and 4-1, the visual sensitivity in this landscape unit is generally considered to be moderately high. The existing scenic quality of this landscape unit ranges from moderate to moderately low. Viewer concern is considered moderately high due both to high numbers of recreational visitors in the area, and to the location of the site in the CDCA. Unlike under the IVS project, however, viewer exposure would be moderate to low under the 300 MW Alternative. The area of foreground and near-middle-ground-distance exposure to visitors in the Plaster City OHV Open Area would be far less than under the IVS project, at approximately 2 mi of Evan Hewes Highway compared to approximately 6 mi under the IVS project.

In contrast to the view of the IVS project**,** the visibility of the 300 MW Alternative from the Plaster City OHV Open Area would be far less. The principal racing and gathering areas in the Plaster City OHV Open Area would be over 1 mi farther from the nearest project features under the 300 MW Alternative. At this distance, the project contrast would range from moderate to weak depending on the viewer's location in the Plaster City OHV Open Area. Strong project contrast would still be experienced adjacent to the parts of the 300 MW Alternative abutting Evan Hewes Highway. However, the area of this foreground and near-middle-ground-distance exposure would be far less than under the IVS project, at approximately 2 mi compared to approximately 6 mi under the IVS project. The overall visual change for visitors of the Open Area would at most be moderate under the 300 MW Alternative.

In the context of moderate overall viewer sensitivity, this would represent an adverse but not substantial visual impact of the 300 MW Alternative.

Upper Yuha Desert (Scenic Quality Rating Unit 1) – Key Observation Points 2, 3, 4, 5

KOP 2 shows the view from a nearby residence on Evan Hewes Highway, looking southwest (approximately 1.5 mi from the site). KOP 2 was discussed under the IVS project but would not be applicable to the 300 MW Alternative, due to the great distance to the project site under the 300 MW Alternative (over 4.5 mi). At virtually background distance, the project contrast and impact under the 300 MW Alternative would be minor. Under the 300 MW Alternative, the

nearest residences would be in Ocotillo, to the west. Similarly, at that distance (approximately 4 mi), the project contrast and impact would be minor under the 300 MW Alternative.

KOP 2 was also representative of viewers on Evan Hewes Highway. Under the 300 MW Alternative, views from KOP 2 would be somewhat similar to those portrayed in Figures 3-8 and 4-2 for a larger segment of that highway, from the vicinity of Plaster City eastward.

As discussed under KOP 1, the strong project contrast would still be experienced by motorists adjacent to the segments of the 300 MW Alternative abutting Evan Hewes Highway, and impacts in that segment would be substantial, with rows of SunCatchers prominent in the immediate visual foreground, strongly dominating the viewers' visual experience. However, the area of this foreground and near-middle-ground-distance exposure would be far less under the 300 MW Alternative than under the IVS project, at approximately 2 mi compared to approximately 6 mi. At distances of approximately 1.5 mi or more, as shown on Figure 4-2, the contrast and dominance would be reduced by distance to moderate levels, and impacts to motorists would be adverse but less than significant under the 300 MW Alternative.

View from Residence to IVS Project Transmission Line, Looking West – Key Observation Point 3

As shown on Figures 3-9 and 4-3, KOP 3 represents views of the IVS project transmission line from the nearest residence, at the west edge of the Imperial Valley agricultural area east of the Yuha Desert. The view under the 300 MW Alternative would be the same as described for the IVS project. As under the IVS project, this visual impact is considered adverse, but not substantial under the 300 MW Alternative.

View from Town of Ocotillo, Looking West (approximately 5 miles) – Key Observation Point 4

As shown on Figures 3-10 and 4-4, KOP 4 is from the town of Ocotillo, approximately 5 mi west of the project site on I-8, and is representative of I-8 motorists at background distances from the project. Similar to conditions under the IVS project, the project viewed at this background distance under the 300 MW Alternative would exhibit weak overall contrast, dominance and visual change. The overall change however would be less than half that of the IVS project. As under the IVS project, the low level of overall visual change at this KOP under the 300 MW Alternative would be a less than substantial impact at this distance.

View from I-8 Near Dunaway Road, Looking Northwest – Key Observation Point 5

As shown on Figures 3-11 and 4-5, KOP 5 represents foreground views, particularly westward views, of the project site by motorists on I-8. This viewpoint appears to be approximately 0.5 mi from the project site or near the outer limit of the foreground distance zone. It is important to note that for the entire project frontage on I-8, the project would be viewed from much closer distances, and would thus appear much more prominently, with the nearest rows of 38-foot-tall SunCatchers within a few feet of the edge of the highway.

The actual location of KOP 5, near Dunaway Road, makes that viewpoint not relevant to the 300 MW Alternative because it is over 5 mi from the nearest part of the project site. However, the general condition represented in that view, that is, views of the project at foreground distance from the highway, is relevant to the 300 MW Alternative. Similar viewpoints on I-8 at foreground distance under the 300 MW Alternative would look much the same. As under the IVS project, a considerable distance of I-8 frontage would be characterized by SunCatchers in the immediate visual foreground of the highway under the 300 MW Alternative, at approximately 3.3 mi rather than the 5.6 mi under the IVS project. Therefore, very strong project contrast viewed by motorists with moderately high sensitivity would represent a substantial adverse impact under the 300 MW Alternative although that impact would be comparatively less than under the IVS project because of its lesser extent and duration.

The impacts of the project transmission line would be similar under the 300 MW Alternative and the IVS project, except that in the 300 MW Alternative it would not be viewed in combination with the SunCatcher fields that would be provided in Phase 2 of the IVS project (but not in the 300 MW Alternative). The new transmission line would be highly prominent in the foreground of I-8 for nearly 1 mi, exhibiting high contrast and dominance. In the context of moderately high sensitivity of I-8 motorists, this would represent a substantial adverse visual impact under the 300 MW Alternative.

Yuha Desert/Yuha Basin (Scenic Quality Rating Units 2 and 3) – Key Observation Points 6, 7, 8

KOP 6 represents the east segment of the Anza Trail near Dunaway Campground, near Dunaway Road south of I-8. Under the 300 MW Alternative, Phase 2 of the IVS project would not be built. As a result, views of the 300 MW Alternative from Dunaway Campground would be seen at distances of 4 mi or more, approaching the background distance zone. At that distance, the project would be evident but would exhibit a moderately low degree of contrast. Color and texture contrast could be moderate, but form and line contrast would be weak due to the level,

oblique angle of view and the small part of the field of view occupied by the 300 MW Alternative. Similarly, visual dominance of the project would be low in scale at this distance.

In the context of high viewer sensitivity, the impacts of the 300 MW Alternative at this distance would not be substantial.

KOP 7 is from Overlook Campground on the Anza Trail at a distance of approximately 1 mi from the project site, or middle-ground distance. However, approximately half of the overall visual field (to the north and west) that would be occupied by the IVS project would also be occupied under the 300 MW Alternative. The 300 MW Alternative would still exhibit strong color and texture contrast and strong spatial dominance, becoming the most dominant feature in views to the northwest. The 300 MW Alternative would demand attention, could not be overlooked, and would be dominant in the landscape. However, the overall contrast and dominance of the 300 MW Alternative would be substantially less than under the IVS project.

In the context of high overall viewer sensitivity in foreground and middle-ground viewpoints in the Yuha Desert ACEC, impacts from KOP 7 and other parts of the Anza Trail in proximity to the 300 MW Alternative would be substantial.

KOP 8 is from the vicinity of the Yuha Geoglyphs, also on the Anza Trail, at a distance of approximately 3 mi, approaching background distance. Because viewer exposure to the site from this viewpoint is primarily to the western, Phase I parts of the IVS project, the impacts under the 300 MW Alternative would be very similar to those under the IVS project. At this distance, the 300 MW Alternative would be very evident but would exhibit a moderate degree of contrast. Color and texture contrast could be moderately high, but form and line contrast would be weak due to the level, oblique angle of view and the small part of the field of view occupied by the 300 MW Alternative. Similarly, the visual dominance of the 300 MW Alternative would be moderate in scale at this distance.

In the context of high viewer sensitivity, the visual impacts of the 300 MW Alternative at this distance would be adverse, but not substantial.

From other destinations in the Yuha Desert ACEC, such as Yuha Well, fossil shell beds, and segments of the Anza Trail south of the Yuha Geolyphs, and Highway 98 and the surrounding areas, the 300 MW Alternative would not be visible due to intervening terrain of washes and low hills.

Glare and Light Impacts

As discussed under the IVS project, in the absence of specific photometric data, it is anticipated that the 300 MW Alternative would have the potential to be a source of intrusive and distracting diffuse reflected light under certain conditions, particularly when an entire row of SunCatcher units could be visible in a near-vertical position to approaching motorists at hours near sunrise and sunset. This impact would require mitigation similar to that described above for the IVS project. The potential distracting nuisance glare, and a strobe or flicker effect of bright reflection on passing motorists would be comparatively less than under the IVS project due to the reduced overall highway frontage under the 300 MW Alternative. This would therefore result in a shorter duration of exposure, but would still represent several miles of potential exposure under certain conditions. Though less than under the IVS project, these effects of the 300 MW Alternative would remain substantial.

Night lighting under the 300 MW Alternative would be similar to that described above for the IVS project and would require similar mitigation.

The operation of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in visual, glare, and nighttime lighting impacts compared to the 300 MW Alternative as described above. This is because these proposed modifications would be designed, function, and in the same general locations and approximately the same overall site size as the facilities evaluated for the original 300 MW Alternative.

Project Construction Impacts

It is expected that the project laydown area under the 300 MW Alternative would be proportionately smaller than under the IVS project, both in extent and duration. However, if the laydown area is located in the same general location and adjoining the highway at Dunaway Road, it would still potentially have strong contrast and represent a substantial impact to viewers on I-8. If the lower overall area needed allows for a greater setback from I-8, the potential impacts to viewers on I-8 during construction could be reduced considerably under the 300 MW Alternative. Potential long-term impacts associated with ground disturbance of the laydown area would be similar to those described under the IVS project.

The potential impacts of project grading and construction would be considerable under the 300 MW Alternative and comparable to those of the IVS project. Grading would result in strong color contrast from soil surface disturbance. Project construction would include a highly industrial scene of assembly and installation of the SunCatcher units. These short-term adverse visual impacts of the 300 MW Alternative are considered substantial and unavoidable.

The construction of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in visual, glare, and nighttime lighting impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed, and in the same general locations as the facilities evaluated for the IVS project.

4.16.4.4 Drainage Avoidance #1 Alternative

The Drainage Avoidance #1 Alternative would occupy the same site as the IVS project but would have fewer SunCatchers in order to avoid the placement of permanent structures in the major drainages. However, these differences would not be readily apparent to most viewers, and would make very little difference in terms of overall effect on all viewer groups within the viewshed. Like the proposed IVS project, the Drainage Avoidance #1 Alternative would substantially degrade the existing visual character and quality of the project site and its surroundings, including motorists on I-8, recreational destinations in the Yuha Desert ACEC, and segments of the Anza Trail, resulting in substantial adverse visual impacts. Overall, the level of short-term and long-term visual impacts under the Drainage Avoidance #1 Alternative would be similar to the IVS project.

The construction and operation of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not result in differences in visual, glare, and nighttime lighting impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed, operated, and in the same general locations as the facilities evaluated for the IVS project.

4.16.4.5 Drainage Avoidance #2 Alternative

The Drainage Avoidance #2 Alternative would occupy a smaller part of the project site than the IVS project. Under the Drainage Avoidance #2 Alternative, development would be concentrated in the middle part of the IVS project site, with no development on the east and west sides of the overall project site.

The Drainage Avoidance #2 Alternative would be smaller in area than the IVS project but would result in similar impacts as the IVS project although those impacts would be somewhat more concentrated in the middle of the site. The visual impacts of the Drainage Avoidance #2 Alternative would be substantial and adverse to I-8 and Yuha Desert ACEC viewers, and

unavoidable. However, like the 300 MW Alternative, the degree and extent of those impacts would be substantially less than under the IVS project.

The construction and operation of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in differences in visual, glare, and nighttime lighting impacts compared to the IVS project as described above although those impacts would be somewhat more concentrated in the middle of the site. This is because these proposed modifications would be designed, constructed, and operated the same as the facilities evaluated for the IVS project.

4.16.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, right-of-way (ROW) grant for the IVS project would not be approved by the BLM and the BLM would not amend the CDCA Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, the views of the site are not expected to change noticeably from existing conditions under this No Action Alternative and, therefore, this No Action Alternative would not result in adverse visual, light, and glare impacts. However, the project site could become available to other uses that are consistent with BLM's land use plan. In addition, in the absence of this project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.16.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, ROW grant for the proposed IVS project would not be approved by the BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan.

Because the CDCA Plan would be amended so no solar projects can be approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition under this No Action Alternative, with no new structures or facilities constructed or operated on the site. As a result, the views of the site are not expected to change noticeably from existing conditions under this No Action Alternative. Therefore, this No Action Alternative would not result in adverse visual, light, and glare impacts. However, in the absence of this project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects would have similar impacts in other locations.

4.16.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the ROW grants for the IVS project would not be approved by the BLM but the BLM would amend the CDCA Plan to allow other solar projects on the site.

Because the CDCA Plan would be amended under this No Action Alternative to allow for solar energy generation, it is possible views of the site could change substantially based on the required buildings and structures on the site for the different solar technologies. Different solar technologies could create different visual effects based on the technology components when compared to the IVS project. It is expected that the views of the site could change substantially with a different solar technology, similar to the changes in views under the IVS project. Therefore, this No Action Alternative could result in adverse visual, light, and glare impacts similar to the impacts under the IVS project.

4.16.5 Cumulative Impacts

The cumulative impacts study area and cumulative projects considered in the cumulative impacts analysis for visual resources are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis.

Visual resources in the general geographic area on and around the project site have been impacted by past and currently approved projects. The U.S. Gypsum Plant is the most visually prominent existing feature in the general viewshed and detracts from the overall scenic intactness of this viewshed, presenting a prominent man-made, industrial feature into views within a radius of a few miles, including the IVS project site. The Plaster City OHV Open Area also has visual effect in the area, including near the IVS project site, as a result of the general visual disturbance of the terrain in the Plaster City OHV Open Area due to periodic heavy OHV use that accounts for its moderate to moderately low visual quality. Most of the cumulative

projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to visual resources less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects. It is anticipated that reasonably foreseeable projects in the area, including a number of energy generation projects, would contribute to substantial visual changes in this area. These visual changes could include construction and operation of aboveground solar equipment and wind turbines, overhead transmission lines, and mixed-use development.

The construction and operation of the IVS project could contribute to cumulative adverse visual impacts in the area as discussed in Sections 4.16.5.1 through 4.16.5.3, below.

4.16.5.1 Construction

As described earlier, the construction of the IVS project is expected to result in short term adverse visual impacts related to views of construction activities, materials, and disturbed soil surfaces. It is possible that some of the planned projects in the area may be under construction or operational at the same time as the IVS project. As a result, the IVS project and any other projects under construction or operational at the same time could contribute to substantial short-term adverse visual impacts. The IVS project would contribute substantially to these possible short-term cumulative adverse visual impacts because of the large area of ground disturbance which would adversely affect the overall degree, extent, and intensity of those short-term effects and, depending on what other construction is occurring concurrently, the IVS may be the single greatest contributor to the overall short-term adverse visual impacts.

4.16.5.2 Operation

The operation of the IVS project is expected to result in long-term adverse visual impacts. It is expected that some of the cumulative projects in the area may be under construction or operational at the same time as the IVS project. As a result, there may be substantial long-term adverse impacts during construction and operation of those cumulative projects. Therefore, the IVS project could contribute substantially to long term adverse cumulative visual impacts due to its vast extent, and the high level of change to visual character and quality that it would contribute to the viewshed. It could essentially form a part of a very large corridor of wind and solar development reaching from the Imperial Valley substation to the border of Imperial County to the west.

4.16.5.3 Decommissioning

The decommissioning of the IVS project is expected to result in adverse impacts related to visual resources similar to the project construction impacts. It is unlikely that the construction or decommissioning of any of the cumulative projects would occur concurrently with the decommissioning of this project, because the decommissioning is not expected to occur for approximately 40 years. The period of decommissioning impacts, however, is longer than 40 years because the period of full visual recovery of the highly disturbed landscape would not be expected to occur for several more decades. It is not known when decommissioning of other cumulative projects, particularly adjacent wind projects, would take place. However, due to the potentially very long period of decommissioning impacts, some overlap and therefore some cumulative impact, would be anticipated. As a result, there may be cumulative adverse visual impacts as a result of the decommissioning of the IVS project in combination with effects of decommissioning of nearby cumulative projects.

4.16.5.4 Cumulative Impact Summary

As discussed above, the anticipated visual impacts of the construction and operation of the IVS project, in combination with past and foreseeable future projects, in the West Mesa/Yuha Desert region and the southern California desert are cumulatively considerable, and the contribution of the IVS project to the cumulatively considerable impact would be substantial and adverse.

4.16.6 Mitigation, Project Design Features, and Other Measures

VIS-1 **Surface Treatment of Project Structures and Buildings.** The project owner will paint the box structures (maintenance building, main services complex, etc.) on the site per BLM and CEC specifications.

Electrical features and features used in the production and transmission of electricity (transformers, bus bars, poles, lattice structures, SunCatchers) will be painted with a blue-grey coloring. This measure includes coloring of security fencing with vinyl or other non-reflective coating; or with slats or similar semi-opaque, non-reflective material, to blend to the greatest feasible extent with the background soil.

The project owner shall submit for BLM Authorized Officer review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan will include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. A specific schedule for completion of the treatment; and

E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner will not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by BLM's Authorized Officer. Subsequent modifications to the treatment plan are prohibited without BLM's Authorized Officer approval.

VIS-2 **Temporary and Permanent Exterior Lighting.**To the extent feasible, consistent with safety and security considerations, the project owner will design and install all permanent exterior lighting and all temporary construction lighting such that (a) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; (b) lighting does not cause excessive reflected glare; (c) direct lighting does not illuminate the nighttime sky, except for required FAA aircraft safety lighting; and will employ on-demand lighting technology such as a radar-triggered audio-visual warning system; d) illumination of the project and its immediate vicinity is minimized, and e) the plan complies with local policies and ordinances. The project owner will submit to BLM's Authorized Officer for review and approval and simultaneously to Imperial County for review and comment a lighting mitigation plan that includes the following:

A. The locations and directions of light fixtures will take the lighting mitigation requirements into account;

B. The lighting design will consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements;

C. The lighting will incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated;

D. Light fixtures that are visible from beyond the project boundary will have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security;

E. All lighting will be of minimum necessary brightness consistent with operational safety and security; and

F. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) will have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied.

VIS-3 **Realignment of Proposed Transmission Interconnection.**To reduce the prominence of the proposed new segment of transmission line paralleling I-8, the applicant shall set back the transmission line at least 1/2 mile from I-8 within the project site. This measure applies only to that segment of the proposed transmission line paralleling I-8 within the project site boundary.

VIS-4 **Setback of SunCatchers from Highway I-8.**To reduce the visual dominance and glare effects of the SunCatchers to motorists on I-8, the applicant will employ a combination of measures as necessary, including set-backs of the nearest SunCatcher units to a distance of 500 feet from the adjoining road or as necessary to avoid excessive glare and reduce the visual height and dominance of SunCatchers, slatted fencing as described under Measure VIS-6, and set-backs of SunCatcher units from project fencing.

VIS-5 **Beneficial Assessment to NPS/BLM for Impacts to Anza Trail.**To off-set unavoidable adverse impacts to visitors on the Anza Trail and Yuha Desert ACEC, the project owner will contribute funds to the National Park Service (NPS) and BLM, specifically to provide improvements to benefit visitors on the Anza Trail. Such improvements could include, but not be limited to, interpretive displays or exhibits, improvements to use areas, mounted telescopes, or other improvements to be determined by the NPS and BLM through preparation of a Comprehensive Interpretive Plan for the Anza Trail as required in Measure REC-2. (Refer to Section 4.12, Recreation, for the language of that measure.)

VIS-6 **Reflective Glare Mitigation.**The project owner will develop and implement a glare mitigation plan that minimizes visibility of the SunCatcher mirrors to both

east- and west-bound traffic on I-8 using one or more measures, which may include but are not limited to 20-foot tall slatted fencing, particularly at the eastern and western boundaries near the highway; earth berms, and/or an increase in the setbacks of the SunCatcher units from the road; and must include a SunCatcher Mirror Positioning Plan (MPP) describing how the outermost rows of SunCatchers could be positioned to avoid or minimize the most intensive potential glare incidents on motorists as called for under Measure TRANS-4. The MPP will include a glare complaint resolution form to be distributed to the BLM and the NPS.

VIS-7 **Setback and Revegetation of Staging Area.**To minimize the visual prominence of the proposed staging area to motorists on I-8, the project owner will provide a revised site plan for staging that includes a set-back of at least ¼-mile or more from the highway, and a description of measures to identify and address biological and cultural issues potentially connected to that revised site plan. In addition, the project owner will provide a re-vegetation plan describing how the staging site will be restored following construction. The plan will call for beginning of restoration of the site within the shortest feasible time following completion of construction.

4.16.7 Summary of Adverse Impacts

Table 4-70 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to visual resources.

As shown in Table 4-70, the IVS project and the other Build Alternatives would substantially degrade the existing visual character and quality of the site and its surroundings. Under the IVS project, an area of roughly 10 square miles, including over 6.5 mi of frontage on I-8, would experience a dramatic visual transformation from a predominantly natural desert landscape to one of a highly industrial character, strongly affecting motorists on I-8. The character and quality of views from some recreational destinations in the Yuha Desert ACEC, including segments of the Anza Trail, would be strongly affected. Given the moderately high-to-high level of viewer sensitivity of these affected viewpoints, the visual impacts of the IVS project are considered substantial and adverse. Mitigation is provided that would reduce or avoid project impacts to the extent feasible.

Table 4-70 Summary of Visual Resources Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	The IVS project would result in permanent visual changes to the desert landscape and would introduce development in an area that is visually open and predominantly free of development. The visual impacts of project grading and construction would be considerable and would include a highly industrial scene of assembly and installation of the SunCatcher units. The project will introduce new sources of glare from the SunCatchers and nighttime lighting. Visual recovery from land disturbance after decommission-ing could occur, although only over a long period of time, with implementation of a comprehen-sive revegetation program.	**Construction Measures** *VIS-7:* Setback and revegetation of staging area **Operations Measures** *VIS-1:* Surface treatment of project structures and buildings *VIS-2:* Temporary and permanent exterior lighting *VIS-3:* Realignment of proposed transmission interconnection *VIS-4:* Setback of SunCatchers from I-8 *VIS-5:* Beneficial assessment compensation to NPS/BLM for impacts to Anza Trail *VIS-6:* SunCatcher MPP	Given the high level of viewer sensitivity of the area and the fact that the site is undeveloped the visual impacts of the IVS project after mitigation are considered unavoidable and adverse after mitigation for construction and operations. The visual impacts of the IVS project in combination with other cumulative projects in the West Mesa/Yuha Desert region, and the southern California desert are considered cumulatively unavoidable and adverse after mitigation. There may be cumulative adverse visual impacts as a result of the decommissioning of the IVS project in combination with effects of decommissioning of nearby cumulative projects and the time span involved for recovery of the landscape.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
709 MW Alternative: Agency Preferred Alternative	Same as the IVS project.	Same as the IVS project.	Same as the IVS project.
300 MW Alternative	Similar to the Agency Preferred Alternative, but because of the smaller development area, the degree and extent of those impacts would be substantially less than under the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #1 Alternative	The visual impacts of this Alternative would be similar to the impacts under the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
Drainage Avoidance #2 Alternative	Similar to the Agency Preferred Alternative, but because of the smaller development area, the degree and extent of those impacts would be less extensive than under the IVS project and the Agency Preferred Alternative	Same as the IVS project and the Agency Preferred Alternative.	Same as the IVS project and the Agency Preferred Alternative.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Potentially the same as or similar to the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially the same as or similar to the IVS project and the Agency Preferred Alternative.	Potentially the same as or similar to the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: ACEC = Area of Critical Environmental Concern; BLM = United States Bureau of Land Management; CDCA Plan = California Desert Conservation Area Plan; I-8 = Interstate 8; IVS = Imperial Valley Solar; MPP = Mirror Positioning Plan; MW = megawatts; NPS = United States National Park Service; ROW = right-of-way.

The visual impacts of the 300 MW Alternative would remain substantial and adverse to I-8 and Yuha Desert ACEC viewers, however, the degree and extent of those impacts would be substantially less than those of the IVS project.

The visual impacts of the Drainage Avoidance #1 Alternative would be very similar to the impacts of the IVS project and would be substantial and adverse. The differences in the visual effects of these two alternatives would be minor.

Similar to the impacts of the 300 MW Alternative, the visual impacts of the Drainage Avoidance #2 Alternative would be much less extensive than under the IVS project, but would remain substantial and adverse.

The anticipated visual impacts of the IVS project and the other Build Alternatives, in combination with past and foreseeable future projects in the West Mesa/Yuha Desert region, and in the southern California desert are considered cumulatively considerable and the contribution of the IVS project to that cumulative impact is substantial and adverse.

Diffuse reflection from the SunCatchers could be an intrusive and distracting nuisance to motorists under at least certain conditions, particularly when an entire row of units could be visible in a near-vertical position to approaching motorists at hours near sunrise and sunset. Mitigation would reduce potential glare impacts so they would no longer be substantial.

4.17 Hydrology, Water Use, and Water Quality

4.17.1 Methodology

The analysis specifically focuses on the potential for the IVS project and the other alternatives to:

- Cause accelerated wind or water erosion and sedimentation on the IVS project site;
- Exacerbate flood conditions on and in the vicinity of the IVS project site;
- Adversely affect surface or groundwater supplies;
- Degrade surface or groundwater quality; and
- Comply with all applicable laws, ordinances, regulations, and standards (LORS) and state policies.

4.17.2 Definition of Resource

The resources considered in this analysis are surface and ground waters on, under, and in the vicinity of the IVS project site.

4.17.3 Applicable Regulations, Plans, and Policies/Management Goals

4.17.3.1 Clean Water Act

The United States Army Corps of Engineers (Corps) has determined that 840 acres (ac) of the project site are jurisdictional waters of the U.S. under Clean Water Act (CWA) Section 404. Of those 840 ac, approximately 165 ac of these waters will be permanently impacted and 5 ac will be temporarily impacted. The United States Environmental Protection Agency (EPA) Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230 et seq.) are substantive environmental criteria used by the Corps to evaluate permit applications. Under these guidelines, an analysis of practicable alternatives is the primary tool used to determine whether

a proposed discharge can be authorized. An alternative is considered practicable if it is available and capable of being implemented after considering cost, existing technology, and logistics in light of the overall project purpose (40 CFR Part 230[a][2]). The guidelines suggest a sequential approach to project planning such that the Corps must first consider avoidance and minimization of impacts to the extent practicable. Mitigation for unavoidable impacts to waters of the U.S. is addressed only after the analysis has determined the Least Environmentally Damaging Practicable Alternative (LEDPA). The Corps has preliminarily identified the Agency Preferred Alternative to be the LEDPA as proposed in the *Draft 404B-1 Alternatives Analysis for the Imperial Valley Solar Project* provided in Appendix H. The Corps participated in the development of this alternative and is currently in the process of a detailed evaluation of the analysis along with the EPA. A Final 404(b)(1) Alternatives Analysis and LEDPA determination will be included as part of the Corps' Record of Decision (ROD). Once the LEDPA is determined, the Corps can issue a Standard Individual Permit for unavoidable impacts with Special Conditions that further minimizes the potential indirect effects of the project on avoided areas and requires mitigation to fully replace the functions and services resulting from the unavoidable impacts to streams. The LEDPA will be in compliance with Section 404 of the Clean Water Act.

4.17.3.2 Porter-Cologne Water Quality Control Act/State Water Board Resolution No. 68 16

Measures SOIL&WATER-1 through SOIL&WATER-9 would satisfy the requirements of the Porter-Cologne Water Quality Control Act and State Water Resources Control Board (SWRCB) Resolution No. 68-16, and other relevant regulations as administered by the Regional Water Quality Control Board (RWQCB).

4.17.3.3 State Water Resources Control Board Resolution 75-58 and Energy Commission's 2003 Integrated Energy Policy Report

The SWRCB Resolution 75-58, the California Energy Commission's (CEC's) 2003 Integrated Energy Policy Report, and The Warren-Alquist Act relate to the use of fresh inland water for power plant cooling. The IVS project would not use water for power plant cooling, but is in compliance with the spirit of these regulations by using reclaimed water for mirror washing. No fresh inland water would be used except for potable water.

4.17.3.4 Public Resources Code, Sections 25300 through 25302

Through compliance with Measure SOIL&WATER-2, information required to conduct assessments and forecasts of potable and industrial water consumption by power plants is achieved.

4.17.3.5 California Code of Regulations Titles 17, 22, 23, 24, and 27

It has been determined that the proposed project would satisfy the requirements of the California Code of Regulations Titles 17, 22, 23, 24, and 27 by upgrading the SWWTP to supply tertiary treated recycled water in accordance with Title 17 and 22 requirements as is proposed by the applicant and with the adoption of Measures SOIL&WATER-2, SOIL&WATER-3, SOIL&WATER-4, SOIL&WATER-7, SOIL&WATER-8, and SOIL&WATER-9.

4.17.3.6 Imperial County Land Use Ordinance, Title 9

It has been determined that the proposed project would satisfy most requirements of Imperial County Land Use Ordinance, Title 9 by adoption of Measures SOIL&WATER-1, SOIL&WATER-5, SOIL&WATER-6, and SOIL&WATER-8. The project may not satisfy the Imperial County Land Use Ordinance with regard to stream morphological changes that could result in excess sediment production from the site. These County Ordinances would apply to the privately-owned land on the project site but not the BLM land.

4.17.3.7 California Water Code Section 1211

It has been determined that the proposed project would satisfy requirements of California Water Code Section 1211 with the adoption of Measure SOIL&WATER-9.

4.17.4 Proposed Action and Alternatives: Direct and Indirect Impacts

The potential impacts of the IVS project, the 709 MW Alternative (the Agency Preferred Alternative), the other Build Alternatives, and the No Action Alternatives are described in the following sections. Additional discussion of the potential effects of the incorporation of the four applicant-proposed modifications described in Chapter 2, Alternatives Including the Proposed Action, in the IVS project and the other Build Alternatives, and the modifications to avoid

impacts to drainages, cultural resources, and the flat-tailed horn lizard in the Agency Preferred Alternative is also provided in this section.

4.17.4.1 IVS Project: 750 MW Alternative

Construction Impacts

Soil Erosion Potential by Wind

Construction of the IVS project is expected to take approximately 40 months to complete. Construction would include soil excavation, clearing, grading, installation of solar disks, installation of the laydown area, and construction of the Main Services Complex, roads, utilities, water pipeline, transmission line, sediment and retention basins, substation, and other ancillary features. Water will be used on site for dust control. That water would come from the off-site private well or the SWWTP.

Potential impacts to soils related to increased erosion from wind and runoff on disturbed areas, or release of hazardous materials, are possible during construction. Potential storm water impacts could result if increased runoff flow rates and volume discharge from the IVS project site were to increase flooding and sedimentation downstream. Dunaway Road and the area upstream of the Westside Main Canal could be affected by increased sediment deposition. Water quality could be impacted by increased sediment load from the ground surface and from discharge of hazardous materials released during construction.

Table 4-71 summarizes the anticipated disturbance on the site during construction of the IVS project. The total construction disturbance area would be 3,000 ac, of which 2,175 ac would be in the SunCatcher array, the rest in other construction as detailed in this table.

Table 4-71 Estimated Disturbed Area Summary

Project Component	Construction Disturbance	Operations Permanent Disturbance	Proposed Length	Comments
Off-Site Development				
Off-site access road	4.5 ac	3.6 ac	1.3 mi	30 ft width for roadway and drainage
Off-site transmission line	91.6 ac	Included below	7.6 mi	50 ft each side of center
Tower structures	Included above	1.2 to 1.4 ac	N/A	85 to 100 towers x 1,024 sf per tower
Waterline and pumping station	8.0 ac	1 ac	3.4 mi	9.5 ft each side of center
Off-site electrical and communications overhead service	0.3 ac	Included below	539 ft	12 ft each side of center
Poles	Included above	26 sf	N/A	2 poles x 13 sf per pole
Subtotal	**104.4 ac**	**4.6 ac**		
On-Site Balance-of-Plant Development				
Construction staging and construction administration area east of Dunaway Road	100 ac	N/A	N/A	N/A
On-site construction laydown area	12 ac	N/A	N/A	N/A
Site boundary fence line	29.9 ac	14.9 ac	20.5 mi	12 ft width construction access; 3 ft each side of the fence
Site paved roadways	137.6 ac	137.6 ac	25.2 mi	45 ft width for roadway & drainage
Unpaved perimeter roadways	16.2 ac	16.2 ac	11.2 mi	12 ft wide
Main Services Complex, parking and services	14.4 ac	14.4 ac	N/A	N/A
Assembly buildings and storage	14 ac	N/A	N/A	N/A
On-Site Wet and Dry Utilities Access				
Water pipeline	8.7 ac	N/A	3.8 mi	9.5 ft each side of center
On-site electrical and communications overhead service	3.8 ac	N/A	6,914 ft	12 ft each side of center
IVS Substation	7.7 ac	5.2 ac	N/A	650 ft by 350 ft

Project Component	Construction Disturbance	Operations Permanent Disturbance	Proposed Length	Comments
On-site transmission line 34.1 ac N/A 2.8 mi 50 ft each side of center line	34.1 ac	N/A	2.8 mi	50 ft each side of center
Transmission access road	Included above	4.1 ac	2.8 mi	12 ft wide
Transmission tower structures	Included above	0.5 to 0.7 ac	N/A	35 to 40 towers at 1,024 sf per tower
34.5 kV overhead runs to Solar 2A Substation	4.0 ac	N/A	N/A	10.95 mi by 12 ft wide with a significant portion overlapping other construction disturbed areas (75%)
Poles	Included above	0.1 ac	N/A	N/A
34.5 kV runs to overhead lines	5.2 ac	N/A	N/A	N/A
Subtotal	**271.31 ac**			
Solar Field Development = 500 by 1.5 MW Solar Groups 2,3				
North-south access routes	245 ac	245 ac	168 mi	1,709 ft per 1.5 MW (0.47 ac total) based on 12 ft-wide road
East-west access routes	148.3 ac	148.3 ac	102 mi	1,033 ft per 1.5 MW (0.28 ac total)
Electrical Collection System				
600 V underground	35 ac	N/A	576 mi	5,850 ft per 1.5 MW (0.52 ac total) based on 2 ft each side of center
34.5 kV underground	20 ac	N/A	45 mi	460 ft per 1.5 MW (0.06 ac total) based on 3 ft each side of center
SunCatcher Installation				
North-south access/SunCatcher	440 ac	440 ac	See total area	1,600 ft per 1.5 MW (0.88 ac total) based on 20 ft by 32 ft access/unit

Project Component	Construction Disturbance	Operations Permanent Disturbance	Proposed Length	Comments
East-west access/SunCatcher	1,735 ac	1,735 ac	See total area	4,200 ft per 1.5 MW (3.47 ac total) based on 36 ft by 70 ft access/unit
Subtotal	2,623.4 ac	2,568.4 ac		
Total Area	3,075.1 ac	2,746.6 ac		

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table General Note 1: Assumes 750 MW net development of 30,000 SunCatchers.

Table General Note 2: During installation of the SunCatchers, only 50% of the total land would be disturbed. The modularity of the SunCatcher design and off-site manufacturing would enable a phased deployment, thereby minimizing the proportion of the overall site that is disturbed at any give time during construction.

Table General Note 3: The plan site layout minimizes traffic road operations of the Project.

Table Key: ac = acre/acres; ft = foot/feet; kV = kilovolt; mi = mile/miles; MW = megawatts; N/A = not applicable; sf = square feet; V = volts.

The soils on the project site described earlier in Table 3-26 are highly susceptible to wind erosion under normal conditions. The scarcity of vegetation on the site contributes to a natural propensity for wind erosion, although the potential for wind erosion is expected to be less in the watercourses than in the upland areas due to much higher density of vegetation in the riparian areas. The potential soil loss due to wind under existing conditions was estimated to be more than 100 tons per acre per year (t/ac/yr) for the IVS project site. This soil loss may more accurately be considered displacement, because soil lost by wind in one area of the Yuha Desert would likely settle in another, so under natural conditions, there is no overall net loss of soil in any given area. Disturbance by project grading and vegetation removal in a specific area will leave soil particles in that area more vulnerable to detachment by wind, resulting in more displacement. Wind-related soil loss is expected to occur on the IVS site during construction, given the overall size of the disturbed area, that soil loss could be substantial during construction depending on wind conditions. This could result in the displacement of topsoil on the site, as well as air quality and dust nuisance problems. Because the prevailing wind in the area for 11 months of the year is toward the east, dust from the IVS project site could potentially reach Seeley, El Centro, and the neighboring agricultural areas.

A Draft Drainage, Erosion and Sediment Control Plan (DESCP)/SWPPP has been prepared for the IVS project. It describes a series of best management practices (BMPs) intended to reduce wind erosion during construction, including applying water or other dust palliatives as to prevent or alleviate dust nuisance generated by construction activities, covering small stockpiles or other areas subject to wind erosion, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, haul truck covers, installing vegetation, mulching, minimizing surface areas to be disturbed, limiting on-site vehicle traffic speed, controlling the number and activity of vehicles on the site, and application of soil binders.

Implementation of the Final DESCP as described later in Measure SOIL&WATER-1 would ensure adequate BMPs are in place to address and mitigate potential erosion and loss of soil from wind.

Soil Erosion Potential by Water

The erosion potential by water during construction of the IVS project is expected to increase as a result of loss of vegetative cover, removal of surface crust and desert pavement, and increased local sediment transport through creation of localized gullies and rills on newly graded slopes. The Draft DESCP described above also identifies BMPs for water erosion control including measures such as silt fences, sediment barriers, grading restrictions, soil binders,

temporary stabilized drains, brush barriers, sediment basins, strawbale barriers, fiber rolls, and sand bags.

Soil erosion rates were estimated using the Revised Universal Soil Loss Equation (RUSLE2). The RUSLE2 equation estimates erosion-related soil loss from a land surface using climate, soil conditions, topography, land cover, support (best management) practices, and hydraulic resistance. The results of that analysis are shown in Table 4-72. Those results show that the Rositas soil association, which covers all the Phase I area and most of the Phase II area, has the potential for producing approximately 0.042 to 0.42 t/ac/yr water-borne sediment. Assuming Rositas Silt Loam soils, this amounts to about 8.4 cubic feet per acre per year (cf/ac/yr) which is a reflection of the very low rainfall of the area. At this rate, the worst-case annual watershed sediment production potential from the 3,075 ac disturbed area under the IVS project would be approximately 950 cubic yards (cy). The analysis also shows that the proposed BMPs would be sufficient to mitigate sediment production during construction. An independent RUSLE2 evaluation was made using very preliminary and simplified BMP inputs, with similar preliminary results.

Refer to the *Draft 404B-1 Alternatives Analysis* in Appendix H for discussion of the sediment transport associated with each alternative. Measure SOIL&WATER-1 would ensure that sediment basins and other construction BMPs are constructed in a timely manner to mitigate potential runoff erosion and loss of soil from wind.

Construction Water Use

As described in the following section, the Seeley Wastewater Treatment Plant (SWWTP), at 1898 West Main Street in Seeley, approximately 13 mi east of the IVS project site, is anticipated to supply treated wastewater for the IVS project for mirror washing and other project uses except potable water. An Environmental Impact Report (EIR) is currently being prepared by Imperial County for an upgrade to the plant to ensure that it can meet the long-term needs of the IVS project.

Table 4-72 Soil Erosion Rates

Soil Type	Existing (ton/ac/yr)	Construction – Cut Area with No BMPs (ton/ac/yr)	Construction – Fill Area with No BMPs (ton/ac/yr)	Construction – Average with No BMPs (ton/ac/yr)	Construction with BMPs (ton/ac/yr)	Operations with BMPs (ton/ac/yr)
Rositas Sand and Fine Sand, 0% to 9% Slopes	0.042	0.042	0.14	0.091	<0.042	<0.042
Rositas Loamy Fine Sand, 0% to 2% Slopes	0.082	0.081	0.25	0.17	<0.082	<0.082
Rositas Silt Loam 0% to 2% Slopes	0.42	0.42	1.3	0.86	<0.42	<0.42
Meloland Fine Sand	0.017	0.017	0.054	0.036	<0.017	<0.017
Vint Fine Sandy Loam	0.13	0.13	0.41	0.27	<0.13	<0.13
Indo Loam	0.25	0.25	0.76	0.51	<0.25	<0.25

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table General Note: Soil erosion rates reflect sheet flow and rill erosion caused by storm water runoff and were calculated using the Revised Universal Soil Loss Equation (Version 2), RUSLE2 computer program.

Table Key: BMP = Best Management Practice; ton/ac/yr = tons per acre per year.

However, at this time, it does not appear that the plant improvements will be completed by the time water is needed for the construction of the IVS project. The applicant has identified an alternative water source and had concurred with including that water source in the IVS project, the Agency Preferred Alternative, and the other Build Alternatives. That alternative water supply is anticipated to be used for during the initial 6 months to 3 years of construction and operation of the project. The alternative water supply would be provided through the Dan Boyer Water Company in Ocotillo. The water source is potable and permitted for use by construction or personal consumption and would be pumped from State Well No. 16S.9E-36G4. This well is approximately 3.5 mi southwest of the western boundary of the project site, immediately south of County Road S22 exit (Exit 89) on I-8. The extraction of water from this well is permitted for at a rate of 40 acre-feet per year (afy) or approximately 41,775 gallons per day (gpd). The well is 10.75 inches (in) in diameter, 560 ft deep and is screened from 340 to 560 ft below ground surface (bgs). State Well No. 16S.9 E-36G4 operates under an existing Conditional Use Permit and is permitted for the extraction of water. Water from this well would be delivered to a point inside the Ocotillo/Coyote Wells Groundwater Basin and would be used for a project that lies primarily over that basin, so that no water export permit would be required. In addition, the temporary nature of the water use would only continue under water is made available from the SWWTP.

This well, in the Ocotillo/Coyote Wells Groundwater Basin (OCWGB), part of the sole source aquifer. The use of water from this well will not introduce contaminants into the aquifer and, therefore, is in compliance with the Sole Source Aquifer program. Further discussion of the use of the well is provided in Appendix B, Determination of NEPA Adequacy.

The water needed during construction for dust control and ground preparation for concrete pours was estimated to average 45,000 gallons per day (gal/day) and not exceed 90,000 gal/day, which is within the agreed-upon delivery of water from the SWWTP for the IVS project. Measure SOIL&WATER-2 would ensure viability of a water supply, whether from the Dan Boyer Company well or the SWWTP and would ensure that water use would be within the amount evaluated for the IVS project. With implementation of Measure SOIL&WATER-2, no adverse water supply impact is anticipated as a result of water needs during construction.

The on-site concrete-lined evaporation ponds would be used as storage reservoirs for construction water prior to completion of the water pipeline from the SWWTP. Water quality impacts could occur to groundwater through infiltration of this treated wastewater. The Colorado River RWQCB will require monitoring of groundwater during this period. Compliance with Measure SOIL&WATER-3 will ensure no adverse impact to groundwater from storage of this water in the evaporation ponds.

Potable water for the construction workforce will be supplied from an as yet to be determined offsite source. Measure SOIL&WATER-4 would ensure that this water comes from a water purveyor licensed to provide potable water in and that the supply provided to IVS project is within the licensed capabilities of the purveyor, ensuring no adverse water supply impact for construction potable water.

Storm Water

Storm water runoff from the site during construction could include excess sediment, trash, oils, grease, coolants, vehicle fluids, solvents, paints, cleaners, asphaltic emulsions, mortar mix, spilled fuel, vehicle fluids and other construction-related contaminants from the construction activity. All construction waste, including hazardous wastes, will be collected and removed from the site on a regular schedule. The IVS project construction will require a Storm Water Pollution Prevention Plan (SWPPP) which would specify BMPs to prevent all construction pollutants including erosion products from contacting storm water, eliminate or reduce nonstorm water discharges to waters of the U.S., and provide for inspection and monitoring of BMPs. Construction storm water BMPs would include temporary soil stabilization techniques such as scheduling activities to minimize land disturbance during the rainy season; marking areas not to be disturbed; using geotextiles, mats, plastic covers, or erosion blankets to stabilize disturbed areas; the use of soil binders, earth dikes, drainage swales, lined ditches, flow velocity protection measures, silt fences, straw bales, fiber rolls, and dust palliatives; tracking control at site entry/exit points; and stabilized construction roads. Measures SOIL&WATER-1 and SOIL&WATER-5 are intended to ensure adequate control of construction storm water pollutants.

Wastewater

Portable chemical toilets would be used for construction sanitary wastes. Sanitary wastewater from these toilets would be periodically pumped to a tanker truck by a licensed contractor and shipped to a sanitary water treatment plant. Measure SOIL&WATER-5 will ensure proper handling of construction sanitary wastes.

Construction Wastes

Recyclable construction waste material including scrap wood, steel, glass, plastic, and paper would be collected and taken to a recycling facility at regular intervals not to exceed 30 days. Hazardous construction waste including empty containers, solvents, oils, paint, cleaners, and adhesives would be collected on site and returned to the vendor or taken to a hazardous waste facility at regular intervals not to exceed 90 days. Waste oil and other fluids from construction

vehicles would be collected on site and recycled or disposed of at a hazardous waste facility at regular intervals not to exceed 90 days. Lead acid, alkaline, gel cell, nickel, and cadmium batteries would be stored on site and taken to an authorized waste recycling facility at regular intervals not to exceed 90 days.

Non-hazardous residual solids (dirt and concrete particles) from the retention ponds would be excavated at the end of construction and spread on-site. Construction wastes are addressed in more detail in Section 4.11, Public Health and Safety, and Hazardous Materials**.** Measures WASTE-3 (Construction Waste Management Plan) and WASTE-6 (Reuse/Recycling Plan) provided in that section address construction wastes which will also further ensure minimal water quality impacts from construction wastes.

Construction Water

Water demands during construction of the IVS project would be relatively light for an effort as large as that proposed. Water use during construction would be approximately 45,000 gpd on average, primarily for dust control. Peak water use during construction would be approximately 90,000 gpd, with approximately half used for dust control and half used for soil preparation on concrete pours. Fifteen peak days are expected during construction. Assuming a 39 month construction period, with 15 peak days, total construction water use would be approximately 54 million gallons (166 acre-feet).

The on-site concrete-lined evaporation ponds would be constructed in a timely manner and used as storage reservoirs for construction water from SWWTP, which would be trucked in to the site prior to completion of the water pipeline.

Applicant-Proposed Modifications

The construction of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in construction related hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed and in the same general locations as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in construction-related hydrology and water quality impacts compared to the IVS project because this modification will not result in the construction of any structures or facilities on or off the IVS project site. This applicant-proposed modification will result in the use of an alternative water source during construction and initial operations as described earlier for the IVS project.

Operation Impacts

Soil Erosion Potential by Wind and Water

Wind erosion could occur on cleared and graded areas during operation of the IVS project. This could result in the loss of topsoil, nuisance deposition of wind-blown soil on other areas, and air quality effects in El Centro and agricultural areas to the east, which is in the direction of the prevailing wind flow.

Under project operations disturbed and cleared areas, primarily within the SunCatcher field, would be subject to increased erosion potential due to the removal of vegetation, the removal of desert pavement, the disturbance of the surface crust, and the placement of SunCatcher foundation poles in the flow path. The result of surface disturbances and the presence of SunCatchers in the flow path could be long-term erosional degradation of the soil surface within the SunCatcher array and in the intervening undisturbed areas, as well as increased sediment discharge off site across Dunaway Road and toward the east where the Westside Main Canal and New River flow.

The DESCP indicates that site soil stabilization would occur following construction and that several alternatives are being considered to determine which solution best achieves the desired effect to minimize wind erosion, prevent water erosion, and minimize weed and undesired vegetation growth, as well as providing a suitable work surface. Soil binders would be used in high traffic areas. Some areas may be covered or stabilized. The laydown areas would be returned to their pre-project condition as practical by removing all material placed there for the construction effort and restoring the soil to a native condition.

Measures SOIL&WATER-1 and SOIL&WATER-5 would ensure surface erosion protection and protection against wind erosion and increased runoff-borne sediment load from the watershed surface. With implementation of the BMPs in the DESCP, soil surface erosion due to wind and surface runoff during project operations would be minimized.

Localized summer monsoon storms can produce high-intensity rainfall spawning variable and unpredictable flash flooding on the project area. Flooding from these types of storms can be locally severe, with deep flows and high flow velocities. The aridity of the region results in sparse vegetative cover. The soils on the IVS project site are generally sandy and subject to erosion during flood events. Consequently, the potential for channel bank erosion and transport of sediment downstream is high.

Figures 4-6, 4-7, and 4-8 show typical channel patterns on the IVS project site. Figure 4-6 shows a view of the G North watercourse in the southwest corner of Section 15. Figure 4-7 is an

oblique aerial photograph of the same area. These images show a typical alluvial fan on Phase II with a braided but confined main channel upstream of the fan, a fan apex, and an alluvial fan with spreading, unconfined channels. At about the right center in Figure 4-7, the local hills diminish in size at the fan apex and the main channel splits into a series of smaller channels on the fan surface. Alluvial fans typically form where confined streams discharge onto relatively flat, unconfined plain areas. As sediment transported from upstream is deposited on the plain, local channels fill and flows can take new paths by avulsion. The alluvial fan surface is covered by radiating flow paths, any one of which, or all, can be taken by any flood. The flood pattern on alluvial fans for any given flood is unpredictable.

Figure 4-7 shows typical braided channel conditions in the C North watercourse of the Phase I part of the IVS project. Braided channels can be formed by streams with steep slopes, high sediment load and easily erodible banks. They are characterized by multiple, shifting channels and alluvial islands. The response of braided streams to floods is difficult to predict because they are unstable, rapidly change their alignment, carry large quantities of sediment, and are wide and shallow even at flood flow. As floods occur, local channels fill and shift across the braided surface in a local avulsion process contained by the adjacent hills. At the location shown in Figure 4-7, a series of approximately 17 interconnected braided channels, across a width of approximately 320 ft, conveys the Drainage C North flows. Most braids at this location are 10 ft or less in width.

Most of the medium to large size ephemeral streams on the IVS project site exhibit braiding or alluvial fan characteristics, or both. The site watercourses are typically unstable, with erodible banks, and are capable of rapidly shifting position where not constrained by high ground.

SunCatcher foundation poles in the flow path would create local areas of flow turbulence, resulting in local stream scour around the foundation poles. Scour such as this occurs on bridge piers, resulting in the need to bury bridge piers to a depth below the depth of scour to ensure stability. SunCatchers subject to scour could also become unstable if the scour is deep enough to undermine the structural foundation, resulting in collapse and potentially damaging and polluting the ground surface with mirror fragments and other SunCatcher debris.

The HEC-RAS model was used as a basis for floodplain modeling and is very effective at modeling floodplains characterized by an incised channel with well-defined overbank areas. HEC-RAS is not as effective at delineating flood hazards in wide braided channels and alluvial fan areas subject to erosion and channel avulsions as occur on most of the IVS project site. HEC-RAS models flow from cross section to cross section using a one-dimensional energy equation. In that model, flow is assigned to the lowest area of a stream cross section first, and the water level is increased equally in the model until the energy equation is balanced with the previous modeled cross section. The result is a single, flat water surface across each cross

section. In the case of braided or alluvial fan conditions, where flow direction can be two-dimensional with variable water surfaces across a cross section, HEC-RAS may give inaccurate results. To illustrate this, Figure 4-9 shows HEC-RAS Cross Section 9469.782 in the G North floodplain. This cross section is in the east part of the Phase II area, approximately 0.5 mi downstream of the transmission line. The floodplain mapped by HEC-RAS is 646 ft wide. A geomorphic evaluation based on field observations, topographic maps, and aerial photographs indicates the actual flood hazard area at this location is closer to 1,490 ft wide as indicated by the presence of visible wash beds. As floods occur on this cross section it is likely there would be variable water surface elevations across the cross section.

Numeric floodplain modeling on braided streams and alluvial fans can be accomplished by two-dimensional analysis for which a number of computer models exist. These models can be more accurate than HEC-RAS, but also have limitations. A simple and effective way to evaluate flood hazards is to use a qualitative geomorphic analysis based on observable factors such as topography, visible presence of past flow, vegetation patterns, soil characteristics, and visible presence of surface features not compatible with frequent flows (for instance desert pavement).

The floodplain mapping in Figure 3-17 attempts to account for HEC-RAS inaccuracies by including an interpreted 100-year floodplain to supplement the HEC-RAS output in areas where the HEC-RAS output is clearly inaccurate. These floodplain limits and HEC-RAS modeling are considered an approximate representation of the main flood-prone areas on the IVS project site, but that the mapping is not complete. Additional geomorphic or two-dimensional analysis is expected to be conducted during final design to more accurately map flood hazard areas. Actual flood-prone areas would be more extensive in areas where active or potentially active braided channels and alluvial fan characteristics extend beyond the HEC-RAS interpretive limits, and where smaller drainages were not mapped.

The HEC-RAS data is considered useful for determining probable hydraulic data, such as potential flow depths and flow velocities. Flow velocities and depths for the 100 year flood as estimated from the HEC-RAS modeling are fairly uniform across the site. Flow depths on the site average approximately 1.2 ft, with flow velocities approximately 3 ft per second (ft/sec). No flood depths in excess of 2 ft were modeled in the Phase I and Phase II areas. Maximum flow velocity for both those areas is 4.7 ft/sec.

The SunCatcher foundations would be buried to a sufficient depth to protect against 5 ft of scour. Using hydraulic information from the HEC-RAS analysis, and the assumption of a 2 ft diameter foundation, it is estimated that the total 100 year scour at SunCatchers would be 5 ft or less in most, but not all, cases. Scour depth is estimated to be deeper than 5 ft in several areas, and if long-term stream degradation and debris accumulation on SunCatcher foundations is considered, the scour depth could be greater than 5 ft in many cases.

The IVS project site contains a large number of small ephemeral streams not mapped on Figure 3-15. Most of those ephemeral streams originate on the IVS project site. Figure 4-10 shows a network of unmapped ephemeral streams in the area of the Main Services Complex. Figure 4-11 is a ground photograph of one of the ephemeral streams shown on Figure 4-10. The ephemeral streams on Figure 4-10 are approximately 80 to 300 ft wide in the area of the Main Services Complex, and converge to approximately 2,000 ft wide farther downstream. They exhibit the same braided pattern described above for the larger ephemeral streams in the area. Although these ephemeral streams are relatively wide, the contributing watersheds for them are small. The beginning of the channel shown in Figure 4-11 is only 3,700 ft upstream. Small ephemeral streams such as this exist throughout the IVS project site, but are more pronounced in the hillier Phase I area than Phase II area. In Phase I they run mostly north-south and are spaced roughly 300 ft apart through most of the area. The widths range from 3 ft to 400 ft or more including braids. Some ephemeral streams in the Phase II area exhibit alluvial fan characteristics as they discharge onto the flatter Phase II slopes.

The flood hazard area of the small ephemeral streams is approximately equivalent to the visible channel width. Although not modeled, based on the hydrology and HEC-RAS results for the modeled watercourses, it is expected that 100-year flood depths and velocities would be less than 1 ft/sec and 3 ft/sec, respectively.

Some SunCatchers could be placed in unmapped flood hazard areas without benefit of scour protection. Measure SOIL&WATER-7 is proposed to prevent soil surface damage and contamination resulting from SunCatcher instability in all areas. Measure SOIL&WATER-1 would also mitigate impacts associated with stream scour and SunCatcher instability.

Stream morphology in areas subject to direct impingement of flow could be altered by local diversions of flow by SunCatcher foundations. Local (pier) scour holes would form around the dish foundations during flooding. Each SunCatcher foundation in the flow path could have a scour hole roughly12 ft in diameter around it (including the foundation post), assuming an average pier scour depth of 3 ft and an angle of repose of 30 degrees for sand during a 100 year flood. The total land area subject to disturbance by scour around the 5,150 dish foundations in the floodplain could be 13 ac.

Scour holes would likely refill, at least partially, as the flood discharge subsides, but local scour during floods would be a continuing occurrence over the life of the IVS project. The turbulence created by local scour at dish foundations would result in the potential for increased local erosion and possibly new channel avulsions. The potential for adverse impact from induced local erosion and channel avulsions is expected to be more severe in the Phase II area because of the generally flatter terrain and higher flow discharges in that area. The Phase II area also has the presence of adjacent property not a part of the IVS project site, on which these impacts

could be manifested. The Phase I area would be subject to the same influences, but streams in this area are better confined to the IVS project site by local topography.

Basic stream morphology and sediment transport characteristics could be affected by the IVS project. Natural streams are typically in a state of dynamic equilibrium in terms of sediment transport. On average, the amount of sediment that a reach of a stream is capable of transporting is equal to the amount of sediment delivered to the reach from upstream. Should the amount of sediment delivered to a reach exceed the capacity of the stream to transport that sediment, the stream channel would tend to aggrade (accumulate sediment in the stream bed) as a result of the sediment delivery being in excess of the sediment transport capacity. A decrease in sediment delivery can result in stream degradation (lowering of the stream bed) as the sediment delivery is less than the sediment transport capacity and the stream takes sediment from the bed.

The stream channels are the most heavily vegetated areas on the property. Figure 4-12, from Drainage C in Figure 3-17, shows the relative density of vegetation within the stream channels as opposed to the watershed surface. The IVS project proposes clearing vegetation along the parallel rows of SunCatchers. The width of clearing would be approximately 130 ft, with approximately 72 ft left undisturbed between rows. Clearing of vegetation and smoothing of surface irregularities would result in a local decrease in channel or floodplain roughness, or resistance to flow, which could result in an increase in flow velocities along the cleared rows located in the floodplain. The capacity of a stream to transport sediment is heavily dependent on flow velocity. The result would be an increased potential for sediment transport in the cleared areas.

In areas where the SunCatcher rows run parallel to and within a natural stream alignment, as is generally the case in the Phase I area and the west part of the Phase II area, cleared areas running longitudinally along the stream alignment could be captured and used as efficient main conduits by flood flows. Localized erosion and scour could result, as well as increased sediment transport through these areas.

A sediment transport analysis to evaluate existing compared to with-project sediment transport conditions on the site was not available at the time the Staff Assessment/Draft Environmental Impact Statement (SA/DEIS) was released. However, this sediment transport analysis has been released by the CEC for public review. The results and conclusions of this sediment transport analysis are included in the *Draft 404B-1 Alternatives Analysis* for the project (Appendix H). The RUSLE2 analysis described above addresses watershed sediment yield, not in-stream sediment transport. A preliminary independent estimate indicates sediment transport in areas cleared and graded for the IVS project could be 10 to 60 percent higher than natural conditions. Increased sediment transport in the SunCatcher arrays could result in stream degradation within

the arrays as well as sediment deposition in channels downstream of the IVS project site where sediment transport capacity is reduced, for instance at highway culverts and bridges which tend to slow upstream flow velocities.

IVS project-induced sediment deposition could be most severe in the areas of the alluvial fans in the Phase II area, and upstream of the railroad and road culvert crossings on Evan Hewes Highway at drainages designated with the letters I, J, A, K, C, and D as shown on Figure 3-17. Deposition upstream of the culverts, if severe enough, could compromise the capacity of these culvert and bridge crossings.

Drainages with the letter designations E, F, G, and H in the west part of the IVS project site run roughly perpendicular to the direction of the rows of solar dishes. After construction of the IVS project, these drainages would include strips of unaltered vegetation between the solar dish rows and perpendicular to the flow direction which should reduce the effect of the vegetation removal within the solar dish rows. The extent of this reduction is unknown at this time due to the absence of a detailed numeric analysis. Drainages F, G and H exit the solar dish array more than 1 mi upstream of the boundary of the IVS project site. This buffer distance, for which the sediment transport capacity should not be affected by the IVS project, could also reduce or mitigate the project effects of offsite sediment deposition.

The sediment basins are proposed to address potential excess sediment production which could result from increased sediment transport capacity in the SunCatcher arrays. These basins are designed by a regional equation rather than a site-specific sediment transport analysis. Because of the lack of precision in this form of analysis, the capacity of these basins to function as intended is not known. Because the basins are designed for 2 years of annual sediment production, they may serve the intended purpose on small floods, but could be overwhelmed by the much larger sediment transport volume of larger floods, with the resulting effect of increased sediment deposition downstream if sediment transport from the SunCatcher fields has been increased through vegetation clearing and grading of surface irregularities.

On an average annual basis, with smaller floods occurring, the basins may function as intended to remove sediment. However, this too could have an adverse impact after a long series of small floods if the basins remove too much sediment from the system.

Artificial removal of sediment from a streambed otherwise in equilibrium usually results in a lowering of the downstream bed. The result would be an alteration of downstream channel morphology from wide sandy washes with shallow banks to deeper channels with steeper banks. This could have an adverse effect on local riparian resources, increase the bank erosion potential, as well as affect in-stream man-made structures. Flow cascading into unprotected basins could create cuts that would migrate upstream along the channels.

Stream morphology on the site could be affected by increased production of sediment from the watershed surface; placement of obstructions in the flow path resulting in local scour and potential diversions; clearing of vegetation in channels and increasing sediment transport capacity; and installing sediment basins throughout the IVS project site to mitigate for increased sediment production. The result could be excess sediment deposition at culverts and bridges along Evan Hewes Highway and the railroad, and to the east in the direction of the Westside Main Canal. Other effects could occur as described above. Based on uncertainties regarding the ability of the IVS project measures to reduce sedimentation and stream morphology impact, sediment transport capacity in on-site drainages would likely be increased by the IVS project, with possible adverse effects. In the absence of a detailed, site-specific sediment transport analysis specifically addressing these issues, these stream morphology impacts are considered an adverse impact of the IVS project.

Storm Water

Operations surface water quality could be affected by the increase in sediment load as discussed above, and through the introduction of surface water pollutants such as operations-related trash; vehicle fuels, coolants, and other fluids; contaminated runoff from developed areas such as the substation and Main Services Complex; water treatment system wastes; sanitary wastes; SunCatcher mirror washing; and the accidental release of other materials, hazardous or non-hazardous, on the IVS project site.

SunCatcher mirror washing would be ongoing throughout the life of the IVS project. Most washing would be with demineralized water. Once a year, a dilute biodegradable soap solution would be used. The amounts of water used in the washes would not be sufficient to produce runoff, and the soap solution would be biodegradable. Measure SOIL&WATER-1 would ensure no adverse water quality or soils impact from mirror washing.

Runoff from the Main Services Complex, including any contaminants in that runoff, would be directed into a 1 ac storm water retention pond rather than being discharged into the natural channel system. The IVS project would include an oil/water interceptor to collect oil and other contaminants from the Main Services Complex. Oil collected from this interceptor would be transported to a certified recycling facility. Measures SOIL&WATER-1 and SOIL&WATER-5 would ensure minimization of operations-related storm water runoff contaminants in all areas except those associated with the sediment content of water related to stream morphological changes described above. Uncertainty regarding sediment content of runoff water results in a conclusion of potential substantial adverse water quality (sediment) impact.

Wastewater

The reverse osmosis (RO) water treatment system would produce water with a high concentration of total dissolved solids (TDS), as well as other contaminants. These wastewaters would be discharged into 1 of the 2 concrete-lined evaporation ponds at the Main Services Complex for drying. After a pond is filled it would be allowed to dry while the other pond is filled. The dry cake from the evaporation process would be removed by truck to a waste disposal facility. Potential impacts to soil and water resources include groundwater degradation from infiltration at the ponds, and surface water degradation from spills and mishandling of the dry cake.

This discharge of wastes to the evaporation ponds would be subject to waste discharge requirements from the RWQCB. CWC Section 3260–13269; 23 California Code of Regulations (CCR) Chapter 9 requires the filing of a Report of Waste Discharge (ROWD) and provides for the issuance of Waste Discharge Requirements with respect to the discharge of any waste that can affect the quality of the waters of the state. An ROWD would be filed for the RO unit discharge waste. Subject to verification by the RWQCB, the RO unit and evaporation ponds would be constructed and monitored in accordance with RWQCB requirements as outlined in detail in Appendices B, C, and D of Section C.7 – Hydrology, Water Use, and Water Quality (Soil and Water Resources). Measures SOIL&WATER-3 and SOIL&WATER-7 would ensure no adverse water quality impact from the RO water treatment system.

The storage, handling and clean-up of hazardous wastes on the IVS project site would be required to comply with a project-specific Hazardous Materials Management Program (HMMP). The HMMP addresses handling and usage, emergency response, spill control and prevention, training, record keeping, and reporting. A fuel handling design plan has been prepared for proper storage and handling of fuels. Measure WASTE-7 requires preparation of an Operation Waste Management Plan and Measure WASTE-8 requires documentation and clean-up of all spills of hazardous substances. Measures SOIL&WATER-3 and SOIL&WATER-5 would address water quality issues related to hazardous wastes.

Sanitary wastes would be discharged into a septic tank system with a dual sanitary leach field alternated every 2 years to allow recovery from bacterial loading. Sewer sludge would be pumped and disposed of by trucks at an approved off-site disposal facility. Adverse surface water quality impacts could occur through overflow of the septic and leach field system. Measure SOIL&WATER-8 would ensure the sanitary system is operated and maintained so potential impacts would be mitigated.

Groundwater Quality

The existing groundwater below the IVS project site is poor in quality and 50 ft or more bgs. Potential groundwater quality impacts could occur from surface contaminants such as oil, grease and other fluids in surface water infiltrating through channel beds to the groundwater, infiltration of sanitary wastes through the septic leach fields, infiltration of contaminated brines through the evaporation ponds for the water demineralization process, and through infiltration of surface contaminants at the retention basin in the Main Services Complex.

Surface contaminants in runoff would be minimized as described under surface water quality above and based on compliance with Measures SOIL&WATER-1, SOIL&WATER-5, and SOIL&WATER-7. Contaminants that do reach surface water would be filtered through at least 50 ft of soil before reaching groundwater. No adverse impact to groundwater quality is expected from surface contaminants in runoff.

The leach fields would be designed according to the California Plumbing Code and County of Imperial regulations and as such would be more than 10 ft above groundwater. The leach fields may also be subject to a RWQCB waste discharge permit. Measure SOIL&WATER-8 would ensure no substantial adverse impact to groundwater quality from the sanitary leach field system.

The demineralized water evaporation ponds would be lined with concrete to prevent infiltration. Solids from the ponds would be removed and transported by truck to a disposal facility. Measures SOIL&WATER-3 and SOIL&WATER-7 would ensure no adverse ground water quality impact from the water treatment system. No substantial adverse impact to groundwater quality is expected from the evaporation ponds.

The retention basin in the Main Services Complex would include an oil/water interceptor and be subject to RWQCB waste discharge requirements. Oil collected from the interceptor would be transported to a certified recycling facility. Measures SOIL&WATER-1 and SOIL&WATER-5 would ensure minimization of operations-related runoff contaminants. No substantial adverse impact to groundwater quality is expected from the retention basin.

Hydrology/Flooding

Flood discharges could be increased on the IVS project site as a result of impervious areas and the channelization of runoff conveyance channels. Channelization of flows within the solar field array would be minimal because grading would be conducted only locally to accommodate individual solar disks or to facilitate road construction. The basic hydrologic conveyance features of the site would remain unchanged. The amount of new impervious area within the

solar field array is estimated to be approximately 3 percent of the total surface, most of which is within the Main Services Complex. Within the SunCatcher array, impervious areas would consist of the SunCatcher foundations (approximately 2 ac for the 30,000 SunCatchers) and 137 ac of paved access roads. These areas would experience an increase in surface runoff locally, but considering the overall size of the entire IVS project site, the overall increase in runoff due to new impervious areas would be small. Assuming 100 percent runoff from impervious areas, the overall runoff coefficient of the SunCatcher array site would be increased by about 3 percent. At Dunaway Road, the point where runoff exits the IVS project site, the increase would be approximately 1 percent, meaning the 100 year discharge at Dunaway Road could be increased from 4,223 to 4,265 cfs. This increase is negligible and would be mitigated by the presence of the site road culverts and sediment basins which would have the effect of retarding and attenuating flood flows. Measure SOIL&WATER-1 would ensure no substantial increase in offsite flooding potential.

The Main Services Complex would be a source of additional runoff through the construction of impervious surfaces and efficient conveyance conduits. Increased runoff from the Main Services Complex would be mitigated through the construction of a 1 ac retention basin with capacity for 3 in of runoff from the Main Services Complex, with no assumed reduction for infiltration or evaporation. No substantial increase in runoff volume or discharge is expected from the Main Services Complex.

The site grading is intended to preserve the existing flow pattern. Localized channel grading would take place on a limited basis to improve channel hydraulics within the dry washes and to control flow direction where buildings and roadways are proposed. An evaluation of a typical dish array pattern within a site floodplain was conducted and determined that it is unlikely the narrow dish foundations, spaced at intervals of 112 ft or more, would substantially increase flood depths. Flood depth increases in most cases are expected to be less than 1 in. Flow depths could actually be lower than existing conditions if stream roughness is reduced through vegetation clearing. Roads would locally increase flooding at the locations of culverts, but the basic flow pattern would not be disturbed. The Main Services Complex would be in an area that is subject to minor drainage flows. The Main Services Complex design would include protection from flooding through fill, berms, and local diversion channels that will direct flow around the perimeter of the building site. Measures SOIL&WATER-1 and SOIL&WATER-7 would ensure hydrology and flooding impacts are kept to a level not substantial.

Project Water Supply

Operations water use, summarized in Table 4-73 would average 33,550 gallons per day (gpd), with total annual use of approximately 32.7 ac ft.

Table 4-73 Water Usage Rates for IVS Project Operations

Water Use	Daily Average, gal/minute	Daily Maximum, gal/min	Annual Usage, acre-feet
Equipment Water Requirements			
Sun Catcher mirror washing	10.4 (Table Note 1)	17.4 (Table Note 2)	14.2 (Table Note 3)
Hydrogen System	0.13 (Table Note 4)	0.13 (Table Note 4)	0.0133
Water Treatment System Discharge			
Brine from Demineralization Process	5.5	10.2 (Table Note 5)	7.5
Potable Water Use			
For drinking and sanitary water requirements	3.9 (Table Note 6)	4.7 (Table Note 7)	5.4 (Table Note 8)
Dust Control			
Raw water for dust control during operations	3.5 (Table Note 9)	6.9 (Table Note 10)	5.6 (Table Note 11)
Totals	**23.3**	**39.2**	**32.7**

Table Source: Staff Assessment/Draft Environmental Impact Statement (CEC/BLM 2010).

Table Note 1: Based on 30,000 SunCatchers requiring a monthly wash with an average of 14 gallons of demineralized water per spray wash and a 5-day work week (21 work days per month).

Table Note 2: During a 3 month period, all SunCatcher mirrors are given a scrub wash requiring up to 3 times the normal wash of 14 gallons per SunCatcher. Therefore, the Daily Maximum usage rate is based on two-thirds of the SunCatchers receiving a normal wash and one-third receiving a scrub wash.

Table Note 3: Based on every SunCatcher having approximately 8 normal washes per year with one additional scrub wash.

Table Note 4: Hydrogen system would require approximately 184 gallons of water per day or about 0.0133 acre-feet per year.

Table Note 5: Based on the maximum amount of demineralized water required for mirror washing and assumes a decrease in raw water quality requiring an additional 20% of system discharge.

Table Note 6: Assumes 30 gallons per person per day for 188 people.

Table Note 7: Maximum amount assumes a 20% contingency over the Daily Average.

Table Note 8: Assumes a 6-day work week and average daily usage.

Table Note 9: Assumes 5,000 gallons per day.

Table Note 10: Assumes up to 10,000 gallons per day.

Table Note 11: Assumes daily average dust control operations.

Table Key: gal/min = gallons per minute.

The SWWTP, at 1898 West Main Street in Seeley, approximately 13 mi east of the IVS project site, is anticipated to supply treated wastewater for mirror washing and other project uses except potable water. The IVS project applicant would construct an approximately 12 mi long pipeline from the IVS project site to the SWWTP to transport that water to the project. The applicant has also committed to finance an upgrade to the SWWTP to allow it to meet Title 22 regulations and to treat up to 250,000 gpd, with up to 200,000 gpd made available to the IVS project. An Environmental Impact Report (EIR) is being prepared by Imperial County for that plant upgrade, in compliance with the requirements of the California Environmental Quality Act (CEQA). The SWWTP currently discharges about 150,000 gpd of reclaimed water into the New River. After construction of the IVS project, an average of 33,550 gpd, and a maximum of 200,000 gpd would be routed to the IVS project.

SWWTP discharges to the New River are currently used only for habitat along the New River and in the Salton Sea. Discharge impacts to the New River for this purpose would be minimal. A discharge of 33,550 gpd is approximately 0.05 cfs. The maximum water allotment to IVS project of 200,000 gpd is approximately 0.31 cfs. United States Geological Service (USGS) records show New River average monthly discharges to be at least 198 cfs at the international boundary upstream of the SWWTP and 554 cfs at Westmorland downstream of the SWWTP. A reduction of 0.05 to 0.31 cfs to the New River discharge is 0.03 to 0.16 percent of the total and would not have a material effect on water quantity of the river. Measure SOIL&WATER-9 would ensure that impacts related to the diversion of flow would be mitigated to a level not substantial. Water quality impacts to the New River would be addressed by a revised waste discharge permit from the RWQCB for the SWWTP upgrades.

The Dan Boyer Water Company well is proposed to be part of all the Build Alternatives including the IVS project and the Agency Preferred Alternative. As a result, either the temporary water source or the SWWTP is expected to reliably provide water to the IVS project. Mirror washing operations would be temporarily suspended should the supply drop below the needs of the IVS project. Measure SOIL&WATER-9 would ensure viability of a water supply and that the amount of water used is consistent with the amounts considered in this analysis.

Potable water for the operations workforce, including water for hand washing and other uses requiring potable water, would be supplied from an offsite water supplier yet to be determined. SOIL&WATER-4 would ensure that this water comes from a water purveyor licensed to provide potable water in California and that the supply provided to IVS project site within the licensed capabilities of the purveyor.

The operation of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed

modifications would be designed, function, and in the same general locations and approximately the same overall site size as these facilities as evaluated for the original IVS project.

The applicant-proposed alternative water supply will not result in differences in operations related hydrology, water use, and water quality impacts compared to the IVS project because this modification would not be used in the long-term and would be replaced by water piped in from the SWWTP.

Decommissioning

The removal of the IVS project from service, or decommissioning, may range from mothballing to the removal of equipment and appurtenant facilities, depending on conditions at the time. A decommissioning plan would be submitted to the BLM for approval before decommissioning. The decommissioning plan would attempt to maximize the recycling of project components including selling unused chemicals back to the suppliers or other purchasers or users, draining and shutting down of equipment containing chemicals, and collection and proper disposal of hazardous and nonhazardous wastes.

Decommissioning activities would result in impacts similar to the construction impacts described above, but likely to a lesser extent. Long-term impacts after decommissioning could be substantial, particularly those related to erosion by water and wind, unless the site is restored to a condition similar to the existing condition, or a post-decommissioning maintenance plan is provided to prevent these impacts. Measure SOIL&WATER-10 would ensure that decommissioning impacts are minimized to a level not adverse.

The decommissioning of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system, would not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and decommissioned the same as these facilities as evaluated for the original IVS project.

4.17.4.2 709 MW Alternative: Agency Preferred Alternative

The Agency Preferred Alternative would result in soil and water impacts similar to those described in the previous section for the IVS project, except at a slightly reduced amount, because of the slight reduction in the area disturbed on site and in the number of SunCatchers. The measures identified for the IVS project would also apply to the Agency Preferred Alternative.

The construction and operation of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Agency Preferred Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and in the same general locations and on approximately the same overall site size as these facilities as evaluated for the original IVS project.

4.17.4.3 300 MW Alternative

Except as otherwise described in this section, all impacts of the 300 MW Alternative would the same as for the IVS project, but reduced in magnitude by about 60 percent due to the reduced area and number of SunCatchers in the 300 MW Alternative. The Measures applicable to the IVS project would also be applicable to the 300 MW Alternative.

Construction Impacts

The construction of the 300 MW Alternative would take less time than the IVS project, at approximately 16 months. Therefore, the potential construction impacts related to soils, water, and wastewater would be similar to under the IVS project, but reduced in magnitude by approximately 60 percent.

The construction of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the 300 MW Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed, and in the same general locations as these facilities as evaluated for the IVS project.

Operation Impacts

Soil erosion impacts by water and wind during operations of the 300 MW Alternative would be substantially reduced compared to the IVS project due to the smaller construction area. The 300 MW Alternative would include SunCatchers in flood hazard areas, as described for the IVS project (drainages I, J, K, A and C), with resultant increased sediment transport potential in these drainages, manifested in sediment deposition upstream of Evan Hewes Highway and south of Plaster City, potential erosion, and potential channel degradation as described for the IVS project. Although impacts to other drainages on the IVS project site would be avoided by

the 300 MW Alternative, in the absence of a detailed sediment transport analysis this impact is considered adverse for drainages I, J, K, A and C.

The surface water quality impacts under the 300 MW Alternative would be similar to, but substantially less than, those under the IVS project. The potential for introduction of surface water pollutants such as operations-related trash, vehicle fuels, coolants and other fluids from the solar dish array would be reduced by about 60 percent under the 300 MW Alternative compared to the IVS project. The potential impacts related to contaminated runoff from the substation and the Main Services Complex would be similar under the 300 MW Alternative and the IVS project.

The potential groundwater and flood related impacts of the 300 MW Alternative would be similar to, but substantially less than, under the IVS project.

The operation of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system under the 300 MW Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and in the same general locations as these facilities as evaluated for the IVS project.

The applicant-proposed alternative water supply will not result in differences in operations related hydrology, water use, and water quality impacts compared to the IVS project because this modification would not be used in the long term under the 300 MW Alternative and would be replaced by water piped in from the SWWTP.

4.17.4.4 Drainage Avoidance #1 Alternative

Except as otherwise described in this section, all impacts of the Drainage Avoidance #1 Alternative would the same as for the IVS project, but reduced in magnitude due to the reduced area and number of SunCatchers in the Drainage Avoidance #1 Alternative. The measures applicable to the IVS project would also be applicable to the Drainage Avoidance #1 Alternative.

Construction Impacts

The Drainage Avoidance #1 Alternative would result in the disturbance of approximately 2,640 ac on the site, of which 1,810 ac would be in the SunCatcher array. The impacts associated with construction disturbances on the site under the Drainage Avoidance #1 Alternative would be similar to, but slightly reduced compared to the IVS project.

The construction of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #1 Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed, and in the same general locations as these facilities as evaluated for the IVS project.

Operation Impacts

Under the Drainage Avoidance #1 Alternative, most of the SunCatcher foundation poles, which would be located in the active drainage flow paths under the IVS project, would not be placed into the flow paths under the Drainage Avoidance #1 Alternative. A small, undetermined number of SunCatchers would be placed in minor drainages originating on the IVS project site. There would be local areas of scour around those foundation poles as described for the IVS project, with the same potential for foundation instability and local erosion. Scour depths would likely be less than 5 ft in most cases for the Drainage Avoidance #1 Alternative due to lower discharges, flow velocities, and flow depths.

The Drainage Avoidance #1 Alternative avoids most stream morphology and sediment transport impacts that would occur under the IVS project. Specifically, adverse impacts associated with altered sediment transport characteristics caused by vegetation removal and grading in the major drainages would not occur under the Drainage Avoidance #1 Alternative. Sediment transport characteristics would be modified in the minor drainages, but these impacts are not considered adverse after implementation of the identified measures due to small drainage areas and discharges affected, and the fact that the small tributaries drain into the major washes which would not be affected.

The operation of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system under the Drainage Avoidance #1 Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and in the same general locations as these facilities as evaluated for the IVS project.

The applicant-proposed alternative water supply will not result in differences in operations-related hydrology, water use, and water quality impacts compared to the IVS project because this modification would not be used in the long term under the Drainage Avoidance #1 Alternative and would be replaced by water piped in from the SWWTP.

4.17.4.5 Drainage Avoidance #2 Alternative

Except as otherwise described in this section, all impacts of the Drainage Avoidance #2 Alternative would the same as for the IVS project, but reduced in magnitude due to the reduced area and number of SunCatchers in the Drainage Avoidance #2 Alternative. The Measures applicable to the IVS project would also be applicable to the Drainage Avoidance #2 Alternative.

Construction Impacts

The Drainage Avoidance #2 Alternative would result in the disturbance of approximately 940 ac on the site, of which 840 ac would be in the SunCatcher array. The impacts associated with construction disturbances on the site under the Drainage Avoidance #2 Alternative would be similar to, but substantially reduced compared to the IVS project.

The construction of the applicant-proposed modifications to the transmission line, water line, hydrogen storage system, and the alternative water supply under the Drainage Avoidance #2 Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, constructed, and in the same general locations as these facilities as evaluated for the IVS project.

Operation Impacts

Under the Drainage Avoidance #2 Alternative, SunCatchers would be placed in flood hazard areas, similar to the IVS project in drainages C and D and the upper alluvial fan part of E. The resulting impact is expected to be increased sediment transport potential in these drainages, manifested in sediment deposition upstream of Evan Hewes Highway and south of Plaster City, potential erosion, and potential channel degradation similar to under the IVS project.

The Drainage Avoidance #2 Alternative avoids most stream morphology and sediment transport impacts that would occur under the IVS project. Specifically, adverse impacts associated with altered sediment transport characteristics caused by vegetation removal and grading in the major drainages would not occur under the Drainage Avoidance #2 Alternative. Sediment transport characteristics would be modified in the minor drainages, but these impacts are not considered adverse after the implementation of the identified measures due to small drainage areas and discharges affected, and the fact that the small tributaries drain into the major washes which would not be affected. Although impacts to other on site drainages would be avoided by the Drainage Avoidance #2 Alternative, in the absence of additional sediment transport information, this impact is considered substantial and adverse for drainages C, D, and E.

The potential soil erosion impacts by water and wind under the Drainage Avoidance #2 Alternative would be similar to, but substantially less than, the IVS project due to the smaller construction area.

The operation of the applicant-proposed modifications to the transmission line, water line, and hydrogen storage system under the Drainage Avoidance #2 Alternative will not result in differences in hydrology, water use, and water quality impacts compared to the IVS project as described above. This is because these proposed modifications would be designed, function, and in the same general locations as these facilities as evaluated for the IVS project.

The applicant-proposed alternative water supply will not result in differences in operations-related hydrology, water use, and water quality impacts compared to the IVS project because this modification would not be used in the long term under the Drainage Avoidance #2 Alternative and would be replaced by water piped in from the SWWTP.

4.17.4.6 No Action Alternative: No ROW Grant and No CDCA Plan Amendment

Under this No Action Alternative, the BLM would not approve the right-of-way (ROW) grant and would not amend the California Desert Conservation Area Plan (CDCA Plan, 1980 as amended). As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Plan. Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this No Action Alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a result, no impacts to soils and water associated with construction and operation of any of the Build Alternatives would occur. However, the site would become available to other uses that are consistent with the CDCA Plan. In addition, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts to soils and water similar to the IVS project, in other locations.

4.17.4.7 No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar

Under this No Action Alternative, the BLM would not approve the ROW grand and would amend the CDCA Plan to make the site unavailable for future solar development. As a result, no solar energy project would be constructed on the IVS project site and BLM would continue to manage

the site consistent with the existing land use designation in the CDCA Plan. Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no soil erosion impacts or impacts to jurisdictional waters. As a result, this No Action Alternative would not result in impacts to soils and water. However, in the absence of the IVS project, other renewable energy projects may be constructed elsewhere to meet State and Federal mandates, and those projects could have impacts to soils and water similar to the IVS project, in other locations.

4.17.4.8 No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar

Under this No Action Alternative, the BLM would not approve the ROW grant but would amend the CDCA Plan to allow for other solar projects on the site. Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts to soils and water would result from the construction and operation of that solar technology and resulting ground disturbance and would likely be similar to the impacts to soils and water under the IVS project. Different solar technologies require different amounts of grading; however, it is expected that all solar technologies would require grading and maintenance. As such, this No Action Alternative could result in impacts to soils and water similar to the impacts under the IVS.

4.17.5 Cumulative Impacts

The geographic area considered for cumulative impacts related to soil and water resources is defined as described below:

- **Soil Erosion Potential by Water and Wind:** Soil erosion can be affected by any development or land alteration. The effects occur in terms of air quality as well as general deterioration of the land surface with potential regional effects. Cumulative impacts were evaluated over all southern California BLM land, including the CDCA.

- **Surface Water Quality:** Project-related surface water quality impacts potentially extend from the IVS project site to the Imperial County agricultural area and the Salton Sea. The geographic extent of cumulative impacts would encompass those areas south of the Salton Sea that could potentially have similar extent. Imperial County is considered the geographical extent of surface water quality impacts.

- **Ground Water Quality:** Ground water quality impacts could affect the Coyote Wells Valley and Imperial Valley Groundwater Basins. These basins comprise the geographic area for cumulative ground water quality impacts.
- **Hydrology/Flooding:** Hydrology and flooding impacts are generally managed on a county-wide or city-wide level. Imperial County is considered the geographic extent of hydrology and flooding impacts.
- **Water Supply:** With the exception of a minimal amount of water for potable uses, the project would entirely use reclaimed water that is currently discharged into the New River.

The cumulative study areas and projects in those areas are discussed in detail in Section 2.10, Overview of the Cumulative Impacts Analysis. Most of the cumulative projects, including the projects described in Section 2.10, have not yet been subject to environmental review under the requirements of CEQA and/or NEPA, as appropriate. As a result, the cumulative impacts analysis was based on the best information available. The cumulative projects may result in adverse impacts related to hydrology, water use, and water equality less than, similar to, or greater than the IVS project, depending on the locations and sizes of those other projects.

Soil and water resources in the geographic area have been impacted by past and currently approved projects including soil and vegetation disturbance resulting in an increased potential for water and wind erosion; placement of structures in flood hazard and erosion hazard areas resulting in flood or erosion hazards to the IVS project or adjacent features; creating flow diversions or increasing runoff potential resulting in increased flood and erosion potential; depleting groundwater or other water resources; degrading water quality through construction-related impacts; and degrading water quality through project operations. Existing and planned development projects in the California desert, described earlier in Section 2.10, Overview of the Cumulative Impacts Analysis, have substantially increased the potential for water and wind erosion during construction and operations. Groundwater use in some areas has been substantial, as has reliance on imported sources of water.

4.17.5.1 Construction Impacts

The construction of the IVS project is expected to result in short-term adverse impacts. It is expected that some of the cumulative projects in the area which are not yet built may be under construction at the same time as the IVS project. As a result, there may be substantial short-term cumulative soil and water impacts during the concurrent construction of those cumulative projects and the IVS project. The IVS project could contribute substantially to these possible

short-term cumulative impacts because of its size. The IVS project, 6,500 ac, amounts to roughly 25 percent of the total area of the cumulative projects. Although measures have been identified to reduce these impacts of IVS project, it is reasonable to assume that similar restrictions and mitigation will be placed on other future projects such that the relative contribution of IVS project to the total cumulative adverse impact would be substantial.

4.17.5.2 Operation Impacts

The operation of the IVS project is expected to result in long-term adverse impacts related to soil and water resources. It is expected that many of the cumulative projects would be operational at the same time as the IVS project. As a result, there may be substantial long-term impacts during operation of those cumulative projects related to soil and water resources. With the exception of impacts related to changes in stream morphology, the IVS project would be expected to contribute only a small amount to these possible long-term operational cumulative impacts related to soil and water resources because the IVS project impacts would be substantially mitigated. Specifically:

- Because the SWWTP improvements may not be ready at the time the construction of the IVS project begins, arrangements have been made with an already permitted third party water provider to supply water for construction and initial operations until the SWWTP water is available. The water provider is already permitted to use groundwater. Therefore, the IVS project would use groundwater, but would not cumulatively contribute to groundwater depletion because the provider is already permitted for the groundwater use and the water would be used on an interim basis between the time that construction starts and the SWWTP water is available.

- Non-sediment water quality impacts would be mitigated with the specified Measures such that the relative size of the IVS project would be less important than in the construction phase.

- Peak discharges and the potential for offsite flooding would not be increased by the IVS project. The IV project features would be protected from flood hazards.

- Water use by the IVS project would be minimal and derived primarily from treated wastewater that currently is discharged into the New River. It has been shown that this diversion of flow from the New River would have negligible impact on New River flows.

The IVS project would contribute substantially to erosion and sediment-related operational cumulative impacts because of its adverse impact related to altered sediment-transport characteristics of the area.

4.17.5.3 Decommissioning

The decommissioning of the IVS project is expected to result in adverse impacts related to soil and water resources similar to the IVS project construction impacts. It is unlikely that the construction, operation, or decommissioning of any of the cumulative projects would occur concurrently with the decommissioning of the IVS project, because that decommissioning is not expected to occur for approximately 40 years. As a result, the impacts of the decommissioning of the IVS project would not be expected to contribute to cumulative impacts related to Soil and Water Resources.

4.17.6 Mitigation, Project Design Features, and Other Measures

SOIL&WATER-1 **Drainage Erosion and Sedimentation Control Plan.**Prior to site mobilization, the project owner shall obtain both BLM's Authorized Officer (AO) and the Compliance Project Manager's (CPM) approval for a site specific DESCP that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding or sedimentation potential, and identify all monitoring and maintenance activities.

The project owner shall complete all necessary engineering plans, reports, and documents necessary for both the AO and CPM to conduct a review of the proposed project and provide a written evaluation as to whether the proposed grading, drainage improvements, sediment control measures, and flood management activities comply with all requirements presented herein. The plan shall contain the following elements:

Vicinity Map. A map shall be provided indicating the location of all project elements with depictions of all major geographic features to include watercourses, washes, irrigation and drainage canals, major utilities, and sensitive areas.

Site Delineation. The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, and drainage facilities. Adjacent property owners shall be identified on the plan maps. All maps shall be presented at a legible scale.

Drainage: The DESCP shall include the following elements:

(1) *Topography:* Topography for offsite areas is required to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.

(2) *Proposed Grade:* Proposed grade contours shall be shown at a scale appropriate for delineation of onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography.

(3) *Hydrology:* Existing and proposed hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow.

(4) *Hydraulics:* Provide hydraulic calculations to support the selection and sizing of the onsite drainage network, diversion facilities and BMPs.

Watercourses and Critical Areas. The DESCP shall show the location of all onsite and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site. Maps shall identify high hazard flood prone areas.

Clearing and Grading. The plan shall provide a delineation of all areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the SunCatchers. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall

include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

Soil Wind and Water Erosion Control. The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including specifically identifying all chemical based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation; BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by both the AO and CPM prior to use.

Project Schedule. The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.

Best Management Practices. The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction (during project operation). BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

Erosion Control Drawings. The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion control specialist.

Agency Comments. The DESCP shall include copies of recommendations, conditions, and provisions from the County of Imperial,

California Department of Fish and Game (CDFG), and Colorado River Regional Water Quality Control Board (RWQCB).

Monitoring Plan. Monitoring activities shall include routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions.

Verification: No later than ninety (90) days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to the County of Imperial, the RWQCB, the AO, and CPM for review and comment. Both the AO and CPM shall consider comments received from Imperial County and RWQCB.

During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage-erosion- and sediment-control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of storm water BMP monitoring and maintenance activities. The property owner shall provide the AO and CPM with two (2) copies each of all reports, including monitoring reports.

SOIL&WATER-2 **Monitoring and Verification of Water Use.** Prior to the use of recycled wastewater for operation of the IVS project, the project owner shall install and maintain metering devices as part of the water supply and distribution system to monitor and record in gallons per day the volume of water supplied to the IVS project. The metering devices shall be operational for the life of the project. An annual summary of daily water use by the IVS project, differentiating between potable and recycled wastewater, shall be submitted to the AO and CPM in the annual compliance report.

Verification: At least 60 days prior to use of any water source for IVS project operation, the project owner shall submit to the AO and CPM evidence that metering devices have been installed and are operational on all water pipelines serving the project. In the annual compliance report, the project owner shall provide a report on the servicing, testing, and calibration of the metering devices.

The project owner shall submit a water use summary report to the AO and CPM in the annual compliance report for the life of the project. The

annual summary report shall be based on the volume of water used and shall distinguish recorded daily use of potable and recycled water. Included in the annual summary of water use, the project owner shall submit copies of meter and/or delivery records from the potable water and recycled water supplies documenting the volume of water supplied over the previous year. The report shall include calculated monthly range, monthly average, and annual use by the project in both gallons per day and acre-feet. After the first year and for subsequent years, this information shall also include the yearly range and yearly average potable and recycled water used by the project.

SOIL&WATER-3 **Industrial Facility SWPPP.**The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, including development of an Industrial Facility SWPPP. If the Regional or State Board finds the project does not require a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, written confirmation from either board confirming this permit is not required would satisfy this condition.

Verification: The project owner shall submit a copy of the Industrial Facility SWPPP for operation of the project to the AO and CPM at least 60 days prior to the start of commercial operation and shall retain a copy of the approved SWPPP on site throughout the life of the project. The project owner shall submit copies of all correspondence between the project owner and the Colorado River RWQCB regarding the general NPDES permit for discharge of storm water associated with industrial activity to the AO and CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, and any permit modifications or changes.

SOIL&WATER-4 **Potable Water Requirements.**Potable water shall be provided by a potable water purveyor licensed to provide potable water in the state of California. Potable water delivered by the purveyor to IVS project shall be within the licensed capacity of the water purveyor. The IVS project shall not operate without an executed agreement for potable water on file with the AO and CPM.

Verification: No later than 30 days prior to the initiation of construction the project owner shall submit two copies of the executed agreement with a licensed water purveyor for the potable water supply. The agreement shall specify that the potable water purveyor can deliver potable water sufficient for the needs of the IVS project construction and operation, specify the amount of water that shall be delivered on a monthly basis, document that the amount of water delivered is within the licensed capabilities of the water purveyor, and specify the contract time limit. The project owner shall ensure that this or an equivalent potable water agreement is in place and valid at all times the IVS project is in operation. New or revised agreements shall be delivered to the AO and CPM 30 days prior to the expiration of any agreement.

SOIL&WATER-5 **NPDES General Permit for Construction Activity.**The project owner shall comply with the requirements of the general National Pollutant Discharge Elimination System (NPDES) permit for discharge of storm water associated with construction activity. The project owner shall submit copies of all correspondence between the project owner and the State Water Resources Control Board (SWRCB) or the Colorado River RWQCB regarding this permit to the AO and CPM. The project owner shall also develop and implement a construction Storm Water Pollution Prevention Plan (SWPPP) for construction on the IVS project main site, laydown areas, pipeline, and transmission line.

Verification: The project owner shall submit a copy of the construction SWPPP to the AO and CPM at least 10 days prior to site mobilization for review and approval, and retain a copy of the approved SWPPP on site throughout construction. The project owner shall submit copies of all correspondence between the project owner and the SWRCB or the Colorado River RWQCB regarding the NPDES permit for the discharge of storm water associated with construction activity to the AO and CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, any permit modifications or changes, and completion/permit Notice of Termination.

SOIL&WATER-6 **Waste Discharge Requirements.**The project owner shall comply with the requirements of the Waste Discharge Requirements in Soil and Water Appendices B, C, and D for the proposed evaporation ponds. The project

owner shall develop, obtain AO and CPM approval of, and implement a monitoring and reporting program for the operation of the project.

Verification: At least 60 days prior to commercial operation, the project owner shall submit to the AO and CPM, for review and approval, a copy of the plan for the monitoring and reporting program in compliance with the requirements outlined in Soil and Water Appendices B, C, and D. The project owner shall retain a copy of the plan onsite. The project owner shall submit copies to the AO and CPM of all correspondence between the project owner and the Colorado River RWQCB regarding the Requirements of Waste Discharge of water associated with industrial activity within 10 days of its receipt or submittal.

SOIL&WATER-7 **Storm Water Damage Monitoring and Response Plan.**The project owner shall prepare a detailed drainage map for existing conditions showing the location of all watercourses on the site, recognizing that site areas with visible evidence of past flows are subject to future flows. The drainage map may be based on a geomorphic evaluation based on aerial photographs, topographic maps, site visits, and other relevant factors, and may be supplemented by a two-dimensional flow analysis at the discretion of the project owner.

The project owner shall ensure that all SunCatchers within flow areas as identified in the above-referenced drainage map are designed to withstand 100 year storm water scour as estimated by a SunCatcher Foundation Depth and Stability Report to be completed by the project owner. The report shall include estimates of hydraulic conditions at each location where SunCatchers are to be located in flood hazard areas and relevant scour calculations for each location. Scour calculations shall be developed by a registered civil engineer competent in scour calculation and include all relevant scour components including pier scour, general scour, antidune trough depth, bend scour, and long-term degradation. An assessment shall be made whether foundation widths should be increased for debris production.

The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including SunCatchers that fail due to storm water flow or otherwise break and scatter mirror debris on to the ground surface. The Storm Water

Damage Monitoring and Response Plan shall include the following elements:

- Detailed maps showing the installed location of all SunCatchers.
- Each SunCatcher shall be identified by a unique ID number marked to show initial ground surface at its base and the depth of the pylon below ground.
- Minimum Depth Stability Threshold to be maintained of pylons to meet long-term stability for applicable wind, water, and debris loading effects.
- Above and below ground construction details of a typical installed SunCatcher.
- BMPs to be employed to minimize the potential impact of broken mirrors to soil resources.
- Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments.
- Monitoring, documenting, and restoring the soil surface when impacted by sedimentation or broken mirror shards.

Monitor and inspect periodically, before first seasonal and after every storm event:

- SunCatchers within Drainages or subject to drainage overflow: Inspect for tilting, mirror damage, depth of scour compared to pylon depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport.
- Drainage Channels: Inspect for substantial migration or changes in depth, and transport of broken glass.
- Constructed Diversion Channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup.

- Ground Surface: Inspect for changes in the surface texture and quality from sediment buildup, erosion, or broken glass.

Short-term incident-based response:

- SunCatchers: Remove broken glass, damaged structure, and wiring from the ground, and for foundations no longer meeting the Minimum Depth Stability Threshold, either replace/reinforce or remove the mirrors to avoid exposure for broken glass.

- Drainage Channels: No short-term response necessary unless changes indicate risk to facility structures.

Long-term design-based response:

- Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards.

- Replace/reinforce foundations no longer meeting the Minimum Depth Stability Threshold or remove the mirrors to avoid exposure for broken glass.

- Propose design modifications to address ongoing issues.

Inspection, short-term incident response, and long-term design-based response may include activities both inside and outside of the approved right of-way. For activities outside of the approved right-of-way, the project owner shall notify BLM and acquire environmental review and approval before field activities begin.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit the final drainage map, the Foundation Depth and Stability Report, and the Storm Water Damage Monitoring and Response Plan, with supporting analysis, to the AO and CPM for review and approval. The project owner shall retain a copy of these documents onsite at the power plant at all times. The project owner shall prepare an annual summary of the number of SunCatchers failed, cause of the failure, and cleanup and mitigation performed for each failed SunCatcher.

SOIL&WATER-8 **Septic System and Leach Field Requirements.** The project owner shall comply with the requirements of the County of Imperial Land Use Ordinance Title 9 and the California Plumbing Code (California Code of Regulations Title 24, Part 5) regarding sanitary waste disposal facilities such as septic systems and leach fields. The septic system and leach fields shall be designed, operated, and maintained in a manner that ensures no deleterious impact to groundwater or surface water. Compliance shall include an engineering report on the septic system and leach field design, operation, maintenance, and loading impact to groundwater.

Verification: The project owner shall submit all necessary information and the appropriate fee to the County of Imperial and the RWQCB to ensure that the project has complied with county and state sanitary waste disposal facilities requirements. Written assessments prepared by the County of Imperial and the RWQCB regarding the project's compliance with these requirements must be submitted to the AO and CPM for review and approval 30 days prior to the start of power plant operation.

SOIL&WATER-9 **Assured Water Supply.** The project owner shall provide the AO and CPM two copies of the executed Recycled Water Purchase Agreement (agreement) with the recycled waste water purveyor for the long-term supply (30 35 years) of disinfected tertiary recycled water to the IVS project. The project shall not operate without a long-term agreement for recycled water delivery and connection to a recycled water pipeline for project use. The agreement shall specify a delivery rate to meet the IVS project's maximum operation requirements and all terms and costs for the delivery and use of recycled water at the IVS project. The IVS project shall not connect to the new recycled water pipeline without the final agreement in place and submitted to the AO and CPM. The project owner shall comply with the requirements of Title 22 and Title 17 of the California Code of Regulations and section 13523 of the California Water Code.

The project owner shall work with the SWWTP to obtain approval from the RWQCB Division of Water Rights for the diversion of flows from the New River to the IVS project.

Verification: No later than 60 days prior to the connection to the recycled water pipeline, the project owner shall submit two copies of the executed

agreement for the supply and on-site use of disinfected tertiary recycled water at the IVS project. The agreement shall specify that the recycled wastewater purveyor can deliver recycled water at a maximum rate up to 250,000 gpd and would provide the IVS project a minimum of 33 acre-feet per year.

The project owner shall submit to the AO and CPM a copy of the Producer/User Water Recycling Requirements, the recycled wastewater criteria, the Engineering Report, the Cross Connection Inspection report, and RWQCB water rights approval under Section 1211 of the Water Code for the SWWTP diversion prior to the connection to the disinfected tertiary recycled wastewater pipeline.

SOIL&WATER-10 **Decommissioning Plan.**The project owner shall identify likely decommissioning scenarios and develop specific decommissioning plans for each scenario that will identify actions to be taken to avoid or mitigate long-term impacts related to water and wind erosion after decommissioning. Actions may include such measures as a decommissioning SWPPP, revegetation and restoration of disturbed areas, post-decommissioning maintenance, collection and disposal of project materials and chemicals, and access restrictions.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit decommissioning plans to the AO and CPM for review and approval prior to site mobilization. The project owner shall amend these documents as necessary, with approval from the AO and CPM, should the decommissioning scenario change in the future.

4.17.7 Summary of Impacts

Table 4-74 summarizes the direct, indirect, short-term, long-term, and cumulative adverse effects of the IVS project, the Agency Preferred Alternative, the other Build Alternatives, and the No Action Alternatives related to hydrology, water use, and water quality. As shown in Table 4-74, with the information provided to date, it was determined that construction, operation, and decommissioning of the IVS project could potentially adversely impact soils, surface water, flooding, surface water quality, ground water quality, and water supply. Where these potential impacts have been identified, measures have been proposed to reduce those impacts such that they are not adverse.

Table 4-74 Summary of Water Resources Impacts by Alternative

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
IVS Project: 750 MW Alternative	The construction, operation, and decommissioning of the IVS project could potentially adversely impact soils, surface water, flooding, surface water quality, groundwater quality, and water supply. The IVS project will result in the short-term use of a local well in the Ocotillo/Coyote Wells Groundwater Basin which is part of the sole source aquifer. The IVS project would result in increased erosion potential on the site during construction and increased potential for pollutant runoff.	**Construction Measures** *SOIL&WATER-1:* Drainage Erosion and Sedimentation Control Plan *SOIL&WATER-3:* Industrial Facility SWPPP *SOIL&WATER-5*: NPDES General Permit for Construction Activity **Operations Measures** *SOIL&WATER-2:* Monitoring and verification of water use *SOIL&WATER-4:* Potable water requirements *SOIL&WATER-6:* Waste Discharge Requirements *SOIL&WATER-7:* Storm Water Damage Monitoring and Response Plan *SOIL&WATER-8:* Septic System and Leach Field Requirements *SOIL&WATER-9:* Assured water supply *SOIL&WATER-10:* Decommissioning Plan	None.
709 MW Alternative: Agency Preferred Alternative	Fewer impacts than the IVS project due to the construction of a smaller number of SunCatchers.	Same as the IVS project.	None.
300 MW Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.

Alternative	Direct, Indirect, Short- and Long-Term, and Cumulative impacts	Mitigation Measures, Project Design Features, and Other Measures	Unavoidable Adverse Impacts After Mitigation
Drainage Avoidance #1 Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.
Drainage Avoidance #2 Alternative	Fewer impacts than the IVS project and the Agency Preferred Alternative due to the smaller number of SunCatchers.	Same as the IVS project and the Agency Preferred Alternative.	None.
No Action Alternative: No ROW Grant and No CDCA Plan Amendment	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for No Solar	None.	None.	None.
Land Use Plan Amendment Alternative – No Action Alternative: No ROW Grant and Amend the CDCA Plan for Other Solar	Not determined, but could be potentially similar to the impacts under the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.	Not determined, but could be potentially similar to the IVS project and the Agency Preferred Alternative.

Table Source: LSA Associates, Inc. (2010).

Table Key: CDCA Plan = California Desert Conservation Area Plan; IVS = Imperial Valley Solar; MW = megawatts; NPDES = National Pollutant Discharge Elimination System NPDES; ROW = right-of-way; SWPPP = Storm Water Pollution Prevention Program.

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4.18 Irreversible and Irretrievable Commitment of Resources

The National Environmental Policy Act (NEPA) requires an analysis of the significant irreversible effects of a proposed action. Resources irreversibly or irretrievably committed to a proposed action are those used on a long-term or permanent basis. This includes the use of nonrenewable resources such as metal, wood, fuel, paper, and other natural or cultural resources. These resources are considered nonretrievable in that they would be used for a proposed action when they could have been conserved or used for other purposes. Another impact that falls under the category of irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

The Imperial Valley Solar (IVS) project would irretrievably commit resources over the 40-year life of the project. After 40 years, the IVS project is planned to be decommissioned and the land returned to its pre-project state. This would indicate that potentially some of the resources on site could be retrieved. However, 40 years is a long time and many variables could affect the project over that period. In addition, it is debatable as to how well the site can recover to its pre-project state. Open desert lands and sensitive desert habitats can take a long time to recover from disturbances such as development. The IVS project site is not currently entirely undisturbed due to the presence of off-highway vehicle use.

The IVS project is a renewable energy project intended to generate solar energy to reduce reliance on fossil fuels. Over the 40-year life of the IVS project, this renewable energy project would contribute incrementally to the reduction in demand for fossil fuel use for electricity-generating purposes. Therefore, this incremental reduction in expending fossil fuels would be a positive effect of the commitment of nonrenewable resources to the IVS project.

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4.19 Growth-Inducing Impacts

The Imperial Valley Solar (IVS) project site is primarily (approximately 95 percent of the site) on Federal land managed by the United States Bureau of Land Management (BLM), 14 miles west of El Centro, California in unincorporated western Imperial County. The project site is in the eastern section of the Imperial County Ocotillo/Nomirage Planning Area.

In 2000, as reported by the United States Census, the population of the Ocotillo/Nomirage Planning Area was 719 persons. The population was 800 persons in 2006. Imperial County had a total population of 142,361 persons in 2000 and 161,867 persons in 2007.

The unemployment rate for Imperial County was 24.5 percent in February 2009 (not seasonally adjusted). Over the past few decades, full employment has been typically defined as approximately 4.0 to 5.5 percent unemployment. For California, the unemployment rate was 10.9% in February 2009 (not seasonally adjusted).

For this analysis, growth inducement is defined as workers permanently moving into the project area because of project construction and operation, thereby encouraging construction of new residences, the extension of roads, and/or the expansion of other infrastructure. To determine whether the IVS project would induce population growth, the availability of the local workforce and the population in the region were analyzed. The local workforce is defined as workers in Imperial, San Diego, Riverside, and San Bernardino Counties. Construction workers beyond a two hour commute (either in- or out-of-state) would likely relocate for the workweek but would return to their primary residences and families on weekends.

The Imperial, San Diego, Riverside, and San Bernardino Counties labor market area was used for the evaluation of construction worker availability. Imperial County was evaluated for potential community services and infrastructure impacts from construction of the IVS project.

The applicant expects construction of the IVS project to occur in 2 phases and employ an average of 360 persons per month, totaling 24,086 personnel months for the 40-month construction period. The applicant proposes that project construction would start in late 2010. The greatest number of construction workers (peak) would occur in the seventh month of construction. The number of construction workers would range from about 101 in the first month of construction to approximately 731 workers at peak construction.

Table 4-75 shows that total construction labor by the types of skills needed for the IVS project, in Imperial, San Diego, Riverside, and San Bernardino Counties, with annual averages for 2009, is adequate when compared to the construction worker needs for the IVS project. The peak

construction employment of 731 workers for the IVS project represents less than 1 percent of the labor force in Imperial, San Diego, Riverside and San Bernardino Counties. The workforce needed for demolition of the IVS project would likely total the peak number of construction workforce.

Table 4-75 Total 2009 Labor Force in Imperial, San Diego, Riverside, and San Bernardino Counties by Construction Skill for Construction

Occupational Title	Annual Average Number of Employees in 2009	Maximum Employees Needed Per Month for IVS Project Construction
Carpenters	55,075	47
Concrete Crews	8,840	46
Electricians	13,980	113
Ironworkers	760	48
Laborers	38,255	142
Miscellaneous Crews	Not available	10
Operators	8,675	86
Plumbers	12,550	26
Technicians	Not available	32
SunCatchers Assemblers	Not available	64
SunCatchers Electricians	13,980	16
SunCatchers Ironworkers	760	32
SunCatchers Laborers	38,255	16
SunCatchers Material Handlers	Not available	16
SunCatchers Operators	8,675	8
SunCatchers Teamsters	32,265	12
SunCatchers Technicians	Not available	32
Teamsters	32,265	60
Technicians	Not available	5

Table Source: Staff Assessment/Draft Environmental Impact Statement (2010).

Because the majority of the construction workforce anticipated for the IVS project currently resides in Imperial, San Diego, San Bernardino, and Riverside Counties, construction and demolition of the IVS project would have little impact with respect to inducing substantial population growth.

When fully operational, the IVS project is forecast to employ approximately 164 full-time workers. The IVS project would operate 7 days a week, with maintenance activities occurring 7 days a week, 24 hours a day. It is expected that most of the operations employees would reside in Imperial, San Diego, San Bernardino, and Riverside Counties. Therefore, inducement of substantial population growth either directly or indirectly by the IVS project would not be substantial or adverse.

4.20 Short-Term vs. Long-Term Productivity of the Environment

The short-term uses of the environment as a result of the Agency Preferred Alternative, the Imperial Valley Solar (IVS) project, and the other Build Alternatives include those typically found with solar energy development. Short-term impacts associated with construction activities described elsewhere in Chapter 4.0, Environmental Consequences, include effects to the natural environment, cultural resources, and recreation resources. These can be compared to the long-term benefits of the Agency Preferred Alternative, the IVS project and the other Build Alternatives all of which would provide for the production of clean, renewable energy consistent with Federal and State goals to increase production of renewable energy to help reduce dependence on fossil fuels.

As discussed earlier in Section 4.18, Irreversible and Irretrievable Commitment of Resources, the Agency Preferred Alternative, the IVS project and the other Build Alternatives could permanently damage sensitive desert habitats, which in turn could adversely affect the long-term productivity of the area. However, these Alternatives would all also provide a long-term benefit by providing electric power without any increase in the use of non-renewable resources such as fossil fuels, which will result in a benefit to air quality and a reduction in carbon-based emissions.

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4.21 Summary of Unavoidable Adverse Impacts

The construction and implementation of the Imperial Valley Solar (IVS) project, the Agency Preferred Alternative, and the other Build Alternatives considered in this Final Environmental Impact Statement (FEIS) would result in short- and long-term adverse environmental impacts. This section summarizes the potential unavoidable adverse impacts that could occur as a result on the IVS project, the Agency Preferred Alternative, and the other Build Alternatives. This section also indicates whether the IVS project and the other Build Alternatives would not result in unavoidable adverse impacts for specific parameters. This summary is based on the technical analyses described throughout Chapter 4.0, Environmental Consequences.

4.21.1 Air Quality

As discussed in Section 4.2, Air Quality, the IVS project includes measures that would reduce the IVS project's stationary source nitrogen oxides (NO_X), volatile organic compounds (VOC), sulfur dioxide (SO_2), inhalable particulate matter (less than 10 microns in diameter, PM_{10}), and fine particulate matter (less than 2.5 microns in diameter, $PM_{2.5}$) emissions through the use of Best Available Control Technology (BACT), minimizing delivery and employee trips, and reducing mobile source emissions by using lower emitting gasoline and propane fueled new vehicles. With the inclusion of these measures, the IVS project would not result in adverse air quality impacts and would not contribute to cumulative adverse air quality impacts. The Agency Preferred Alternative and the other Build Alternatives are also not expected to result in adverse air quality impacts or to contribute to cumulative adverse air quality impacts.

In summary, the construction and operation of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would not result in unavoidable adverse air quality impacts.

4.21.2 Biological Resources

As discussed in Section 4.3, Biological Resources, even with implementation of Measures BIO-1 through BIO-20, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will result in unavoidable adverse impacts to the flat tailed horned lizard (FTHL).

Implementation of Measures BIO-1 through BIO-20 is anticipated to reduce the severity of the impacts to other biological resources such that those impacts after mitigation are not considered adverse. As a result, the IVS project, Agency Preferred Alternative, and the other Build

Alternatives will not result in unavoidable adverse impacts to biological resources after mitigation other than the impacts to FTHL.

4.21.3 Climate Change

As discussed in Section 4.4, Climate Change, there would be no unavoidable adverse impacts related to greenhouse gas (GHG) emissions under the IVS project, the Agency Preferred Alternative, and the other Build Alternatives. The IVS project, the Agency Preferred Alternative, and the other Build Alternatives are not mandated to consider adaptation strategies including sea level rise because of the distance of the project site from the Pacific Ocean. In summary, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to climate change.

4.21.4 Cultural Resources

As discussed in Section 4.5, Cultural and Paleontological Resources, the likelihood of avoiding impacts to all the resources eligible for the National Register of Historic Places (National Register) for the IVS project, the Agency Preferred Alternative, and the other Build Alternatives is very remote. Although those impacts can be substantially mitigated, they cannot be 100 percent mitigated. In summary, the IVS project, the Agency Preferred Alternative and the other Build Alternatives will result in unavoidable adverse Impacts to cultural resources after mitigation.

Paleontological resources have been documented within the Quaternary alluvium, colluvium, lakebed sediments, and in sedimentary units of the Palm Springs Formation underlying the IVS project site. The potential adverse effects of the construction and operation of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives on paleontological resources will be mitigated based on implementation of Measures PAL-1 through PAL-7. After mitigation, the IVS project, the Agency Preferred Alternative and the other Build Alternatives would not result in unavoidable adverse impacts to paleontological resources.

4.21.5 Fire and Fuels Management

Based on compliance with the applicable laws, ordinances, regulations, and standards (LORS) and Measures WORKER SAFETY-1 and WORKER SAFETY-2, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to fire and fuel risks.

4.21.6 Geology, Soils, Topography, Mineral Resources, and Seismic

The IVS project, the Agency Preferred Alternative, and the other Build Alternatives will comply with LORS applicable to geology, mineral resources, and the seismic environment. The design and construction of these Alternatives should have not be adversely affected by or adversely affect the geology, mineral resources, and seismic environment.

4.21.7 Grazing, and Wild Horses and Burros

As discussed in Section 4.8, Grazing, and Wild Horses and Burros, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to grazing, wild horses, and burros because the site is not currently used, designated as, or planned for grazing lands, and no wild horses or burros are known to inhabit the IVS project site.

4.21.8 Land Use and Corridor Analysis

As discussed in Section 4.9, Land Use and Corridor Analysis, the following unavoidable adverse land use impacts would occur if the IVS project was implemented; they would also occur, to a lesser extent, if the Agency Preferred Alternative or one of the other three Build Alternatives were to be implemented:

- The conversion of 6,500 acres (ac) of land to support the project components and activities would directly disrupt current recreational activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of those lands.

- The IVS project would result in reduced off-highway vehicle (OHV) access routes on the project site and would result in adverse impacts to recreation opportunities on the IVS site as envisioned in the *California Desert Conservation Area Plan* (CDCA Plan, 1980, as amended) and the Western Colorado Desert Routes of Travel Designations (WECO) which are in an amendment to the CDCA Plan.

- Cumulative impacts to approximately 1 million acres of land in the southern California desert would combine to result in adverse effects on recreational resources and would result in an unavoidable adverse impact. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in southern California would occur mostly in undeveloped desert lands or areas of

rural development, and therefore, would not create physical divisions of established residential communities. Nonetheless, approximately 1 million acres of land are proposed for solar and wind energy development in the southern California desert. The conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore, would contribute to a cumulative adverse land use impact.

4.21.9 Noise and Vibration

As discussed in Section 4.10, Noise and Vibration, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would result in short- and long-term noise impacts which can be substantially mitigated based on implementation of Measures NOISE-1 through NOISE-7. After mitigation, the IVS project, the Agency Preferred Alternative, and the other Build Alternative would not result in direct, indirect, or cumulative unavoidable adverse noise impacts.

4.21.10 Public Health and Safety, and Hazardous Materials

As discussed in Section 4.11, Public Health and Safety, and Hazardous Materials, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in adverse impacts related to public health and safety.

After implementation of Measures HAZ-1 through HAZ-6, IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to hazardous material use, storage, and transportation, and other hazardous materials management activities.

4.21.11 Recreation

As discussed in Section 4.12, Recreation, the following unavoidable adverse impacts to recreation would occur under the IVS project and to a slightly lesser extent under the Agency Preferred Alternative and the other Build Alternatives:

- The conversion of 6,500 ac of land to support the project's components and activities would directly disrupt current recreational activities in established Federal, State, and local recreation areas and would result in adverse effects on recreational users of these lands.

- Because the IVS project and the other Build Alternatives would result in reduced off-highway vehicle (OHV) access routes on the project site, it would result in adverse land use and planning impacts to recreation opportunities on the site as envisioned in the CDCA Plan and the WECO amendment.

- Cumulative impacts to approximately 1 million acres of land in the southern California desert would result in adverse effects on recreational resources and would result in an unavoidable cumulative adverse impact. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in southern California would occur mostly in undeveloped desert lands or areas of rural development. Nonetheless, approximately 1 million acres of land are proposed for solar and wind energy development in southern California desert lands. The conversion of these lands would remove existing land uses including recreation, wilderness, rangeland, and open space and therefore would result in a cumulative adverse impact related to recreation resources.

- The impacts of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would contribute to a cumulative change in the visual and historic context of the Juan Bautista de Anza National Historic Trail (Anza Trail) corridor on and in the vicinity of the project site. Therefore, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would contribute to a secondary cumulative adverse impact to the overall recreational experience on the Anza Trail.

4.21.12 Socioeconomics and Environmental Justice

As discussed in Section 4.13, Socioeconomics and Environmental Justice, the construction, operation, and decommissioning of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would not result in direct, indirect, or cumulative adverse impacts on the study area's environmental justice populations, housing, schools, parks and recreation, law enforcement, and emergency services.

4.21.13 Special Designations

As discussed in Section 4.14, Special Designations, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in any unavoidable adverse impacts related to Wilderness Areas or Special Areas because none of those types of resources are located on or in the immediate vicinity of the IVS project site.

The IVS project, the Agency Preferred Alternative, and the other Build Alternatives will result in the conversion of designated agricultural lands to nonagricultural uses, but as described in Section 4.14, this is not considered an adverse impact under the National Environmental Policy Act (NEPA). Therefore, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts to designated agricultural lands.

4.21.14 Traffic and Transportation

As discussed in Section 4.15, Traffic and Transportation, based on implementation of Measures TRAN-1 through TRAN-4, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to traffic and transportation.

4.21.15 Visual Resources

As discussed in Section 4.16, Visual Resources, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would substantially degrade the existing visual character and quality of the project site and its surroundings. The approximately 6,500 ac project site, including over 6.5 miles (mi) of frontage on Interstate 8 (I-8), would experience a dramatic visual transformation from a predominantly natural desert landscape to one of a highly industrial character, strongly affecting motorists on I-8. The character and quality of views from some recreational destinations in the Yuha Desert ACEC, including segments of the Anza Trail, would be strongly affected. Given the moderately high to high level of viewer sensitivity of these affected viewpoints, the visual impacts are considered substantial and adverse under the IVS project, the Agency Preferred Alternative, and Drainage Avoidance #1 Alternative and, to a lesser degree, under the 300 MW and Drainage Avoidance #2 Alternatives.

The anticipated visual impacts of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives, in combination with past and foreseeable future projects in the West Mesa/Yuha Desert region and the southern California desert are considered cumulatively considerable and the contribution of the IVS project to that cumulative impact is substantial and adverse.

In summary, even with implementation of Measures VIS-1 through VIS-7, the visual impacts of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will be unavoidable and adverse.

Diffuse reflection from the SunCatchers could be an intrusive and distracting nuisance to motorists under at least certain conditions, particularly when an entire row of units could be visible in a near-vertical position to approaching motorists at hours near sunrise and sunset.

With implementation of Measure VIS-6, those potential adverse glare impacts would no longer be substantial, and therefore, would not be unavoidable and adverse.

4.21.16 Hydrology, Water Use, and Water Quality

As discussed in Section 4.17, Hydrology, Water Use, and Water Quality, with the information provided to date, it was determined that construction, operation, and decommissioning of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives could potentially adversely impact soils, surface water, flooding, surface water quality, groundwater quality, and water supply. With implementation of Measures SOIL&WATER-1 through SOIL&WATER-10, those impacts are reduced to a level where they are not adverse. Therefore, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will not result in unavoidable adverse impacts related to hydrology, water use, and water quality.

4.21.17 Irreversible and Irretrievable Commitment of Resources

As discussed in Section 4.18, Irreversible and Irretrievable Commitment of Resources, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives would irretrievably commit resources over the 40-year life span of the project. After the 40 years, the project is planned to be decommissioned and the land returned to its pre-project state. This would indicate that potentially some of the resources on site could be retrieved. However, 40 years is a long time and many variables could affect the project over that period. In addition, it is debatable as to how well the site can recover to its pre-project state. Desert lands and sensitive desert habitats can take a long time to recover from disturbances such as development. The IVS project site is not currently entirely undisturbed due to the presence of OHV use. In addition, the two private out-parcels surrounded by the project site represent development potential. In the most conservative interpretation of commitment of resources, and given the unknowns surrounding the long-term future, it is reasonable to assume that the IVS project, the Agency Preferred Alternative, and the other Build Alternatives will irretrievably and irreversibly commit these undeveloped lands to a solar project. This would be an unavoidable effect of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives.

The IVS project, the Agency Preferred Alternatives, and the Build Alternatives would result in a renewable energy project intended to generate solar energy to reduce reliance on fossil fuels. Over the 40-year life of the facility, there should be a reduction or at least a no net increase in the demand for fossil fuels. Therefore, the reduction in demand for fossil fuels would be a positive effect of the commitment of nonrenewable resources to the IVS project, the Agency Preferred Alternative, and the other Build Alternatives.

4.21.18 Growth-Inducing Impacts

As discussed in Section 4.19, Growth-Inducing Impacts, because the majority of the construction and operation workforces for the IVS project, the Agency Preferred Alternative, and the other Build Alternatives currently reside in Imperial, San Diego, San Bernardino, and Riverside Counties, the construction, operation, and decommissioning of the project would have little impact with respect to inducing population growth. That effect would not be adverse.

4.21.19 Short-Term vs. Long-Term Productivity of the Environment

As discussed in Section 4.20, Short-Term vs. Long-Term Productivity of the Environment, the short-term uses of the environment associated with the IVS project, the Agency Preferred Alternative, and the other Build Alternatives include those typically associated with the construction and operation of solar energy projects. The short-term impacts associated with construction activities described throughout Chapter 4.0 include effects to the natural environment, cultural resources, and recreation resources. These can be compared to the long-term benefits of the IVS project, the Agency Preferred Alternative, and the other Build Alternatives associated with clean, renewable energy production for a growing regional population and economy.

As discussed in Section 4.18, the IVS project, the Agency Preferred Alternative, and the other Build Alternatives could permanently damage sensitive desert habitats which in turn could affect the long-term productivity of the area. However, they would also provide a long-term benefit by providing power without any increase in the use of nonrenewable resources such as fossil fuels, a benefit to air quality, and a reduction in carbon-based emissions.