Chapter 4
Other CEQA Analyses

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4.1 Introduction

This chapter analyzes cumulative impacts, identifies potential growth inducement due to the project, identifies significant irreversible environmental changes and significant unavoidable impacts, summarizes the differences between the project alternatives and discusses the environmentally superior project alternative.

4.2 Cumulative Impacts

4.2.1 Approach to Impact Analysis

4.2.1.1 Legal Requirements

State CEQA Guidelines require that the cumulative impacts of a project be addressed in an EIR when the cumulative impacts are expected to be significant and when the project's incremental effect is *cumulatively considerable* (State CEQA Guidelines Section 15130[a]). Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (State CEQA Guidelines Section 15355[b]). Such impacts can result from individually minor but collectively significant actions taking place over time.

Section 15130 of the State CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable. This section introduces the methods used to evaluate cumulative effects, lists related projects and describes their relationship to the project, identifies cumulative impacts by resource area, and recommends mitigation for considerable contributions to significant cumulative effects.

Note that this section focuses on whether or not the project makes a *considerable contribution* to a significant cumulative impact. If the project makes a considerable contribution to a significant cumulative impact, this is defined as a significant impact under CEQA. If it does not, it is defined as a less-than-significant impact. However, following the terminology used in CEQA Guidelines noted above, this section uses the term "considerable" in the evaluation instead of the term "significant". They are functionally equivalent in terms of impact conclusions.

4.2.1.2 Methodology

According to the State CEQA Guidelines, an adequate discussion of significant cumulative impacts should contain the following elements:

- An analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the project;
- A summary of the expected environmental effects to be produced by those projects, with specific reference to additional information stating where that information is available; and
- A reasonable analysis of the cumulative impacts of the relevant projects.

An EIR must examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative impacts.

4.2.2 Cumulative Setting

Reasonably foreseeable future projects that could result in environmental impacts that could combine with impacts from the PG&E remediation to result in cumulative impacts are identified below and in Figure 4-1, Foreseeable Future Projects.

- *Abengoa Mojave Solar Project*. Mojave Solar, LLC (Mojave Solar), which is solely owned by Abengoa Solar, Inc., is an under-construction 250-megawatt (MW) net output solar power plant located approximately 9 miles northwest of the project area on 1,765 acres of private land southwest of Harper Lake. Additional facilities include a new substation and interconnection to the adjacent transmission lines, and a fiber-optic telecommunication line linking various substations in the region. Southern California Edison (SCE) proposes to construct and operate these additional facilities. The U.S. Department of Energy released an Environmental Assessment in April 2011, and the California Public Utilities Commission gave final approval to the project in November 2011. The project is expected to go online in June 2014. (California Public Utilities Commission, 2012).
- *Nursery Products Hawes Composting Facility Project* The Hawes Composting Facility project is an approved open-air composting facility for biosolids (wastewater treatment plant solids) and green material on approximately 80 acres and is planned to start construction in 2012. This project is located south of SR 58, approximately 12.3 miles east of Kramer Junction and 8 miles west of Hinkley, in San Bernardino County (URS, 2006).
- *Caltrans State Route 58 Hinkley Expressway Project*. The proposed State Route 58 (SR 58) Hinkley Expressway Project would grade separate, widen, and realign an existing 9.3-mile segment of SR 58, starting approximately 5 miles west of the city of Barstow, from two lanes to four lanes to join the existing four-lane expressway on either side. The purpose of this project is to address the following issues: correct the bottleneck; improve safety features; provide continuity with existing four-lane sections; improve goods movement; reduce conflicts between the movement of people and goods; improve pavement; and meet future traffic demands (California Department of Transportation 2011). As of July 2012, Caltrans is in the process of preparing a Draft EIR/EIS to assess alternative routes for widening and realigning this segment of SR 58 and the potential environmental impacts that could result if those routes were built (California Department of Transportation 2012).
- *Desert View Dairy and other Former Dairies in Hinkley*. The Desert View Dairy is owned by PG&E and located within the boundaries of the project area. Two other dairies, including the Nelson Dairy, were located nearby. As documented in 2008 and 2009, groundwater sampling results at the current and former dairies indicate levels of nitrate, TDS, chloride, sodium, sulfate, and specific conductance above drinking water standards on the Desert View Dairy property and

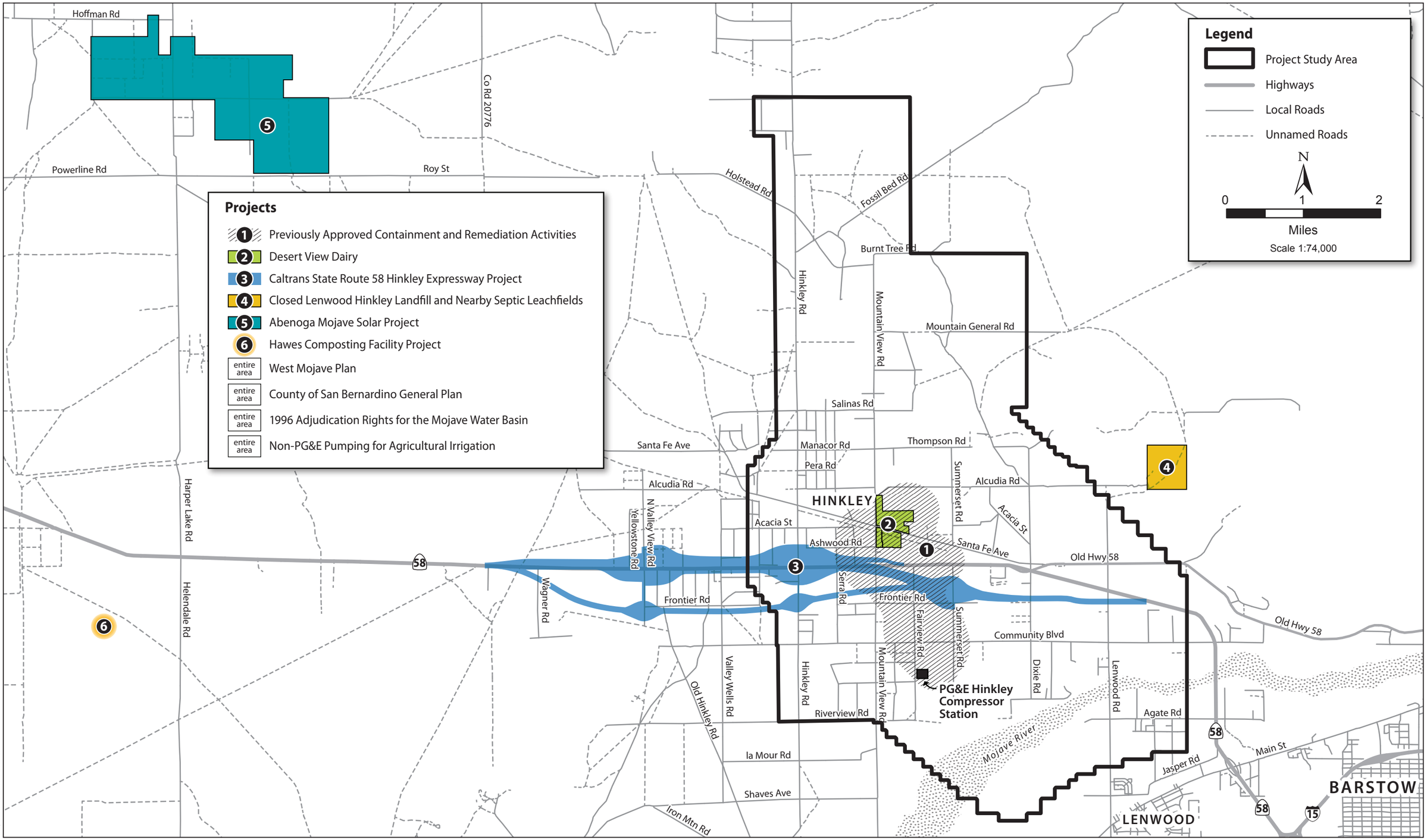

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Figure 4-1
Foreseeable Future Projects

other properties north and south of the Desert View Dairy. The existing contamination due to dairy operations is included in this cumulative analysis, as well as the continuation of Desert View Dairy operations and any remediation efforts deemed necessary, to address water quality issues on the site and relevant adjacent sites (Lahontan Regional Water Quality Control Board 2010).

- *San Bernardino County General Plan Buildout*. The county general plan was adopted on March 13, 2007, by the San Bernardino County Board of Supervisors. The general plan, in part, contains the goals, policies, and implementing actions for a variety of issues, including natural and human-made hazards and natural and human-made resources, and sets the framework for decision-making regarding the County's long-term development and use of resources. The General Plan allows for long-term growth within the unincorporated county areas as allowed by the plan designations, zoning and requirement. Within the project area, as discussed in Section 3.2, *Land Use, Agriculture, Population, and Housing*, the General Plan allows primarily for rural residential and agricultural development, with more limited commercial and industrial uses in discrete areas (San Bernardino County 2007).
- *Lenwood-Hinkley Landfill*. The Lenwood-Hinkley Landfill is a closed landfill owned by San Bernardino County located to the east of the proposed project area. The landfill was a Class III (Municipal waste) landfill and closed in 1997. Investigation to date has indicated that the landfill has resulted in contaminated groundwater beneath the landfill with elevated levels of volatile organic compounds (VOCs). However, contamination with VOCs has not been identified in downgradient wells, indicating contamination is limited to the project site itself. The remedial approach being used is Monitored Natural Attenuation as there has been evidence from site monitoring that the contamination is being attenuated by natural processes over time. Because the landfill is located outside the proposed project area, no contamination has been detected in downgradient areas, and the remedial activity consists only of site monitoring, this project is not considered to contribute to any cumulative impacts and is not considered further in this analysis (Lahontan Regional Water Quality Control Board 2006).

The references noted above are the sources for information about these cumulative projects unless otherwise noted in the analysis below.

The above projects are considered for the cumulative impact analysis. As discussed below, for greenhouse gas emissions, the analysis considers state, national, and international emissions in the cumulative evaluation.

4.2.3 Cumulative Impact Area

Cumulative impacts can occur locally, regionally, and even globally. However, cumulative impacts relative to the proposed project only occur when the project's impacts can combine in time and location with the impacts of other projects. Where another project affects resources that are not affected by the proposed project, then a cumulative impact is not identified. For example, another project may affect roadway traffic in a location that is not affected by the proposed project. Table 4-1 summarizes the impact area considered for different resources and the cumulative projects considered for analysis of different resources.

4.2.4 Summary of Impacts

Table 4-2 presents a summary of cumulative impacts. See Section 4.2.5, *Cumulative Impacts by Resource*, for a detailed discussion of all impacts and mitigation measures.

4.2.5 Cumulative Impacts by Resource

4.2.5.1 Water Resources and Water Quality

Impact CUMUL-1: Cumulative Impacts Related to Water Resources and Water Quality (Temporarily Significant and Unavoidable Project Level Water Quality Impacts for Action Alternative; All Other Impacts Less than Significant with Mitigation)

Implementation of the project in combination with the ongoing effects of the chromium plume and existing contamination from the former and present dairy operations has the potential to result in cumulative effects related to groundwater and water quality. The potential for the project to contribute to cumulative impacts is discussed in the following paragraphs.

Groundwater Drawdown

Regional Groundwater Drawdown

The following projects, which are considered in the cumulative analysis, would affect water demand as follows:

- Abengoa Mojave Solar Project—The solar project acquired the water rights of prior agricultural lands near Harper Lake in the amount of 10,478 acre-feet per year. The project's environmental assessment estimated the project's consumptive water use would be 2,163 acre-feet per year, and their adjusted free production allocation (considering Harper Lake Zone requirements) would be 3,143 acre-feet per year. The project would have drawdown within the Harper Lake zone of the aquifer but would not result in lowering of the aquifer into the screen level of other wells. The project would have minimal impacts on the regional aquifer, as conditioned (California Public Utilities Commission 2010).
- Hawes Composting Facility Project—The composting facility has an estimated water demand of 1.1 acre-feet to be supplied from local groundwater, and the project's EIR identified that this would not result in groundwater drawdown (URS 2006; PBS &J 2009).
- Ongoing dairy operations at the Desert View Dairy—Dairy operations would not increase use of groundwater in the region. The remedial project irrigation of land treatment units at the Desert View Dairy is part of the existing condition.
- SR 58 Hinkley Expressway Project—Constructing the roadway would involve water use for dust control, but this use would be temporary. Operation of the roadway would not involve water use as state highways in the Mojave Desert do not usually include irrigated landscaping.
- San Bernardino County General Plan Buildout—New residential and other development that may occur in the area, as allowed by the San Bernardino General Plan, could also result in additional water demand in the Centro Subarea.

Table 4-1. Cumulative Impact Areas

Impact	Cumulative Impact Area for this EIR	Projects Contributing to the Cumulative Impact (one or more resource in overall subject area)
Impact CUMUL-1: Water Resources and Water Quality		
Groundwater drawdown	Hinkley Groundwater Basin	Proposed Project
Water quality	Hinkley Groundwater Basin	SR58 Hinkley Expressway
Drainage	Hinkley Valley	DVD Dairy Operations
Flooding	Mojave River/Harper Lake watershed	SB County General Plan Buildout
		Abengoa Mojave Solar
Impact CUMUL-2: Land Use, Agriculture, Population and Housing		
Division of an existing community		
Land use compatibility	Proposed Project Area	Proposed Project
Consistency with West Mojave Plan	Proposed Project Area	SR58 Hinkley Expressway
Conversion of agricultural land	West Mojave Plan area	SB County General Plan Buildout
Population and housing composition	Hinkley Valley and Vicinity	Abengoa Mojave Solar
	Hinkley Valley and Vicinity	
Impact CUMUL-3: Hazards and Hazardous Materials		
Exposure to hazardous materials	Hinkley Valley	Proposed Project
Emergency access	Hinkley Valley	SR58 Hinkley Expressway
Fire hazards	Hinkley Valley	SB County General Plan Buildout
		Hawes Composting Facility
Impact CUMUL-4: Geology and Soils		
Erosion	Mojave River/Harper Lake watershed	Proposed Project
Land subsidence	Hinkley Groundwater Basin	SB County General Plan Buildout
Seismic risks to structures	Proposed Project Area	SR58 Hinkley Expressway
Seismic risks to people	Proposed Project Area	Abengoa Mojave Solar
		Hawes Composting Facility

Impact	Cumulative Impact Area for this EIR	Projects Contributing to the Cumulative Impact (one or more resource in overall subject area)
Impact CUMUL-5: Air Quality and Climate Change		
Criteria pollutants	Mojave Air Basin	Proposed Project
Sensitive receptors (toxic air contaminants)	Proposed Project Area	SR58 Hinkley Expressway
Greenhouse gas emissions	County/State/Nation/Globe	SB County General Plan buildout
Odor	Proposed Project Area	Hawes Composting Facility
		Abengoa Mojave Solar
Impact CUMUL-6: Noise		
Temporary construction noise/vibration	Proposed Project Area	Proposed Project
Permanent operational noise/vibration	Proposed Project Area	SR58 Hinkley Expressway
		SB County General Plan Buildout
Impact CUMUL-7: Biological Resources		
Special status species	Western Mojave Desert	Proposed Project
Sensitive vegetation communities	Western Mojave Desert	SR58 Hinkley Expressway
Waters/wetlands	Proposed Project Area	SB County General Plan Buildout
Wildlife movement	Proposed Project Area	Hawes Composting Facility
Protected trees	Proposed Project Area	Abengoa Mojave Solar
Consistency with Conservation Plans	West Mojave Plan Area	
Impact CUMUL-8: Cultural Resources		
Historic architectural resources	Proposed Project Area	Proposed Project
Archaeological resources	Proposed Project Area	SR58 Hinkley Expressway
Human remains	Proposed Project Area	SB County General Plan Buildout
Paleontological resources	Western Mojave Desert	Hawes Composting Facility
		Abengoa Mojave Solar
Impact CUMUL-9: Utilities and Public Services		
Utility services	Proposed Project Area/Barstow	Proposed Project
Landfill capacity	Proposed Project Area/Barstow	SR58 Hinkley Expressway
Public services	Proposed Project Area/Barstow	SB County General Plan

Impact	Cumulative Impact Area for this EIR	Projects Contributing to the Cumulative Impact (one or more resource in overall subject area)
Impact CUMUL-10: Transportation and Traffic		
Roadway capacity	Proposed Project Area/SR58	Proposed Project
Traffic Safety	Proposed Project Area/SR58	SR58 Hinkley Expressway
Emergency Access	Proposed Project Area/SR58	SB County General Plan Buildout
		Hawes Composting Facility
		Abengoa Mojave Solar
Impact CUMUL-11: Aesthetics		
Scenic views	Hinkley Valley	Proposed Project
Visual character	Hinkley Valley	SR58 Hinkley Expressway
Light and glare	Proposed Project Area	SB County General Plan Buildout
Impact CUMUL-12: Socioeconomics		
Physical Blight	Proposed Project Area	Proposed Project

Table 4-2. Summary of Cumulative Impacts

Impact	Is the Cumulative Impact Potentially Significant?	Is the Project's Contribution to the Cumulative Impact Significant	Project Mitigation Measures	Significance of Project Contribution after Mitigation
Impact CUMUL-1: Water Resources and Water Quality	Yes	Yes	WTR-MM-1 to WTR-MM-8	Significant and unavoidable (Degradation of groundwater aquifer water quality in Hinkley during remediation)
Groundwater Drawdown	Yes	Yes		
Water Quality	Yes	Yes		
Drainage	No	N/A		Less than Significant
Flooding	No	N/A		(All other water resource and water quality impacts)
Impact CUMUL-2: Land Use, Agriculture, Population and Housing	Yes	Yes	WTR-MM-2 LU-MM-1, LU-MM-2	Less than Significant
Division of existing community	Yes	No	BIO-MM-1a to BIO-MM-1m	
Land use compatibility	Yes	No	BIO-MM-1p, BIO-MM-6	
Consistency with West Mojave Plan	Yes	Yes		
Conversion of agricultural land	Yes	Yes		
Population and housing composition	No	N/A		
Impact CUMUL-3: Hazards and Hazardous Materials	Yes	Yes	HAZ-MM-1, HAZ-MM-2 TRA-MM-1	Less than significant
Exposure to Hazardous Materials	Yes	Yes		
Emergency Access	Yes	Yes		
Fire Hazards	No	N/A		
Impact CUMUL-4: Geology and Soils	Yes	Yes	AIR-MM-4	N/A
Erosion	Yes	Yes	GEO-MM-1, GEO-MM-2	
Land Subsidence	Yes	Yes	WTR-MM-2	
Seismic risk to structures	No	N/A		
Seismic risk to people	Yes	Yes		

Impact	Is the Cumulative Impact Potentially Significant?	Is the Project's Contribution to the Cumulative Impact Significant	Project Mitigation Measures	Significance of Project Contribution after Mitigation
Impact CUMUL-5: Air Quality and Climate Change	Yes	Yes	AIR-MM-1 to AIR-MM-8	Less than Significant
Criteria Pollutants	Yes	Yes		
Sensitive Receptors (Toxic Air Contaminants)	Yes	Yes		
Odor	No	N/A		
Greenhouse Gas emissions	Yes	Yes		
Impact CUMUL-6: Noise	Yes	Yes	MM-NOI-1	Less than Significant
Temporary Construction Noise and Vibration	Yes	Yes	CUM-MM-1	
Permanent Operational Noise and Vibration	No	N/A		
Impact CUMUL-7: Biological Resources	Yes	Yes	BIO-MM-1a to BIO-MM-1p BIO-MM-2 to BIO-MM-6	Significant and Unavoidable (Alternative 4C-4 for desert tortoise movement)
Special Status Species				
Sensitive Vegetation Communities	Yes	Yes		
Waters/Wetlands	Yes	Yes		
Wildlife Movement	Yes	Yes		Less than Significant (All other alternatives)
Protected Trees	Yes	Yes		
Consistency with Conservation Plans	Yes	Yes		
	Yes	Yes		
Impact CUMUL-8: Cultural Resources	Yes	Yes	CUL-MM-1 to CUL-MM-8	Less than Significant
Historic Architectural Resources	Yes	Yes		
Archaeological resources	Yes	Yes		
Human Remains	Yes	Yes		
Paleontological resources	Yes	Yes		
Impact CUMUL-9: Utilities and Public Services	No	N/A	None required	N/A
Utilities	No	N/A		
Electricity Consumption	No	N/A		
Landfill capacity	No	N/A		
Public services	No	N/A		

Impact	Is the Cumulative Impact Potentially Significant?	Is the Project's Contribution to the Cumulative Impact Significant	Project Mitigation Measures	Significance of Project Contribution after Mitigation
Impact CUMUL-10: Transportation and Traffic	Yes	Yes	TRA-MM-1	Less than Significant
Roadway Capacity	Yes	No	CUM-MM-2	
Traffic Safety	Yes	Yes		
	Yes	Yes		
Impact CUMUL-11: Aesthetics	Yes	Yes	AES-MM-1 to AES-MM-3	Less than Significant
Scenic views	Yes	No		
Visual character	Yes	Yes		
Light and Glare	Yes	Yes		
Impact CUMUL-12: Socioeconomics			[Project-level only:	[Project-level only: Less than
Physical Blight	No	N/A	SE-MM-1]	Significant]

The project would cause groundwater drawdown effects on the regional water supply, specifically the Mojave River Basin, Centro Subarea. Pumping for agricultural treatment would increase in proportion to the increased irrigated acreage for agricultural treatment. On a regional scale, the total pumping by PG&E from the Hinkley Valley aquifer would be greater than PG&E's current allowance under the Mojave River Basin Adjudication. New remedial pumping for the project could range from 3,900 acre-feet (Alternative 4B) up to 7,100 acre-feet (Alternative 4C-4) (see Section 3.1, *Water Resources and Water Quality*).

The basin has been adjudicated, and thus all major water uses are required to comply with the pumping limitations, which overall seek to stabilize groundwater levels. Absent any mitigation, the combined demand of the proposed project and other cumulative projects could result in net drawdown which would be a significant impact. However, as described in Section 3.1, *Water Resources and Water Quality*, PG&E must acquire sufficient water rights to allow the proposed water use with agricultural treatment, and will be required to demonstrate to the Water Board that it has acquired the necessary water rights before ramping up agricultural treatment (per Mitigation Measure WTR-MM-1). As discussed in Section 3.1, *Water Resources and Water Quality*, in the groundwater basin overall there appears enough unused Free Production Allocation that PG&E could acquire without exceeding the overall adjudication limits. Acquiring these water rights would ensure that the project would not contribute considerably to regional groundwater drawdown. In addition any other new users with substantial water demands would be subject to the adjudication requirements, which would prevent regional groundwater drawdown.

Localized Drawdown in the Hinkley Valley

The following projects, which are considered in the cumulative analysis, would affect local water drawdown as follows:

- Abengoa Mojave Solar Project—This project is not located in the Hinkley Valley, was found to have minimal drawdown effects on the regional aquifer according to its environmental assessment (California Public Utilities Commission, 2010), and thus would not contribute to localized groundwater drawdown.
- Hawes Composting Facility Project—This project is not located in the Hinkley Valley and has minimal water demands that would not contribute to regional or local groundwater drawdown.
- Desert View Dairy Operations—Ongoing dairy operations would not increase use of groundwater locally. The irrigation of land treatment units at the Desert View Dairy is part of the existing conditions.
- SR 58 Hinkley Expressway Project—Constructing the roadway would involve water use for dust control, but this use would be temporary and would not have a lasting effect on groundwater levels, even if drawn from local wells. Operation of the roadway would likely involve very limited, if any, irrigation use as state highways in the Mojave Desert either do not have landscaping or use drought-tolerant plants.
- San Bernardino County General Plan Buildout—New residential and other development that may occur in the area, as allowed by the San Bernardino General Plan, could also result in additional water demand in the Hinkley Valley which could contribute to localized cumulative groundwater drawdown.

The project would also cause groundwater drawdown effects on the local water supply, specifically the Hinkley Valley Aquifer. The additional pumping for increased agricultural treatment could have impacts on individual wells.

If new homes or businesses are built in the Hinkley Valley, their water demand would be in addition to the project's water demand. Given that the project would result in significant drawdown and other demands could worsen this situation, this is a cumulatively significant impact. Without mitigation, such drawdown could disrupt domestic or agricultural supply and potentially result in abandonment of domestic/agricultural activity.

To address the projects' contribution to local groundwater drawdown effects, PG&E would provide alternative water supply for wells that are affected by localized drawdown impacts from remedial activities (per Mitigation Measure WTR-MM-2) and would be responsible to ultimately plan for recovery of water levels (per Mitigation Measure WTR-MM-4). Provision of this alternative water supply would ensure that the project would not contribute considerably to a significant localized drawdown impact.

Aquifer Compaction

Remedial pumping for agricultural treatment will result in groundwater drawdown levels including in areas that were not subject to historic drawdown and areas that may contain subsurface soil conditions that are more susceptible to compaction. As discussed above, the only other cumulative project that would contribute to localized drawdown in the Hinkley Valley would be residential and other buildout per the General Plan. The cumulative effect of the project and additional residential and other development is considered potentially significant as it might result in aquifer compaction in certain areas which may affect the aquifer capacity in the long term.

In order to address the project's contribution to this potential cumulative impact, Mitigation Measures WTR-MM-1 and WTR-MM-2 would require PG&E to acquire additional water rights for its additional water use and to provide replacement water for water supply wells affected by project-caused groundwater drawdown. Implementation of these mitigation measures would assure that other Hinkley Valley water users affected by the proposed project would be able to obtain water supplies unimpaired by the project even if aquifer compaction were to occur. PG&E is required to plan for recovery of water levels to pre-project baseline per Mitigation Measure WTR-MM-4. However, while the water supply impact can be mitigated through alternative water supplies, as discussed in Section 3.1, *Water Resources and Water Quality*, it is possible that project-related aquifer compaction may permanently reduce aquifer capacity in certain areas which would be a significant and unavoidable impact.

Water Quality

The focus of the cumulative water quality analysis is on the Hinkley Valley groundwater aquifer.

All of the remedial action alternatives would reduce chromium contamination in the groundwater aquifer relative to existing conditions, which would be a beneficial effect on the environment. As a beneficial impact, containment and remediation of the chromium plume relative to existing conditions is not an adverse water quality effect under CEQA, and would not contribute to a cumulatively considerable impact.

However, while the project overall would reduce chromium contamination, certain remediation activities have the potential to adversely impact water quality during remediation and are also discussed below in the context of their contribution to cumulative water quality impacts.

The cumulative projects would affect local water quality in the Hinkley Valley as follows:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—These projects are located outside the Hinkley Valley and would not affect local water quality. These projects are not considered further in the cumulative water quality impact analysis.
- Desert View Dairy Operations—As discussed in section 3.1, *Water Resources and Water Quality,* prior dairy operations at the Desert View Dairy (and at several former dairies) has resulted in contamination of the groundwater aquifer with elevated levels of Total Dissolved Solids and nitrate in an area between Community Boulevard on the south, Mountain View Road on the west, Thompson Road on the east, and approximately 0.5 mile west of Summerset Road on the east.
- SR 58 Hinkley Expressway Project—Construction of the widened roadway has the potential to result in construction spills and erosion/sedimentation during construction, but routine best management practices would control construction period effects on water quality. Roadside runoff would be channeled to infiltrate in adjacent areas and would be treated (as and if necessary). Any associated roadway runoff contamination is expected, at worst, to be limited to the topsoil and not to affect groundwater conditions.
- San Bernardino County General Plan Buildout—New rural residential and other growth in the area is likely to have limited effects on groundwater quality for most likely uses. New industrial or agricultural uses could have greater potential to affect groundwater quality such as could occur if new dairies are added (which could result in increased nitrate and TDS contamination) or additional agriculture (which would result in increased TDS concentrations) or other uses. Rural residential growth could affect groundwater quality if the addition of septic systems were to exceed the local assimilative capacity.

Increased Chromium in Groundwater

The major prior water quality impact associated with the project area is the existing chromium plume from the PG&E Compressor Station which has been steadily migrating in a northerly downgradient direction for over 50 years. Without additional action, the future movement and spreading cannot be predicted exactly but would likely expand in downgradient areas. This existing condition is considered to be a significant risk to water quality and public health and likely would result in the exposure of additional domestic wells to the contaminated plume.

However, none of the cumulative projects are expected to contribute chromium to the Hinkley groundwater aquifer, and thus no cumulative impact is identified associated with chromium. Project-level temporary effects on chromium due to "bulging" are addressed in Section 3.1, *Water Resources and Water Quality*, and impacts can be mitigated to a less than significant level with Mitigation Measures WTR-MM-2 (alternative water supplies) and WTR-MM-3 (plume bulge control).

Increased Total Dissolved Solids (TDS), Uranium and Other Radionuclides in Groundwater

The project includes increased groundwater pumping and application to irrigated agricultural lands, which would result in increased TDS in the water that infiltrates back to the aquifer below the irrigated land. Dairy operations and irrigated agriculture in the Hinkley Valley are the major cause of increased TDS in the Hinkley Valley groundwater, although natural dissolution of salts from the geologic materials (i.e., aquifer sediments) does occur as the water moves from the Mojave River toward the north. The project would increase the TDS in the aquifer below the irrigated land treatment areas.

Ongoing Desert View Dairy operations could also further increase TDS in this aquifer contributing to a cumulative impact. The SR 58 Hinkley Expressway Project is not likely to have any effect on TDS in groundwater. Buildout of the General Plan could have an effect on TDS concentrations in the aquifer if new dairies, new agriculture or a concentration of septic fields were to result in contributions of TDS to the groundwater. Thus, there is a potential cumulative impact related to TDS concentrations.

As described in Section 3.1, *Water Resources and Water Quality*, Mitigation Measure WTR-MM-2 would require alternative water supplies for all significantly affected wells, and Mitigation Measure WTR-MM-4 would require long-term remediation of increased TDS levels due to the project above baseline.

Increased project groundwater pumping for agricultural treatment could also result in increased uranium and other radionuclide concentrations in groundwater but the potential for this impact to occur is currently not well understood due to limited available data. Together with other, non-PG&E pumping for agricultural irrigation or buildout of the General Plan, there is a potential for cumulative changes in groundwater concentrations of uranium and other radionuclides. For the proposed project, PG&E will be required to investigate, monitor and implement contingency actions in the event that agricultural treatment is found to have the potential to increase naturally-occurring uranium or other radionuclides in groundwater (per Mitigation Measure WTR-MM-5); and if necessary, alternative water supplies will be required to be provided to affected wells (per Mitigation Measure WTR-MM-2).

As discussed in Section 3.1, *Water Resources and Water Quality*, project-level water quality impacts may be temporarily significant and unavoidable where remedial byproducts result in aquifer degradation that may be temporarily necessary to facilitate chromium remediation. If and when this happens, the project could contribute to a cumulatively significant impact, despite the mitigation noted above. At the end of chromium remediation, PG&E will be required to remediate any significant water quality effects of remedial activities to restore beneficial uses and thus this will not be a permanent impact.

Increased Nitrate in Groundwater

The project includes increased groundwater pumping for irrigated land treatment of the contaminated Cr[VI] groundwater. Agricultural treatment in the same area as extraction will reduce nitrate concentrations in that area (as shown in prior agricultural treatment). The overall effect of agricultural treatment will be removal of nitrate from groundwater, which will be a beneficial effect for the aquifer as a whole. However, localized effects could occur where water extracted from areas with higher nitrate levels is used to irrigate a location with lower nitrate levels. Combined with ongoing dairy operations associated with the Desert View Dairy, there could be cumulative impacts on nitrate levels in the aquifer without mitigation.

For the proposed project, required mitigation measures include monitoring nitrate levels and managing agricultural treatment to avoid increases in nitrate concentration above 10 ppm or by more than 25% compared to existing conditions (per Mitigation Measure WTR-MM-6). This mitigation measure would reduce the project's contribution to a less than considerable level.

Increased Iron, Manganese, and Arsenic in Groundwater

None of the cumulative projects are likely to result in increased concentrations of iron, manganese or arsenic in groundwater. The SR 58 Hinkley Expressway Project is not expected to result in any contamination of the groundwater aquifer. Ongoing operations of the Desert View Dairy may affect levels of TDS and nitrate in the aquifer, but not iron, manganese and arsenic. Additional growth pursuant to the San Bernardino County General Plan (including residential, agricultural, and other uses) is not likely to result in new uses that would result in groundwater contamination, because all new uses would have to comply with County policies that control impacts on water resources, and any new sources of discharge would have to comply with state and federal water quality regulations.

As discussed in Section 3.1, *Water Resources and Water Quality*, project impacts to water supply associated with dissolved iron, manganese and arsenic can be reduced to a less than significant level through Mitigation Measures WTR-MM-2 (alternative water supply), WTR-MM-4 (remediation of byproduct plumes) and WTR-MM-7 (byproduct plume control).

As discussed in Section 3.1, *Water Resources and Water Quality*, project-level water quality impacts may be temporarily significant and unavoidable where remedial byproducts result in aquifer degradation that may be temporarily necessary to facilitate chromium remediation. If and when this happens, the project could contribute to a cumulatively significant impact, despite the mitigation noted above. At the end of chromium remediation, PG&E will be required to remediate any significant water quality effects of remedial activities to restore beneficial uses and thus this will not be a permanent impact.

Exceedance of Taste and Odor Objectives

Ongoing Desert View Dairy operations would affect taste and odor objectives through continued contributions of TDS to the groundwater aquifer. The SR 58 Hinkley Expressway Project would have limited effects on water quality and is not likely to affect the groundwater water quality. Residential growth and other non-agricultural uses are not likely to result in groundwater contamination, because all new uses would have to comply with County policies that control impacts on water resources, and any new sources of discharge would have to comply with state and federal water quality regulation. New agricultural growth consistent with the County General Plan could affect TDS levels in groundwater which could also affect taste.

The project would include more agricultural treatment than existing conditions, which could increase TDS levels in groundwater and in-situ remediation which could increase iron and manganese levels which could exceed taste and odor objectives for drinking water. Implementation of Mitigation Measures WTR-MM-2 (alternative water supply), WTR-MM-4 (remediation of byproduct plumes) and WTR-MM-7 (byproduct plume control).

As discussed in Section 3.1, *Water Resources and Water Quality*, project-level water quality impacts may be temporarily significant and unavoidable where remedial byproducts result in aquifer degradation that may be temporarily necessary to facilitate chromium remediation. If and when this happens, the project could contribute to a cumulatively significant impact, despite the mitigation

noted above. At the end of chromium remediation, PG&E will be required to remediate any significant water quality effects of remedial activities to restore beneficial uses and thus this will not be a permanent impact.

Drainage

The cumulative projects could affect local drainage in the Hinkley Valley as follows:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—These projects are not located in the Hinkley Valley and thus would not affect local drainage.
- Desert View Dairy Operations—Ongoing dairy operations would not change local drainage patterns over existing conditions
- SR 58 Hinkley Expressway Project -The roadway project could affect local drainage patterns due to the widening of the existing roadway or due to realignment of the roadway. There are no perennial water bodies, so the alignment would cross desert washes leading either north (to Harper Lake) or south (to the Mojave River). Drainage facilities (i.e. culverts) will need to be designed to handle roadway drainage so that storm drainage is facilitated and does not result in unsafe roadway conditions or drainage impairment of adjacent areas.
- San Bernardino County General Plan Buildout—Additional residential and other development per the County General plan would result in new structures, roadways, and impervious surfaces, which may affect local drainage patterns.

The project would cause an increase in alteration of local drainage patterns from new road segments, parking lots, and structures associated with the construction and operation of above-ground treatment plants (Alternatives 4C-3 and 4C-5 only). However, as discussed in Section 3.1, *Water Resources and Water Quality*, the project is not expected to result in substantial drainage impacts. Even considering cumulative development, given the nature of local conditions (with widely dispersed development and rapid infiltration of drainage due to generally sandy substrates), drainage impacts are expected to be addressed through project by project considerations such that significant cumulative effects are not considered likely.

Flooding

The cumulative projects would affect flooding in the Mojave River/Harper Lake watersheds as follows:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—These projects are not located in the Hinkley Valley and thus would not affect local flooding.
- Desert View Dairy Operations—Ongoing dairy operations would not change local flooding compared to existing conditions.
- SR 58 Hinkley Expressway Project—The roadway project could affect local flooding due to the widening of the existing roadway or due to realignment of the roadway (with increased impervious surfaces and alteration of drainage sources). However, it is expected that standard roadway design improvements can avoid any flooding impacts that might be associated with the project.
- San Bernardino County General Plan Buildout—Additional residential and other development per the County General plan would result in new impervious surfaces, which may affect local

flooding.

The project would cause an increase in impervious area due to new road segments, parking lots, and structures associated with the construction and operation of above-ground treatment plants (Alternatives 4C-3 and 4C-5 only). However, as discussed in Section 3.1, Water *Resources and Water Quality*, the project is not expected to result in substantial flooding impacts. Even considering cumulative development, given the nature of local conditions, with widely dispersed development and rapid infiltration of drainage due to generally sandy substrates, flooding impacts, if any, are expected to be addressed through project by project considerations such that significant cumulative effects are not considered likely.

4.2.5.2 Land Use, Agriculture, Population and Housing

Impact CUMUL-2: Cumulative Changes in Existing Land Use, Agriculture, Population and Housing (Less than Significant with Mitigation)

Land Use

Cumulative projects would have varying changes in local land use in the Hinkley Valley as follows:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—Neither of these projects are in the Hinkley Valley and thus would not affect local land use in the Hinkley Valley and are not discussed further in the cumulative land use analysis.
- Desert View Dairy Operations—This is an existing use that would not change future land uses.
- SR 58 Hinkley Expressway Project—The SR 58 project would expand the 2-lane portion of SR 58 to a 4-lane facility and thus would convert some of the adjacent land in the Hinkley area to roadway use. Based on a review of aerial photography of the 2-lane section of SR 58, the land adjacent to SR 58 where the widening or realignment would occur is mostly undeveloped land, but does contain some structures and could require acquisition of portions of some rural residential properties to complete the roadway project. Construction of SR 58 could divide the community of Hinkley by creating a larger barrier between residences and businesses to the north and south of SR 58.
- San Bernardino County Buildout—Buildout in accordance with the County General Plan could result in new rural residential, agricultural, and other uses, but only in accordance with planning requirements for the area.

The project would result in land use changes necessary to implement remediation activities. The project area is used largely for rural residential and agricultural purposes and ongoing remediation activities with limited other commercial and industrial uses.

Disruption of Land Uses

While construction of SR 58 could divide an existing community, the proposed project would not contribute to this impact, as it does not include project elements that could divide communities. The project is compatible with surrounding land uses, with the exception of above-ground treatment facilities, which would be somewhat anomalous features in the rural landscape of Hinkley Valley.

The majority of construction and operational project impacts would occur during the initial buildout of remedial infrastructure and would result in short-term inconvenience, but would not

substantially impede surrounding land uses. However, two water resource impacts of remedial operations could disrupt adjacent land uses: groundwater drawdown and water quality degradation due to remedial byproducts. As discussed in Section 3.1, *Water Resources and Water Quality*, the project would result in groundwater drawdown due to agricultural treatment pumping that could disrupt water supply wells. Combined with other foreseeable activities, including non-PG&E pumping for agriculture, this disruption could lead to a cumulatively considerable disruption of land uses. Also, agricultural treatment and in-situ treatment could result in generation of remedial byproducts that could affect the water quality for water supply wells, which in concert with other foreseeable projects could lead to a cumulatively considerable impact related to disruption of adjacent land uses.

Implementation of Mitigation Measure WTR-MM-2, which requires the provision of alternative water supplies so that adjacent land uses are not substantially disrupted, would reduce this impact to level that would not be considered cumulatively considerable.

Consistency with Land Use Designations and Zoning

Most project activities would be consistent with local land use and zoning designations, with the exception of the above-ground treatment facilities. It is anticipated that San Bernardino County will be able to permit such a proposed use; and if above-ground treatment is advanced as part of the remediation, PG&E would be required to obtain a conditional-use permit, a special-use permit, and/or a General Plan Amendment, and comply with all relevant San Bernardino County development requirements. There are no other foreseeable projects that are expected to conflict with local land use and zoning designations; therefore, there would not be a cumulatively considerable impact.

Consistency with BLM Land Use Management

The Abengoa Mojave Solar Project primary solar collector site is located on private land; however, the project requires upgrade to transmission facilities, which cross both private and BLM land. The project has been evaluated by the BLM and an Environmental Assessment/Finding of No Significant Impact (FONSI) has been completed for the transmission facility upgrade on BLM land and the BLM has determined that the project is consistent with the California Desert Conservation Plan of 1980 (as amended) including the West Mojave Plan.

The Hawes Composting Facility Project requires upgrading and using an access road which crosses BLM land. The project has been evaluated by the BLM and an Environmental Assessment/Finding of No Significant Impact (FONSI) has been completed for the road upgrade on BLM land and the BLM has determined that the project is consistent with the California Desert Conservation Plan of 1980 (as amended) including the West Mojave Plan.

The SR 58 Expressway Project appears to avoid BLM land based on preliminary alignments. None of the other cumulative projects (Desert View Dairy operations, General Plan buildout) in the project vicinity would be on BLM land.

A portion of the PG&E remedial project area is on BLM land that is subject to the requirements of the West Mojave Plan. For all action alternatives, under which the project disturbs BLM land, potential conflicts with the conservation requirements of the West Mojave Plan could occur. However, implementation of Mitigation Measure LU-MM-1 (compliance with BLM permit requirements as described in Section 3.2, *Land Use, Agriculture, Population, and Housing*) and Mitigation Measures

BIO-MM-1a through BIO-MM-1m, BIO-MM-1p and BIO-MM-6 (described in Section 3.7, *Biological Resources*) would minimize potential conflicts with conservation requirements of the West Mojave Plan on BLM.

Recreation

There are no recreation facilities in the project area, and none of the project alternatives include the construction, expansion, or elimination of recreation facilities. The project would not impede access to nearby BLM lands for recreation. In addition, the project would not result in a substantial increase in population or demand for recreational facilities. Therefore, the project would not contribute to any cumulative recreational impacts.

Agriculture

Cumulative projects would have varying effects on agricultural land in Hinkley Valley and vicinity:

- Abengoa Mojave Solar Project—Construction of this project is located mostly on fallowed agricultural land, but would remove approximately 128 acres actively farmed (irrigated) land (which is designated prime farmland and farmland of statewide importance in the FMMP) from production and convert it to solar use. Based on NRCS designations, the project would result in conversion of 1,588.5 acres of farmland. (The NRCS designations are based on soils and do not consider whether land is irrigated or not.) The project is required to purchase agricultural easements or farmland and conserve the land on a 1:1 basis.
- Hawes Composting Facility Project—This project site does not contain important farmlands and would not affect farmland.
- Desert View Dairy Operations—Ongoing dairy operations at the Desert View Dairy are existing uses that would not convert agricultural land to non-agricultural use.
- SR 58 Hinkley Expressway Project—The SR 58 project would expand the 2-lane portion of SR 58 to a 4-lane facility and may include an alternative alignment through the Hinkley Valley. The project may convert some of the adjacent agricultural land in the Hinkley Valley to roadway use. Farmland potentially affected by the SR 58 project is located south of the railroad and east of Summerset Road.
- San Bernardino County Buildout—Buildout in accordance with the County General Plan could result in new rural residential and other uses, some of which might be proposed on existing farmland, but only in accordance with planning requirements for the area which would avoid substantial loss of agricultural land.

The project would add between 262 acres (Alternative 4B) and 1,212 acres (Alternative 4C-4) of new agricultural treatment units. Agricultural treatment units may be proposed on areas used for agriculture already, but this would not represent a conversion of use. The project may utilize small areas of existing farmland for above-ground remedial infrastructure, but the amount converted to non-agricultural use would be small, and the project overall would increase the amount of farmland.

Project remedial activities could also indirectly result in disruption of agricultural use due to groundwater drawdown or changes in water quality. As discussed in Section 3.1, *Water Resources and Water Quality*, remedial pumping for agricultural treatment for all action alternatives will result in groundwater drawdown compared to existing conditions which, in concert with non-PG&E pumping for agricultural irrigation, could lead to a cumulatively considerable impact. In addition,

agricultural treatment could also result in increased total dissolved solid concentrations that could result in water quality degradation such that it might not be useable for agriculture.

PG&E will be required to acquire water rights in sufficient amounts to support proposed agricultural treatment pumping levels. This water could be acquired from agricultural users. While agricultural treatment would continue agricultural use in the area, the long-term fallowing of currently productive agricultural land could result in alternative uses of that land that might prevent its return to agricultural productivity. In the Hinkley Valley, the area of most current and persistent agricultural activity is closest to the Mojave River, likely due in part to the greater reliability of water supplies closer to the river. Thus, long-term fallowing of this land could diminish the overall agricultural productivity and potential in the area, if conversion to other uses occurred during the long fallow period.

The Abengoa Mojave Solar Project and SR 58 Hinkley Expressway Project could contribute to a cumulative impact related to long-term significant cumulative loss of farmland. As described above, the proposed project could contribute considerably to this cumulative impact, primarily in relation to indirect effects. Mitigation Measure LU-MM-2 would require acquisition of agricultural conservation easements for any agricultural areas if water rights are acquired for remediation which would avoid conversion of farmland to non-farmland uses where water rights are acquired. Mitigation Measure WTR-MM-2 would require PG&E to provide alternative water supplies to agricultural where necessary to prevent substantial disruption to existing agricultural activities due to drawdown or water quality effects. Thus, with mitigation, the project would not contribute considerably to conversion of farmland to non-farmland uses.

Population and Housing

Cumulative projects would have limited effect on population and housing as follows:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—These projects are not located in the project area and would have no effect on housing in the Hinkley Valley but may increase employment which might indirectly increase regional housing demand; however, the effects are expected to be minimal.
- Desert View Dairy Operations—Ongoing dairy operations are existing uses that would not change future population or housing.
- SR 58 Hinkley Expressway Project—The SR 58 project would expand the 2-lane portion of SR 58 to a 4-lane facility. The widening could require acquisition of portions of some rural residential property, and it appears the right-of-way needed for the project contains housing as of late 2011.
- San Bernardino County Buildout—Buildout in accordance with the County General Plan could result in new rural residences and associated increase in population but only in accordance with planning requirements for the area.

The project includes construction activities that would temporarily increase local employment. However, due to the temporary nature of construction, it is expected that workers would use existing housing and services in Hinkley, Barstow, and elsewhere during construction.

Implementation of the action alternatives would also have the potential to require acquisition of existing rural residential properties in the largely open land areas within the project area, resulting in limited displacement of population and housing. Given the areas of likely acquisition and the very

low density of residences, the number of homes acquired to facilitate remedial activities is expected to be low. With the current housing market conditions (i.e., high vacancy rates), combined with the limited potential number of residences actually affected, the likelihood of contributing to new housing construction elsewhere is considered to be very low.

Considering the cumulative projects and the proposed project, cumulative impacts on population and housing are expected to be limited and would not result in a significant change in the population size or housing demand that would result in substantial physical changes in the environment. As a result, the project's contribution to a cumulative population and housing impact is also less than significant.

4.2.5.3 Hazards and Hazardous Materials

Impact CUMUL-3: Cumulative Effects Related to Hazards and Hazardous Materials (Less than Significant with Mitigation)

Hazardous Materials

Cumulative projects have the following impacts relative to hazardous materials.

- Abengoa Mojave Solar Project—Construction and operation of this project would require transport of small quantities of hazardous materials (including diesel, water treatment chemicals, oil, and heat transfer fluid) and would include limited generation of hazardous wastes (such as used hydraulic fluid, oil, grease, cleaning solutions, and batteries). The project's conditions of approval require management, spill control, and countermeasures. The solar project is not located in the PG&E remedial project area and thus would only affect the proposed project area in terms of hauling of any hazardous materials along SR 58. Transport of hazardous materials would occur during daylight and requires a safety management plan for delivery of hazardous materials.
- Hawes Composting Facility Project—This project would not accept hazardous materials in composting material (URS 2006). Construction would involve use of fuels, oils and other fluids in construction equipment and vehicles. Operations would include fuel transfer facilities on-site for project vehicles and use of fuels and oils for vehicles and operations. Project conditions of approval would control potential for release of hazardous materials or waste. The project includes controls for biosolids in compliance with federal, state, and local regulations to safely manage potential fungus and pathogens that may be contained in or attracted to biosolids used in composting at the facility. The Hawes Composting Facility will not be located in the PG&E remedial project area and thus would only affect the proposed project area in terms of transport along SR 58. Fuels and oils contained within trucks are controlled per state and federal requirements. Materials transported to the site will be contained during transit.
- Desert View Dairy Operations—The ongoing dairy operations at the Desert View Dairy do not involve the use of hazardous materials although dairy waste has resulted in contamination of the groundwater. This is a water quality impact addressed separately above as the dairy operations do not include the handling, treatment, or disposal of hazardous materials or hazardous waste as defined in state or federal law.
- SR 58 Hinkley Expressway Project—The SR 58 project would involve the use of petroleum and other vehicle fluids during construction, but handling and control of such materials would be

pursuant to local and state regulations for their use. Operationally, the expanded roadway would continue to allow for legal transport of materials. The expansion to 4-lanes would likely improve traffic safety by spreading existing traffic over two lanes in each direction, which would reduce the risk of spills of hazardous materials transported over the roadway.

- San Bernardino County General Plan Buildout—Buildout could result in hazardous materials use for construction of new residences and other structures. Buildout in accordance with the County General Plan could result in new rural residences and other uses, but all new proposed facilities would have to comply with local, state, and federal requirements for hazardous materials or waste, as applicable.

Project-specific impacts would be reduced to less-than-significant levels by implementation of mitigation measures. All treatment chemicals used for the project would be transported on public roads in accordance with federal DOT hazardous material regulations. Proposed above-ground treatment of contaminated groundwater would generate residual by-products of chromium, which could be considered hazardous waste and would be required to be disposed of at a Class I landfill in accordance with the requirements of Title 27. PG&E would be required to obtain permits from the San Bernardino County Fire Department to comply with federal and state hazardous materials requirements administered through the Unified Program. These requirements address the proper handling of hazardous wastes and materials and hazardous materials worker safety requirement procedures. Implementation of Mitigation Measure HAZ-MM-1 and Mitigation Measure HAZ-MM-2 would ensure that the project does not contribute to a cumulative impact on the community related to hazardous materials handling.

Considering the cumulative projects and the proposed project, cumulative impacts on hazardous materials may be significant in the event of a spill containing hazardous materials or waste in the proposed project area. However, all handling of hazardous materials or waste would need to comply with existing local, state, and federal regulations which would reduce this potential and the project's contribution to this potential impact to a less than significant level. Thus, with project-level mitigation, the project's contribution to any cumulative risks would be less than considerable.

Emergency Access

Cumulative projects would have the following effects on emergency access and response:

- Abengoa Mojave Solar Project—Project construction could cause minor delays in emergency access due to the increase of construction trucks. Project conditions of approval require development of a traffic control plan for construction. Operational traffic will be minimal and should not affect emergency access.
- Hawes Composting Facility Project—The project has adequate emergency access to the compost site and traffic impact analysis conducted for this project indicated that it would not create significant traffic impacts to the surrounding roadway circulation system and thus should not affect emergency access.
- Desert View Dairy Operations—This is an existing use, and would not alter emergency access in the Project Area.
- SR 58 Hinkley Expressway Project—During project construction, there could be delays in emergency access. Once the project is complete, there would be an improvement in emergency

access in the project area, as emergency vehicles would have more road capacity to utilize on SR 58.

- San Bernardino County General Plan Buildout—During construction of additional residences and other structures associated with buildout of the General Plan, transport of construction equipment could delay emergency access in the project area.

The proposed project would not result in significant impacts on levels of service on public roads and highways, and construction vehicle and employee parking would be off public roads and on PG&E owned land or within undesignated locations along public streets. Emergency vehicle response times would not be adversely affected by slowed traffic or blocked streets. Roadway closures are not anticipated due to the large availability of secondary access roads off public streets that could be used by PG&E workers as alternative routes to access construction sites, and/or completed facilities.

If there is overlap in construction timing of several of the cumulative projects, it is possible that there could be cumulative impacts related to impeding emergency access. However, like the proposed project, it is expected that substantial construction projects, like the SR 58 Hinkley Expressway Project, would have construction traffic controls which would limit potential impacts to traffic improvements and provide for emergency access and response during construction periods. By implementing TRA-MM-1 (implement traffic control measures during construction), the project's contribution to this potential impact would be mitigated to a less than significant level, and the severity of other project's impacts would be reduced. With project-level mitigation, the project's contribution to any potential cumulative impact on emergency access or response would be less than considerable.

Fire Safety

Desert View Dairy is an existing use that would not alter fire risk in the project area. Construction of the Abengoa Mojave Solar, SR 58 Hinkley Expressway, and Hawes Composting Facility projects and construction of buildings associated with buildout of the General Plan could cause minor increases in fire risk during construction due to the use of construction equipment, other machinery and fuel. A cumulative impact is not anticipated because all projects would be required to comply with the provisions of San Bernardino County's Fire Code regulating use, storage or transport of flammable substances; provisions of the Fire Hazard Abatement Program to manage and prevent fire hazards and risks; and the County's General Plan Safety Element Policy S 3.1 requiring applicants for new land developments to prepare a site-specific fire protection plan.

The proposed project's impacts related to fire safety would not be significant and, therefore, would not contribute considerably to any potential cumulative impact. Considering the cumulative projects and the proposed project, there would not appear to be cumulatively significant impact on fire safety.

4.2.5.4 Geology and Soils

Impact CUMUL-4: Cumulative Exposure of People or Structures to Geologic and Seismic Hazards (Less than Significant with Mitigation)

Erosion

Some of the cumulative projects would also affect erosion in the same watersheds affected by the project (Mojave River and Harper Lake). The Desert View Dairy is an existing use, and does not include operational elements that could increase erosion in the Mojave River/Harper Lake watershed. However, construction of the Abengoa Mojave Solar and SR 58 Hinkley Expressway projects and construction of structures associated with General Plan buildout would require ground disturbance during construction, and potentially some ground disturbance during maintenance. Should construction activities occur at the same time, there is the potential for a cumulatively considerable impact related to erosion in the Mojave River and Harper Lake watershed.

PG&E remediation construction activities would require ground disturbance that have the potential to result in increased soil erosion or loss of topsoil. Once facilities are built and operating, ground-disturbing activities could be required for periodic maintenance of subsurface infrastructure. In addition, remedial activities would increase use of local dirt roadways.

In concert with cumulative projects that would include similar ground-disturbing activities, there could be cumulative erosion and sedimentation impacts. Project specific impacts would be reduced to a less than significant level with implementation of Mitigation Measure AIR-MM-4 and compliance with San Bernardino County erosion control policies and ordinances as described in the county general plan. It is reasonable to assume that other foreseeable projects would be required to implement similar mitigation, thereby ensuring soil erosion and loss of topsoil are minimized and that there would not be a significant cumulative impact.

Land Subsidence

Other cumulative projects would have the following effects relative to land subsidence in the Hinkley Valley:

- Abengoa Mojave Solar Project—The project would have drawdown within the Harper Lake zone of the aquifer but would have minimal impacts on the regional aquifer, as conditioned, and thus could not be expected to contribute to any land subsidence in the Hinkley Valley.
- Hawes Composting Facility Project— Minor amounts of groundwater pumping would be required for project operation, but drawdown and land subsidence are not expected from the minimal amount of pumping.
- Desert View Dairy Operations—The Desert View Dairy is an existing use that would not alter current levels of groundwater pumping in the project area and thus would not affect land subsidence.
- SR 58 Hinkley Expressway Project—While this project could require minor amounts of groundwater pumping during project construction for dust control and possibly limited irrigation for landscaping, it should not be a significant enough amount to contribute to land subsidence.

- San Bernardino County General Plan Buildout—Additional water supply would be required for new residences and other structures associated with buildout of the General Plan, and some water supply from groundwater pumping may be required which, in combination with the project's substantial groundwater use, could contribute to potential cumulative impacts.

The project would increase groundwater pumping substantially, which could increase the risk of land subsidence. There is potential for existing or proposed facilities to be exposed to an increased risk of land subsidence in areas with finer-grained soils such as silts and clays. There is also the possibility that buildout of the San Bernardino General Plan would also contribute to local drawdown and risk of land subsidence. Implementation of Mitigation Measure GEO-MM-1 would reduce project-specific land subsidence impacts to a less than significant level by requiring monitoring of land subsidence and repair or replacement of structures damaged by project-induced land subsidence, if it occurs. This mitigation measure would also address the project's potential contribution to cumulative risk of land subsidence.

Seismic Risk to Structures

The Abengoa Mojave Solar, SR 58 Hinkley Expressway, and Hawes Composting Facility projects and buildout of the General Plan would all locate new infrastructure and structures near active faults, such as the Lenwood-Lockhart fault zone.

The project would increase the risk of damage to infrastructure due to seismic activity because it would locate new infrastructure near active faults, such as the Lenwood-Lockhart fault zone. Although proposed new facilities would not be located on the fault, seismic ground shaking could result in damage to all proposed infrastructure. Construction of all facilities during initial buildout and future phases of remediation would conform to applicable requirements of the California Building Code and San Bernardino County General Plan Safety Element goals and policies, which specifies design parameters to reduce seismic and other potential hazards to acceptable levels. This, along with implementation of Mitigation Measures GEO-MM-2 would reduce project-specific impacts to a less-than-significant level. Because it's reasonable to assume that other foreseeable projects built in the project vicinity would comply with relevant building codes and, if necessary, would implement similar mitigation, this would not be a significant cumulative impact; and the project will not contribute considerably to any cumulative impact.

Seismic Risk to People

Approximately 18 employees would be needed to run the Hawes Composting Facility, and 68 employees would be required for the Abengoa Mojave Solar Facility. Additional operational employees are not anticipated for the Desert View Dairy. Buildout of the General Plan in the Hinkley Valley may include additional commercial or agricultural enterprises, but the overall amount of employment is expected to be minimal. There may be increased residents in the area over time with buildout of the General Plan which could increase occupied structures in the area.

For the proposed project, one to three workers would be present at all times (24 hours a day) at each of the proposed above-ground treatment facilities, working in two to three shifts per day to conduct operations and maintenance activities (Alternatives 4C-3 and 4C-5 only). Since these facilities would be occupied by employees on a daily basis, as opposed to the temporary presence of construction workers and employees performing other operations and maintenance activities, there

is greater potential for human exposure to seismic activity at the permanent above-ground treatment facility areas. In concert with other foreseeable projects, there could be a cumulatively considerable impact. Implementation of Mitigation Measures GEO-MM-2 would reduce project-specific impacts. Other development must comply with state building codes concerning seismic risks. Therefore, significant cumulative impacts are not expected and the proposed project would not considerably contribute to any cumulative impacts.

4.2.5.5 Air Quality and Climate Change

Impact CUMUL-5: Cumulative Impacts on Air Quality and Climate Change (Less than Significant with Mitigation)

Criteria Pollutants

Cumulative projects would have the following effects on criteria pollutants:

- Abengoa Mojave Solar Project—Project construction would result in the emission of criteria pollutants and project construction mitigation was required. Minor amounts of operational emissions would occur, but project-level mitigation was identified to reduce emissions to a less than significant level.
- Hawes Composting Facility Project—Project construction would result in the emission of criteria pollutants but less than MDAQMD thresholds. Operational emissions would result from a variety of activities, including periodic grading, employee commute trips, truck transportation of compost material, fugitive dust emissions, and unloading of compost. The project's EIR found that operational volatile organic compound (VOC) emissions from composting would be significant and unavoidable as they would exceed MDAQMD thresholds and feasible mitigation. The project's EIR also found that the composting facility would result in a cumulative VOC impact.
- Desert View Dairy Operations—Ongoing operations would not result in an increase above current levels of air pollution from the Desert View Dairy.
- SR 58 Hinkley Expressway Project—Project construction would result in the emission of criteria pollutants. Project operations would not be expected to increase vehicle emissions as the distance travelled through the area would not substantially change, and the project would not likely induce traffic as this is the only east-west highway through the area. A mild reduction of periodic congestion may actually reduce operational emissions.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan would result in increased emissions of criteria pollutants. In addition, additional vehicle trips would be created by new residences and structures, thereby causing an operational increase in vehicle emissions. It is reasonable to assume that new projects allowed under the General Plan would also be required to implement construction and operational mitigation to reduce emissions to a less than significant level.

During construction and operation, the project would not conflict with or obstruct with implementation of MDAQMD's attainment plans for criteria pollutants. Construction of all alternatives would result in an increase in criteria pollutant emissions, compared to existing conditions. Implementation of Mitigation Measures AIR-MM-1, AIR-MM-2, AIR-MM-3 and AIR-MM-4 would reduce project-specific criteria pollutants to a less than significant level. Implementation of Alternatives 4C-3 and 4C-5 would result in increased operations and maintenance activities and a

consequent increase in PM10 emissions that would exceed MDAQMD thresholds during long-term operations. Implementation of Mitigation Measure AIR-MM-4 would reduce project-specific operational PM10 emissions and this impact to a less than significant level.

Since other cumulative projects either don't have significant construction emissions or can mitigate their emission to a less than significant level, and the PG&E remediation project includes mitigation for construction emissions, the proposed project, as mitigated would not contribute to a cumulatively considerable impact for construction emissions. For operational emissions, there would be a cumulative impact related to VOC emissions, due to the Hawes Composting Facility. While the PG&E remediation project would also have VOC emissions during operations, the project emissions would be mitigated to a less than considerable level and would not contribute considerably to the significant cumulative impact.

Sensitive Receptors/Toxic Air Contaminants

Other cumulative projects would have the following effects on toxic air contaminants:

- Abengoa Mojave Solar Project—Project construction would require the use of equipment that could generate diesel exhaust, and project operation would include trips to the project site in vehicles that could generate diesel exhaust. Project site operations are outside the PG&E project remediation area and thus could not affect the same receptors as the PG&E project, but some of the trips to the site by trucks would use SR 58 through the Hinkley Valley.
- Hawes Composting Facility Project—Project construction would require the use of equipment that could generate diesel exhaust, and project operation would include multiple daily trips to and from the project site to transport materials to be composted and compost for delivery to other sites. Project site operations are outside the PG&E project remediation area and thus could not affect the same receptors as the PG&E project, but some of the trips to the site by trucks would use SR 58 through the Hinkley Valley.
- Desert View Dairy Operations—Dairy operation does use diesel equipment for project operations; however, diesel equipment use is not expected to increase above current levels.
- SR 58 Hinkley Expressway Project—Project construction would require the use of equipment that could generate diesel exhaust. Upon project completion, there would be a beneficial impact in the project area, as vehicles emitting diesel exhaust would be able to move more quickly through the project area.
- San Bernardino County General Plan Buildout—Project construction would require the use of equipment that could generate diesel exhaust, and maintenance of constructed buildings could require occasional and sporadic trips for maintenance.

Construction activities associated with all project alternatives would include the use of diesel-powered equipment and vehicles. Operations and maintenance activities for all alternatives would include daily trips to remediation sites in vehicles that could generate diesel exhaust, similar to existing operations and maintenance for in-situ treatment (wells and associated infrastructure) and agricultural treatment. For Alternatives 4C-3, the health risk would be in excess of the MDAQMD cancer risk threshold of 10 risks per million. Implementation of Mitigation Measure AIR-MM-5 would reduce project-specific impacts to less than the threshold.

Cumulative impacts within Hinkley Valley are primarily limited to those from vehicles on SR 58 due to cumulative changes in truck volumes with perhaps some limited contribution from General Plan

buildout new uses. The cancer risk thresholds used by MDAQMD are designed to assess both project and cumulative contributions. As such, since the PG&E remediation project would mitigate to less than the risk thresholds, it would not contribute considerably to any cumulative toxic emissions impacts.

Odors

Cumulative projects would have the following effects on odors:

- Abengoa Mojave Solar Project—There would be minor odors during construction activity, and no operational odors associated with this project.
- Hawes Composting Facility Project—There would be minor odors during construction activity. During project operation, there would be composting-related odors associated with feedstock management (e.g., delivery, storage and handling); active composting (e.g., surface emissions, turning windrows, tearing down piles); and curing (e.g., surface emissions, turning windrows, and tearing down piles). Other minor sources of composting-related odor associated with project operations would include mixing of feedstocks into windrows, finished product loading, and poor site management conditions (e.g., runoff, leachate, surface ponding, and road spillage). The project is required to implement an Odor Impact Mitigation Plan (OIMP) which is expected to reduce odors to nearby residents to a less than significant level. Given the distance from the Hinkley Valley, it is not expected that this facility, particularly with the mitigation plan, would have odor impacts in the Hinkley Valley.
- Desert View Dairy Operations—While odors are emitted from operation of the Desert View Dairy, odors would not increase compared to existing conditions.
- SR 58 Hinkley Expressway Project—There would be minor odors during construction activity. After project completion, there would likely be a beneficial impact, as reductions in traffic would lead to decreased odors from vehicles passing through the project area.
- San Bernardino County General Plan Buildout—There would be minor odors during construction of residences and other structures associated with buildout of the general plan. New land uses would be required to evaluate and mitigate any significant new sources of odors.

PG&E remediation project construction activities near existing receptors would be temporary in nature and would not likely result in nuisance odors that would violate MDAQMD Rule 402 or frequently expose the public to objectionable odors. Operations and maintenance activities would include some minor odors, but none that would result in a project-specific significant impact.

PG&E remediation project odors would be minor and would be site-specific, occurring at a diversity of places in the project area. The Hawes Composting Facility Project is not close enough to the proposed project to combine with and thereby increase odors in the proposed project area, and the contributions of foreseeable projects would be minimal within the proposed project area. Therefore, there would not be a cumulatively significant impact, and the project would not contribute considerably to a cumulative odor impact.

GHG Emissions

Unlike criteria pollutant impacts, which are local or regional in nature, climate change impacts occur at a global level. The relatively long lifespan and persistence of GHGs require climate change to be considered a cumulative and global impact. It is unlikely that any increase in global temperature or sea

level could be attributed to emissions resulting from a single project. Rather, it is more appropriate to evaluate project-related GHG emissions in combination with emissions from across California, the U.S., and the globe, including emissions from nearby cumulative projects, to contribute cumulatively to potential adverse environmental impacts of global climate change.

Cumulative projects would have the following effects on GHG emissions:

- Abengoa Mojave Solar Project—This project would emit GHGs during construction and operation. The solar project would ultimately result in a beneficial impact by supplying electricity that results in far lower emissions of greenhouse gases compared to fossil-fuel-based electricity generation.
- Hawes Composting Facility Project—Project construction would emit GHGs. The primary source of GHG emissions associated with the Project results from the transportation of materials to the facility and the associated emissions from heavy duty diesel trucks. The GHG emissions associated with the decomposition of the proposed feedstock material (biosolids and green waste) currently occur and would continue to occur, with or without the Project into the future. The project's EIR found that the project would actually result in a reduction of GHG emissions due to a reduction in transportation emissions compared to existing conditions.
- Desert View Dairy Operations—This project would result in GHG emissions, primarily associated with methane from animal waste, but would not increase GHG emissions above current levels.
- SR 58 Hinkley Expressway Project—Project construction would emit GHGs. Upon project completion, there could be a beneficial impact regarding GHG emissions, as a reduction in congestion could lead to less idling in the project area, and a consequent reduction in total GHG emissions associated with trips on SR 58.
- San Bernardino County General Plan Buildout—General plan buildout (Hinkley area and county-wide) could result in minor amounts of GHG emissions from construction or new residences and structures associated with buildout of the General Plan and from new trips associated with additional residents living in the County. The County has adopted and is implementing a GHG emissions reduction plan designed to reduce county-wide emissions to 15% below 2007 levels by 2020.

California's emissions are projected to grow with population increase and economic growth. However, AB 32 requires the state to limit its 2020 emissions to 1990 levels and the state has adopted numerous regulations already to achieve this reduction target. There is also an executive order (S-03-05) calling for greater emissions reductions by 2050, but there is no legislation with a post-2020 reduction requirement for overall GHG emissions. SB 375 requires regional transportation planning to reduce passenger/light-duty emissions out to 2035.

The United States currently does not have a fixed GHG reduction target for national emissions, although there are various efforts by the federal government in regards to stationary sources (under the Clean Air Act) and vehicle emissions (under corporate fleet average requirements) and other efforts to reduce emissions.

At present, there is no international treaty to reduce global emissions by 2020 or 2050. The Kyoto Protocol included commitments of developed countries (other than the U.S. that did not sign the treaty). A number of countries, primarily in Europe and Japan, have made commitments to reduce

emissions, but not all countries have committed to reductions. Global GHG emissions are projected to rise substantially without further commitments to their reduction.

All proposed project alternatives would result in increased GHG emissions during construction and from operations. Increased emissions of GHGs would make an incremental contribution to global climate change and the adverse global environmental effects thereof, as would most development projects occurring worldwide. Mitigation Measures AIR-MM-6, AIR-MM-7, and AIR-MM-8 will be required to reduce potential project-specific impacts to a less than significant level for construction and operations through compliance with the requirements in the County's GHG Emissions Reduction Plan.

Within San Bernardino County, the county's plan is designed to reduce emissions overall by 2020 to be consistent with AB 32. Based on their environmental analyses, both the Abengoa Mojave Solar and Hawes Composting Facility projects would reduce GHG emissions compared to existing conditions. New land uses with buildout of the County General Plan would also need to comply with the county's reduction plan. Although national and global GHG emissions may continue to increase, with the identified mitigation above, the proposed project would not contribute to the cumulatively significant impact of GHG emissions (and its impact on climate change).

Impacts of Climate Change

Given its inland location, all project alternatives and foreseeable projects in the project vicinity are in an area that would not be inundated by a predicted rise of up to 1.4 meters in sea level by 2100 (California Climate Change Center 2006). The project and nearby foreseeable projects are in areas not subject to substantial wildfire risks and are not anticipated to rely on imported water supplies. There is a range of other potential effects of climate change to which the project vicinity may be subject, including increased temperatures and heat stress days and changes in water supply conditions, for example. With the exception of water supply, the actions associated with all alternatives and foreseeable cumulative projects would not exacerbate the potential effects of climate change nor create a particular hazard related to those potential effects. As discussed above, the project's effect on groundwater levels would be significant, but can be mitigated through provision of alternative water supplies and long-term planning for aquifer recovery. It is unknown how hydrologic regimes and groundwater levels might be affected in the long-term due to climate change, but with mitigation, the project should not contribute to any potential cumulative effects on groundwater levels.

While climate change impacts in the project area may be substantial over time, the PG&E remediation project with mitigation would not contribute considerably to potentially significant cumulative climate change effects.

4.2.5.6 Noise

Impact CUMUL-6: Cumulative Increases in Noise (Less than Significant with Mitigation)

Construction Noise and Vibration

Cumulative projects would have the following effects on noise and vibration during construction in the Hinkley Valley:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—Neither of these projects are in the Hinkley Valley and thus would not contribute to noise impacts in the proposed project area.
- Desert View Dairy Operations—There would be no construction associated with the ongoing operations, and therefore no construction-related noise impacts.
- SR 58 Hinkley Expressway Project—Project construction would produce significant noise impacts in the project area associated with construction equipment and activities.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan could produce minor construction-related noise impacts in the project area.

Construction activities would have the potential to expose noise-sensitive land uses to excessive construction noise. All alternatives would require construction of new wells, which would result in substantial temporary increases in noise relative to ambient noise conditions at some residences in the project area. Under all alternatives, there would be construction noise increases that would exceed County standards at residences located within several thousand feet of the activity. Additionally, the project would result in the construction of new facilities which would involve the construction of more wells, pipelines, and associated infrastructure and further increase the number of residences exposed to construction noise.

The only foreseeable project that could cause substantial additional noise affecting residences in the project area is the SR 58 widening project, which, in concert with the project, could cause a cumulatively considerable impact. In addition to implementation of project Mitigation Measure MM-NOI-1, which would reduce the severity of project-specific impacts associated with construction noise, implementation of Mitigation Measure CUM-MM-1 would reduce this impact to a less that cumulatively considerable level.

Mitigation Measure CUM-MM-1: Coordinate with Caltrans during the SR 58 Widening Concerning Noise

If PG&E plans to construct any facilities or otherwise increase the noise in the area of SR 58, they shall determine the potential for construction of the SR 58 widening to occur at the same time. If it is determined that there could be noise generated from PG&E activities concurrent with Caltrans activities, PG&E will coordinate with Caltrans to maintain cumulative noise levels at the nearest noise receiver at below the county noise standard.

In order to implement plume monitoring and to implement Mitigation Measure WTR-MM-2 (See Section 3.1, *Water Resources and Water Quality*), PG&E may need to install monitoring wells and may need to drill deeper wells in close proximity to residences. If this were to be necessary, it is possible that the County standard for vibration could be exceeded if the well located were less than 25 feet from a residence. However, there are no other foreseeable projects that could cause similar levels of vibration on any residences in the project area. Therefore, with implementation of project-specific impacts through Mitigation Measure NOI-MM-1, the project would not have a cumulatively considerable impact.

Permanent Noise and Vibration

Other cumulative projects would have the following effects on permanent noise and vibration:

- Abengoa Mojave Solar Project and Hawes Composting Facility Project—Neither of these projects are in the Hinkley Valley and thus would not contribute to noise impacts in the proposed project area.
- Desert View Dairy Operations—While project operations do produce noise associated with dairy activities, noise levels would not be increased above already existing levels.
- SR 58 Hinkley Expressway Project—Project operation could produce higher permanent noise levels than currently present in the project area due to cars and trucks being able to travel at higher speeds on SR 58 after project completion.
- San Bernardino County General Plan Buildout—Structures built associated with buildout of the General Plan could produce minor amounts of noise.

PG&E remediation project operations could expose noise-sensitive land uses to operational noise from well pumps. Because of the relative large spacing between the pumps and the distance to the nearest residences, no meaningful cumulative pump noise is anticipated at nearby residences. Under all alternatives, based on known locations, no residences are located within 200 feet of the proposed pumps, and increases in noise relative to the existing ambient noise level are not expected to be substantial.

While the widening of SR 58 could contribute to noise impact in the project areas leading to a significant impact, the proposed project would not contribute considerably to this impact from project operations.

4.2.5.7 Biological Resources

Impact CUMUL-7: Cumulative Loss of Sensitive Biological Resources (Significant for Desert Tortoise Movement; All Other Impacts, Less than Significant with Mitigation)

Special Status Wildlife

Other cumulative projects would have the following effects on special-status wildlife species:

- Abengoa Mojave Solar project—Construction, operation, and maintenance of this project would cause potential special status wildlife disturbance, displacement, injury, and mortality. Indirect impacts would occur from loss of habitat, fragmentation, and potential effects to avian species from evaporation ponds. This project would not affect special status species in the same location as the proposed project, but since the population of these species extends across the western Mojave Desert, there is a potential for cumulative impacts.
- Hawes Composting Facility Project—This project could result in an incremental reduction in desert scrub vegetation that provides habitat for special status wildlife and loss of native biological resources.
- Desert View Dairy Operations -This project would have no additional impacts on wildlife species as it is an already existing use.
- SR 58 Hinkley Expressway Project—Construction, operation, and maintenance of this project would result in potential direct and indirect impacts on special-status wildlife species within the PG&E proposed project area.

- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan could result in direct impacts as well as loss of special-status wildlife species habitat.

The proposed remediation activities would infringe on habitat that supports the federally protected desert tortoise and the state protected Mohave ground squirrel and would also affect several other special-status wildlife species (see Section 3.7, *Biological Resources*) including burrowing owl, American badger, loggerhead shrike, northern harrier, Mojave River vole, Mojave fringe-toed lizard, and several raptors. Some of these species would also be affected by other cumulative development. Considered in concert, the foreseeable projects could lead to a cumulatively considerable impact on special status wildlife species in the Western Mojave Desert.

The Abengoa Mojave Solar and Hawes Composting Facility projects are both required to implement construction and operational mitigation for impacts to special-status wildlife species. In addition, it is assumed that all future projects in the project vicinity, including SR 58 widening and new land uses from buildout of the County General Plan, would implement similar mitigation, thereby minimizing the severity of each respective project's impacts on special status species. For the PG&E remediation project, implementation of the Mitigation Measures BIO-MM-1a through BIO-MM-1h and Mitigation Measures BIO-MM-1j through BIO-MM-1o would avoid or minimize project-specific species loss and habitat disturbance impacts. With this mitigation, the proposed project would not contribute considerably to cumulative special-status wildlife species impacts, except in relation to desert tortoise movement As discussed in Section 3.7, *Biological Resources*, depending on the amount and configuration of agricultural treatment units, all of the action alternatives may result in contiguous agricultural treatment units of up to 2 miles in length that could substantially impede east-west desert tortoise movement through the center of Hinkley Valley. Feasible mitigation was not identified to avoid a significant impact, without resulting in far greater habitat fragmentation or not meeting project goal and objectives. Thus, relative to desert tortoise movement, the project may potentially have a considerable contribution to a significant cumulative impact.

Special Status Plants

Other cumulative projects would have the following effects on special-status plant species:

- Abengoa Mojave Solar Project—No rare plants were found on the project site; however there is a potential for special-status plants in areas of suitable habitat. Project mitigation is required to reduce special-status plant species impacts to a less than significant level.
- Hawes Composting Facility Project—No rare plants were found on the project site.
- Desert View Dairy Operations—Ongoing operations would have no additional impacts on special-status plant species and this an existing use.
- SR 58 Hinkley Expressway Project—Project construction may result in the loss of special-status plants and their habitat, if found present along the proposed alignments.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan could result in loss of special-status plants.

Operations and maintenance activities of the project are not expected to have adverse effects to special status plants or their habitat since these activities would primarily occur within areas that have already been disturbed during construction of new remediation facilities. However, construction-related impacts have the potential to cause direct and indirect permanent loss of

individual special status plants and their existing and potential future occupied habitats in the project area resulting in a contribution to reduction in their local and regional population. For those alternatives that contain new above-ground treatment facilities (Alternatives 4C-3 and 4C-5 only), there may be increased potential to introduce non-native plants due to increased presence of vehicles (for materials deliveries and waste disposal) that may carry remnants of non-native plants on their tires. Implementation of Mitigation Measure BIO-MM-1g and BIO-MM-1p would minimize impacts to special status plant species and their supporting habitat.

Although there is a potential for cumulative impacts on special-status species, as mitigated, the proposed project would not make a considerable contribution to this cumulative impact. In addition, it is probable that all future projects in the project vicinity (such as SR 58 widening and County General Plan buildout) would be required implement similar mitigation to the proposed project, thereby minimizing the severity of each respective project's impacts on special status plants.

Sensitive Vegetation Communities

While project construction would not cause impacts to sensitive vegetation communities, it is possible that future requirements for PG&E to provide alternate water supplies to residents of the Hinkley area could require construction of new freshwater water supply wells and conveyance pipelines in the California joint fir scrub. If new infrastructure is constructed, there may be potential for significant adverse impacts due to construction-related disturbance and permanent loss of California joint fir scrub.

California joint fir scrub is not found in the Abengoa Mojave Solar or the Hawes Composting Facility project sites. In addition, within the PG&E project area, the SR 58 project potential alignments avoid the identified joint fir scrub area. Ongoing Desert View Dairy operations would not affect joint fir scrub as this is an existing activity. It is possible that buildout of the County General Plan may include proposed future uses in joint fir scrub. Thus, considered in concert with other foreseeable projects, there could be a cumulatively considerable impact.

Implementation of Mitigation Measure BIO-MM-2 would minimize proposed project impacts related to loss of sensitive vegetation communities. Therefore, the proposed project would not make a considerable contribution to any cumulative impact. In addition, it is assumed that all future projects in the project vicinity implemented per the County General Plan would be required to implement similar mitigation, thereby minimizing the severity of each respective project's impacts on such vegetation communities.

Jurisdictional Wetlands/Waters

Other cumulative projects would have the following effects on wetlands and waters:

- Abengoa Mojave Solar Project—The project may affect state jurisdictional wetlands directly or indirectly. Project mitigation includes tamarisk eradication monitoring, maintenance of a wetland well, and monitoring of groundwater quality which combined would mitigate impacts to wetlands to a less than significant level.
- Hawes Composting Facility Project—Project construction is not expected to impact jurisdictional wetlands or waters.

- Desert View Dairy Operations—This is an already existing use that would not be expanded. There is therefore no potential for impacts to jurisdictional wetlands or waters over existing conditions.
- SR 58 Hinkley Expressway Project—Construction of this project could result in the loss or impairment of wetlands or other jurisdictional waters, both due to removal of such resources and replacement with roadway infrastructure, or due to increased stormwater runoff impairing nearby wetlands or waters.
- San Bernardino County General Plan Buildout—Construction of residences or other structures associated with buildout of the General Plan could result in the loss or impairment of wetlands or other jurisdictional waters depending on location.

With regard to drainages in the context of habitats, project construction could damage drainages in the project area, and in concert with other foreseeable projects in the project area, particularly the SR 58 Hinkley Expressway Project could lead to a cumulatively considerable impact. The Abengoa Mojave Solar project would only affect wetlands near Harper Lake and would not affect wetlands in the Hinkley Valley and thus is unlikely to contribute to impacts to the same drainages or wetlands potentially affected by the proposed project. The proposed project is not expected to affect Harper Lake or associated wetlands directly, but could affect the lake or associated wetlands indirectly due to erosion. Current estimates of groundwater drawdown areas due to PG&E remediation project pumping approach, but do not encroach on Harper Lake.

Implementation of Mitigation Measure BIO-MM-3 would reduce the PG&E remedial project's potential impacts on wetlands by requiring avoidance of ground disturbing activities within drainages wherever feasible, conducting delineations if any drainages are expected to be affected, and implementing compensatory mitigation in accordance with federal and state requirements if deemed necessary. County erosion control requirements would address potential erosion and sedimentation impacts. Therefore, with mitigation, the proposed project would not make a cumulatively considerable contribution to potential cumulative impacts on wetlands. In addition, it is assumed that all future projects in the project vicinity would implement similar mitigation, thereby minimizing the severity of each respective project's impacts on jurisdictional waters.

Wildlife Movement

Other cumulative projects would have the following effects on wildlife movement:

- Abengoa Mojave Solar Project—The project would have adverse impacts on wildlife movement (adverse but less than significant for Mohave ground squirrel, adverse and significant for desert tortoise); however, project compensation is expected to reduce these impacts to a less than significant level.
- Hawes Composting Facility Project—Although 160 acres of desert scrub would be lost due to this project, it is not expected to have a significant effect on wildlife movement due to the continuity of suitable habitat in existing corridors on public lands in the vicinity of the project's location.
- Desert View Dairy Operations—Dairy operations would not include expansion of the current Desert View Dairy facilities, and would thus not impact wildlife movement.

- SR 58 Hinkley Expressway Project—This project would involve the expansion and potential realignment of an already existing roadway that currently impedes wildlife movement. Thus, this project may likely have substantial impacts on wildlife movement.
- San Bernardino County General Plan Buildout—Buildout of the General Plan is expected to result in isolated residences and structures constructed in various areas throughout the project vicinity. Thus buildout in the local area may result in localized but not large-scale impediments to wildlife movement.

With the PG&E remediation project, depending on its ultimate configuration, there could be contiguous agricultural treatment areas extending for perhaps up to 2 miles in length (with all action alternatives, see discussion in Section 3.7, *Biological Resources*); or the agricultural treatment areas could be more dispersed, with suitable movement habitat located between the units. Although desert tortoise would be physically able to move through the agricultural treatment units and there won't be any physical barriers (like fences) to their movement, they may choose to avoid these areas entirely. Thus, if there is a contiguous area of agricultural treatment of perhaps 2 miles or more, desert tortoise moving east to west or west to east could incur detours of several miles in length which is considered a significant impact. Given that agricultural treatment units need to be located in the center of the plume area in order to facilitate hydraulic control, and given the amount of agricultural treatment necessary for the action alternatives to address the expanded plume, this is considered a significant and unavoidable impact for desert tortoise. Other wildlife species (like the Mohave ground squirrel) are far more mobile, and significant impairment of movement for other wildlife species is not expected to occur with the PG&E remediation project.

Considering that the SR 58 Hinkley Expressway Project may also have an affect on desert tortoise movement, the PG&E remediation project (depending on extent and configuration of agricultural treatment units) could contribute considerably to a significant cumulative impact on desert tortoise movement. As discussed in Section 3.7, *Biological Resources*, feasible mitigation was not identified for the PG&E remedial project to avoid a significant impact, without resulting in far greater habitat fragmentation or not meeting project goal and objectives. Thus, relative to desert tortoise movement, the project may potentially have a considerable contribution to a significant cumulative impact.

Protected Trees

Other cumulative projects would have the following effects on protected trees:

- Abengoa Mojave Solar Project—The project site has no Joshua trees, Mojave yuccas and creosote rings, and other species protected by the Development Code and other regulations.
- Hawes Composting Facility Project—There are no trees on the project site.
- Desert View Dairy Operations—This is an existing operation and would not damage or remove protected trees.
- SR 58 Hinkley Expressway Project—Project construction could cause removal of protected trees.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan could cause removal of protected trees.

Joshua trees, which are protected desert native plants under San Bernardino ordinance, were identified within the project area. In concert with other foreseeable projects (specifically SR 58 widening and General Plan buildout), this removal could lead to a cumulatively considerable impact on protected trees.

If construction requires removal of Joshua trees or other potentially occurring locally-protected desert native plants, PG&E would be required to comply with the San Bernardino County Plant Protection and Management Ordinance (Chapter 88.01 of the San Bernardino County Development Code) and obtain a tree removal permit prior to initial of ground disturbance. Compliance with the County's plant protection ordinance ensures that potential direct impacts to Joshua tree or other locally-protected plants would be avoided or minimized according to the provisions of the County's permit requirements. Therefore, the proposed project would not contribute considerably to a significant cumulative impact. In addition, it is assumed all foreseeable projects in the project vicinity would also be required to comply with the San Bernardino County Plant Protection and Management Ordinance, thereby avoiding cumulatively significant impacts.

Conservation Plans

Other cumulative projects would have the following effects on conservation plans:

- Abengoa Mojave Solar Project—Portions of the project are on BLM land and could disturb this land, leading to potential conflicts with the conservation requirements of the West Mojave Plan. However, the project has already obtained approval from the BLM and from the USFWS concerning special-status species and thus will be consistent with conservation requirements on BLM lands.
- Hawes Composting Facility Project—This project does not include any BLM land and would not conflict with an adopted conservation plan.
- Desert View Dairy Operations—Ongoing operations do not include any elements that could conflict with an adopted conservation plan.
- SR 58 Hinkley Expressway Project—It appears that the project alignments would not cross BLM land; and thus at this time, no potential conflicts with the West Mojave Plan are identified.
- San Bernardino County General Plan Buildout—Project construction associated with buildout of the General Plan would only occur on non-federal land and consequently would not cause conflicts with the West Mojave Plan.

For the PG&E remediation project, where the project disturbs BLM land, potential conflicts with the conservation requirements of the West Mojave Plan could occur. Implementation of Mitigation Measures BIO-MM-1a through BIO-MM-1m, BIO-MM-1p and BIO-MM-6 would minimize potential conflicts with conservation requirements of the West Mojave Plan on BLM land. In addition, the provisions of the West Mojave Plan that address specific desert tortoise, Mohave ground squirrel and burrowing owl avoidance, minimization and conservation measures could also be considered during agency consultations to obtain federal and state ESA permits if required.

The only other cumulative project that may also affect BLM land is the Abengoa Mojave Solar Project which has already been approved by the BLM and the USFWS in regards to the West Mojave Plan.

As described above, the project would mitigate its biological resource impacts, including those that may occur on BLM land to a less than significant level. Therefore, the proposed project would not contribute considerably to a cumulative impact.

4.2.5.8 Cultural Resources

Impact CUMUL-8: Cumulative Increase in Impacts on Cultural Resources (Less than Significant with Mitigation)

Architectural Resources

Other cumulative projects would have the following effects on architectural resources:

- Abengoa Mojave Solar Project—As currently designed, this project would not result in any effects to historic properties.
- Hawes Composting Facility Project—No historic architectural resources exist within the site or within the area of potential effect that would be significantly affected by this project.
- Desert View Dairy Operations—This is an existing operation and would not alter or destroy any historic architectural resources.
- SR 58 Hinkley Expressway Project—Project construction could require the acquisition and demolition of historic structures if present in proposed right of way areas.
- San Bernardino County General Plan Buildout- Construction of new residences or other structures associated with buildout of the General Plan could result in the demolition of existing historic structures, if present.

The PG&E remediation project may require demolition of historic structures that could be eligible for listing on the NRHP or CRHR. Combined with other foreseeable projects in the project area, including the SR 58 Hinkley Expressway Project and development associated with buildout of the General Plan, the project could contribute considerably to a cumulative impact on historic structures. Implementation of Mitigation Measures CUL-MM1 and CUL-MM-2 would require evaluation of architectural resources prior to construction and avoidance of any identified significant architectural resources, where feasible. If avoidance is infeasible, Mitigation Measure CUL-MM-3, which would require recordation of historic structures before disturbance, would reduce the project's contribution to a cumulative impact to a less than considerable level.

Archaeological Resources

Other cumulative projects would have the following effects on archaeological resources:

- Abengoa Mojave Solar Project—The project would have a significant impact on one significant historical archaeological site, but conditions of approval would reduce impacts to less than significant. Project mitigation is required to address as yet unknown cultural resources that might be encountered during construction.
- Hawes Composting Facility Project—No significant cultural resources were observed within the project area. However, because the Project is located several miles south of an ancient playa (Harper Lake) and several remnant tributaries of this ancient lake are within the Project area,

subsurface cultural materials may be encountered during construction. Project mitigation is required to address as yet unknown cultural resources that might be encountered during construction.

- Desert View Dairy Operations—Dairy operations will continue existing practices, which would not affect cultural resources above existing conditions.
- SR 58 Hinkley Expressway Project—Ground-disturbing activities associated with project construction have the potential to damage archaeological resources in the project area, if present.
- San Bernardino County General Plan Buildout—Ground-disturbing activities associated with construction of residences, residential infrastructure, and other structures have the potential to damage archaeological resources in the project area if present.

Considered in concert, foreseeable projects, including the SR 58 Hinkley Expressway and buildout of the General Plan, could lead to a cumulatively considerable level.

Within the PG&E remediation project area, there is only one known significant archaeological resource site, but all of the project area has not yet been evaluated. The remediation project would include ground-disturbing activities that have the potential for impacts on previously known and potentially unknown prehistoric-era or historic-era archaeological resources. The implementation of Mitigation Measures CUL-MM-4, CUL-MM-5, and CUL-MM-6 would reduce the severity of construction impacts by determining if unique or historical archaeological resources exist and, if found, avoid damaging the resource through project modification or developing and implementing a recovery plan if they cannot be avoided. With this mitigation, the proposed project would have a less than considerable contribution to cumulative impacts on archaeological resources.

It is also assumed that other foreseeable future projects (like SR 58 widening or development associated with buildout of the General Plan) in the project area would be required to implement similar mitigation which would reduce further the potential for cumulative impacts.

Human Remains

Like the proposed project, cumulative projects with ground disturbance have the potential to disturb human remains. Human remains could be discovered during PG&E remedial project activities, which could result in cumulatively considerable effects on cultural resources in concert with other foreseeable projects in the project area. Implementation of Mitigation Measure CUL-MM-7 would ensure the project's contribution to this impact would not be cumulatively considerable, and it is anticipated that other foreseeable projects would implement similar mitigation in compliant with state and federal regulations.

Paleontological Resources

Cumulative projects would have the following effects on paleontological resources:

- Abengoa Mojave Solar Project—Certain areas of the project site contain Quaternary alluvial sediments that have a high Paleontological Resource Potential for vertebrate fossil types. Project construction could damage this resource. Project mitigation is required to reduce potential impacts to a less than significant level including worker training and monitoring.

- Hawes Composting Facility Project—Pleistocene sediments in the location of this project have high potential to contain fossil resources and thus are assigned high paleontological sensitivity; therefore, this project has a high potential to adversely impact significant fossil resources. Project mitigation is required to include monitoring, resource recovery and curation to reduce impacts to a less than significant level.
- Desert View Dairy Operations—There are no new ground-disturbing activities associated with ongoing operations.
- SR 58 Hinkley Expressway Project—Paleontological resources may occur within the project footprint and if present and could be disturbed during project construction.
- San Bernardino County General Plan Buildout—Paleontological resources may occur within the project footprints and if present and could be disturbed during project construction.

For the PG&E remediation project, paleontological resources could be discovered during project activities, which could result in cumulatively considerable effects on such resources in concert with other foreseeable projects described above. Implementation of Mitigation Measure CUL-MM-7 would ensure that any paleontological resources affected during proposed project activities shall be recovered and curated as appropriate, and that the project would not make significant contribution to any cumulative impacts.

4.2.5.9 Utilities and Public Services

Impact CUMUL-9: Cumulative Impacts Related to Disruption of Utilities and Public Services (Less than Significant Impact)

Utilities

Other cumulative projects would have the following effects on utilities:

- Abengoa Mojave Solar Project—This project would include the introduction of new utility infrastructure, including a new substation and telecommunications lines. Interruptions to utility services for existing customers due to project construction are not anticipated. Project effects due to new transmission lines are assessed in the project's environmental report and mitigation is provided for physical impacts associated with new infrastructure.
- Hawes Composting Facility Project—This project would not affect or cause an increased need for additional public utilities. Telephone service would be cellular, and electricity would be supplied by solar equipment, with a portable diesel-fueled generator backup.
- Desert View Dairy Operations—Ongoing operations would not result in impacts to utilities above existing conditions.
- SR 58 Hinkley Expressway Project—Construction of the roadway could disrupt utilities, but operation of the new roadway would not be expected to affect utilities.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan could cause interruption of utility service to existing customers in the project area.

PG&E remediation project would require ground-disturbing activities that have the potential to occur in proximity to existing underground utilities and could require interruption of service (e.g., planned shutdowns, accidental rupture) to existing customers. Once facilities are built and operating, ground-disturbing activities could be required for periodic maintenance of subsurface infrastructure to conduct repairs or replace infrastructure. The project also has the potential to disrupt aerial utility and transmission lines for electricity, telecommunications, and possibly other aerial lines and facilities in the project area during construction and operations and maintenance activities. These impacts, in concert with other disruptions due to construction of foreseeable projects at the same time as the proposed project, could cause a cumulatively significant impact.

State regulations require contractors working in the vicinity of utilities, both below and above ground, to implement standard procedures to prevent accidental ruptures of utility infrastructure and loss of service. In addition, contractors are required to comply with provisions of the County's Development Code to prevent disturbances to electrical uses and services. Because any ground-disturbing project activities associated with the project or any other foreseeable projects are required to comply with state and local regulations to prevent impacts on utility infrastructure and utility services, a significant cumulative impact is not expected and the PG&E remediation project would not contribute considerably to any cumulative impacts.

Electricity Consumption

Other cumulative projects would have the following effects on electricity consumption:

- Abengoa Mojave Solar Project—Once constructed and operating at full capacity, this project would produce enough electricity to power approximately 70,000 California homes and provide customers with solar-generated electricity. This project would result in a net increase in electricity production in the project vicinity.
- Hawes Composting Facility Project—Electricity for this project would be supplied by solar equipment, with a portable diesel-fueled generator backup. There would be no impact on electricity consumption or demand in the project vicinity.
- Desert View Dairy Operations—Ongoing operations would not require any additional electricity for project activities.
- SR 58 Hinkley Expressway Project—Additional electricity use may be required during project construction, but the need would be temporary. The roadway would be designed as a divided 4-lane highway and thus may not include traffic signals. Project operational electricity use would be limited to any streetlights, warning lights, or traffic signals associated with the new roadway, which would be minimal overall.
- San Bernardino County General Plan Buildout—Construction of new residences and other structures associated with buildout of the General Plan would require minor amounts of electricity during project construction and would increase permanent demand for electricity in the project area.

The PG&E remediation project would require increased electricity consumption during construction and operations and maintenance activities. During construction, a minor increase in electricity consumption is anticipated in order to power construction equipment. This increase would likely be provided through a diesel-powered or other type of generator and would not require tie-ins to the existing electrical grid. Even if the proposed project is constructed at the same time as other cumulative projects, other projects would not require a significant amount of additional electricity during project construction, and there would not be a significant cumulative impact.

Once PG&E remediation project facilities are built and operating, additional electricity would be required to power project elements. Overall, the increase in electricity consumption under the proposed project, in concert with other foreseeable projects, would be low relative to that of the entire County, for which Southern California Edison provides the majority of electricity. Southern California Edison is one of the largest providers of electricity in the United States and has the infrastructure and capacity to provide electricity to more than 14 million people in a 50,000–square mile area. In addition, one foreseeable project, the Abengoa Mojave Solar Project, would result in a significant increase in available electricity in the project vicinity. Therefore, the project in concert with other foreseeable projects would not result in a significant cumulative impact related to electricity demand in that the cumulative demands are unlikely to result in substantial expansion of electricity generation or transmission facilities.

Landfill Capacity

Other cumulative projects would have the following effects on landfill capacity:

- Abengoa Mojave Solar Project—Construction and operation of this project would generate limited amounts of solid waste.
- Hawes Composting Facility Project—A maximum of eight employees are anticipated at any one time, generating a small amount of solid waste that would be transported to the Barstow Sanitary Landfill.
- Desert View Dairy Operations—Solid waste production would occur at similar levels than those already in existence.
- SR 58 Hinkley Expressway Project—Project construction could result in generation of solid waste associated with demolition of buildings, existing roadways and infrastructure. Operations of this project would not result in routine waste generation, except minor amounts during roadway maintenance.
- San Bernardino County General Plan Buildout—Minor amounts of construction-related solid waste would be generated. New residents and businesses would also generate solid waste on an ongoing basis due to buildout of the General Plan.

Construction of the PG&E remediation project would generate solid waste. Similar to other foreseeable projects in the area, those wastes that could not be reused or backfilled would be hauled to the Barstow Sanitary Landfill. The Barstow Sanitary Landfill is expected to reach capacity by 2071. Because the intensity of construction for the project would decrease over the course of future project phases, it is anticipated that the overall amount of solid waste generated by project construction would not substantially decrease the existing lifespan of the landfills near the project area. In addition, there are no other foreseeable projects that would generate a substantial enough amount of solid waste to significantly decrease the existing lifespan of the landfills near the project area. All solid waste generated by the project and all other foreseeable projects would be required to comply with the County's waste reduction requirements. For all of these reasons, the proposed project would not considerably contribute to cumulatively significant impacts with regards to solid waste generation.

Public Services

Other cumulative projects would have the following effects on public services:

- Abengoa Mojave Solar Project—The existing public service capacity, such as police and fire service, would be adequate to serve this project; and the project is not expected to substantially disrupt emergency services during construction or operations.
- Hawes Composting Facility Project—This project would not induce growth; therefore, no additional public services are required. The existing public service capacity, such as police and fire service, would be adequate to serve the project; and the project is not expected to substantially disrupt emergency services during construction or operations.
- Desert View Dairy Operations—No additional public services would be required relative to ongoing operations.
- SR 58 Hinkley Expressway Project—Project construction may increase demand for public services slightly during construction due to increased construction activity and workers in the area. Project operations would not increase the need for public services in the project vicinity. Emergency services would benefit from improved roadway conditions.
- San Bernardino County General Plan Buildout—Increases in public services could be necessary to serve new residences constructed in association with buildout of the General Plan.

PG&E remediation project impacts to public services are limited to the potential disruption to emergency services, which would be less than significant due to the temporary nature of construction activities and the small amount of vehicular trips needed for commuting employees, materials delivery, and off-site transportation during operations. Other public services would not be affected because the PG&E remediation project does not include development of facilities that would generate additional population and thus increased demand for police or fire service, schools, parks, or other public services. Therefore, in concert with other foreseeable projects, the project's impact on public services would not be cumulatively considerable.

4.2.5.10 Transportation and Traffic

Impact CUMUL-10: Cumulative Reduction of Roadway Capacity, Traffic Safety, and Emergency Access (Less than Significant with Mitigation)

Roadway Capacity

Other cumulative projects would have the following effects on roadway capacity:

- Abengoa Mojave Solar Project—During the construction and operation phases, local roadway and highway demand resulting from the daily movement of workers and materials would not increase beyond significance thresholds established by San Bernardino County or the State of California.
- Hawes Composting Facility Project—The traffic impact analysis conducted for this project indicates that it would not create significant traffic impacts to the surrounding roadway circulation system according to the traffic impact guidelines specified by San Bernardino County.
- Desert View Dairy Operations—Traffic levels to and from the project site would remain similar to current levels, given there is no expansion of dairy operations proposed.
- SR 58 Hinkley Expressway Project—Traffic levels could increase during project construction due to transport of construction equipment and workers commuting to the project site. In

addition, there may be need to temporary close parts of SR 58 which could temporarily reduce roadway capacity. Upon project completion, there would be a net benefit to roadway capacity in the project area, as SR 58 would be expanded.

- San Bernardino County General Plan Buildout—Buildout of the General Plan could cause amounts of additional trips in the project area associated with new residences. However, given the existing low traffic volumes in the Hinkley Valley and with the planned completion of the SR 58 Hinkley Expressway, the local increase in trips is not expected to have a significant impact roadway capacity.

With the PG&E remediation project, there would be only incremental increases in traffic volumes from construction activities; however, the project could worsen traffic operations and increase congestion because of slow-moving trucks. This would affect mostly SR 58 because the surrounding surface streets in the project area are rural two-lane roads with very little traffic. The increase in traffic volumes would be minor, spread over time, and in relatively remote locations, affecting streets with low traffic volumes. However, because of the speed of vehicular traffic and unprotected turning movements on SR 58, there is the potential for significant impacts to occur as a result of increased congestion from construction-related truck traffic on SR 58. Depending on timing, cumulative project truck traffic and road closure during SR 58 project construction could also contribute to this impact. Implementation of Mitigation Measure TRA-MM-1 would minimize PG&E remediation project-specific impacts, and implementation of Mitigation Measure CUM-MM-2 would reduce the project's contribution to potential cumulative impacts related to construction to a less than considerable level.

Mitigation Measure CUM-MM-2: Coordinate with Caltrans during the SR 58 Widening regarding Traffic

If PG&E plans to construct any facilities or otherwise increase the traffic in the area of SR 58, they shall determine the potential for construction of the SR 58 widening to occur at the same time. If it is determined that there could be traffic generated from PG&E construction activities concurrent with Caltrans construction and/or lane closures that could have significant impacts on traffic levels of service, PG&E will coordinate with Caltrans to maintain cumulative traffic service levels at an acceptable level.

Operationally, with implementation of the SR 58 Hinkley Expressway, traffic operations along SR 58 should improve with the expansion of 2 to 4 lanes.

Traffic Safety

Cumulative projects would have the following effects on traffic safety:

- Abengoa Mojave Solar Project—Construction traffic would have minimal impacts to traffic safety due to the use of a shuttle for worker trips and a designated haul road specifically for the project. For operations, the project includes conditions of approval to increase the eastbound left-turn pocket on SR 58 at Harper Lake Road and address other traffic safety issues.
- Hawes Composting Facility Project—The project could cause minor increases in traffic safety risks during project construction due to equipment transport and during project operation due to truck trips transporting materials to and from the project site.

- Desert View Dairy Operations—Traffic levels to and from the project site would remain similar to current levels, given there is no expansion of dairy operations proposed. There would be no consequent increase in traffic safety risks.
- SR 58 Hinkley Expressway Project—Construction-related truck traffic associated with the proposed project could create a safety hazard and increase the risk of accidents. Roadway work and potential temporary lane closures could also create safety hazards. Construction traffic hazards would be managed per standard Caltrans requirements for traffic safety control. Completion of the proposed project would likely have beneficial impacts with regards to traffic safety in the project area, as increased roadway capacity would reduce congestion and constrained travel lanes.
- San Bernardino County General Plan Buildout—While introduction of residents to the area could cause minor increases in traffic, minimal impacts related to traffic safety are anticipated.

With the PG&E remediation project, increases in construction-related truck traffic could create a safety hazard and increase the risk of accidents. Combined with construction activities during the widening of SR 58, the PG&E remediation project could contribute to cumulatively significant impact. Implementation of Mitigation Measure TRA-MM-1 would minimize project-specific impacts, and implementation of Mitigation Measure CUM-MM-2 would reduce the proposed project's contribution to this impact to a less than cumulatively considerable level.

PG&E remediation project increases in traffic volumes and congestion under operations and maintenance would be considered incremental because the project would not substantially increase the number of vehicles on local roads, and there is sufficient capacity on local roads to accommodate new project-related traffic. Thus the project would not have significant impacts on traffic safety during operations. There are no other foreseeable projects in the project vicinity that are expected to cause substantial increases in traffic on local roadways in the project area or to otherwise significantly affect traffic safety. In addition, it is anticipated that the primary roadway in the project vicinity, SR 58, would be widened in the future, thereby increasing roadway safety by eliminating the potential for unsafe passing by providing two travel lanes in each direction. As a result, significant cumulative impacts on traffic safety during operations are not expected, and the PG&E remediation project would not make a considerable contribution to any cumulative impacts.

Emergency Access

Emergency access is discussed above under hazards and hazardous materials.

4.2.5.11 Aesthetics

Impact CUMUL-11: Cumulative Impacts on Scenic Views and Visual Character (Less than Significant with Mitigation)

Scenic Views

Cumulative projects would have the following effects on scenic views:

- Abengoa Mojave Solar Project—The project would change the existing character of the 1,765-acre project site from a primarily open, partially abandoned agricultural landscape to a highly human-altered, industrial landscape very similar to the adjacent existing solar developments. The change in character would be evident to the few people who live in the immediate area, to

employees at the existing solar facilities, and to those who visit the Harper Dry Lake Watchable Wildlife Area. Due to its visual isolation from substantial numbers of the public, overall visual effects of the project would be very limited and aesthetic impacts were determined to be less than significant overall. The project would not affect visual aesthetics in Hinkley Valley.

- Hawes Composting Facility Project—There are no trees, rock outcroppings or buildings are located in the vicinity that would be affected by the project, and none of the area has been characterized by the San Bernardino County General Plan as "scenic". Aesthetic impacts were determined to be less than significant overall. The project would not affect visual aesthetics in Hinkley Valley.
- Desert View Dairy Operations—Project operations would continue, and no additional structures are anticipated to be constructed so there would be no new aesthetic impacts.
- SR 58 Hinkley Expressway Project—Project construction would cause short-term changes in views associated with clearing, grading, and excavating. Once the project would be completed, views could be altered due to the introduction of overpasses, expanded roadway capacity, and the demolition of buildings within project right of way. These impacts may be significant as they may result in large-scale changes in visual character.
- San Bernardino County General Plan Buildout—New residences and other structures associated with buildout of the General Plan could be constructed in the Hinkley Valley. Impacts would be associated with introducing new structures and uses on undeveloped land.

The PG&E remediation project construction, combined with other foreseeable projects in the Hinkley Valley, would contribute to cumulative short-term changes in views. However, these changes would be temporary in nature, and the intensity of the changes would decrease once initial buildout of projects in the project area is complete. Further, upon completion of construction, all equipment would be removed and construction staging areas and other areas that are temporarily disturbed would be returned to pre-project conditions. Long-term changes in scenic views could result in the Hinkley Valley due to construction of SR 58 Hinkley Expressway. However, because permanent project impacts to scenic views associated with the proposed project would be minimal, the proposed project would not contribute considerably to any cumulative impact.

Visual Character

Other cumulative projects would have the following effects on visual character:

- Abengoa Mojave Solar Project—Direct visual impacts include the change from open views of fallow agricultural fields to a commercial-scale solar farm, which would permanently alter the visual character of the project area. However, overall impacts on aesthetics were determined to be less than significant.
- Hawes Composting Facility Project—Project impacts would be associated with introducing structures and compost processing infrastructure to relatively undisturbed natural areas, which would permanently alter the visual character of the project area. However, overall impacts on aesthetics were determined to be less than significant.
- Desert View Dairy Operations—There are no new project elements that would alter the project area's visual character.

- SR 58 Hinkley Expressway Project—Expansion of the existing roadway, construction of overpasses, and demolition of structures in the project right of way would alter the visual character of the project area.
- San Bernardino County General Plan Buildout—Construction of residences and other structures associated with buildout of the General Plan would cause minor changes to the visual character of the project area.

The PG&E remediation project, in concert with other foreseeable projects, would contribute incrementally to the long-term change the visual character or quality of the Hinkley Valley through the presence of new infrastructure and introduction of new operation and maintenance activities throughout the project area. The main project infrastructure with potential to permanently degrade the visual character or quality are the above-ground treatment facilities proposed under Alternatives 4C-3 and 4C-5, which, in concert with other foreseeable projects project area, could lead to a cumulatively considerable impact. Implementation of Mitigation Measures AES-MM-1 and AES-MM-2 would ensure the project's contribution to this impact would be less than significant.

Light and Glare

Cumulative projects would have the following effects on light and glare:

- Abengoa Mojave Solar Project—This would increase light and glare in the project area due to the introduction of solar panels to the project area, but project mitigation fencing would limit the effect of glare on adjacent areas and residences. Given its location near Harper Lake, this project would not contribute to any light and glare impacts in Hinkley Valley.
- Hawes Composting Facility Project—This project would cause minor increases in light in the project area associated with lighting built for the facility, but all new lighting would be shielded to preclude light pollution or light trespass. Given its location, this project would not contribute to light and glare impacts in Hinkley Valley.
- Desert View Dairy Operations—Ongoing operations would not add new sources of light and glare above current conditions.
- SR 58 Hinkley Expressway Project—This project could add light to the project area associated with new streetlights if they are included in the project design.
- San Bernardino County General Plan Buildout—Construction of residences associated with buildout of the General Plan could cause minor increases in light and glare in the project area.

For any new sources of light associated with the PG&E remediation project, there is potential to negatively affect drivers on adjacent roadways and adjacent rural residences due to spillover lighting and residual glare, as well as a general increase in ambient lighting at above-ground facilities. In concert with other foreseeable projects in the project area, including the SR 58 project, there could be a cumulatively considerable impact associated with new sources of light. Implementing Mitigation Measures AES-MM-1, AES-MM-2, and AES-MM-3 would reduce potential project-specific impacts from light and glare on daytime or nighttime views in the project area. With implementation of this mitigation, and given the project's relatively small impact area where new light sources are introduced and the majority of new sources of light being created in areas set back from adjacent roads and nearby residences, the proposed project would not contribute considerably to any cumulative impacts to light and glare.

4.2.5.12 Socioeconomics

Impact CUMUL-12: Socioeconomic Impacts Resulting in Physical Blight

Cumulative projects would have the following physical impacts due to socioeconomic effects:

- Abengoa Mojave Solar Project—This project would not require the acquisition of any structures and could increase employment opportunities, sales taxes, and school impact fees. Thus the project would not create any adverse socioeconomic conditions that might lead to adverse physical impacts on the environment.
- Hawes Composting Facility Project—This project would not create any blighted conditions that could have significant physical adverse effects on the environment.
- Desert View Dairy Operations—Ongoing operations will not change socioeconomic conditions or create blighted conditions.
- SR 58 Hinkley Expressway Project—This project may require the acquisition of properties in the project area. However, any land acquisition necessary would be compensated at fair market value, and acquired structures would be demolished to allow for construction of the expanded roadway. The roadway expansion is not expected to create adverse socioeconomic conditions and would improve access in the local area. Thus this project is not expected to result in physical blighted conditions that may have significant adverse physical impacts on the environment.
- San Bernardino County General Plan Buildout—Construction of residences could require the occasional demolition of an existing structure, but demolition would likely only occur to allow new construction to occur, thereby causing a beneficial socioeconomic impact and not resulting in blighted conditions.

PG&E remedial project actions could require property acquisition, which could include acquisition of existing residences and structures. If not properly secured and maintained, these structures could deteriorate over time, degrading local visual aesthetics and attracting vandalism, illegal occupation, other criminal activity, and wild animals. Unsecured or maintained structures could result in physical hazards to individuals who might access such structures and be exposed to unsafe construction, lead-based paint, asbestos, or other physical hazards. Such structures could also be subject to arson which could result in fires that could affect neighboring areas and residents.

There are no other reasonably foreseeable projects that could lead to blight in the project area, and thus there is no potential for cumulative impacts to blight. In order to avoid the creation of potential physical risks due to blight, PG&E would implement Mitigation Measure SE-MM-1, which would reduce the potential physical impacts of blight related to acquired/abandoned structures on land that PG&E may acquire. In addition, in order to avoid creation of conditions that might cause abandonment of other land uses (which could otherwise create blighted conditions), PG&E would be required per Mitigation Measure WTR-2 to provide alternative water supplies to affected homes, businesses, and agriculture where their wells may be affected by remedial activities. Although chromium contamination from the PG&E Compressor Station itself may have previously contributed and may be currently contributing to adverse socioeconomic conditions in Hinkley that may have resulted in physical blight, with mitigation, the proposed remediation project would not contribute considerably to further physical blight with the mitigation described above. Because there are no other foreseeable projects that would contribute considerably to blighted conditions in the Hinkley Valley, there would be no cumulatively significant impact.

4.3 Growth-Inducing Impacts

Section 21100(b)(5) of CEQA requires an EIR to discuss how a project, if implemented, may induce growth and the impacts of that induced growth (see also State CEQA Guidelines Section 15126). CEQA requires the EIR to discuss specifically "the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment" (State CEQA Guidelines Section 15126.2[d]).

The project is not considered growth-inducing as it would not remove an obstacle to growth or otherwise foster economic or population growth. The project involves authorization to implement a comprehensive remediation plan for chromium-contaminated groundwater in the Hinkley area, which would result in overall improvements to the community by cleaning up previous groundwater contamination. This improvement would not induce growth or remove an obstacle to growth.

The project would require additional workers during project construction, including approximately 3-6 workers for installation and development of a well and approximately 15 workers required for pipeline installation per day. In addition, for construction of the above-ground facilities associated with Alternatives 4C-3 and 4C-5, there would be approximately 5-19 workers on site during construction activities. The unemployment rate in San Bernardino County is 11.7% (California Employment Development Department 2012), and it is expected that a significant portion of needed workers could be hired locally. In addition, there are a relatively minor amount of construction activities associated with the project, and the jobs are temporary. Some permanent, operational jobs would be created by the project, including a minor amount of additional workers to operate and maintain the new wells and associated facilities and the new agricultural treatment units. Additional, under Alternatives 4C-3 and 4C-5 only, there would be 1–3 workers present at all times (24-hours a day) at each of the above-ground treatment facilities, working in 2–3 shifts per day, to conduct all operations and maintenance activities. Again, there are relatively few jobs created by the project, and it is expected a significant portion of workers could be hired locally. Alternatives 4C-3 and 4C-5 would create more jobs than other alternatives due to the additional construction and operation of above-ground treatment facilities. Under all project alternatives, hiring workers for the project is not expected to induce growth in the project area.

Finally, due to the conversion of some portions of the project area to agricultural uses associated with remediation efforts, it is possible some housing units must be purchased and either removed or converted to a non-residential use. This decrease in available housing in the project area would further limit the possibility for project-induced growth in the Hinkley area.

4.4 Significant Irreversible Environmental Changes

In accordance with Section 21100(b)(2)(B) of CEQA and with Sections 15126(c) and 15126.2(c) of the CEQA Guidelines, the purpose of this section is to identify significant irreversible environmental changes that would be caused by the project. Construction and operational impacts associated with improvements proposed as part of the project would result in an irretrievable and irreversible commitment of natural resources through the use of power supply and construction materials.

Proposed improvements would require the use of petroleum products, primarily in the form of gasoline, diesel, and motor oil, for a variety of construction activities, including excavation, grading, and vehicle travel on site and between sites during construction. Construction of wells and above-ground treatment facilities would commit resources, such as concrete and steel.

Operation of the project would require additional energy consumption provided by Southern California Edison and generated in large part by fossil fuel–based sources.

4.5 Significant and Unavoidable Environmental Impacts of the Project

In accordance with Section 21067 of CEQA and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify environmental impacts that cannot be eliminated or reduced to a less-than-significant level by mitigation measures. Chapter 3, *Existing Conditions and Impacts*, describes the potential environmental impacts of the project and recommends feasible mitigation measures to reduce potentially significant project-specific impacts to less-than-significant levels. Cumulative impacts are discussed earlier in this chapter. The following impacts were determined to be significant and unavoidable even with implementation of feasible mitigation measures.

- **Impact WTR-1c: Groundwater Drawdown Effects on Aquifer Compaction.** Agricultural treatment will require use of water which is predicted to lower the water table substantially over time in the remedial area. There is a potential that lowering of the water table may result in compaction of sediments and the aquifer particularly in areas of fine sediments that are outside of areas that have experienced previous drawdown due to historic agricultural pumping. If compaction does occur, it is possible that aquifer storage capacity could be reduced. This is considered a potentially significant and unavoidable impact. Where this causes permanent effects to water supply wells, PG&E is required to provide permanent alternative water supplies (refer to Section 3.1, *Water Resources and Water Quality*).

- **Impact WTR-2d: Temporary Localized Chromium Plume Spreading ("Bulging") Due to Remedial Activities.** With the implementation of increased agricultural treatment and in-situ remediation, compared to existing conditions, temporary localized spreading ("bulging") of the chromium plume in the upper aquifer could occur. Impacts to water supply wells can be mitigated through provision of alternative water supplies, but the groundwater aquifer water quality could be temporarily impaired until the chromium plume is fully remediated (refer to Section 3.1, *Water Resources and Water Quality*).

- **Impact WTR-2e: Increase in Total Dissolved Solids, Uranium, and Other Radionuclides due to Agricultural Treatment.** Agricultural treatment would result in increased total dissolved solids in the water that infiltrates back to the aquifer below the irrigated land as a result of increased concentrations of total dissolved solids in the root zone due to evaporation. Mitigation is required to control the spread of remedial byproducts and to ultimately return water quality to baseline conditions, but temporary degradation of the aquifer water quality is likely unavoidable in some locations in order to facilitate the chromium remediation. Increased groundwater pumping for agricultural treatment could also result in increased uranium and other radionuclide concentrations in groundwater, but this impact requires further investigation in order to be fully characterized, and thus temporary water quality degradation

may also occur for these constituents as well (refer to Section 3.1, *Water Resources and Water Quality).*

- **Impact WTR-2g: Increase in other Secondary Byproducts (Dissolved Arsenic, Iron and Manganese) due to In-Situ Remediation.** The project would increase in-situ remediation compared to existing conditions. Temporary degradation of the aquifer near carbon amendment injection points is unavoidable if in-situ remediation is to be employed. Mitigation is required to control the spread of remedial byproducts and to ultimately return water quality to baseline conditions, but temporary degradation of the aquifer water quality is likely unavoidable in some locations in order to facilitate the chromium remediation (refer to Section 3.1, *Water Resources and Water Quality*).
- **Impact BIO-4: Conflicts with Wildlife Movement (Desert Tortoise only).** With expansion of remedial infrastructure to address the expanded plume, all alternatives could result in a nearly 2-mile contiguous area of new agricultural treatment units which may substantially impede east-west movement of desert tortoise in the Hinkley Valley. Aside from selecting the No Project Alternative or selecting alternatives (such as plume-wide pump and treat) previously rejected as not meeting the project's goal and objectives, feasible mitigation is not available for this impact. The agricultural treatment units need to be placed in central areas in Hinkley Valley in order to promote hydraulic control of the plume, and corridors between agricultural treatment units are unlikely to promote tortoise movement and would only increase habitat fragmentation, which is considered an inferior outcome for habitat conservation. Thus, this is considered a potentially significant and unavoidable impact depending on the ultimate configuration and extent of agricultural treatment units (refer to Section 3.7, *Biological Resources*).

4.6 Environmentally Superior Alternative

4.6.1 Introduction

CEQA requires the identification of an environmentally superior alternative in relation to a proposed project (CEQA Guidelines Section 15126.6[e]) to inform the CEQA lead agency's decision making process when they are considering approval of a project. The environmentally superior alternative is typically the alternative that meets the overall project goals and objectives and can avoid or substantially lessen one or more of the significant effects of a project when compared to all other project alternatives, including the No Project Alternative. If it is determined that the No Project Alternative would be the environmentally superior alternative, then the EIR must also identify an environmentally superior alternative among the other project alternatives (Section 15126.6[e]).

4.6.2 Method for Evaluation

Since all of the action alternatives are feasible to implement and also meet the project goal and objectives, the identification of the environmentally superior alternative is based on a comparative evaluation to determine which of the alternatives would have the least damaging environmental impacts if implemented, in comparison to existing conditions. The key areas of differentiation between alternatives are water resources and water quality, biological resources, and visual character. Thus, the focus of the evaluation is in relation to these areas of impacts while the other resource impacts are discussed, but at a lesser level of detail.

4.6.3 Comparison of Environmental Impacts of the Project Alternatives

Table 4-3 summarizes the approximate cleanup timeframes for each alternative. The evaluation of environmental impacts of each of the alternatives is based on the analysis in Chapter 3, *Existing Conditions and Impacts*, and is summarized in Table 4-4 below. The rankings in Table 4-4 are relative levels of impact between the alternatives and are not absolute ratings. Alternatives were ranked in order of least impact to highest impact, with 1 being the alternative with the least impacts and 6 being the alternative with the greatest impacts. Where alternatives are roughly equivalent they are given the same ranking, and the next ranking is skipped.

The evaluation of the alternatives follows Tables 4-3 and 4-4.

Table 4-3: Comparison of Estimated Cleanup Timeframes to Achieve Background Levels of Chromium Concentrations in Groundwater

Alternatives	No Project[a]	4B	4C-2	4C-3	4C-4	4C-5
Time to 50 ppb	6[b]	6	6	4	3	20
Time to 80% Cr (VI) Mass Conversion to Cr (III) or Removal	13[b]	10	7	6	6	15
Time to 3.1 ppb cleanup	NA[c]	40	39	36	29	50
Time to 1.2 ppb cleanup	NA[c]	95	90	85	75	95

Notes:

[a] No Project Alternative defined based on the No Project details provided for Alternative 4C-2 in Feasibility Study Addendum No. 3.

[b] Based on Feasibility Study Alternative No. 4 cleanup times because Feasibility Study Addendum No. 3 did not identify cleanup times for No Project conditions.

[c] No Project Alternative limited to addressing the 2008–2010 plume. Thus, no duration for cleanup of entire plume is identified.

Table 4-4: Summary Comparison of Potentially Significant Environmental Impacts of Project Alternatives (Relative Impact Ranking: 1 = lowest impact; 6 = highest impact)

	Alternative					
Impact Area	No Project	4B	4C-2	4C-3	4C-4	4C-5
Water Resources and Water Quality Impacts						
Regional aquifer drawdown	1	2	4	5	6	3
Local aquifer drawdown						
Aquifer compaction						
Containment and Treatment of Existing Chromium Contamination	6	5	3	2	1	3
Removal of Chromium from the Aquifer	3	3	3	2	3	1
Water Quality Effects due to use of Tracer Compounds	1	1	1	1	1	1
Temporary Bulging of the Chromium Plume due to Remedial Activities	1	2	3	5	5	3

Impact Area	Alternative					
	No Project	4B	4C-2	4C-3	4C-4	4C-5
Increase in Total Dissolved Solids and Uranium due to Agricultural Treatment	1	2	3	5	6	3
Increase in Nitrate due to Remedial Activities	1	2	3	5	6	3
Increase in Other Secondary Byproducts (Dissolved Arsenic, Iron and Manganese) due to In-Situ Remediation	1	4	4	3	4	2
Taste and Odor Impacts due to Remedial Activities	1	3	4	5	6	2
Impacts Related to Drainage Patterns and Runoff	1	2	3	5	6	4
Impacts Related to Flooding	1	2	3	6	4	6
Land Use, Agriculture, Population and Housing						
Physically Divide a Community	1	2	2	2	2	2
Incompatibility with or Disruption of Surrounding Land Uses	1	2	2	6	2	5
Inconsistency with San Bernardino County General Plan	1	2	2	6	2	5
Inconsistency with the West Mojave Plan	1	2	2	2	2	2
Conversion of Agricultural Land to Non-Agricultural Use (Including FMMP-Designated and Williamson Act Lands)	1	2	4	5	6	3
Population and Housing Changes due to Remedial Activities	1	2	2	2	2	2
Hazards and Hazardous Materials						
Potential to Encounter Hazardous Materials in Soil and Groundwater	1	2	3	5	6	4
Accidental Releases of Hazardous Materials	1	2	3	6	4	5
Exposure to Hazardous Building Materials during Demolition	1	2	3	5	6	4
Conflict with or Impeded Emergency Access	1	2	2	2	2	2
Increased Risk of Fire Hazards during Construction	1	2	3	6	4	5
Geology and Soils						
Increased Soil Erosion or Loss of Topsoil during Construction	1	2	3	5	6	4
Increased Soil Erosion or Loss of Topsoil from Operations and Maintenance	1	2	3	3	6	3
Increased Risk of Land Subsidence from Additional Pumping and Adverse Effects on Existing and Proposed Infrastructure	1	2	4	5	6	3
Increase Risk of Infrastructure Damage due to Seismic Activity	1	2	3	6	4	5
Increase Risk of Human Exposure due to Seismic Activity	1	2	3	6	4	5
Air Quality and Climate Change						
Conflict with or Obstruct Implementation of Mojave Desert Air Quality Management District Attainment Plans for Criteria Pollutants	1	1	1	1	1	1

Impact Area	Alternative					
	No Project	4B	4C-2	4C-3	4C-4	4C-5
Exceed MDAQMD Threshold Levels for Criteria Pollutants during Project Construction	1	2	3	5	4	5
Exceed MDAQMD Threshold Levels for Criteria Pollutants from Project Operations	1	2	3	5	3	6
Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air Contaminants during Construction	1	2	3	5	4	5
Expose Nearby Receptors to Increased Health Risk Associated with Toxic Air Contaminants from Operations	1	2	3	5	6	4
Create Objectionable Odors at Nearby Receptors during Construction	1	2	3	6	5	4
Create Objectionable Odors at Nearby Receptors during Operation	1	2	2	6	4	5
Generate GHG Emissions, Either Directly or Indirectly, That May Have a Significant Impact on the Environment or Conflict with the Goals of AB 32	1	3	2	6	5	4
Expose Property or Persons to the Physical Effects of Climate change	1	2	4	5	6	3
Noise						
Exposure of Noise-Sensitive Land Uses to Excessive Construction Noise	1	2	3	6	4	5
Exposure of Noise-Sensitive Land Uses to Excessive Ground Vibration from Construction Activities	1	2	3	6	4	5
Exposure of Noise-Sensitive Land Uses to Excessive Noise from Remediation Operations	1	2	2	2	2	2
Biological Resources						
Disturbance, mortality, and loss of habitat for Desert Tortoise	1	2	3	5	6	4
Disturbance, mortality, and loss of habitat for Mohave Ground Squirrel						
Disturbance, mortality, and loss of habitat for Burrowing Owl and American Badger						
Disturbance, mortality, and loss of habitat to Loggerhead Shrike and Northern Harrier						
Mortality and loss of habitat to Mohave River Vole						
Mortality and Loss of Habitat for Mojave Fringe-Toed Lizard						
Loss of Other Special-Status Birds						
Loss of individual plants or disturbance to Special-Status Plants						
Reduction or Loss of Function of Riparian Habitat or Sensitive Natural Communities						

Impact Area	Alternative					
	No Project	4B	4C-2	4C-3	4C-4	4C-5
Loss or Disturbance of Federal and/or State Jurisdictional Waters (including wetlands)						
Conflicts with Wildlife movement						
Removal of Protected Trees						
Conflicts with West Mojave Plan Conservation Requirements on BLM Land						
Cultural Resources						
Change in Significance of Listed or NRHP/CRHR-eligible Historic Properties or Historic Architectural Resources	1	2	3	5	6	4
Change in Significance of Listed or NRHP/CRHR-Eligible Prehistoric-Era and Historic-Era Archaeological Resources						
Potential Disturbance of Buried Human Remains						
Directly or Indirectly Destroy a Unique Paleontological Resource						
Utilities and Public Services						
Disruption to Utility Lines during Trenching, Excavation, and Earthwork	1	2	3	5	6	4
Increased Electricity Consumption	1	2	3	6	4	5
Increased Contributions to Local Landfills Beyond Allowable Capacity	1	2	3	6	4	5
Disruption to Emergency Services	1	2	2	2	2	2
Transportation and Traffic						
Increase in Traffic Volumes or Roadway Congestion from Construction	1	2	3	6	4	5
Increase in Traffic Volumes or Roadway Congestion from Operations and Maintenance	1	2	3	6	4	5
Create Significant Roadway Hazards from Construction Truck Traffic	1	2	3	6	5	4
Impede Emergency Access during Construction	1	2	3	6	5	4
Aesthetics						
Degradation of Visual Character or Quality from Construction	1	2	3	5	6	4
Permanent Change of Visual Character or Quality from Wells or Agricultural Treatment	1	2	2	2	2	2
Permanent Degradation of Visual Character or Quality from Above-ground Treatment Facilities	1	2	3	6	4	5
New Source of Light or Glare	1	2	3	6	4	5
Socioeconomics						
Physical Impacts of Blight due to Remedial Actions	1	2	3	3	6	3

4.6.4 Evaluation of Project Alternatives

Although all project alternatives, with the exception of the No Project Alternative, would achieve the project objective of containment and treatment of existing chromium contamination in the project area, there are significant differences with regards to the speed with which this beneficial impact would occur and differences in remedial characteristics.

Of the action alternatives, Alternative 4C-4 would have the shortest time period for remediation. In order from shortest time period to longest, the remaining alternatives are ranked as follows: Alternative 4C-3, 4C-2, 4B, and 4C-5. The No Project Alternative would be slower than all the action alternatives.

The differences in timeframes to cleanup will be considerations for the Water Board when determining cleanup requirements in the new Cleanup and Abatement Order and associated WDRs for this site. However, as a beneficial impact, containment and remediation of the chromium plume relative to existing conditions is not an adverse water quality effect under CEQA. The remainder of this section addresses differences in severity of adverse impacts across all alternatives in regards to each resource area analyzed in this EIR.

4.6.4.1 Water Resources

Groundwater Drawdown

All alternatives, with the exception of the No Project Alternative, would cause groundwater drawdown effects compared to existing conditions on the regional water supply, specifically the Mojave River Basin, Centro Subarea. Summer pumping for agricultural treatment would increase in proportion to the increased irrigated acreage for agricultural treatment. On a regional scale, the total pumping by PG&E from the Hinkley Valley aquifer would be greater than PG&E's current allowance under the Mojave River Basin Adjudication. The severity of this impact varies across alternatives. Alternative 4B would require the lowest volume of pumping above PG&E's current free production allowance (FPA). Alternatives 4C-2, 4C-3, and 4C-5 would all require the same amount of pumping above PG&E's current FPA, an amount higher than Alternative 4B. Alternative 4C-4 would require the most amount of pumping. PG&E must acquire sufficient water rights to allow the proposed water use with agricultural treatment, and impacts associated with this acquisition would increase with the amount of rights needed to be required for each alternative.

All action alternatives would also cause groundwater drawdown effects on the local water supply, specifically the Hinkley Valley Aquifer. The additional pumping for increased agricultural treatment could have impacts on individual wells. Without mitigation, such drawdown could disrupt domestic or agricultural supply, forcing construction of deeper wells, use of alternative water supplies, or abandonment of domestic/agricultural activity. The severity of this impact varies across alternatives, and the ranking of alternatives from least severe to most severe is the same as detailed above for regional water supply. To address local groundwater drawdown effects, PG&E would provide alternative water supply for wells that are affected by localized drawdown impacts from remedial activities.

All action alternatives may also cause aquifer compaction associated with groundwater drawdown which could affect long-term aquifer water storage capacity. The severity of this impact varies across alternatives, and the ranking of alternatives from least severe to most severe is the same as

detailed above for regional and local water supply. To address potential aquifer compaction, PG&E would be required to provide alternative water supply for wells in perpetuity for any wells that are permanently affected.

Water Quality

While project alternatives overall would reduce chromium contamination, certain remediation activities have the potential to adversely impact water quality. A comparison of these potential impacts across alternatives is discussed below

Contaminated Cr[VI] Plume Temporary "Bulging" due to Remedial Activities

With the implementation of increased extraction and injection with all project alternatives, there would be temporary bulging of the chromium plume (PG&E 2011c). The severity of project impacts varies across alternatives.

The No Project Alternative would have the least severe impact overall. In terms of agricultural treatment extraction activities that could contribute to plume bulge, Alternative 4B would have the least amount of new pumping. Alternatives 4C-2 and 4C-5 would have similar amounts of such extraction, which would be a greater level than Alternative 4B. Alternatives 4C-3 and 4C-4 would have the greatest amount of agricultural treatment extraction.

In terms of injection activities that could lead to plume bulging, all alternatives would have similar in-situ remediation injection flows, with the exception of Alternative 4C-5, which would have less in-situ remediation injection in the source area but an equivalent ex-situ injection amount, and thus similar impacts as the other alternatives.

Increased Total Dissolved Solids (TDS), Uranium and other Radionuclides due to Agricultural Treatment

The project includes increased groundwater pumping and application to irrigated agricultural lands, which would result in increased TDS in the water that infiltrates back to the aquifer below the irrigated land. Increased groundwater pumping for agricultural treatment could also result in increased uranium or other radionuclide concentrations in groundwater. While mitigation of increased total dissolved solids, uranium and other radionuclide concentrations in drinking water supply wells is feasible, temporary impacts to the aquifer water quality may not be avoidable without slowing down chromium remediation activities. Baseline water quality would be required to be restored in all alternatives at the end of chromium remediation actions in any case. The No Project Alternative would add no new agricultural treatment and thus would have the least impact of all alternatives. The severity of the impact would be relatively similar across the action alternatives in nature, but would vary in extent according to the amount of new agricultural lands put into production and irrigated. The action alternatives would add between 262 acres (Alternative 4B, which would produce the least severe impact of the action alternatives) and 1,212 acres (Alternative 4C-4, which would produce the most severe impact) of new agricultural treatment units.

Increased Nitrate due to Remedial Activities

The project includes increased groundwater pumping for irrigated land treatment of the contaminated Cr[VI] groundwater, which could result in increased nitrate-N in the water that

infiltrates back to the aquifer below the irrigated land. Agricultural treatment has the potential to reduce the nitrate concentration in the aquifer overall when the applied nitrate from the groundwater is used for plant nutrients. Agricultural treatment in the same area as extraction would reduce nitrate concentration in that area. The overall effect of agricultural treatment would be removal of nitrate from groundwater, which would be a beneficial effect for the aquifer as a whole, but localized effects could still occur if extraction from areas of relatively higher nitrate is used to irrigate areas of relatively lower nitrate. The No Project would add no new agricultural treatment and thus would not change nitrate conditions relative to existing conditions. The potential for the impact would be relatively similar across alternatives in type, but would vary in scale according to the amount of new agricultural lands put into production and irrigated (i.e., the more agricultural land in production, the greater chance localized nitrate concentrations could occur). The action alternatives would add between 262 acres (Alternative 4B, which would produce the least severe impact of the action alternatives) and 1,212 acres (Alternative 4C-4, which would produce the most severe impact) of new agricultural treatment units. Alternatives 4C-2, 4C-3 and 4C-5 would have a similar level of impact due to similar levels of agricultural treatment.

Increased Iron, Manganese, and Arsenic due to In-Situ Remediation

All project alternatives would create temporary mobilization of reduced metals as a result of anaerobic groundwater conditions caused by injecting biological reagents into the aquifer. Dissolved metals are expected to oxidize and precipitate onto the aquifer sediments once the reagents (ethanol) have been depleted and/or the metals are exposed to background aerobic groundwater conditions.

Implementation of the No Project Alternative would cause the least severe potential impacts because it has the least amount of in-situ remediation. Alternative 4C-5 would cause slightly more severe impacts than the No Project Alternative, but less severe impacts than all other action alternatives because it would use ex-situ treatment in the source areas, whereas the other action alternatives would use in-situ remediation in the source area. Implementation of Alternatives 4B, 4C-2, 4C-3, and 4C-4 all have similar amounts of in-situ remediation associated with each alternative and would have the most severe impacts.

Exceedance of Taste and Odor Objectives due to Remedial Activities

Implementation of all project alternatives would require the injection of biological reagents (ethanol) into the aquifer. Ethanol should dissipate by anaerobic or aerobic microorganisms before reaching receptors (domestic wells). The project would also include more agricultural and in-situ treatment than existing conditions, which could also affect taste and odor in drinking water due to remedial byproducts.

The No Project Alternative would cause the least severe impact as it would include new in-situ treatment, but would have no increase in agricultural treatment. For the action alternatives, agricultural treatment impacts would result in an increase in total dissolved solids in groundwater, which would increase with the amount of agricultural treatment and thus would be the lowest with Alternative 4B, the highest with Alternative 4C-4, and roughly similar for Alternatives 4C-2, 4C-3, and 4C-5. In-situ remediation impacts would be the same for Alternatives 4B, 4C-2, 4C-3, and 4C-4 due to similar levels of carbon-amended flows and somewhat less impacts with Alternative 4C-5 due to less use of carbon-amended flows.

Drainage and Flooding

Implementation of all project alternatives would create minor impervious surfaces for supporting infrastructure, such as treatment system equipment pads, wellhead protection pads, etc. However, these impacts would be minimal compared to the overall project area. Implementation of Alternatives 4C-3 and 4C-5 would include above-ground treatment facilities, creating a greater increase in impervious area due to new road segments, parking lots, and structures associated with the construction and operation of above-ground treatment plants. Although impacts associated with Alternatives 4C-3 and 4C-5 would be slightly greater due to their inclusion of above-ground treatment plants, impacts associated with all project alternatives are expected to be comparatively similar.

No significant impacts associated with drainage or flooding are anticipated, and any impacts that would occur would be similar across alternatives.

4.6.4.2 Land Use, Agriculture, Population and Housing

Land Use

None of the project alternatives would divide an existing community.

Two water resource impacts of remedial operations could disrupt adjacent land uses: groundwater drawdown and water quality degradation due to remedial byproducts. As discussed above in *Water Resources and Water Quality*, the project would result in groundwater drawdown due to agricultural treatment pumping that could disrupt water supply wells. The number of affected wells varies with each alternative according to the level of agricultural treatment and pumping proposed. The ranking of least to most severe project impacts for each alternative with regards to water drawdown impacts is as follows: No Project Alternative; Alternative 4B; Alternatives 4C-2, 4C-3, and 4C-5; and Alternative 4C-4. Also, agricultural treatment and in-situ treatment could result in generation of remedial byproducts that could affect the water quality for certain domestic, commercial, or agricultural wells. Impacts to water quality vary depending on the type of contaminant being analyzed, as well as across alternatives. Please see the discussion above under “Water Quality” for a detailed analysis of the difference in severity of impacts associated with water quality across alternatives.

All alternatives would be consistent with local land use and zoning designations, with the exception of Alternatives 4C-3 and 4C-5, due to their inclusion of above-ground treatment facilities. However, should San Bernardino County permit such a proposed use, which is anticipated, all alternatives would have similar impacts.

After mitigation, none of the project alternatives are expected to conflict with the requirements of the West Mojave Plan. Although the alternatives could vary in the level of effect to biological resource effects on BLM land or encroachment on BLM land, all alternatives would have similar impacts related to consistency with the West Mojave Plan and BLM land us requirements.

All alternatives would have similar impacts on recreation, as there are no recreation facilities in the project area, and none of the project alternatives include the construction, expansion, or elimination of recreation facilities. No alternatives would impede access to nearby BLM lands for recreation or result in a substantial increase in population or demand for recreational facilities.

Agriculture

The action alternatives would add between 262 acres (Alternative 4B) and 1,212 acres (Alternative 4C-4) of new agricultural treatment units, but this would not result in any conversion of existing important farmland to non-farmland uses.

Based on the current design, the only new known encroachments within FMMP-designated important farmland would be for an extraction well for Alternative 4C-3 and Alternative 4C-5, and for an agricultural treatment unit for Alternative 4C-4. However, agricultural treatment areas would be expanded beyond that described in the Feasibility Study/Addenda, and associated wells and pipelines might need to be installed in areas of designated important farmlands. However, the encroachment is expected to be small and far less than the addition of agricultural land with any of the action alternatives. The No Project Alternative would have the least impact, and all action alternatives would have similar limited impacts with regards to direct conversion of FMMP-designated and non-FMMP-designated farmland.

Remedial activities could indirectly result in disruption of agricultural use due to groundwater drawdown that might disrupt agricultural use. As discussed above in *Water Resources and Water Quality*, remedial pumping for agricultural treatment for all action alternatives would result in groundwater drawdown. PG&E would be required to acquire water rights in sufficient amounts to support proposed agricultural treatment pumping levels. This water could be acquired from agricultural users, which could in turn lead to a long-term loss of farmland, but project mitigation is required to place conservation easements to avoid this long-term loss. PG&E would also be required to provide alternative water supplies to agriculture if agricultural wells are substantially disrupted by the remedial actions. Generally, the ranking of least to most severe project impacts for each alternative with regards to water drawdown impacts, water right acquisition and consequent potential for loss of farmland is as follows: No Project Alternative, Alternative 4B, Alternatives 4C-2, 4C-5, 4C-3, and Alternative 4C-4.

As discussed above in *Water Resources and Water Quality*, agricultural treatment could also result in increased total dissolved solid concentrations that could result in water quality degradation such that it could not be used for agriculture. The severity of the impact would be relatively similar across alternatives, though would likely vary according to the amount of new agricultural lands put into production and irrigated. The action alternatives would add between 262 acres (Alternative 4B, which would produce the least severe impact) and 1,212 acres (Alternative 4C-4, which would produce the most severe impact) of new agricultural treatment units.

Population and Housing

All alternatives include construction activities that would temporarily increase local employment; however, it is expected that workers would use existing housing and services in Hinkley, Barstow, and elsewhere during construction. In addition, there would not be significant differences in the amount of employees needed to cause major differences in the level of impact across alternatives.

Implementation of the action alternatives would have the potential to require acquisition of existing rural residential properties in the largely open land areas within the project area, resulting in limited displacement of population and housing. The No Project Alternative would have no impact. Alternative 4B would have the least potential to result in displacement of existing residences. Alternatives 4C-2, 4C-3, and 4C-5 would have slightly greater impacts, and Alternative 4C-4 has the greatest potential for impacts. Given the areas of likely acquisition and the very low density of

residences, the number of homes acquired to facilitate remedial activities is expected to be low, and the likelihood of contributing to new housing construction elsewhere is also considered to be very low.

4.6.4.3 Hazards and Hazardous Materials

All proposed alternatives would require transport and use of hazardous materials. Standard practices and implementation of proposed mitigation measures would ensure there would be no significant impacts, and the overall severity of impacts would be similar across all alternatives. The potential to encounter hazardous materials in soils varies in accordance with ground disturbance, which would be lowest with Alternative 4B and highest with Alternative 4C-4. Alternatives 4C-3 and 4C-5 include above-ground treatment facilities which would generate hazardous waste in the form of precipitated chromium and require special handling and disposal; thus, operationally these two alternatives have greater impacts than the other alternatives.

4.6.4.4 Geology and Soils

All project alternatives would include ground-disturbing activities that could increase soil erosion and loss of topsoil, which could in turn result in sediment being washed to drainages (washes), some of which drain to the Mojave River and most of which drain to Harper Lake. Implementation of proposed mitigation and compliance with relevant regulations would ensure impacts would be similar across all alternatives.

Routine remediation activities, including irrigation and agricultural tilling, pumping and carbon injection, and well monitoring would be similar in character across alternatives, as would use of unpaved roads for operation and maintenance activities. Operational erosion impacts would be highest in alternatives with the highest amount of agricultural treatment, like Alternative 4C-4 and lowest with the alternatives with the least amount of agricultural treatment like the No Project Alternative and Alternative 4B.

The project would increase groundwater pumping, which could increase the risk of land subsidence due to groundwater drawdown. The potential for land subsidence in the project area from significant aquifer drawdown would be the greatest under Alternative 4C-4 due to the highest level of groundwater extraction being associated with this alternative, and the least under the No Project Alternative and Alternative 4B.

The project would increase the risk of damage to infrastructure due to seismic activity because it would locate new infrastructure near active faults, such as the Lenwood-Lockhart fault zone. The No Project Alternative would have the least amount of new infrastructure located near the Lenwood-Lockhart fault zone, followed by Alternatives 4B, 4C-2, and 4C-4. Alternatives 4C-3 and 4C-5 would include above-ground treatment facilities and thus would result in the most above-ground structures near the Lenwood-Lockhart Fault zone and the greatest potential for significant impacts.

The project would increase the risk of human exposure to seismic activity because workers would be in areas near active faults during construction, and new operation of remediation facilities would result in more workers near active faults. This impact would be the least severe under the No Project Alternative, due to this alternative consisting of the least amount of construction and new operational activities necessary. Alternatives 4B, 4C-2, and 4C-4 would have slightly greater impacts

than the No Project Alternative. Alternatives 4C-3 and 4C-5 would have the greatest potential for impacts to human exposure due to the need for workers at the new above-ground treatment facilities associated with these alternatives.

4.6.4.5 Air Quality and Climate Change

All alternatives would result in increased criteria pollutant emissions during construction and from operation and maintenance. Alternatives with greater construction activity would have higher construction emissions. Alternatives 4C-3 and 4C-5 would have the highest daily construction emissions because the also includes above-ground treatment facilities, and the No Project Alternative would have the lowest construction emissions (with Alternative 4B having the lowest among the action alternatives). Similar conclusions apply to operational criteria pollutants.

All alternatives would also result in increased toxic air contaminant (TAC) emissions during construction and from operation and maintenance. Alternatives with greater construction activity would have higher construction TAC emissions. Alternative 4C-4 would have the highest operational TAC emissions, and the No Project Alternative would have the lowest (with Alternative 4B having the lowest construction emissions of the action alternatives).

All alternatives could result in increased greenhouse gas (GHG) emissions during construction and from operation and maintenance. The order of least to most operational GHG emissions associated with each alternative would be: No Project Alternative, Alternative 4C-2, 4B, 4C-5, 4C-4, and 4C-3.

Given its inland location, all project alternatives are in an area that would not be inundated by a predicted rise of up to 1.4 meters in sea level by 2100 (California Climate Change Center 2006). The project and nearby foreseeable projects are in areas not subject to immediate wildfire risks and are not anticipated to rely on imported water supplies. There is a range of other potential effects of climate change to which the project vicinity may be subject, including increased temperatures and heat stress days and water supply effects (due to changed in hydrologic cycles), for example. As discussed under *Water Resources and Water Quality* above, the project would lower groundwater levels. If rising temperatures due to climate change would result in changes to local weather patterns that reduced local precipitation, it is possible that the project could contribute to cumulative groundwater table lowering. Alternatives with the most agricultural treatment (such as Alternative 4C-4) would have the highest impact, and those with the least amount (No Project Alternative) would have the least impact.

4.6.4.6 Noise

Construction activities would have the potential to expose noise-sensitive land uses to excessive construction noise. The No Project alternative would have the least level of impact, followed by Alternative 4B. Alternative 4C-2 would include more intensive agricultural treatment and, therefore, would have greater impacts than 4B. Similarly, Alternative 4C-4 would have an even more intensive agricultural treatment, leading to greater impacts than 4C-2. The most severe impacts would be associated with Alternatives 4C-3 and 4C-5, with Alternative 4C-3 having slightly greater impacts due to construction of two above-ground treatment facilities as opposed to one.

In order to implement plume monitoring and to implement Mitigation Measure WTR-MM-2, PG&E may need to install monitoring wells and may need to drill deeper wells in close proximity to residences. If this were to be necessary, it is possible that the County standard for vibration could be exceeded if the well is less than 25 feet from a residence. Mitigation would reduce the significant of this impact, and project impacts would be similar across all alternatives.

Remediation operations could expose noise-sensitive land uses to operational noise from well pumps. Because of the relatively large spacing between the pumps and the distance from the nearest residences, no meaningful cumulative pump noise is anticipated at nearby residences. Under all alternatives, based on known locations, no residences are located within 200 feet of the proposed pumps, and increases in noise relative to the existing ambient noise level are not expected to be substantial. Therefore, impacts would be the same across all alternatives.

4.6.4.7 Biological Resources

The proposed remediation activities have the potential to infringe on habitat that supports special-status wildlife and plant species, sensitive natural communities, jurisdictional waters or wetlands, to conflict with wildlife movement, and remove protected trees. The severity of impacts to biological resources varies under different alternatives due to the size and location of project activities. The No Project would have the least impact, followed by Alternative 4B, then Alternatives 4C-2, 4C-3, and 4C-5, which would all have a similar level of impact. Alternative 4C-4 (with the most agricultural treatment) would have the greatest amount of impacts to biological resources. All action alternatives would potentially have a significant and unavoidable impact to desert tortoise movement but Alternative 4C-4 has the highest likelihood of this impact occurring.

4.6.4.8 Cultural Resources

The proposed remediation activities have the potential to disturb historic architecture resources, archaeological resources, and paleontological resources. No specific construction actions are proposed within known cultural or paleontological resources, but potential disturbance could occur to undiscovered resources. All action alternatives also have the potential for disturbance to one known archaeological resource due to alternative water supply mitigation, but the specific potential for this impact cannot be known until the mitigation is designed. The severity of impacts to cultural and paleontological resources varies under different alternatives due to the size and location of project ground-disturbing activities and property acquisition. The No Project would have the least impact, followed by Alternative 4B, then Alternatives 4C-2, 4C-3, and 4C-5, which would all have a similar level of impact. Alternative 4C-4 would have the greatest amount of potential impacts to cultural and paleontological resources as it has the greatest amount of potential disturbance and the greatest potential need for water supply mitigation.

4.6.4.9 Utilities and Public Services

Construction activities would require ground-disturbing activities that have the potential to occur in proximity to existing underground utilities and could require interruption of service to existing customers. Once facilities are built and operating, ground-disturbing activities could be required for periodic maintenance of subsurface infrastructure to conduct repairs or replace infrastructure. The project also has the potential to disrupt aerial utility and transmission lines for electricity, telecommunications, and possibly other aerial lines and facilities in the project area during construction and operations and maintenance activities. The only differences in impacts between the alternatives would be the extent of area and level of activity that would occur, with the severity of impact being the least under the No Project Alternative in comparison to the action alternatives.

The project would require increased electricity consumption during construction and operations and maintenance activities. Once project facilities are built and operating, additional electricity would be required to power project elements. Alternative 4C-3 would have the highest amount of

electricity consumption (primarily due to two above-ground treatment facilities), and the No Project Alternative would have the lowest.

Construction of all alternatives would generate comparatively similar amounts of solid waste. However, the potential to generate hazardous residual by-products from groundwater treatment requiring disposal in a Class I facility would occur only under Alternatives 4C-3 and 4C-5 from the above-ground treatment, leading these alternatives to cause the greatest level of impact. The No Project would generate the least amount of solid waste. However, because all solid waste generated by all alternatives would be required to comply with Assembly Bill 939 and the County's waste reduction requirements, the differences between the severity of impacts across alternatives is not anticipated to be substantial.

Project construction would generate additional vehicular traffic to the project area which would have limited impact to emergency services which would be similar for the action alternatives. Once built, project operation and maintenance would not substantially affect emergency services

4.6.4.10 Transportation and Traffic

Increase in traffic volumes associated with project construction would be minor, dispersed over time, and in relatively remote locations, affecting streets with low traffic volumes. However, because of the speed of vehicular traffic and unprotected turning movements on SR 58, there is the potential for significant impacts to occur as a result of increased congestion from construction-related truck traffic on SR 58. Increases in construction-related truck traffic could also create a safety hazard and increase the risk of accidents, as well as impede emergency vehicles. Although impacts are similar across all alternatives and proposed mitigation would ensure there would be no significant impacts associated with any alternatives, the No Project Alternative would have the least impact, while Alternatives 4C-3 and 4C-5 would have the greatest impact because they would include above-ground treatment facilities that require more construction workers, a longer initial buildout phase, and more equipment and materials than all other alternatives.

Traffic associated with operations and maintenance activities would be generated by all alternatives. Increases in traffic volumes and congestion under operations and maintenance would be considered incremental for all alternatives, and there is sufficient capacity on local roads to accommodate new project-related traffic because of the rural and relatively remote location of the project area and the low traffic volumes on existing roads. New traffic volumes would be the lowest under the No Project Alternative, and slightly higher under Alternatives 4C-3 and 4C-5 because the above-ground treatment facilities generate solid waste that would require off-site hauling and require more site workers traveling to work. However, overall impacts would be similar across all alternatives, as there would not be a significant impact under any alternative.

4.6.4.11 Aesthetics

Clearing, excavating, grading, and other activities associated with construction of the project would contribute to cause short-term changes in views. However, these changes would be temporary in nature, and the intensity of the changes would decrease once initial buildout of projects in the project area is complete. Further, upon completion of construction, all equipment would be removed and construction staging areas and other areas that are temporarily disturbed would be returned to pre-project conditions. Construction-related impacts would be greatest with Alternative 4C-4

because it has the greatest amount of agricultural treatment and land disturbance, and the least with the No Project Alternative which requires the least amount of disturbance and construction.

All alternatives would have similar minor impacts on visual character or quality of the project area through the presence of new wells and pipelines and introduction of new operation and maintenance activities throughout the project area. Action alternatives with agricultural treatment units would not change visual character of Hinkley Valley given the history of agricultural use from the past to the present; thus, project impacts overall on visual character are similar across all alternatives. The exception is Alternatives 4C-3 and 4C-5, which would have the most visual impact because they include above-ground treatment facilities, with Alternative 4C-3 having a slightly greater impact due to the addition of two treatment facilities instead of one.

For any new sources of light associated with project alternatives, there is potential to negatively affect drivers on adjacent roadways and adjacent rural residences due to spillover lighting (and residual glare), as well as a general increase in ambient lighting at above-ground facilities. These impacts would be most severe under Alternatives 4C-3 and 4C-5 because they include the above-ground treatment facilities, which are the major new sources of light and glare. Alternatives 4B, 4C-2 and 4C-4 would have a greater impact than the No Project Alternative, as new sources of light would occur over a much larger area than the area associated with the No Project Alternative.

4.6.4.12 Socioeconomics

Remedial actions could require property acquisition (primarily for new agricultural treatment units), including property with existing residences and structures. If not properly secured and maintained, the structures could deteriorate over time, resulting in physical risks associated with abandoned structures. The No Project Alternative would have no impact because it would not require any property acquisition for agricultural treatment. Among the action alternatives, Alternative 4B would require the least amount of acquisition followed by Alternatives 4C-2, 4C-3, and 4C-5 which would have greater impacts than Alternative 4B but similar to each other. Acquisition of properties would be the most significant impact under Alternative 4C-4 because it would require the most new agricultural treatment land and would result in the highest potential acquisition of residential properties and other structures.

4.6.5 Identifying the Environmentally Superior Alternative

As shown in the evaluation above, there is no single alternative that is clearly environmentally superior from all aspects. Different alternatives are environmentally superior to the other alternatives for specific subject areas.

The key areas of differentiation between alternatives are as follows:

- **Remediation of the Chromium Plume:** Alternative 4C-4 is considered the environmentally superior alternative in terms of remediation of the chromium plume because it would reach the cleanup levels the fastest and would provide for year-round containment pumping through use of a winter crop.
- **Groundwater Drawdown Effect on Local Water Supply:** The No Project Alternative is identified as the environmentally superior alternative in terms of drawdown. Since the No Project Alternative does not meet the project goal and objectives, Alternative 4B is identified as the Environmentally Superior Alternative in terms of drawdown among the action alternatives.

- **Water Quality Effects of Remedial Byproducts:** The No Project Alternative is considered the environmentally superior alternative in terms of water quality effects due to remedial byproducts. Since the No Project Alternative does not meet the project goal and objectives, Alternative 4B is identified as the Environmentally Superior Alternative in terms of water quality effects due to remedial byproducts among the action alternatives.
- **Disturbance of Biological Resources:** The No Project Alternative would be the environmentally superior alternative in terms of new impacts on biological resources. Since the No Project Alternative does not meet the project goal and objectives, Alternative 4B is identified as the Environmentally Superior Alternative in terms of biological resources among the action alternatives.
- **Change in Visual Character:** The No Project Alternative would be the environmentally superior alternative in terms of changes in visual character as it would have the least amount of above-ground facilities and aesthetic change. Since the No Project Alternative does not meet the project goal and objectives, Alternative 4B is identified as the Environmentally Superior Alternative in terms of visual character as it would have the least amount of changes to existing visual aesthetics of the action alternatives.
- **Other Impacts Involving Construction or Operational Impacts:** In general terms, the No Project Alternative would be the environmentally superior alternative in terms of other impacts including air quality, greenhouse gas emissions, biological resources, geology and soils, noise, cultural resources, traffic, public utilities and public services, land use, and population and housing. Since the No Project Alternative does not meet the project goal and objectives, Alternative 4B is identified as the Environmentally Superior Alternative as it would have the least impacts among the action alternatives to these same resources.

Because the alternatives involved fundamental tradeoffs between different impacts, there is no objective way to determine a single environmentally superior alternative without making value judgments about different impacts. For example, Alternative 4C-4 would remediate the plume the fastest of all alternatives but would also result in the highest level of groundwater drawdown, the highest level of remedial byproducts, and the largest amount of disturbance and loss of special-status species habitat. In contrast, the No Project Alternative would have the least groundwater drawdown, the lowest level of remedial byproducts, and the least new disturbance of special-status species habitat; but it would also not remediate the entire chromium plume. Of the action alternatives, Alternative 4B would have the least groundwater drawdown, the lowest level of remedial byproducts, and the least new disturbance of special-status species habitat; but it would take much longer to reach the plume cleanup levels than Alternatives 4C-2, 4C-3 and 4C-4.

Different individuals may value one impact more than another impact and could identify different alternatives as the environmentally superior alternative. As such, this EIR does not identify a single environmentally superior alternative and instead provides a detailed comparison of the alternatives for all resources studied.