5 OTHER CEQA SECTIONS

5 OTHER CEQA SECTIONS

This chapter summarizes the environmental impacts of the proposed project for which no mitigation is available to reduce the level of significance to a less-than-significant level, addresses resource areas where no significant impacts were found, and addresses the growth-inducing impacts of the project.

5.1 UNAVOIDABLE SIGNIFICANT IMPACTS

As required by CEQA Guidelines, Section 15126.2(b), an EIR must describe any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described. Chapter 4 of this EIR describes the potential environmental impacts of the proposed project and recommends mitigation measures to reduce impacts, where feasible.

5.1.1 CULTURAL RESOURCES

The proposed project would have a substantial adverse impact on the Topock Cultural Area, which is considered a historical resource because of its historic (and continuing) importance to representatives of the Fort Mojave Indian Tribe and certain other Yuman-speaking tribes in the lower Colorado River region. The area in which ground-disturbing activities and facilities would be located has been designed to avoid the NRHP- listed and NRHP- and CRHR-eligible site CA-SBR-219 (Loci A, B, and C, of the Topock Maze), which is an integral part of the Topock Cultural Area. However, because of the introduction of additional infrastructure, ground-disturbing activity, and overall nature of modern intrusions associated with the proposed project, the changes to the character, nature, and use of the historical resource the proposed project would indirectly affect the Topock Maze and adversely affect the Topock Cultural Area. Further, as discussed further in Section 4.1 ("Aesthetics") and Section 4.9 ("Noise") of this EIR, the construction of new modern features such as wells and water pipelines would be inconsistent with the setting and visual and auditory characteristics of the Topock Cultural Area that contribute to its historical significance to certain Native American tribes. As expressed by tribal stakeholders during the NACP, even the transformation of Cr(VI) to trivalent chromium [Cr(III)] would create an impact to the cultural and historical values associated with the Topock Cultural Area through the deposition of an unnatural amount of Cr(III) into the environment. The only mitigation that would reduce this impact to a less-than-significant level would be avoidance of any type of project-related activity. It should be noted, however, the proposed remedy would affect a relatively small percentage of the ground surface within the Topock Cultural Area and that the evidence suggests that the Topock Cultural Area will retain its historical and cultural significance even after the proposed remedy is in operation and completed. Thus, there are mitigation measures that will reduce the level of impact, although not below the level of significance.

Complete avoidance of the Topock Cultural Area is not feasible given the need to have an active remediation system to clean up the contaminated groundwater plume. As such, impacts on this historical resource would be **significant and unavoidable. (IMPACT CUL-1a)**

Mitigation Measure CUL-1a: *During Design, Construction, O&M, and Decommissioning Implement Measures to Avoid, Minimize, or Mitigate Impacts on Cultural Resources.*

Establishment of a cultural impact mitigation program and a Corrective Measures Implementation Workplan (CMI Workplan), with specific activities stipulated for each phase of the project, will reduce the potential for impacts on historical resources within the project area, and will help preserve the values of and access to the Topock Cultural Area for local tribal users. As detailed below, measures will be implemented to avoid known resources, re-use existing disturbed areas to the extent feasible and consistent with the Final Remedy, allow for

tribal input to the final design and maintain access for tribal users during design, construction, operation, and decommissioning activities, as appropriate. During construction, a Worker Education Program and regular archaeological and tribal monitoring will be implemented, and measures intended to reduce the potential for incursion by outside parties will be strengthened.

Mitigation during the design, construction, O&M, and decommissioning phases includes these specific actions:

CUL-1a-1: During development of the final design and the construction, operation, and decommissioning phases of the project, PG&E shall carry out and require all subcontractors to carry out all investigative, testing, and remediation activities, including all supporting operations and maintenance activities, in ways that avoid, minimize, and mitigate significant adverse effects to historically significant cultural and historic resources, consistent with the CEQA Guidelines, and including the Topock Cultural Area, to the maximum extent feasible as determined by DTSC.

CUL-1a-2: As part of the CMI Workplan, PG&E shall develop a written access plan to preserve tribal members' access to, and use of, the project area for religious, spiritual, or other cultural purposes. This plan will allow access to the extent PG&E has the authority to facilitate such access, and be consistent with existing laws, regulations, and agreements governing property within the project area. The access plan may place restrictions on access into certain areas, such as the Compressor Station and the existing evaporation ponds, subject to DTSC review with regard to health and safety concerns and to ensure noninterference with approved remediation activities. This access plan may be developed in coordination with the federal agencies with land management responsibilities in the project area (e.g., BLM and USFWS) in accordance with the related stipulation (General Principle I.C) contained in the Programmatic Agreement (Appendix PA). PG&E shall demonstrate a good faith effort to coordinate with Interested Tribes[1] by including communication logs as part of the CMI Workplan.

CUL-1a-3: PG&E shall enhance existing measures to prevent and reduce incursions from recreational and/or other outside users from affecting unique archeological and historically significant resources, including resources within the Topock Cultural Area, by:

a. Retaining a Qualified Cultural Resource Consultant to implement the Mitigation Monitoring and Reporting Program (MMRP) and conducting yearly inspections (or less frequently upon approval by DTSC) of identified historical resources, including inspections of the Topock Cultural Area, to determine if substantial adverse changes have occurred relative to the condition of the historical resources during the past year or prior to the implementation of the proposed project. PG&E shall offer to retain a tribal monitor at historic rates of compensation or tribal representatives designated by the Tribal Council or chairperson, if so requested, to accompany the Qualified Cultural Resources Consultant during the inspections. The Qualified Cultural Resource Consultant shall be a person who is acceptable to DTSC and who is also a qualified archaeologist with a graduate degree in archaeology, anthropology or closely related field, plus at least 3 years of full-time professional experience in general North American archaeological research and fieldwork, with expertise/experience in the Southwest preferred.

[1] "Interested Tribes" means, for purposes of this EIR and the mitigation measures contained herein, the six tribes that have substantially participated in the various administrative processes surrounding remediation of the site with DTSC, PG&E, and DOI, including throughout development of the final remedy. Interested tribes include the Chemehuevi Indian Tribe, Cocopah Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Fort Yuma-Quechan Indian Tribe, and Hualapai Indian Tribe.

b. Developing a site security plan as part of the CMI Workplan. The site security plan shall include, but not be limited to, instructions for PG&E personnel to inspect the project site routinely during construction and report any human-caused disturbance to project facilities and the surrounding environment to DTSC and the appropriate landowner, such as BLM, USFWS, or FMIT, as appropriate, depending on the ownership of the property involved in the incursion. Notification shall be within a specified period, as established in the site security plan for the event, and shall also be summarized as part of the periodic implementation status report, as approved by DTSC for remedy implementation. This measure does not impose any obligation on PG&E to perform law-enforcement duties on federal or private lands, but is intended to provide increased observation of potential intrusions into the project area during construction and operation of the final remedy that may impact significant cultural resources. PG&E staff, or assigned agents, should be instructed to report any outside disturbance to the environment personally observed over the course of the working day. Information shall be reported within a specific period, as established in the site security plan, to DTSC and the appropriate landowners, such as BLM, USFWS, or FMIT, depending on the ownership of the property intruded upon. The site security plan may also include the use of PG&E security cameras at major ingress/egress gates into the project site. Finally, if requested by the FMIT the plan may include the use of private security personnel to patrol the FMIT-owned parcel within the project area to prevent outside incursions.

c. Coordinating with BLM and San Bernardino County to facilitate an outreach effort to the staff at Moabi Regional Park, requesting that they communicate to visitors the parts of the project area that are off limits to off-road vehicle usage because of health and safety concerns, public lands management plans, or landowner requests. PG&E shall make a good faith effort to involve the surrounding tribes in this outreach effort, providing Interested Tribes with the opportunity to comment on outreach materials or provide a tribal cultural resources specialist the opportunity to participate in the outreach activities. As part of this outreach effort, PG&E shall work with Park Moabi and offer to design, develop, and fund the installation of an informational kiosk within Park Moabi that informs visitors of the work being done at the project site. PG&E shall involve the tribes to the maximum extent feasible, as determined by DTSC, in the design and development of the informational kiosk.

d. Posting signage to indicate those parts of the project area that are off limits to off-road vehicle usage due to possible health and safety concerns and to reduce potential damage to environmental resources. If agreed to by land owners and/or local, state, or federal management entities within the project area, PG&E shall work with the relevant land owner or land management entity to develop, design, and fund the installation of easily visible and clear signage. This may include coordination with BLM to install signage noting the designation of the area as an Area of Critical Environmental Concern owing to its biological and cultural resources, while ensuring that signs are placed in a way that does not draw unwanted attention to specific resources.

CUL-1a-4: PG&E shall work with representative members of the Interested Tribes to convene and retain a multidisciplinary panel of independent scientific and engineering experts as part of a Technical Review Committee (TRC). The TRC shall be made up of not more than five multidisciplinary experts who will be on call to review project-related documents, participate in project-related meetings, and advise interested tribal members on technical matters relating to the final design and remedy. The TRC shall include only persons with technical expertise, including but not limited to geology, hydrology, water quality, engineering, paleontology, toxicology, chemistry, biology, or botany. Before July 1, 2011, PG&E shall post an open grant or Request for Qualifications (RFQ) and retain members of the TRC at rates comparable to those paid

historically to tribal experts by PG&E for the remediation project. TRC members shall be selected by majority vote of one representative from each participating Interested Tribe. PG&E shall provide Interested Tribes at least 30-days notice of the meeting to select TRC members and to review TRC candidate qualifications. For the purposes of contracting, the grant may be awarded to one tribal government to manage or, alternatively, PG&E may reimburse the tribe or TRC members directly. The entirety of the monies shall be used to fund the scientific and engineering team exclusively, and shall not be used to fund other tribal government expenses or used to support legal counsel. A stipulation of the open grant shall be that the scientific and engineering team shall provide all deliverables and results to all involved tribes, despite a possible contract agreement with only one tribe or with PG&E. Upon conclusion of the construction phase of the project, the necessity and dollar value of the TRC shall be assessed by PG&E and, with the approval of DTSC, shall either be extended, reduced, or terminated under the operations and maintenance phase. An annual activity report shall be sent to DTSC for review and to ensure PG&E is in compliance.

CUL-1a-5: Should any indigenous plants of traditional cultural significance and listed in Appendix PLA of this FEIR be identified within the project area, PG&E shall avoid, protect, and encourage the natural regeneration of the identified plants when developing the remediation design, final restoration plan, and IM-3 decommission plan. In the event that impacts on the identified plants cannot be avoided and such plants will be displaced, PG&E shall retain a qualified botanist who shall prepare a plant transplantation/monitoring plan which can be included as part of the Cultural Impact Mitigation Program (CIMP) referenced in CUL-1a-8 either by (1) transplanting such indigenous plants to an on-site location, or (2) providing a 2:1 ratio replacement to another location decided upon between PG&E and members of the Interested Tribes. Plans to transplant or replace such plants shall be approved by DTSC. In coordination with the qualified botanist, PG&E shall monitor all replanted and replacement plants for at least 3 years, and shall ensure at least a 75 percent survivorship during that time. This mitigation measure is not meant to replace or subsume any actions required by state or federal entities with regard to the protection of species listed as rare, threatened, or endangered.

CUL-1a-6: All additional phone calls and alarms associated with remediation activities or facilities shall not be routed through PG&E's existing alarm system utilized at the compressor station. The notification system for remediation-related alerts and/or phone calls shall not introduce additional noise to the project area, to the maximum extent feasible, provided there is ongoing compliance with applicable safety regulations or standards of the Federal Energy Regulatory Commission, Occupational Safety and Health Administration, and other agencies. (See Mitigation Measure NOISE-3 for additional mitigation related to the Topock Cultural Area).

CUL-1a-7: Nighttime construction-related activities shall be limited to work that cannot be disrupted or suspended until the following day, such as, but not limited to, well drilling and development or decommissioning activities. Lighting considerations, including the potential use of solar power for some lighting, shall be included as part of the remedial design plan to be developed with involvement of Interested Tribes and the U.S. Department of the Interior. To minimize construction and operations-related lighting impacts, the lighting in the remedial design plan shall include, at a minimum: (1) shrouding/shielding for portable lights needed during construction and operational activities; (2) installation of portable lights at the lowest allowable height and in the smallest number feasible to maintain adequate night lighting for safety; (3) shielding and orientation of lights such that off-site visibility of light sources, glare, and light from construction activities is minimized to the extent feasible. No additional permanent poles shall be installed for lighting. This mitigation measure is not meant to replace or subsume any actions required by the

County or state or federal entities with regard to lighting required for minimum security and safety purposes.

CUL-1a-8: Prior to commencement of construction, PG&E shall submit as part of the final Remedial Design, a CIMP developed in coordination with Interested Tribes for DTSC's review and approval. The CIMP may be developed in coordination with the federal agencies with land management responsibilities in the project area (e.g., BLM and USFWS) in accordance with the Programmatic Agreement (Appendix PA). The CIMP shall include, at a minimum and to DTSC's satisfaction, the following:

a. Protocols for continued communication. Consistent with past practice and the communication processes previously entered into by PG&E with Interested Tribes, the company shall continue to communicate with Interested Tribes during the design, construction, operation, and decommissioning of the project. Prior to implementation of construction, PG&E shall communicate with Interested Tribes that place cultural significance on the Topock Cultural Area. Outreach efforts between the Tribes and PG&E shall be communicated by PG&E to DTSC quarterly during the design and construction phase for review and input, and annually during project operations.

b. Protocols for the appropriate treatment of archaeological materials that may be disturbed or discovered during implementation of the final remedy, including protocols for the repatriation of significant items of cultural patrimony that may be recovered during the project, and protocols for the curation of cultural materials recovered during the project. Treatment of archaeological sites may include data recovery or capping. If data recovery is proposed, a Research Design following California Office of Historic Preservation guidelines or federal guidelines, as applicable, shall be prepared and reviewed and approved by DTSC.

c. Protocols for the review of cultural resource-related documents throughout the design, construction, and operational phases.

d. Protocols for the review of project design documents before the beginning of construction, including reviews of project design documents throughout the design process (e.g., Preliminary [approximately 30% completed], Intermediate [approximately 60% completed] and Pre-final design).

e. Protocols for the appropriate methods to be used to restore the environment to its preconstruction condition upon decommissioning of individual groundwater remedy facilities.

f. A plan for the decommissioning and removal of the IM-3 Facility and proposed restoration of the site (to be an appendix to the CIMP).

g. Protocols for the repatriation of clean soil cuttings generated during construction activities and during drilling associated with repair/replacement activities during operations and maintenance phases. The soil cuttings shall be managed in compliance with applicable laws and regulations on site.

h. Protocols for the appropriate methods, consistent with Mitigation Measure NOISE-3, to reduce auditory impacts.

i. Protocols for the appropriate methods, consistent with Mitigation Measures AES-1 and AES-2, to reduce visual intrusions.

j. Protocols for tribal notification in advance of project-related activities that the Interested Tribes may feel have the potential to cause adverse impacts to sensitive cultural resources.

k. Protocols to be followed by project personnel to accommodate, if feasible as determined by DTSC, key tribal ceremonies that involve the Topock Cultural Area.

l. Provisions affording sufficient tribal monitors to observe ground-disturbing activities and/or other scientific surveying (e.g., biological surveys) that may occur in preparation for construction activities. Ground-disturbing activities include trenching, excavation, grading, well excavation/drilling, decommissioning of the IM-3 Facility and subsurface pipeline, or other construction-related activities.

m. Provisions of reasonable compensation for tribal monitors consistent with historic rates.

n. Locations requiring specific protective devices, such as temporary fencing, flagging, or other type of demarcation during construction.

o. Protocols for the reporting of discoveries of cultural importance consistent with existing statutes and regulations.

p. Protocols for the inspection of remediation facilities and/or staging areas throughout the construction phase.

Mitigation during the design phase includes these specific actions:

CUL-1a-9: During selection of the design and specific locations for physical remediation facilities, PG&E shall, in communication with the Interested Tribes (and subject to their review), and to the maximum extent feasible, as determined by DTSC, give: (1) priority to previously disturbed areas for the placement of new physical improvements; and (2) priority to re-use of existing physical improvements, such as but not limited to wells and pipelines, but not including IM-3 facilities. "Disturbed" areas in this context means those areas outside of documented archaeological site boundaries that have experienced ground disturbance in the last 50 years. PG&E shall produce an aerial map of these disturbed areas to guide project design, and PG&E shall make a good faith effort to provide tribes with an opportunity to review and comment on the information displayed on the map in determining "disturbed" areas.

CUL-1a-10: PG&E shall consider the location of Loci A, B, and C of the Topock Maze during the design and approval of the physical facilities necessary for the final remedy and is prohibited from creating any direct physical impact on the Topock Maze, as it is manifested archaeologically. Through the design, PG&E shall prevent all indirect (e.g. noise, aesthetics) impacts on the Topock Maze, to the maximum extent feasible as determined by DTSC.

Mitigation during the design and construction phases includes these specific actions:

CUL-1a-11: PG&E shall provide an open grant for two part-time cultural resource specialist/project manager positions during the design and construction phases of the remediation project. The positions shall be filled by qualified members of an Interested Tribe as nominated by a majority vote of their Tribal Council(s) and appointed by DTSC's project manager if more than two members are nominated. The award of the grants is for continued involvement in review of project documents and participation in project-related meetings, including TRC meetings, at rates of historic compensation. Additionally, in light of FMIT's ownership of land in the project area and historical involvement in the environmental process, additional funding is guaranteed for one full-

time FMIT position upon submission of an application by a qualified FMIT member who shall be appointed by the FMIT council, provided such funding is not duplicative of the services and funding provided by PG&E pursuant to the Settlement Agreement between PG&E and the FMIT in *Fort Mojave Indian Tribe v. Dept. of Toxic Substances Control, et al*., Case No. 05CS00437 for a position with the FMIT's AhaMakav Culture Society. The payment of grant monies shall be timed to the awarded tribes' fiscal cycles so that the tribes are not forced to front funds for long periods of time. These positions shall act as cultural resources contacts and project managers for interactions between the tribes, PG&E, and DTSC to ensure coordination for review and comment of subsequent project and/or environmental documents related to the design and implementation of the groundwater remediation project to avoid, reduce, or otherwise mitigate impacts on historical resources, as defined by CEQA. This funding is separate from provisions for tribal monitor positions and shall not be used for routine tribal business or legal counsel. For review and approval, PG&E shall provide DTSC with the names of the selected grant recipients and an annual report that summarizes activities associated with the grant program. Upon the conclusion of the construction phase of the project, the necessity and dollar value of the grant program shall be assessed by PG&E and, with the approval of DTSC, shall either be extended or terminated under the operations and maintenance phase.

Mitigation during the construction phase includes these specific actions:

CUL-1a-12: PG&E shall provide reasonable opportunity, as determined by DTSC, for Interested Tribes to conduct a traditional healing/cleansing ceremony (or ceremonies) before and after the construction phase.

Mitigation during the construction and O&M phases includes these specific actions:

CUL-1a-13: PG&E shall, in communication with Interested Tribes, develop as part of the CMI Workplan, a worker cultural sensitivity education program. The program shall be implemented before commencement of construction and throughout construction and operations as personnel are added. This program may include information provided directly by tribal entities either in written form or on video, in a manner consistent with Appendix C in the existing BLM Programmatic Agreement. The worker cultural sensitivity education program shall ensure that every person working on the project as an employee or contractor, before participating in design or outdoor activities at the project site, is informed regarding:

- the cultural significance of the Topock Cultural Area,
- appropriate behavior to use within the Topock Cultural Area,
- activities that are to be avoided in the Topock Cultural Area, and
- consequences in the event of noncompliance.

~~Consider the Location of Historical Resources During Project Design, Avoid Resources to the Extent Feasible, Communicate with Native American Tribes, Ensure Continued Tribal Access to the Topock Cultural Area~~

- ~~During selection of the final design and location for physical improvements, PG&E shall utilize previously disturbed areas for the placement of new physical improvements to the extent feasible, and shall use previously existing physical improvements, such as wells and other facilities, where appropriate.~~

- ~~PG&E shall also consider the location of Loci A, B and C of the Topock Maze during the design of the physical improvements necessary for the proposed project and avoid direct impacts to the Topock Maze to the fullest extent feasible.~~

- ~~Upon selection of the final design and location for physical improvements, PG&E shall consult with Native American Tribes that attach cultural significance to the Topock Maze and the Topock Cultural Area and develop a plan to ensure tribal access to and use of the project area for religious, spiritual or cultural purposes, to the extent PG&E has the authority to grant such access, consistent with existing laws, regulations and agreements governing property within the project area. The plan may specify that such access may not interfere with the project or create health and safety concerns. Due to health and safety issues, PG&E may exclude the Topock Compressor Station and related facilities from the area for which tribal access and use may be provided.~~

- ~~This mitigation measure shall be implemented, to the extent feasible, in a manner that is consistent with mitigation required through the federal CERCLA process.~~

- ~~Mitigation measures AES-1, AES-2 and NOISE-3 are also applicable to the Topock Cultural Area. Mitigation measures AES-1 and AES-2 would reduce impacts related to aesthetic qualities of the project area, including those views from the Topock Maze Locus B. Mitigation measure NOISE-3 would serve to reduce noise impacts that could be experienced within the Topock Cultural Area and notify tribal members of project activity that would generate new noise.~~

Complete avoidance of the Topock Cultural Area is not feasible given the need to have an active remediation system to clean up the contaminated groundwater plume. Accordingly, even with the implementation of mitigation via use of previously disturbed areas and previously existing physical improvements, avoidance of direct impacts to the Topock Maze, and a plan to ensure reasonable continued tribal access to and use of the project area for religious, spiritual or cultural purposes, the proposed project retains the potential to result in significant impacts on the Topock Cultural Area. Thus this impact is **significant and unavoidable**.

Two resources that have been previously determined eligible for listing on the NRHP are located within the proposed project area. These resources consist of CA-SBR-2910H (remnant segments of Route 66) and CA-SBR-11701 (a prehistoric quarry site with associated hearth and artifacts). In addition CA-SBR-219 (Loci A, B, and C of the Topock Maze) is adjacent to the project area. In addition to being a contributing component of the Topock Cultural Area, this site qualifies as a historical resource under CEQA and could be subject to visual and auditory intrusions that affect its character as a historical resource (see Sections 4.1 and 4.9 of this EIR for further information on visual and noise-related impacts). These NRHP-eligible and listed resources are automatically considered eligible for inclusion in the CRHR and are treated as historical resources under CEQA as described above.

CA-SBR-2910H (Route 66) has significance as an important historical highway associated with westward migration during the Great Depression and post-war years. It could be subject to ground disturbance and out-of-character visual intrusions. Historic and prehistoric archaeological deposits that are spatially and functionally associated with the Maze or Route 66 are likely to contain information that would be important to the understanding of prehistoric lifeways or the use of Route 66.

Additionally, other unevaluated cultural resources identified in Table 4.4-3 may qualify as historical resources under CEQA. While most of the cultural resources listed in Table 4.4-3 have not been formally evaluated for listing on the CRHR, sufficient information exists to conservatively consider that many of them are likely to qualify as historical resources. The variety and density of recorded resources within the project area suggests that they may have the potential to qualify for the CRHR for their associations with significant historical events or because of the information that they can provide in the study of prehistory and history. Thus it is reasonable to conservatively consider that some of the documented but currently unevaluated resources identified within the project area would qualify as historical resources, and they are all treated as such for purposes of the analysis in this EIR.

Project construction, operations, and decommissioning could disturb or alter these historical resources. Disturbance could occur through ground-disturbing work that may be required within the boundaries of these resources and the introduction of intrusive new features to the landscape. Excavation within the boundaries of the archaeological sites would materially alter these historical resources by (1) disrupting the spatial associations that contain information about the prehistoric or historic lifeways represented by those sites or (2) by materially altering in an adverse manner the physical characteristics that convey the resource's historical significance. These impacts would be **potentially significant. (IMPACT CUL-1b)**

Ground disturbing activities associated with the proposed project during construction, operation and maintenance, and decommission would have the potential to cause substantial adverse changes to undocumented and/or buried archaeological resources. This impact could result in **potentially significant** impacts on currently undocumented historical resources. **(IMPACT CUL-1c)**

Mitigation Measure CUL-1b and CUL-1c: *During Design, Construction, O&M, and Decommissioning Consider the Location of Historical Resources and Implement Measures to Avoid Resources to the Extent Feasible.*

The following actions will reduce the potential for impacts on identified historically significant resources (other than the Topock Cultural Area, which is separately addressed in CUL-1a) within the project area. As detailed below, these actions include consideration of the location of historical resources, preparation of a cultural resources study, and preparation of a treatment plan. Monitoring of ground-disturbing activities during project construction will further protect historically significant resources. Protective actions are also described pertaining to the discovery of any previously unidentified potentially significant cultural resources.

Mitigation during the design phase includes these specific actions:

CUL-1b/c-1: PG&E shall consider the locations of the identified historic resources described above (Table 4.4-3) during the design of the physical improvements necessary for the proposed project and avoid, minimize, or mitigate impacts on historical and archaeological resources to the maximum extent feasible, as determined by DTSC. The final design plans for the project will be submitted to DTSC for review and approval.

CUL-1b/c-2: During preparation of the final design, and consistent with CUL-1a-3, PG&E shall retain a Qualified Cultural Resources Consultant to prepare a cultural resources study that assesses the potential for the construction, operations, or decommissioning of specific proposed improvements to result in significant impacts on identified historically significant resources described in Impacts CUL-1b and CUL-1c. This may include a geoarchaeological investigation and/or non-destructive remote-sensing surveys of potentially disturbed areas to determine if a potential exists for buried historical and archaeological resources. "Significant impacts" as used here means the potential for construction to demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR. The study will be submitted to DTSC for review and evaluation to determine if existing mitigation measures are appropriate.

CUL-1b/c-3: If the cultural resources study determines that the construction of physical improvements would result in significant impacts on identified historically significant resources described in Impacts CUL-1b and CUL-1c, and avoidance of the resource is not feasible, PG&E shall prepare a treatment plan that identifies measures to reduce these impacts (see above description of the CIMP) for DTSC's review and approval. The treatment plan shall identify which criteria for listing on the CRHR contribute to the affected resource's significance and which aspects of significance would be materially altered by construction, operations, or decommissioning and shall provide for reasonable efforts to be made to permit the resource to be preserved in place or left in an undisturbed state. Methods of accomplishing this may include capping or covering the

resource with a layer of soil. To the extent that a resource cannot feasibly be preserved in place or left in an undisturbed state, excavation as mitigation shall be restricted to those parts of the resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a historically significant resource if the treatment plan determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource. The plan shall require communication with all Interested Tribes with regard to their perspectives and wishes for the treatment of the resources.

Mitigation during the construction phase includes these specific actions:

CUL-1b/c-4: Consistent with CUL-1a-3a above, PG&E shall retain a Qualified Cultural Resources Consultant to observe ground-disturbing activities and shall be required to request the participation of tribal monitors during those activities, including steps necessary during operations and decommissioning activities to ensure that historically significant resources are avoided to the maximum extent feasible, as determined by DTSC, during actual construction (see the description of the CMI Workplan, above). The Qualified Cultural Resources Consultant shall provide training to construction personnel on the locations of identified resources, values associated with the identified resources, responsibility for reporting suspected historic resources, and procedures for suspension of work in the immediate vicinity of the discovery, and shall use exclusionary fencing, flagging, or other appropriate physical barriers to mark the boundaries of identified resources. The Qualified Cultural Resources Consultant shall invite participation from Interested Tribal members to participate in the training.

In the event that previously unidentified potentially significant cultural resources are discovered during ground-disturbing activities, the Qualified Cultural Resources Consultant shall have the authority to divert or temporarily halt ground-disturbing activities in the area of discovery to allow evaluation of the potentially significant cultural resources. If such discoveries occur on land managed by a federal agency, Stipulation IX (Discoveries) of the Programmatic Agreement shall apply and are deemed adequate by DTSC. If a discovery occurs on other lands within the project area, the Qualified Cultural Resources Consultant shall contact the PG&E and DTSC project managers at the time of discovery and, in consultation with DTSC and tribal monitors, shall evaluate the resource before construction activities will be allowed to resume in the affected area. For significant cultural resources, and before construction activities are allowed to resume in the affected area, the resource(s) shall be recovered with coordination of the tribal monitors and DTSC. Recovery may include a Research Design and/or Data Recovery Program submitted to DTSC for review and approval. The Qualified Cultural Resources Consultant (and tribal monitors) shall determine the amount of material to be recovered for an adequate sample for analysis or data recovery. Any concerns or recommendations regarding the ground-disturbing activities or the handling of cultural resources shall be directed to the Qualified Cultural Resources Consultant or PG&E's site supervisor.

~~Consider the Location of Historical Resources During Project Design, Avoid Resources to the Extent Feasible, Communicate with Native American Tribes, and Prepare and Implement Treatment for Impacted Historical Resources~~

~~The following actions will reduce the potential for impacts to identified historical resources (other than the Topock Cultural Area, which is separately addressed in CUL-1a) within the project area. To the extent feasible, these actions shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process.~~

- ~~PG&E shall consider the locations of the identified historic resources described above during the design of the physical improvements necessary for the proposed project and avoid impacts to historical and archaeological resources to the extent feasible. DTSC shall review the plans for the final design of the~~

project and compare such plans to the location of identified resources to assist in and enforce the avoidance of identified resources to the extent feasible.

- Upon selection of the final design and location for physical improvements, PG&E shall retain a qualified cultural resources consultant to prepare a cultural resources study that assesses the potential for the construction, operations, or decommissioning of proposed improvements to result in significant impacts on identified historical resources described in Impact CUL-1b and CUL-1c. This will include cultural resources survey and evaluation of unsurveyed areas that could be affected by construction as determined by DTSC in consultation with PG&E and BLM. "Significant impacts" as used here means the potential for construction to demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR. DTSC shall review this study.

- If the study determines that the construction of physical improvements would result in significant impacts on identified historical resources described in Impact CUL-1b and CUL-1c, and avoidance of the resource is not feasible, PG&E shall prepare and DTSC shall review a treatment plan that identifies measures to reduce these impacts. The treatment plan shall identify which criteria for listing on the CRHR contribute to the affected resource's significance and which aspects of significance would be materially altered by construction, operations, or decommissioning. However, if avoidance is not feasible, the Plan shall provide for reasonable efforts to be made to permit the resource to be preserved in place or left in an undisturbed state. Methods of accomplishing this may include capping or covering the resource with a layer of soil. To the extent that resource cannot feasibly be preserved in place or not left in an undisturbed state, excavation as mitigation shall be restricted to those parts of resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archaeological resource if the treatment plan determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource. The plan shall require communication and consultation with Native American tribes that attach cultural significance to the Topock Maze and the Topock Cultural Area with regard to their perspectives and wishes for the treatment of the resources.

- PG&E shall retain a qualified cultural resources consultant to observe ground-disturbing activities and shall invite the participation of Native American tribal monitors during those activities, including repairs necessary during operations and decommissioning activities, to ensure that identified historical resources are avoided, to the extent feasible, during actual construction. The cultural resources consultant shall provide training to construction personnel on the locations of identified resources, values associated with the identified resources, responsibility for reporting suspected historic resources, and procedures for suspension of work in the immediate vicinity of the discovery, and shall use exclusionary fencing, flagging, or other appropriate physical barriers to mark the boundaries of identified resources. The cultural resources consultant shall invite Native American tribes to participate in this training.

- PG&E shall retain a qualified cultural resources consultant and shall invite Native American tribal monitors to conduct yearly inspections (or less frequently if agreed upon) identified historical resources and unique archaeological resources to determine if they have been impacted by ongoing operations activity relative to their condition prior to the project. If deterioration caused by ongoing operations is detected, PG&E shall develop and implement a treatment plan to reduce or avoid further degradation.

These measures would reduce but may not completely avoid the potential for significant impacts on identified historical resources identified in Table 4.4-3. While excavations or documentation performed to capture and retrieve the qualities of significance associated with identified other historical resources would diminish these impacts this mitigation may not completely avoid such impacts. For example because archaeological deposits often contain information relevant to archaeological research in the spatial associations of artifacts contained in the deposit, studies and excavations may not completely capture all of this information and thus may not

completely avoid the impact. While documentation of these resources in their current state would capture some of the significance and feeling associated with these resources it would not preserve the status quo but instead would simply record it for posterity. Thus this impact is **potentially significant and unavoidable**.

Most of the cultural resources identified in Table 4.4-3 above have not yet been formally evaluated to determine if they qualify as unique archaeological resources under CEQA. Impacts to unique archaeological resources may be avoided by conducting studies to evaluate known resources and areas that are likely to contain buried or obscured resources. However, the possibility remains that it will not be feasible to avoid ground-disturbing work within the boundaries of unique archaeological resources. The construction of improvements and ground disturbing work performed during ongoing operations may physically destroy archaeological features and artifacts, disrupt the scientific context and spatial patterns of the archaeological resource, or alter the visual appearance that conveys the significance of a unique archaeological resource. Additionally the introduction of new facilities that are inconsistent with the setting of these resources may diminish the significance of unique archaeological resources whose significance is derived in wholly or in part from its aesthetic qualities and historical associations. Thus this impact is **potentially significant. (IMPACT CUL-2)**

Mitigation Measure CUL-2: During Project Design Consider the Location of Unique Archaeological Resources and Avoid Resources to the Maximum extent Feasible

Cultural resources that qualify as unique archaeological sites in the project area would probably also meet one or more of the criteria for historical resources and would be subject to Mitigation Measures CUL-1b/c-2 and CUL-1b/c-3. The mitigation measures under this identified impact are the same as listed for Impact CUL-1b and CUL-1c.

These mitigation measures would reduce the potential for impacts on unique archaeological resources.

~~Consider the Location of Unique Archaeological Resources during Project Design, Avoid Resources to the Extent Feasible, Communicate with Native American Tribes, and Prepare and Implement Treatment for Impacted Resources~~

~~Cultural resources that qualify as unique archaeological sites in the project area would probably also meet one or more of the criteria for historical resources and would be subject to Mitigation Measures CUL-1b and CUL-1c. The following actions will further reduce the potential for impacts on unique archaeological resources. To the extent feasible, these actions shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process.~~

- ~~PG&E shall consider the locations of the unique archeological resources described above during the design of the physical improvements necessary for the proposed project and avoid impacts to those resources to the extent feasible. DTSC shall review the plans for the final design of the project and compare such plans to the location of the resources to assist in and enforce the avoidance of identified resources to the extent feasible.~~

- ~~Upon selection of the final design and location for physical improvements, PG&E shall retain a qualified cultural resources consultant to prepare a cultural resources study that assesses the potential for the construction, operations, or decommissioning of proposed improvements to result in significant impacts on unique archeological resources. "Significant impacts" as used here means the potential for construction to demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR. DTSC shall review this study to ensure avoidance has been implemented to the extent feasible.~~

- ~~If the study determines that the construction of physical improvements would result in significant impacts on unique archeological resources, and avoidance of the resource is not feasible, PG&E shall prepare and DTSC shall review a treatment plan that identifies measures to reduce these impacts. The treatment plan shall identify which criteria for listing on the CRHR contribute to the affected resource's significance and~~

~~which aspects of significance would be materially altered by construction, operations, or decommissioning. However, if avoidance is not feasible, the Plan shall provide for reasonable efforts to be made to permit the resource to be preserved in place or left in an undisturbed state. Methods of accomplishing this may include capping or covering the resource with a layer of soil. To the extent that resource cannot feasibly be preserved in place or not left in an undisturbed state, excavation as mitigation shall be restricted to those parts of resource that would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a unique archaeological resource if the treatment plan determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the resource. The plan shall require communication with Native American tribes that attach cultural significance to the Topock Cultural Area with regard to their perspectives and wishes for the treatment of the resources.~~

- ~~PG&E shall retain a qualified cultural resources consultant and shall invite the participation of Native American tribal monitors to observe ground-disturbing activities and shall invite the participation of Native American tribal monitors, during those activities, including repairs necessary during operations and decommissioning activities, to ensure that identified unique archeological resources are avoided, to the extent feasible, during actual construction. The cultural resources consultant shall provide training to brief construction personnel on the locations of identified resources, values associated with the identified resources, responsibility for reporting suspected unique archeological resources, and procedures for suspension of work in the immediate vicinity of the discovery, and shall use exclusionary fencing, flagging, or other appropriate physical barriers to mark the boundaries of identified resources. The cultural resources consultant shall invite Native American tribes to participate in this training.~~

These measures would reduce but not completely avoid the potential for significant impacts on unique archaeological resources. Because it may be necessary to construct physical improvements in the location of such resources to achieve the project objective the proposed project retains the potential to result in significant impacts on these resources. While avoidance, monitoring and treatment would diminish these impacts this mitigation may not completely avoid such impacts. For example because archaeological deposits often contain information relevant to archaeological research in the spatial associations of artifacts contained in the deposit, studies and excavations may not completely capture all of this information and thus may not completely avoid the impact. While documentation or study of these resources in their current state would capture some of the significance and feeling associated with these resources it would not preserve the status quo but instead would simply record it for posterity. Thus this impact is **potentially significant and unavoidable**.

Ground-disturbing activities would occur during all phases of the proposed project. While none of the approximately 80 documented sites in the project area have been found to contain human remains, these ground-disturbing activities would have the potential to encounter previously undiscovered human remains associated with past uses of the project area. The absence of identified burials and grave goods associated with known cultural resources does not provide a strong indication that such resources do not exist because few of these sites have been systematically excavated. The density of cultural resources in the project area (approximately 80 resources total) instead suggests that there is the potential to encounter human remains during ground-disturbing construction because at least some of the identified resources may contain human remains. The disturbance of these remains could damage such remains. This impact is thus **potentially significant. (IMPACT CUL-4)**

Mitigation Measure CUL-4: With Discovery of Human Remains or Burials Suspend Work, Protect Remains, and Comply with Local, State, and Federal Laws Regarding Discoveries During Ground-Disturbing Activities.

Ground-disturbing activities may disturb as-yet undiscovered human remains or Native American burials and associated grave goods. PG&E shall retain a Qualified Cultural Resource Consultant and request designated tribal monitor(s) to train construction personnel in the identification of human remains so that they may aid in the identification of such resources (see above description of the CIMP). A Qualified Cultural Resource Consultant and tribal monitor(s) shall be in place to adequately oversee all ground-disturbing activities. In the event human

remains are uncovered over the course of project construction, operation and maintenance, and/or decommissioning activities, the following procedures shall be followed to ensure compliance with all applicable local, state, and federal laws.

- The construction contractor shall immediately suspend work within the vicinity of the discovery and determine if the remains discovered are human or nonhuman. This determination shall be made by the Qualified Cultural Resources Consultant, a qualified archaeologist and/or physical anthropologist with expert skill in the identification of human osteological (bone) remains.

- The Qualified Cultural Resources Consultant (and tribal monitor), or construction contractor, shall protect discovered human remains and/or burial goods remaining in the ground from additional disturbance.

- The Qualified Cultural Resources Consultant, archaeologist, or construction site supervisor shall contact the San Bernardino County Coroner, and the PG&E and DTSC project managers immediately. In California, all subsequent action shall conform to the protocols established in the Health and Safety Code and regulations. In Arizona, the Qualified Cultural Resources Consultant or PG&E construction site supervisor will follow Arizona laws and the implementing regulations. Human remains found on federal land would require the notification of the BLM Havasu City field office and compliance with applicable federal laws and regulations, including the Native American Graves Protection and Repatriation Act if the remains are determined to be of Native American origin. The Qualified Cultural Resources Consultant shall coordinate the interaction between Interested Tribes, PG&E, the County, and DTSC to determine proper treatment and disposition of any remains.

- The San Bernardino County Coroner will determine if the remains are of recent origin and if an investigation of the cause of death is required (California Health and Safety Code Section 7050.5). If the coroner determines that the human remains are not Native American and not evidence of a crime, project personnel shall coordinate with the Qualified Cultural Resources Consultant (s) to develop an appropriate treatment plan. This may include contacting the next-of-kin to solicit input on subsequent disposition of the remains. If there is no next-of-kin, or recommendations by the next-of-kin are considered unacceptable by the landowner, the landowner will reinter the remains with appropriate dignity in a location outside the project area and where they would be unlikely to be disturbed in the future.

- In the event that the San Bernardino County Coroner determines that the human remains are Native American and not evidence of a crime, project personnel shall contact the NAHC so that a most likely descendent (MLD) can be identified as required under California Public Resources Code Section 5097.98.

- The MLD (s) shall inspect the area in which the human remains were found and provide treatment recommendations to the landowner and PG&E site manager in accordance with the provisions of PRC Section 5097.98. The treatment may include reburial, scientific removal of the discovered human remains and relinquishment to the MLD(s), nondestructive analysis of human remains and/or other culturally appropriate treatment. If the MLD(s) so requests, the landowner would reinter the remains with the appropriate dignity in a location outside the area of disturbance in a location unlikely to be disturbed in the future.

- To the maximum extent feasible, Mitigation Measure CUL-4 shall be implemented in a manner that is consistent with mitigation required by local, state, and federal requirements.

~~Mitigation Measure CUL-4: Complete Inventory Efforts, Train Construction Personnel and Monitor Ground-Disturbing Construction, Stop Work in the Event of a Discovery of Human Remains, Comply with State Law Regarding Discoveries~~

~~Ground disturbance activities may disturb as-yet undiscovered human remains or Native American burials and associated grave goods. PG&E shall retain a qualified cultural resources consultant and invite designated Native American tribal monitor(s) to train construction personnel in the identification of human remains so that they may~~

~~aid in the identification of such resources. In the unlikely event human remains are uncovered over the course of project construction, operation and maintenance, and/or decommissioning activities, the following procedures shall be followed to ensure compliance with all applicable state and federal laws:~~

- ~~The construction contractor shall immediately suspend work within the vicinity of the discovery and determine if the remains discovered are human or nonhuman. This determination shall be made by a qualified archaeologist with skill in the identification of human osteological (bone) remains.~~

- ~~The cultural resources monitor or construction contract shall protect discovered human remains and/or burial goods remaining in the ground from additional disturbance.~~

- ~~The archaeologist or construction contractor shall contact the San Bernardino County Coroner and PG&E project personnel immediately. In Arizona, the archaeologist and construction contractor will follow Arizona laws and implementing regulations. Human remains found on federal land would require the notification of the BLM Havasu City field office and compliance with applicable federal laws and regulations, including the Native American Graves Protection and Repatriation Act.~~

- ~~The San Bernardino County Coroner will make determine if the remains are of recent origin and if a investigation of the cause of death is required (California Health and Safety Code Section 7050.5). If the coroner determines that the human remains are not Native American and not evidence of a crime, project personnel shall coordinate with a qualified archaeologist(s) to develop an appropriate treatment plan. This may include contacting the next-of-kin to solicit input on subsequent disposition of the remains. If there is no next-of-kin, or recommendations by the next-of-kin are considered unacceptable by the landowner, the landowner will reinter the remains with appropriate dignity in a location outside the project area and where they would be unlikely to be disturbed in the future.~~

- ~~In the event that the San Bernardino County Coroner determines that the human remains are Native American and not evidence of a crime, project personnel shall contact the NAHC so that a most likely descendent (MLD) can be identified as required under California Public Resources Code Section 5097.98.~~

- ~~The MLDs shall inspect the area in which the human remains were found and provide treatment recommendations to the landowner and project personnel in accordance with the provisions of California Public Resources Code Section 5097.98. The treatment may include reburial, scientific removal of the discovered human remains and relinquishment to the MLD, nondestructive analysis of human remains and/or other culturally appropriate treatment. If the MLD so requests, the landowner would reinter the remains with the appropriate dignity in a location outside the area of disturbance in a location unlikely to be disturbed in the future.~~

- ~~To the extent feasible, this mitigation measure shall be implemented in a manner that is consistent with mitigation required through the federal CERCLA process.~~

Despite a mitigation plan that includes compliance with applicable state laws and regulations, and the involvement of qualified archaeologists, the NAHC, and MLDs, when appropriate, disturbance of human remains, including possible Native American burials and grave goods, to the extent that any discovered human remains and grave goods are removed from the site, this would result in an unavoidable impact to the resource. Therefore, impacts on unknown human remains would remain **significant and unavoidable**.

5.1.2 NOISE

Implementation of the proposed project would result in the exposure of sensitive receptors to groundborne noise and vibration levels that exceed the applicable standards of the San Bernardino County Development Code

(83.01.090) and the Mohave County Zoning Ordinance (Table 4.9-9). These groundborne noise and vibration levels could result in annoyance or architectural/structural damage. As a result, this impact would be **potentially significant**. **(Impact NOISE-1)**

Mitigation Measure Noise-1: Short-Term Groundborne Noise and Vibration Levels Caused by Construction Activities near Sensitive Receptors.

- Construct new wells as far from vibration-sensitive receptors as feasible.
- Avoid constructing wells during the nighttime hours when in proximity to vibration-sensitive uses.
- A disturbance coordinator shall be designated by the project applicant. The disturbance coordinator will post contact information in a conspicuous location near the entrance so that it is clearly visible to nearby receivers most likely to be disturbed. The coordinator will manage complaints resulting from the construction vibration. Reoccurring disturbances will be evaluated by a qualified acoustical consultant retained by the project applicant to ensure compliance with applicable standards. The disturbance coordinator shall contact nearby vibration-sensitive receptors, advising them of the construction schedule.

Predicted vibration levels are difficult to determine for comparison with applicable vibration standards under the assumptions used for vibration analysis; however, the potential for exceeding applicable standards still exists, making this impact **potentially significant and unavoidable**. Vibration levels from the construction of additional wells may generate an annoyance or cause sleep disturbance dependent upon the distance between receptor and the location of the well construction.

Implementation of the proposed project could result in future noise that could expose the Topock Cultural Area (a place of worship for Native Americans) to levels that exceed the County's standards or would conflict with Native American values associated with this resource. As noted in Section 4.4, "Cultural Resources" of this EIR, the Topock Cultural Area is considered highly sensitive, and changes in the noise environment would adversely affect Native American participants.

Future construction, operations and maintenance, and decommissioning activities associated with the proposed project could increase noise levels within the Topock Cultural Area. There are intervening topographic features (mesas) in the project area that could shield noise emanating from the proposed activities at certain locations within the Topock Cultural Area. However, locations of future project-related activities are not specifically known at this time and it is not feasible to calculate noise levels attributable to the proposed project throughout the project area. Without knowing the specific locations of each noise generating remediation activity, there is no assurance that topographic features would intervene and result in adequate shielding of sensitive receptors from project noise impacts. The potential for future noise to conflict with the values associated with the Topock Cultural Area by Native American participants would still exist and it is expected that any introduction of new noise sources would be perceived as a significant impact by some Native Americans. Meteorological conditions (wind direction) would also affect the noise levels experienced by Native American participants. As a result, this impact would be **potentially significant**. **(Impact NOISE-3)**

Mitigation Measure NOISE–3: Land Use Compatibility of Future Project Noise Levels with Places of Worship and the Topock Cultural Area.

Provided that the proposed project would be required to achieve the normally acceptable exterior noise level standard for places of worship, the following mitigation measure shall be incorporated in the project design:

- Implement all of the mitigation measures outlined for Impact NOISE-1 and Impact NOISE-2;

- Upon completion of detailed project design, the determination of remediation activities and the schedule established to achieve these activities shall be communicated to Native American tribes. PG&E shall maintain a liaison with requesting Tribes to alert them to project activities that would generate new noise in the Topock Cultural Area on at least an annual basis.

Although Mitigation Measure NOISE-3 would achieve the normally acceptable exterior noise level standard for places of worship, the unique values associated with the Topock Cultural Area cannot be reconciled with additional project-related noise. The impact would be **significant and unavoidable** after implementation of the measures detailed above.

5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD BE CAUSED BY THE PROPOSED PROJECT

Section 21100(b)(2)(B) of the Public Resources Code and Section 15126.2(c) of the CEQA Guidelines require that an EIR analyze the extent to which the proposed project's primary and secondary effects would affect the environment and commit nonrenewable resources to uses that future generations would not be able to reverse. "Significant irreversible environmental changes" include the use of nonrenewable natural resources during the initial and continued phases of the project, should this use result in the unavailability of these resources in the future. Primary impacts and, particularly, secondary impacts generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with projects. Irretrievable commitments of these resources are required to be evaluated in an EIR to ensure that such consumption is justified.

The proposed project would result in the irreversible and irretrievable commitment of energy and ~~material~~ natural resources during project construction and maintenance, including the following:

- construction materials, including such resources as soil and rocks; and

- energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project investigative, construction, maintenance, and decommissioning-related activities.

The use of these nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region. Construction activities would not result in inefficient use of energy or natural resources. Construction contractors selected would use best available engineering techniques, construction and design practices, and equipment operating procedures. The relatively small commitment of land to project uses is considered less than significant when compared to other types of development, such as urban development, in a local and regional context. Operation and maintenance of the proposed project is anticipated to last for 29 years, (but could occur for up to 110 years) and therefore the use of resources is considered temporary for the purposes of this discussion.

Implementation of the project would eliminate the potential for the contaminated groundwater plume to come into contact with surface waters of the Colorado River or users of groundwater (because of institutional controls). In addition, the proposed project would not result in solid waste byproducts (as opposed to alternatives that include ex situ treatment (treatment plant) and therefore environmental accidents associated with the construction and operation of the proposed project are not considered to be significant.

5.3 ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

As required by Section 15128 of the CEQA Guidelines, an EIR shall contain a brief discussion stating the reasons that various possible significant effects of a project were determined not be significant and were therefore not

discussed in detail in the EIR. In accordance with the CEQA Guidelines, this section discusses the following issue areas that were found to have no significant impacts with implementation of the proposed project.

5.3.1 AGRICULTURE RESOURCES

This discussion addresses Appendix G Checklist, "Agriculture Resources." which considers whether the proposed project would convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program, to nonagricultural use, conflict with existing zoning for agricultural use or Williamson Act contract, or involve other changes in the existing environment that could result in a conversion of Farmland to nonagricultural use.

1) The project area is characterized by arid conditions and high temperatures. While there are agricultural uses north of the project area and Needles along the Colorado River, the landscape in the project area consists of considerably eroded small to moderately sized terraces with very steep slopes. These conditions are not conducive to agriculture purposes. A review of Farmland Mapping and Monitoring Program 2006 maps indicates that no farmland designated as Prime Farmland, Unique Farmland, or Farmland of Local Importance are within the project area or in the vicinity of the project (California Department of Conservation 2006). No lands under a Williamson Act contract are on or near the project site (California Department of Conservation 2008). A review of aerial photographs from 1936 through 2007 show no historic or current agricultural uses either on or near the project site (CH2M Hill 2007:3-95 through 3-113). Because no agricultural resources have been identified within the vicinity of the project, no direct or indirect impacts on agricultural resources would occur from implementation of the proposed project. Water that is used to irrigate crops in the areas outside the project area could come from the Colorado River or nearby wells. As described in Section 4.12, "Water Supply," the proposed project would not result in consumptive use of groundwater supplies because all water extracted for the remediation effort would be reinjected into the supply, and no interruptions with existing water delivery or supply are likely.

5.3.2 MINERAL RESOURCES

This discussion addresses Appendix G Checklist, "Mineral Resources." The checklist questions ask whether the project would result in the loss of availability of a known mineral resource of value to the region and the residents of the state or result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan.

The California Surface and Mining Act of 1975 required the classification of land into Mineral Resource Zones (MRZs) according to the land's known or inferred potential to contain mineral resources. The portion of the project area that is within California has been classified as MRZ-4. MRZ-4 is defined as areas where geologic information does not rule out either the presence or absence of mineral resources. MRZ-4 is commonly applied to areas of unknown mineral potential that occur within a broader favorable terrain known to host economic mineral deposits (DOC 1985).

There are three general categories of geologic mineral resources that may be present in the project area including:

1. Construction Mineral Materials: Sand, gravel, and crushed rock (San Diego County 2007:2). The federal land management agencies including the U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Bureau of Reclamation (Reclamation) refer to these as "saleable mineral resources."

2. Metallic and Rare Minerals: Gold, silver, platinum, iron, copper, lead, zinc, gemstones and semiprecious materials (San Diego County 2007:4). The federal land management agencies refer to these as "locatable mineral resources."

3. Leasable Mineral Resources: Oil, coal, sodium, potassium and geothermal resources. The federal land management agencies refer to these as "leasable mineral resources" (BLM 2008).

It is possible that any of the three resource categories listed above may be present in the project area because the portion of the project area that is located in California is classified as MRZ-4. The classification of MRZ-4 does not rule out either the presence or absence of mineral resources and the classification is also commonly applied to areas that occur within a broader favorable terrain known to host economic mineral deposits (DOC 1985). Metallic, rare, and leasable minerals may also be present, but their existence in the project area is unknown at this time. The project site's geologic units/site stratigraphy and the physical characteristics and setting of the project area, as detailed above, indicate that construction mineral materials, including sand and gravel, are present in the project area.

Although there is the potential for some mineral resources to exist in and around the project area, the proposed project would not significantly reduce the availability of known mineral resources. There are no mining claims on or immediately adjacent to the project site. In addition, the majority of federal lands in the project area are closed to mineral entry (i.e., mining claims) under the General Mining Act of 1872, as amended (BLM 2007:44). Therefore, no impact would occur related to loss of availability of a known mineral resource, either of regional or local importance.

5.3.3 POPULATION AND HOUSING

This discussion addresses Appendix G Checklist, "Population and Housing," impact questions (b) and (c). The checklist questions ask whether the project would displace substantial numbers of existing housing, necessitating construction of new housing elsewhere or displace substantial numbers of people, necessitating construction of replacement housing elsewhere. For a discussion of checklist item (a) regarding the potential for inducement of substantial population growth, refer to Section 5.4, "Growth Inducement."

The proposed project does not involve displacement of existing housing or people. The maximum number of new full-time employees and new residents that could result from construction, operation, and decommissioning of the proposed project is estimated at 295, 88, and 48, respectively. The construction phase, which would result in the most employment, would still only represent 0.012% of growth in the region. It is expected that the majority of these new employees would be from the local employment base. Based on the existing labor pool, there would be no need for new housing to be constructed as a result of the project. No impact would occur regarding these issues.

5.3.4 PUBLIC SERVICES

This discussion addresses Appendix G Checklist, "Public Services." The checklist questions ask whether the project would result in substantial adverse physical impacts associated with the provision of or need for new or altered government facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks or other public facilities.

The maximum number of new full-time employees and new residents that could result from construction, operation, and decommissioning of the proposed project is estimated at 295, 88, and 48, respectively. The construction phase, which would result in the most employment, would still only represent 0.012% of growth in the region. Existing public services would be able to accommodate this slight increase in population while still maintaining acceptable service ratios, response times, or other performance objectives. No new or expanded public services would be required with implementation of the proposed project. Therefore, no impact would occur related to fire protection, police protection, schools, parks or other public facilities.

5.3.5 RECREATION

This discussion addresses Appendix G Checklist, "Recreation." The checklist questions ask if the project would increase the use of existing recreational facilities such that substantial physical deterioration of the facility would

occur or be accelerated or include construction of recreational facilities which might have an adverse physical effect on the environment. The maximum number of new full-time employees that could occur with implementation of any of the proposed project would be 40. The addition of up to 40 new residents would not be considered a substantial change in population. Existing recreational facilities would accommodate this slight increase without causing substantial physical deterioration. The project does not propose construction of any new recreational facilities. In addition, operation of the proposed project would not introduce facilities that would preclude existing recreational uses that occur on the Colorado River or the National Wildlife Refuge, which includes boating, wildlife observation and photography, education and interpretation, hunting, and fishing. Therefore, no impact would occur related to recreation.

5.4 GROWTH INDUCEMENT

As required by CEQA, this EIR must discuss ways in which the project could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding area (CEQA Guidelines, Section 15126.2[d]). Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place in the absence of the proposed project. A project can be determined to have a growth-inducing impact if it directly or indirectly causes economic or population expansion through the removal of obstacles to growth or encourages or facilitates other activities that could significantly affect the environment; actions that are sometimes referred to as "growth accommodating."

The proposed project is located in eastern San Bernardino County, California. The U.S. Census Bureau indicates that the population of San Bernardino County grew from 1,709,434 persons in 2000 to 2,007,800 persons in 2007 (U.S. Census Bureau 2008). This represents an increase of 298,366 persons, or a 17% increase. The city of Needles is the closest urban community to the project area that is located in California. Population data specific to Needles shows the community grew from 4,830 persons in 2000 to 5,290 persons in 2007 (U.S. Census Bureau 2008). This represents an increase of 460 persons, or almost a 10% increase. Based on Southern California Association of Governments (SCAG) projections for San Bernardino County, population growth for the County is expected to continue at a rapid pace, increasing by almost 60% to over 2,397,700 by the year 2020 (San Bernardino County 2007:4A-1).

The proposed project would implement remediation efforts to clean up contaminated groundwater at and in the vicinity of the compressor station. The proposed project would not result in the creation of new residences on or adjacent to the project site. The anticipated employment, both direct and indirect, generated by the proposed project is evaluated in detail in Section 9.2, "Socioeconomics." The estimated total number of new residents as a result of the construction of the proposed project is approximately 590, which would likely be distributed throughout five counties included in the region of influence (ROI). This increase would represent approximately 0.012% growth for the region. The estimated total number of new residents to the ROI as a result of the operations and maintenance of the proposed project is approximately 88, which would likely be distributed throughout the five counties included in the ROI. This increase would represent approximately 0.0018% growth for the region. The estimated total number of new residents to the ROI as a result of the operations and maintenance of the proposed project is approximately 148, which would likely be distributed throughout the five counties included in the ROI. This increase would represent approximately 0.003% growth for the region. The growth associated with all phases of the proposed project is anticipated to be relatively small in comparison with projected growth for the region and would not be significant.

The project site is currently served by existing roadways, utilities, and public services. While there is the chance that the proposed project could result in off-site infrastructure or service expansions related to electrical systems, which could serve other future development, due to the relatively isolated nature of the area, other limiting factors to development, and the projected growth forecasts, this additional electrical supply is not anticipated to result in substantial indirect growth, if any. For these reasons, implementation of the proposed project would not result in primary or secondary environmental effects related to additional growth.

6 CUMULATIVE IMPACTS

6 CUMULATIVE IMPACTS

6.1 INTRODUCTION TO THE CUMULATIVE ANALYSIS

CEQA Guidelines Section 15130 requires that an EIR discuss cumulative impacts of a project and determine if the project's incremental effect is "cumulatively considerable." The definition of cumulatively considerable is provided in Section 15065(a) (3):

> "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

According to Section 15130(b) of the CEQA Guidelines:

> [t]he discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

For purposes of this EIR, the project would have a significant cumulative effect if:

- the cumulative effects of other past, current, and probable future projects without the project are not significant and the project's incremental impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or
- the cumulative effects of other past, current, and probable future projects without the project are already significant and the project contributes measurably to the effect. The standards used herein to determine measurability are that either the impact must be noticeable or must exceed an established threshold of significance.

This EIR identifies potentially significant environmental impacts associated with implementation of the proposed project, which are addressed by resource topic in Chapter 4. These issues, and others that could contribute considerably to cumulatively significant effects, are discussed below in the context of cumulative development.

6.2 GEOGRAPHIC SCOPE

The geographic area that could be affected by the proposed project varies depending on the type of environmental resource being considered. When the effects of the project are considered in combination with those other past, present, and reasonably foreseeable future projects to identify cumulative impacts, the other projects that are considered may also vary depending on the type of environmental effects being assessed. The general geographic area associated with different environmental effects of the project defines the boundaries of the area used for compiling the list of projects considered in the cumulative impact analysis. Each section of this EIR considers the specific geographic segment of this growth that is directly related to the individual topic addressed within that section. For example, the analysis of some air quality impacts is based on regional-scale growth; thus a regional perspective must be used to assess cumulative air quality impacts. In the case of aesthetic impacts, given the localized impact area of concern, a smaller more localized area surrounding the immediate project area, as well as a community scale that encompasses the larger community within which the proposed project is located, would be appropriate for consideration. Table 6-1 presents the geographic scales associated with the different resources addressed in this DEIR analysis.

Table 6-1 Geographic Scope of Cumulative Impacts	
Resource Issue	Geographic Scale of Impacts
Aesthetics	Local and community scales
Air Quality	Local (carbon monoxide, particulate matter, air toxics) Air basin/regional (ozone and particulate matter) Global (greenhouse gases)
Biological Resources	Local scale and areas within the same watershed
Cultural Resources	Archaeological survey area (local scale) Topock Cultural Area (local scales) Lower Colorado River Valley (regional scale)
Geology and Soils	Local scale
Hazardous Materials	Local and community scales
Hydrology and Water Quality	Local scale and downstream areas within the same watershed and aquifer
Land Use and Planning	Local scale
Noise	Local scale
Transportation	Regional and local scales
Utilities and Service Systems	Regional and community scales
Water Supply	Regional and local scales
Source: Data compiled by AECOM in 2009	

6.3 RELATED PROJECTS

The CEQA Guidelines Section 15130 provides that ~~allow~~ the following elements are necessary to an adequate discussion of significant cumulative impacts: ~~for the use of two alternative methods to determine the scope of related projects for the cumulative impact analysis:~~

- List Method—A list of past, present, and probable ~~reasonably anticipated~~ future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or.

- Regional Growth Projections Method—A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which ~~that~~ described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency. ~~is designed to evaluate regional or area-wide conditions (CEQA Guidelines Section 15130).~~

For the purpose of this EIR, both approaches are used. This is due to the localized nature and specific land use of the proposed project, while also considering that the project site is located in an area that has and will continue to experience some regional growth. This method allows for a thorough, project-based cumulative analysis within the defined geographic area of the proposed project. However, certain issues, which extend far beyond the project vicinity (air quality, global climate change), also rely on projections.

6.3.1 REGIONAL GROWTH PROJECTIONS

The proposed project is located within a region (San Bernardino County and neighboring Mohave County, Arizona) that has experienced historical and recent growth, and is also projected to experience population increases in the future. Table 6-2 below shows growth trends in the two counties and the cities of Needles, California, and Lake Havasu City, Arizona.

Table 6-2
Regional Growth Projections

Jurisdiction	Year				Percent Change (2000-2030)
	2000	2010	2020	2030	
California					
San Bernardino County, California[1]	1,721,942	2,177,596	2,581,371	2,958,939	72
Unincorporated San Bernardino County, California[2]	NA	346,523	408,654	462,447	33 (2010-2030)
City of Needles, California	4,830[3]	5,658[2]	5,775[2]	5,819[2]	20
Arizona					
Mohave County, Arizona	155,032[3]	221,443[4]	281,668[4]	330,581[4]	113
Lake Havasu City, Arizona	41,938[3]	65,073[4]	86,053[4]	103,093[4]	146

Sources:
[1] California Department of Finance 2007
[2] SCAG 2008
[3] U.S. Census Bureau 2000
[4] Arizona Department of Commerce ~~Department~~ 2006

This type of regional and localized growth has the potential to result in numerous environmental issues such as traffic congestion, air quality degradation, biological habitat loss, water quality degradation, and other environmental changes. This cumulative analysis considers the regional growth trends and the more specific individual projects that are discussed below.

6.3.2 LIST OF PROJECTS IN THE VICINITY

A summary of the projects identified at or within the general vicinity of the compressor station is provided in Table 6-3 and shown in Exhibit 6-1. This is not intended to be an all-inclusive list of projects in the region, but rather a list of projects in the vicinity of the compressor station that have some relation to the setting conditions of the project and are: (1) completed, (2) currently under construction or implementation or beginning construction or implementation, (3) proposed and under environmental review, or (4) reasonably foreseeable. The proposed project is located near the Colorado River, thus projects associated with federal agencies with interests along the river were considered as part of this analysis and included on the project list. While the project site is located in an unincorporated area of the County of San Bernardino, it is in also in the general vicinity of the City of Needles, California; Mohave County, Arizona; and Lake Havasu City, Arizona. For this reason, projects in each of the aforementioned jurisdictions are included in Table 6-3 as well. This analysis is based on information obtained from the U.S. Bureau of Reclamation (Reclamation); U.S. Bureau of Land Management (BLM); U.S. Fish and Wildlife Service (USFWS); the County of San Bernardino and the City of Needles, California; Mohave County and Lake Havasu City, Arizona; and PG&E. The Metropolitan Water District of Southern California (MWD) was

contacted for input on any potential MWD related projects to include in this DEIR. MWD indicated that no MWD projects are located in the vicinity of the project area (Koch, pers. comm. 2010).

The existing infrastructure within the project area, including roads, bridges, I-40, railroads, utilities , etc. are not included in the Table 6-3, since all of these past projects in the vicinity of the proposed project are part of the baseline/existing conditions that are described throughout Chapter 4 of this DEIR. Likewise, the construction of the marinas in California and Arizona and nearby industrial facilities, such as the other operators of the six natural gas transmission lines, in the vicinity of the project area are part of the existing conditions of this DEIR.

Table 6-3
List of Projects Located at or within the Vicinity of the Proposed Project

Exhibit 6-1 Map Key	Project Name	Description of Project	Size (Acreage) or Extent	Jurisdiction/ Land Owner	Approximate Distance from Proposed Project (miles)	Status
1. PG&E: Projects at the Compressor Station						
1A	Major Plant Refurbishment	Substantial replacement of and/or modernization of major plant equipment	Within the compressor station footprint	PG&E	On-site	Potential future project
1B	Site Improvement Projects	Minor annual site improvements based on available budget	Within the compressor station footprint and surrounding PG&E facilities	PG&E	On-site	Potential future project
1C	CRMP for Groundwater Extraction and Treatment System	Management plan for cultural resources during remediation activities	Immediate vicinity of the compressor station	PG&E	On-site	Ongoing
1D	Soil Investigation and Remediation	Investigation and remediation of contaminated soils	Immediate vicinity of the compressor station	PG&E	On-site	Potential future project
1E	AOC 4 (Debris Ravine)	Investigation and remediation of contaminated soils	Immediate vicinity of the compressor station	PG&E/DOI	On-site	Initial investigation conducted and potential future project
1F	Upland In situ Pilot Test, Aquifer Testing, Groundwater Well Maintenance and Well Decommissioning	Three work plans to address investigation and remediation of contaminated groundwater	Immediate vicinity of the compressor station	PG&E	On-site	Past project
1G	Site Work Plan for Additional Groundwater Characterization Underneath the Colorado River	Provides measurable data with respect to the location of the contaminated groundwater plume and to confirm effectiveness of an IM	Immediate vicinity of the compressor station	PG&E	On-site	Past project

Table 6-3
List of Projects Located at or within the Vicinity of the Proposed Project

Exhibit 6-1 Map Key	Project Name	Description of Project	Size (Acreage) or Extent	Jurisdiction/ Land Owner	Approximate Distance from Proposed Project (miles)	Status
1H	In situ Hexavalent Chromium Reduction Pilot Test Work Plan	Describes field activities for pilot tests to be conducted to evaluate in situ technologies	Immediate vicinity of the compressor station	PG&E	On-site	Past project
1I	Pore Water and Seepage Study Work Plan	Assesses chromium concentrations during seasonal low river stands and assess geotechnical conditions below the Colorado River	Immediate vicinity of the compressor station Colorado River	PG&E	On-site Less than 1 mile	Past project
1J	Installation of Conveyance Piping and Power Supply for Extraction Well PE-1	Provides piping and electricity to Extraction Well PE-1	Immediate vicinity of the compressor station	PG&E	On-site	Past project
1K	Interim Measures 1 and 2 Emergency Groundwater Extraction and Management	Extraction was required as part of IM-1 and was superseded by IM-2, which floodplain extraction and off-site disposal.	Immediate vicinity of the compressor station	PG&E	On-site extraction/off-site disposal	Past project
1L	Interim Measures 3 Emergency Groundwater Extraction and Management	Provides extraction rate of 130 gallons per minute at TW-2 extraction well during month of highest groundwater discharge rates	Immediate vicinity of the compressor station	PG&E	On-site	Past project
~~1M~~	~~East Ravine/TCS Hydrogeologic Investigation~~	~~Provides plume delineation and characterization of groundwater conditions in alluvium and bedrock.~~	~~On the TCS property and in ravine to the east~~	~~PG&E~~	~~On-site~~	~~Past and potential future project~~
1N	Arizona Drilling and Hydrogeologic Characterization Program	Provides characterization of groundwater conditions on the east side of the River (in Arizona)	On the AZ side of the river near Topock, AZ	PG&E	On-site Across the River	Past Project
1O	Pilot Study for well TW-1 on the Compressor Station	Installation of an extraction well on PG&E property to determine hydraulic influence of extraction to the Cr(VI) plume	Immediate vicinity of the compressor station	PG&E	On-site	Past Project

Table 6-3
List of Projects Located at or within the Vicinity of the Proposed Project

Exhibit 6-1 Map Key	Project Name	Description of Project	Size (Acreage) or Extent	Jurisdiction/ Land Owner	Approximate Distance from Proposed Project (miles)	Status
2. U.S. Bureau of Reclamation						
2A	Lower Colorado River Multi-Species Conservation Program	Program to conserve and work toward recovery of endangered species and protect and maintain habitat along the Colorado River	Extends along Colorado River from Lake Meade to Southerly International Border with Mexico	Multiple federal agencies	Less than 1 mile	Ongoing
2B	Interim Guidelines for Lower Basin Shortages and Coordinated Operations	Guidelines to address operations at Lakes Powell and Mead during drought and low reservoir conditions	Affects the Colorado River from Lake Powell to Southerly International Border with Mexico	U.S. Bureau of Reclamation	Less than 1 mile	Ongoing
2C	Quarry Operations	Evaluation of nine operating quarry sites, reopening 5 other sites, and establishing two new sites to support projects along Colorado River	Bat Cave No. 1: 40 acres	U.S. Bureau of Reclamation/Bureau of Land Management	Less than 1 mile	Ongoing
3. U.S. Fish and Wildlife Service						
3A	Lower Colorado River National Wildlife Refuges Comprehensive Management Plan	Management plan for refuges along Lower Colorado River, including Havasu National Wildlife Refuge (HNWR)	HNWR: 30 river miles (300 miles of shoreline) between Needles, CA and Lake Havasu City	U.S. Fish and Wildlife Service	Less than 1 mile	Ongoing
3B	Topock Marsh Water Infrastructure Improvement Project on the Havasu National Wildlife Refuge	Replacement and rehabilitation of the HNWR main water delivery system for the Topock Marsh unit	Approximately 63 acres	U.S. Fish and Wildlife Service	Less than 1 mile	Ongoing
4. Arizona Department of Transportation						
4A	Needle Mountain Rest Area Improvements (Interstate 40)	Improvements to an existing highway rest area	To be determined	ADOT	Approximately 3 miles	Proposed
4B	State Route 95 Passing Lanes	New passing/climbing lanes	To be determined	ADOT	Approximately 11 miles	Proposed
5. San Bernardino County						
5A	Moabi Regional Park Improvements	Construction utility hookups, and recreational vehicle spaces	To be determined	San Bernardino County	1 mile	Ongoing

Table 6-3
List of Projects Located at or within the Vicinity of the Proposed Project

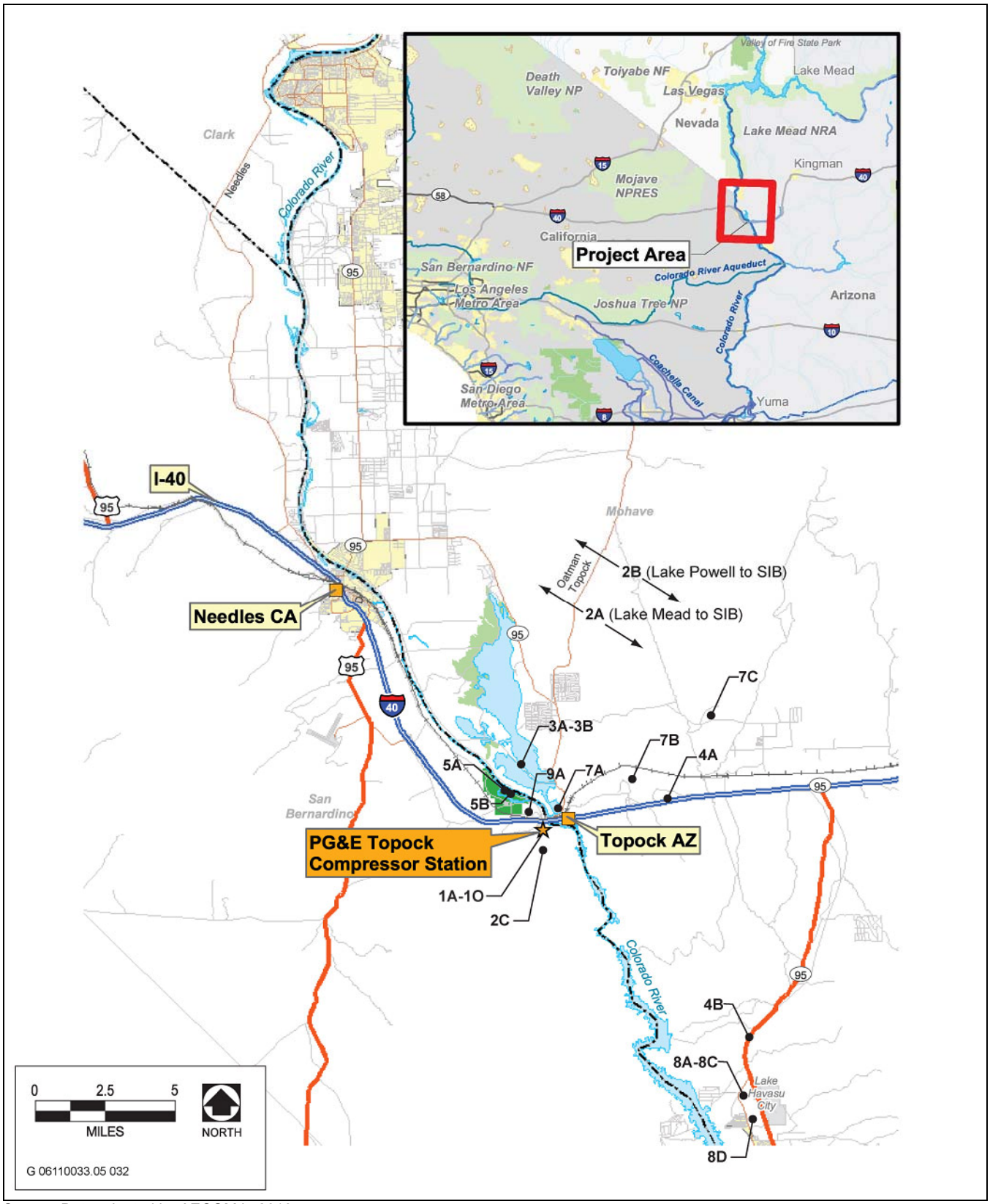
Exhibit 6-1 Map Key	Project Name	Description of Project	Size (Acreage) or Extent	Jurisdiction/ Land Owner	Approximate Distance from Proposed Project (miles)	Status
5B	Pirate Cove Resort	Resort with condominiums, camping areas, commercial development, and a 300-slip marina.	To be determined	San Bernardino County	Less than 1.5 miles of the station	Approved and constructed Ongoing
6. City of Needles, CA						
6A	Holiday Inn	Hotel	46,209 sq. ft. (3 stories)	City of Needles	10 miles	Approved and set to begin construction
6B	Solar Project	Solar energy facility	80 acres	City of Needles	10 miles	Ongoing
6C	Social Security Building	Office building	6,596 sq. ft.	City of Needles	10 miles	Approved and constructed
7. Mohave County						
7A	Topock Marina Improvements	~~Expansion of recreational vehicle spaces~~ Hotel/Restaurant	Approximately ~~20~~ 5.6 acres	Mohave County	Less than 1 mile	~~Proposal not yet formalized~~ Site plan submitted in August 2010
7B	Unnamed 80-acre residential subdivision	Residential subdivision and wastewater treatment plant	80 acres	Mohave County	Approximately 2 miles	Preliminary plat submitted
7C	Sterling	Master planned community pending re-evaluation as a solar power generation site	Approximately 10,000 acres	Mohave County	Approximately 5 miles	Approved in 1999, but not constructed
8. Lake Havasu City						
8A	Airport Business Park	Light industrial business park development	Approximately 80 acres	Lake Havasu City	Approximately 14 miles	Approved. Grading and infrastructure have been completed for Phase 1. Remaining phases will need to be zoned.
8B	Auto Mall	Commercial and retail auto mall development	Approximately 37 acres	Lake Havasu City	Approximately 14 miles	Approved. Two of 12 parcels have been developed.

Table 6-3
List of Projects Located at or within the Vicinity of the Proposed Project

Exhibit 6-1 Map Key	Project Name	Description of Project	Size (Acreage) or Extent	Jurisdiction/ Land Owner	Approximate Distance from Proposed Project (miles)	Status
8C	Shopping Mall	Commercial and retail shopping mall development	Approximately 200 acres	Lake Havasu City	Approximately 14 miles	Approved. Majority of project site has been constructed. Several small out-parcels remain undeveloped.
9. U.S. Bureau of Land Management						
9A	Cathodic Protection System	Installation of cathodic protection system for a gas pipeline by Southern California Gas	Approximately 235 feet	U.S. Bureau of Land Management	Approximately 2,000 feet	Potential future project

Sources: Provided by U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Department of Transportation, City of Needles Planning Department, City of Lake Havasu Planning Department, San Bernardino County , CA, Mohave County, AZ, and U.S. Bureau of Land Management

The following briefly describes each of the projects that were considered in this DEIR as part of the cumulative baseline used in conducting the cumulative impacts analysis. PG&E activities at the compressor station are described as a part of the cumulative baseline, followed by a description of activities by other parties.



Source: Data adapted by AECOM in 2010

Approximate Location of Cumulative Projects **Exhibit 6-1**

6.3.2.1 PG&E TOPOCK COMPRESSOR STATION

Major Plant Refurbishment (1A)

Since operation of the compressor station began in 1951, periodic (approximately every 5 years) reviews of the condition of the major plant equipment are conducted by PG&E, in order to determine if improvements or refurbishments are needed. These activities could include substantial replacement and/or modernization of major equipment at the compressor station. According to PG&E, the most recent review was conducted approximately 3 years ago and the preliminary recommendation from the review was that a major refurbishment was considered feasible and may be necessary to comply with anticipated changes in the air regulations. While the refurbishment at the compressor station is still in the planning stages, it is anticipated to be completed within the existing plant footprint and projected to occur after 2012.

Site Improvement Projects (1B)

PG&E staff regularly develops an annual "wish list" of site improvement projects involving on-site features such as roads, drainage systems, and equipment improvements. These projects are implemented based on the availability of funding and the priority assigned to the projects. The projects are limited to the existing footprint of the PG&E facilities and do not involve new facilities or the expansion of plant operations or capabilities.

Cultural Resources Management Plan for Topock Compressor Station Expanded Groundwater Extraction and Treatment System (1C)

A 2004 memorandum of agreement between the Bureau of Land Management (BLM) and the California State Historic Preservation Office (SHPO) required PG&E to develop and implement a cultural resources management plan (CRMP) for the IM-3 project. Through an approved CRMP, the BLM can require consideration and appropriate management of effects on historic properties throughout the term of the project.

The CRMP has been developed in response to that requirement. It describes for PG&E, project officials, the BLM as lead federal agency, DTSC as project lead, and the SHPO, the measures that will be taken to avoid or minimize harm to significant cultural resources. It includes a plan for identifying, evaluating, and managing cultural resources within an expanded area of potential effect (APE) of 1,815 acres and describes various treatment measures designed to address effects on historic properties that may result from the groundwater extraction and treatment system remediation measures.

An important element of the CRMP is the transportation management plan (TMP). The TMP analyzes the expected amount and types of road traffic and its expected effects on segments of Historic Route 66, an important historic property eligible for listing on the National Register of Historic Places. The TMP also specifies protective measures to control the amount of vehicular traffic on the roadbed to levels that would not cause significant harm to the roadway and includes specific measures to avoid or minimize damage to the historic roadbed.

Soil Investigation and Remediation (1D)

Areas of soil contamination with elevated concentrations of chemicals of potential concern (COPCs), surface stains, and hazardous debris have been identified both within the compressor station boundary and in the surrounding area. As noted in Section 2.2.5, "Ongoing Evaluation of Soils Contamination," the identification and remediation of contaminated soils is a separate, but related, project that will be addressed by DTSC in the future as additional analytical data regarding the extent of soil contamination becomes available and evaluated. Additional environmental review for soil remediation activities will be conducted in compliance with CEQA prior to a soil remedy decision similar to the manner addressed for groundwater. Information regarding the soil investigation and potential remediation techniques are described herein in order to evaluate the potential cumulative impacts.

Identification and investigation of areas where soil may have been affected by the compressor station operations began in 1987. The location of identified solid waste management units (SWMUs) and areas of concern (AOCs) at the compressor station are shown in Exhibits 4.5-6 and 4.5-7, and a description of each of the SWMUs and AOCs to be further investigated is provided in Section 4.5.1.5.

Recently, additional areas of potential historical waste handling were identified through interviews with former employees or were directly observed through field investigations. Some of these areas are identified in PG&E's January 29, 2010, response letter to DTSC's inquiry of past waste burning activities (PG&E 2010). These areas of potential concern, as well as other areas discovered during the site investigation, will be evaluated and added to a future addendum of the 2007 Resource Conservation and Recovery Act (RCRA) facility investigation/remedial investigation (RFI/RI) report.

Since 1987, a number of characterization and remediation activities have been completed or are currently ongoing at the identified SWMUs/AOCs:

- *Past and Planned Soil Characterization*. Investigations to characterize the concentrations and distribution of the COPCs were performed from 1988 to 2003 and during autumn 2008. Data from these investigations and during soil cleanup activities described below are being compiled and evaluated. Additional investigations to supplement these past investigations are anticipated to continue.

- *Past and Current Soil Cleanup Activities*. Past remediation activities have included excavation and off-site disposal of soil, debris, and construction/building materials at a number of the identified SWMUs and AOCs (CH2M HILL 2007). These activities included limited soil cleanup from 1988 to 1990 associated with the closure activities at several former hazardous waste treatment units (SWMUs 5, 6, 7, 8, 9, AOC 18, and Units 4.3, 4.4, and 4.5); in 1993 associated with the closure activities at SWMU 10; in 1995–1996 associated with the closure activities of Former 300B Pipeline Tank; and remediation of stained soil, debris, and construction/building materials at AOC 5, AOC 6, AOC 9, AOC 14 and AOC 19 from 1990 to 2002. PG&E is currently also implementing an interim remediation effort at AOC 4 consisting of excavation and off-site disposal of contaminated fill and waste debris through a Time Critical Removal Action as required by the U.S. Department of Interior (CH2M Hill et al. 2009). Following completion of the interim remediation effort, AOC 4 data will be combined with data from past investigations and evaluated to determine whether additional investigation or remediation is necessary at that location.

Potential contaminants identified in soils at and near the compressor station to date include total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, other semivolatile organic compounds, volatile organic compounds, and metals, including Cr(VI) and total chromium [Cr (T)] (see Section 4.5, "Geology and Soils," for a discussion of all known AOCs and SWMUs). Dioxins were also identified as contaminants in soil at AOC 4.

Investigation and cleanup of contaminated soils associated with the long-term operation of the compressor station is being conducted under both (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act. Soils in the project area are known to have been contaminated through the wastewater discharge directly to Bat Cave Wash (AOC-1) starting in 1951 and through the use of percolation beds (SWMU-1) from 1964 to 1970. The contaminant associated with the former percolation beds is mainly chromium, as Cr(VI) and Cr(T). In addition, soil may have been contaminated through spills and leaks of cooling water and other fluids at the compressor station. Additional data regarding the extent and type of contamination will be collected to assess these other AOCs and SWMUs to complete Volume 3 of the RFI/RI. Currently, it is anticipated that Volume 3 of the RFI/RI will be completed in 2013.

The characterization of each SWMU/AOC required to prepare the RFI/RI is not complete at this time; therefore, the subsequent risk assessment necessary for the determination of remedial action objectives and the identification of potential remedial alternatives for the final preferred soil remediation or technology or method, or combination of technologies, to address the different contaminants and conditions at locations with soil contamination have not

yet been decided. However, planning for final remedial action for soils is proceeding in a manner consistent with the planning for the final remedial action for groundwater, only on a different schedule. DTSC, however, does not anticipate that remedial action will be necessary for groundwater contamination to trigger remedial action for soil contamination. Groundwater remediation facilities in areas of soil contamination (e.g., construction of pipelines or utilities within Bat Cave Wash or within the compressor station or construction of remediation or monitoring wells south of the railroad tracks) will be designed and constructed to protect the integrity of the groundwater remedial structures in the event of possible future soil remediation, as well as to ensure access to the areas of possible future soil remediation.

Such division of remedial activities at the Topock site is common at remediation sites. Clean up of the groundwater is considered a priority because of the proximity of the Cr(VI) groundwater plume to the Colorado River and the degradation of the water within a beneficial groundwater basin at the Topock site.

Potential Remediation Methods and Technologies

Cleanup of chemicals of concern in soils at and around the Topock site can be accomplished using a variety of remediation methods and technologies. In consideration of the multiple separate SWMUs and AOCs with varying historical uses, different potential contaminants, and variation in the extent of soil contamination (notably depth below the ground surface), soil remediation may require multiple methods or technologies, and the remedial technology or combination of technologies may not be the same at each SWMU/AOC. However, based on the factors mentioned above, the remedial methods/technologies that are likely to be most appropriate for cleanup of soil are assumed to consist of the following:

- excavation and off-site disposal,
- excavation and on-site treatment,
- soil flushing,
- solidification/stabilization,
- in situ chemical reduction,
- capping, and
- institutional controls.

The following sections describe each of these potential soil remediation methods/technologies and the estimated range of scenarios for each.

Excavation and Off-Site Disposal

Overview of Excavation and Off-Site Disposal

Excavation and off-site disposal involves the physical removal of contaminated soil from the source area and transportation of the soil to an approved and permitted disposal site (landfill), treatment facility, or recycling facility. Contaminants and their concentrations in the soil will determine the disposal requirements, and which landfills and/or treatment or recycling facilities are permitted for final treatment, disposal, or reuse of the soil.

Equipment used for excavation may include backhoes, dozers and loaders, excavators, scrapers, haulers, graders, screw augers, and other equipment. The excavated soil is typically staged for loading, prior to being loaded into haul vehicles for transport to the off-site treatment, recycling or disposal facility. If chemical concentrations in the excavated soil exceed established acceptance limits for off-site facilities, some soil treatment may be required before disposal. Treatment may be performed at the off-site facility or on-site (see on-site soil treatment technologies below). If soil concentrations are known and on-site treatment is not required, excavated soil can be directly loaded into the haul vehicle. Prior to transport, the haul vehicle is prepared, which may include placing a plastic liner in the bed of the haul vehicle before loading and covering the loaded bed to prevent dust emissions.

Clean soil or other appropriate fill material is transported to and placed in the excavation locations to establish final ground surface topography, and appropriate surface materials are placed to support future land use.

Implementation of Excavation and Off-Site Disposal

The method of soil excavation will depend upon several factors, and these factors may vary among the SWMUs/AOCs. These factors include the area for excavation, the depth of contaminated soil, the surface topography, proximity and types of in-place structures, land uses during the construction period, available area for excavated soil staging and loading onto the haul vehicles, requirements for maintaining excavation side wall stability, site access for excavation equipment and the haul vehicles, and field support requirements to safely perform the field operations and confirm, through sampling and field observations, that the removal of the contaminated soil has met the remedial criteria. To the extent practicable, excavated soils requiring off-site treatment, recycling or disposal is stockpiled, transferred to bins, and/or separated from soils suitable for reuse as backfill. Chemical analysis may be performed to evaluate whether the excavated soil is contaminated and to appropriately characterize the soils for off-site treatment, recycling, or disposal. Depending on contaminant concentration levels, all excavated soils may not be transported for off-site treatment, recycling, or disposal, but may be temporarily stored for reuse at the site.

Following completion of the excavation, clean soil or other appropriate backfill material is transported to and placed in each excavation. The backfill materials may be transported to the site from an off-site or on-site source. The backfill material is compacted to establish final ground surface topography. Depending on the location and future land use, site restoration may include reestablishing vegetation; erosion and drainage control; and/or placement of concrete, asphalt or other suitable building material.

Implementation of excavation and off-site disposal may include constructing access roads and staging areas; managing waste, soils, and materials; and controlling traffic and health, safety, and security.

Excavation and off-site disposal is intended to meet the objectives of the remedial actions immediately after construction, so that no operation and maintenance period would exist for the materials remaining on-site (operation and maintenance would likely be required at the off-site permitted facility).

Excavation and On-Site Treatment

This technology involves excavation of contaminated soil and treatment of the excavated soil, typically within the area of contamination at the site, rather than at an off-site treatment facility. Different treatment methods may be considered depending on the type of contaminants present.

Overview of Excavation and On-Site Treatment

For this technology, excavation is performed as described for the excavation and off-site disposal component, with the excavated soil transported as necessary to the on-site treatment area. Soil treatment depends on the contaminant(s) present and the contaminant(s) concentration. Possible treatment methods for different types of contaminants include:

- petroleum hydrocarbons and other organic compounds—soil (i.e., compost-like) piles for biodegradable organic compounds and soil washing,
- metals (including chromium)—soil washing, and
- hexavalent chromium—chemical reduction.

An on-site area with suitable physical conditions (notably flat topography and good access) and sufficient area is needed for the on-site treatment. Sufficient area is required for the storage and handling of both the untreated and treated soil, equipment for the soil treatment process(es), and management of any residual products from the treatment. A description of potential on-site technologies for soil treatment is provided below.

Soil Piles: Soil piles are an ex situ treatment method that have typically been applied for the biotreatment of contaminated soil, notably soil containing hydrocarbon.

Soil Washing: Soil washing is an ex situ process that uses liquids (usually water and sometimes water with chemical additives) and a mechanical scrubbing process to separate contaminants from soil. The scrubbing combined with physical and chemical processes removes contaminants from the soil and concentrates contaminants into a smaller volume of treatment residue. This residue stream can be further treated on-site or transported to an off-site treatment, recycling, or disposal facility.

Chemical Reduction: Chemical reduction is an ex situ technology for treating oxidized contaminants, such as materials containing Cr(VI), that involves the addition of a chemical reducing compound to the soil to enhance a chemical oxidation–reduction reaction and reduce the contaminant forming a less hazardous, less mobile, or inert compound, such as the reduction of Cr(VI) to Cr(III) and/or other inorganic or organic compounds subject to reduction.

Implementation of Excavation and On-Site Treatment

Excavation: The implementation method for excavation will essentially be the same as previously described for excavation and off-site disposal component. Excavated soil is transported to the on-site location for ex situ treatment.

On-Site Treatment: One treatment method or a combination of methods may be used for the on-site treatment of soils, with the method(s) determined by the chemical contamination in the soil, as well as the treatment requirements. Implementation considerations for the different on-site treatment approaches are described below.

Soil Piles—The excavated soils will typically be placed over a low permeability liner to minimize the possibility of contaminants leaching below ground surface. The excavated soils would be mixed with additives (e.g., water, bulking agents, nutrients, chemicals) and then placed in aboveground treatment cells. The soil piles would likely be covered to prevent dust emissions and erosion from rain events and to minimize moisture loss. To maintain suitable conditions for biotreatment and in consideration of the climatic conditions at the site, the completed soil pile would also likely need an irrigation system to add water to the pile. Except for the initial mixing of additives to the soil and subsequent addition of water as necessary, soil piles are a passive treatment approach. Chemicals, such as a reducing agent, can be included with the water addition.

Soil Washing—The excavated soils will typically be placed over a low permeability liner to minimize the possibility of contaminants leaching below ground surface. Before washing, the soil undergoes particle size separation to remove oversized material (coarser sand and gravel particles) and to concentrate the contaminants, because most contaminants are associated with soil particles with a finer grain. Oversize materials and other materials not suitable to soil washing are separated out and are assumed to be managed similar to excavated soils in the excavation and off-site disposal component. Besides water, the washwater generated from the soil washing process can include additives that enhance the separation of contaminant(s) from the soil. Depending on the contaminant(s), additives may include acids, bases, surfactants, solvents, chelating agents, and/or sequestering agents. The wash water from soil washing may be treated on-site and recycled back to the soil washing process.

The typical components associated with soil washing are:

- soil screening and separation of oversized particles,

- soil scrubbing/washing,
- separation of treated soils from wash water,
- wash water treatment, and
- management of treated soil (drying followed by replacement at the site as clean backfill).

Chemical Reduction—The chemical reduction process typically comprises the following steps:

- Contaminated soil is excavated and screened to separate oversized material and other material not suitable for chemical reduction.

- Reducing chemicals, in aqueous or gaseous form, are added to the soil and the soil and reducing chemicals are mixed in a reactor.

- The reagent/soil mixture is transferred to a separator, where excess reagent is removed and recycled back into the reactor. The treated soil is washed and the chemical sludge separated from the soil. The treated soil and chemical sludge are separately dewatered.

- Water from the soil washing process is recycled back to the soils washer. The dewatered chemical sludge is combined with the oversized material for disposal.

Requirements for chemical reduction are similar to those described for soil washing.

Backfill: Following on-site treatment, the soil is expected to be transported to and replaced in the area of excavation, if appropriate. The backfill soil is compacted to establish final ground surface topography. Soil that is not suitable for backfill would be managed on-site or transported off-site to an appropriate disposal or recycling facility as described for the excavation and off-site disposal component.

The implementation of ex situ treatment at the on-site location may include constructing access roads and staging areas; managing waste, soils, and materials; and controlling traffic and health, safety, and security.

Ex situ treatment in an on-site location is intended to meet the remedial action objectives immediately after construction, so that no operation and maintenance period would exist for the materials remaining on-site. Depending on the location and future land use, additional material may be placed at the surface such as a vegetation layer of asphalt/concrete, and site restoration may include establishing vegetation, placement of concrete/asphalt or other suitable building material, and/or erosion and drainage control.

Soil Flushing

Overview of Soil Flushing

Soil flushing is an in situ treatment technology that is commonly used in combination with a groundwater remedial technology. The soil flushing process involves infiltrating water, with or without additives (such as surfactants), through contaminated soils to flush (in situ wash) contaminants from the soil into the underlying groundwater for collection by downgradient wells that are extracting groundwater and/or for treatment within downgradient in situ treatment zones for groundwater. Additives are typically surfactant compounds that enhance the solubility of the contaminants and improve the efficiency of the flushing process.

Soil flushing is typically coupled with groundwater treatment to allow contaminants flushed from soil to be addressed by the groundwater remediation system(s).

Infiltrated water with additives and desorbed contaminants that are flushed into the underlying groundwater may need treatment to meet the objectives of the groundwater remedial action. Water used for infiltration in the soil flushing may be from an off-site or an on-site source.

The primary requirement for soil flushing is that groundwater can be captured, extracted, and treated or that the groundwater can be treated in situ to meet the objectives of the groundwater remedial action. Other considerations may include the efficiency of the flushing solution to contact the targeted subsurface soil, washing of the contaminants beyond the target area of the groundwater remediation system, and/or the introduction of surfactants to the subsurface. In addition, soil flushing could reduce soil porosity.

Implementation of Soil Flushing

The application of soil flushing may be suited to localized areas with contaminants that are soluble in water and present above cleanup levels in vadose zone soils. The flushing process would mobilize and induce vertical migration of contaminants to groundwater. The contaminants are later addressed through the groundwater remediation system.

Implementation would be constrained to those areas that are underlain by permeable soils to allow for percolation of the flushing solution applied to flush the contaminants The flushing solution would be applied either by flooding the surface of the area to be treated or by injection through trenches, infiltration galleries, or injection wells. The delivery method is based on factors such as soil properties, soil heterogeneity, depth, and extent of contaminant, and physical conditions at the area to be treated. The areas selected for soil flushing would also have to be accessible for installation of the flushing solution application method and for the flushing solution delivery via piping or tanker truck. Preparation for application of soil flushing may include removing surface vegetation, removing concrete/asphalt pavement, and/or grading to control drainage.

For flooding, containment berms may need to be constructed to control application.

For trench, infiltration gallery, and injection well applications, the areal extent, and depth occurrence of the contaminant and the radial influence of the treatment are the factors in determining the number and extent of the flushing solution delivery. For those treatment areas requiring installation of trenches or infiltration galleries, the area would need to be accessible to equipment such as a backhoes or tracked excavators. The soils removed from the excavation for the trenches or infiltration galleries would be segregated and contained in bins or stockpiles. The trenches or infiltration galleries would be constructed with perforated piping to allow for controlled release of the flushing fluid. The trenches would typically be backfilled with a uniform gravel and potentially covered with the excavated soils or imported soils. Any remaining soils not backfilled would be managed as described for the excavation and off-site disposal component.

The areas for construction of injection wells, if selected, would need to be accessible to drilling equipment for installation of injection points within a gridded network. Soil cuttings generated during installation of injection wells would be contained in roll-off bins or stockpiles and characterized for off-site treatment, recycling, or disposal and/or reuse on-site.

The implementation of soil flushing may include constructing access roads and staging areas; managing waste, soils and materials; and controlling traffic and health, safety, and security.

Following the construction of the flushing solution delivery systems, an operations and maintenance period is anticipated to meet the remedial action objectives. Following attainment of remedial action objectives, a verification period would likely take place, followed by decommissioning of well, piping, tanks, and other treatment equipment. Depending on the location and future land use, site restoration may include reestablishing vegetation; erosion and drainage control; or placement of concrete, asphalt, or other suitable building material.

Solidification/Stabilization

Overview of Solidification and Stabilization

Solidification/stabilization reduces mobility of contaminants in the environment through both physical and chemical means. Solidification generally refers to a physical process where a semisolid material such as soil is treated, resulting in a solid matrix with greater compressive strength, lower permeability, and the encapsulation of contaminants. Stabilization typically refers to a chemical process that actually binds the matrix of the contaminant such that its constituents are immobilized. Both processes tend to trap or immobilize contaminants within their "host" medium. Typical binding/stabilizing agents include Portland cement, pozzolanic binders (a siliceous or aluminosiliceous material, which form a cementlike solid when combined with materials containing calcium hydroxide), and various kiln dusts. Most of these materials are highly alkaline and form a solidified matrix when mixed with the contaminated soil. Leachability testing is typically performed to measure the degree that the contaminant is immobilized following treatment.

Solidification and stabilization can be performed in situ or ex situ. The ex situ method involves excavation and staging of the soil, screening to remove larger diameter material or other material not suitable to the solidification/stabilization treatment, blending binding agents and water with the excavated soil, and stockpiling treated soil for testing prior to off-site disposal or placement back in the excavation. The in situ method involves injection or mixing of stabilizing agents into soils, addition of water if necessary, and in-place mixing with equipment such as the bucket of a backhoe or track hoe to thoroughly mix and stabilize the soils in place.

The solidification/stabilization process may require laboratory and field treatability studies prior to its full-scale implementation. These studies are used to define the appropriate concentration of the binding/stabilizing agents; the effectiveness of the solidification/stabilization in binding the contaminants, especially for soils with multiple constituents of concern; mixing requirements to achieve the desired contaminant immobility, which is a key consideration in performing the solidification/stabilization in situ or ex situ; and other field implementation requirements and/or limitations, especially for in situ applications.

In situ solidification/stabilization or ex situ solidification/stabilization that is returned to the excavated area may not be suitable for all future land uses. Depending on future land use, additional material may be placed at the surface, such as part of site restoration as a vegetation layer or asphalt/concrete.

Implementation of Solidification and Stabilization

Ex Situ: For the ex situ implementation of solidification/stabilization, many implementation aspects for excavation and on-site treatment previously described are applicable. Solidification/stabilization of the excavated soil would typically occur at a central area; therefore, the excavation and transport of the contaminated soil, as well as the central treatment area requirements, would be consistent to those previously described for the excavation and on-site treatment component. In addition, soil screening may be performed to remove oversized material or other material not suitable to the solidification/stabilization treatment.

The excavated soils would be mixed with binding/stabilizing agents and then an appropriately constructed area treatment cell to allow sufficient time for the reaction of the agents with the soil. The type of binding/stabilizing agent(s) will depend on the chemical(s) present in the contaminated soil. Depending on the desired degree of mixing, the method of mixing could range from using the bucket of an excavator to processing the soil through a pug mill (i.e., a machine in which materials such as soil are simultaneously ground and mixed with a liquid). Following the mixing, the processed soil would be covered as necessary to control erosion and dust emissions in the staging area. Backfilling the original excavations with the treated soil is similar to that described for the excavation and off-site disposal component.

In Situ: For the in situ implementation of solidification/stabilization, the depth of contaminated soil, along with the chemical contaminants present, are key factors. Preparation for in situ application may include removing surface vegetation, removing concrete/asphalt pavement, and/or grading to control drainage. If the extent of contaminated soil is shallow, the bucket of the excavator can be used to mix the solidification/stabilization agent(s) with the soil. For deeper depths of contaminated soil, soil augers or other equipment may be used. Augers have a hollow stem shaft with a single flight auger. As the auger penetrates the soil, a slurried reagent is pumped through the hollow shaft and injected into the soil by means of jets located on the auger flight. As the auger moves to the bottom of the treatment zone, a vertical column of solidified/stabilized soil is created. Overlapping of adjacent columns is used to ensure complete mixing of affected soil with the solidified/stabilized agent.

Implementation of solidification/stabilization may include constructing access roads and staging areas; managing waste, soils, and materials; and controlling traffic and health, safety, and security.

Solidification/stabilization is intended to meet the remedial action objectives immediately after construction, so that no operation and maintenance period would exist for the materials remaining on-site. Soil treated by in situ solidification/stabilization or ex situ solidification/stabilization that is returned to the excavated area may not be suitable for all future land uses. Depending on location and future land use, additional material may be placed at the surface, such as a vegetation layer or asphalt/concrete, and site restoration may include reestablishing vegetation, placing concrete/asphalt or other suitable building material, and/or controlling erosion and drainage. Any treated soil not backfilled will be managed similarly to excavated soils in the excavation and off-site disposal component.

In Situ Chemical Reduction

Overview of In situ Chemical Reduction

In situ chemical reduction applies to Cr(VI) or other oxidized chemicals that, when reduced, have a much lower potential environmental and/or human health risk. Application of this technology involves the addition of reagents to react with targeted constituents in soil resulting in a chemical reaction that reduces oxidation. This reaction converts hazardous contaminants to compounds that are nonhazardous or less toxic and more stable, less mobile, and/or inert.

Reductants can be introduced in either liquid or gaseous form. When using liquid reductants, this process would be similar to soil flushing described above except that only a fraction of the contaminant would be flushed to the groundwater. Much of the contaminant would be reduced by contact with the reductant within the unsaturated zone. In situ reduction using gaseous injection would involve injecting a gaseous reductant, such as sulfur dioxide or methane, into a network of wells.

Implementation of In-Situ Chemical Reduction

In situ chemical reduction applications may be suited to localized areas with contaminants subject to reduction at concentrations in vadose zone soils above cleanup levels. The in situ chemical reduction process treats the contaminant in place and reduces the contaminant mass through redox reactions to convert the contaminant to a less hazardous, less mobile, or inert compound. Whether added in liquid or gaseous form, a key condition for successful application of this technology is the ability to achieve uniform distribution of the reductant through the soil zones affected by the target contaminants.

Implementation of in situ chemical reduction would be constrained to those areas that are underlain by permeable soils to allow for the solution to percolate and be distributed to the soils with the contaminants. The liquid phase solution would be applied either by flooding the surface of the area to be treated or by injection through trenches, infiltration galleries, or injection wells as previously described for the soil flushing application. Preparation of the

surface may include removing surface vegetation, removing concrete/asphalt pavement, and/or grading to control drainage.

A gas-phase application is typically used in injection wells to deliver reductant to the contaminated soils. The delivery method and injection well network are based on factors such as soil properties, soil heterogeneity, depth, and extent of contaminant. A well network may be needed to enhance distribution of the gaseous reductant throughout the zone of contaminated soil. This network could include wells for injection of gaseous reductant and extraction of soil vapor, with the extraction well operating under vacuum to induce the movement of gaseous reductant through the subsurface soil. Extraction would continue until the gaseous reductant in the soil vapor is detected at the extraction well.

The areas selected for in situ chemical reduction would also have to be accessible for installation of the solution application method and for the treatment solution or gas delivery via piping or tanker truck.

For flooding, construction of containment berms may be needed to control application.

For trench, infiltration gallery, and injection well applications, the areal extent and depth occurrence of the contaminant and the radial influence of the treatment are the factors in determining the number and extent of the flushing solution delivery. For those treatment areas requiring installation of trenches or infiltration galleries, the area would need to be accessible to equipment such as a backhoes or tracked excavators in order to install trenches or infiltration galleries. The soils removed from the excavation for the trenches or infiltration galleries would be segregated and contained in bins or stockpiles. The trenches or infiltration galleries would be constructed with piping perforated to allow for controlled release of the flushing fluid. The trenches would be backfilled typically with a uniform gravel and potentially covered with the excavated soils or imported soils. Any remaining soils not backfilled would be managed as described for the excavation and off-site disposal component.

Implementation of in situ chemical reduction may include constructing access roads and staging areas; managing waste, soils and materials; and controlling traffic and health, safety, and security.

Following the construction of the in situ chemical reduction system, an operations and maintenance period is necessary to attain the remedial action objectives, followed by a verification period and decommissioning of well, piping, tanks and other treatment equipment. Depending on the location and future land use, site restoration may include establishing vegetation; erosion and drainage control; and placement of concrete, asphalt, or other suitable building material.

Capping

Overview of Capping

Capping involves the construction of an engineered cover or a capping system on top of the contaminated soil area to contain and minimize exposure of the soil contaminants to the environment and to humans. A capping system may consist of liners and covers or only a cover system. If the soil contamination is not deep and control of leachate and/or downward migration is an objective of the remediation, liners can be installed on the bottom and sides using natural (low permeability soil or clay) and/or synthetic barriers to prevent liquids and waste from migrating into underlying soils. Engineered covers, constructed of synthetic membrane liners, low permeability soils, and/or concrete, asphalt, or other building materials are installed on top of the contaminated soil area to keep water (surface water or precipitation) from infiltrating the contaminated soil while maintaining a protective cover to secure the materials in place and prevent humans or burrowing animals from contacting the contaminated soil. If infiltration is not of concern, the cover can be constructed of permeable materials of sufficient depth to prevent contact between potential receptors and contaminated soil.

Construction of a cap does not reduce toxicity, mobility, or volume of contaminated soil, but the cap does mitigate migration and direct exposure to human and ecological receptors. The effective life of the capping system can be extended by long-term inspection and maintenance. In addition, precautions must be taken to ensure that the integrity of the cap is not compromised by current or future land use activities. Therefore this technology is assumed to include long-term management and institutional controls to supplement the remedial technology.

Implementation of Capping

Prior to installing an engineered cover, the surface of the area to be capped may be contoured to enhance positive runoff drainage. This surface contouring may extend beyond the area to be capped to divert surface runoff away from areas being capped, which enhances the long-term integrity of the cap and/or to more effectively keeps the contaminated soil from percolating water. A layer of coarse sand or engineered drainage layer may be placed over the cover to collect and transport the water off the surface of the cover. A protective soil layer may be added to protect the underlying cover components and support vegetative growth. In developed areas, bedding material such as sand may be placed over the contaminated soil, and surface material such as concrete or asphalt placed over the bedding material.

For those areas requiring installation of a cap, the area would need to be accessible to construction equipment such as backhoes, dozers and loaders, scrapers, haulers, excavators, graders or other equipment in order to prepare the surface and for placement of the cap materials. The area of a cap depends on the footprint of the area to be capped and possible surrounding surface contouring. Soils removed for the installation of the cap would typically be segregated and managed as described in the excavation and off-site disposal component.

Capping material (such as low-permeability soils) from an off-site location may be transported to the site. Alternatively, capping material from an on-site source, if deemed appropriate, may be used. Analytical testing (geotechnical and/or chemical) may be performed on the source of the capping materials to assess suitability. If appropriate to enhance the long-term integrity of the cap, additives may also be added to the capping material to enhance soil binding. If a synthetic material were used such as a high-density polyethylene (HDPE) cover, rolls of HDPE sheets would be placed and welded together to provide a low permeability cover material that would then typically be covered with a soil layer. Soil would be compacted for stability and to establish final ground surface topography. Depending on the location and future land use, site restoration may include reestablishing vegetation at the surface.

In lieu of soils for capping material, pavement (asphaltic concrete or concrete) may be applicable for some areas, such as at the compressor station. Standard construction practices associated with pavement installation are anticipated to be used for any area being paved for purposes of installing a cap. Soils removed for placement of the pavement would be managed as described in the excavation and off-site disposal component.

Implementation of capping may include constructing access roads and staging areas; managing waste, soils and materials; and controlling traffic and health, safety, and security.

Capping does not reduce toxicity, mobility, or volume of contaminated soil; therefore, periodic inspections are needed to confirm the integrity of the installed caps. Based on findings from these inspections, maintenance activities may be needed to restore the integrity of the cap and/or make modifications to surface water drainage patterns to protect the cap integrity. Cap maintenance activities may extend from minor patch work of the soil or pavement cap to replacement of the installed cap with a new cap. An institutional control would be implemented during the operation and maintenance period to prevent disturbance of the cap system by future site activities.

Institutional Controls

Land use controls or other forms of institutional controls are expected be incorporated into the remedial alternative development. Controls are likely to include restrictions on residential or other sensitive uses,

restrictions on the use of groundwater and development of water supplies, and access restrictions such as road closures or vehicular barriers.

AOC 4—Debris Ravine (1E)

On May 28~~June 24~~, 2009, the U.S. Department of the Interior (DOI) issued an action memorandum entitled "Request for Time-Critical Removal Action Number 4 at AOC 4 Debris Ravine, Pacific Gas and Electric Topock Compressor Station." This action memorandum directs PG&E to stabilize and mitigate the threat of release of contaminated material at AOC 4, which is comprised of the area known as the Debris Ravine. The Debris Ravine is a narrow, steep-sided arroyo that drains into Bat Cave Wash at the southwest corner of the facility. Most of AOC 4 is on PG&E property and outside of the facility fenceline; however, it extends to the west onto Havasu National Wildlife Refuge property.

Historical operations in this area are not well documented; however, over the years some scrap and debris have ended up on the northern slope and at the bottom of the ravine. Wood, metal (e.g., cans, machine parts, rebar, wire), concrete, transite siding, and white powder have all been identified in the ravine. Prior to June 2009, 69 soil samples were collected at AOC 4. This sampling has indicated the presence of 18 constituents with maximum concentrations that exceed recognized human health and/or ecological health soil screening levels. Of particular note were Cr(VI) at 42 times the Industrial California Human Health Screening Levels (CHHSL), lead at three times the Industrial CHHSL, and polyaromatic hydrocarbons at 92 times the Industrial CHHSL. Additional data was collected pursuant to the June 29th DOI action memorandum that included additional soil samples, an asbestos survey, a survey of surface soils using a field X-ray fluorescence analyzer, and geotechnical borings.

In response to the June 29th DOI action memorandum and additional data collection conducted at AOC 4, PG&E developed a work plan to stabilize and mitigate the threat of release of contaminated material at AOC 4. Work began in December 2009 and consisted of the removal of contaminated debris and fill material and disposal of these materials in a suitable landfill to stabilize and mitigate the threat of release. Removal of the contaminated debris and fill material consists primarily of mechanical excavation using standard-reach and long-reach excavators and hoisting and winching equipment, with some manual collection and excavation and vacuum excavation. The two primary areas targeted for removal are the western portion of the north slope of the ravine and a smaller area along the service road in the eastern portion of the AOC. Approximately 4,000 cubic yards would be removed from these two areas. Because full characterization of the AOC has not been completed, additional removal may be required. Material stockpiling and other support/staging areas are located on the compressor station site and on other approved nearby properties. Soil samples taken after removal of the materials will be collected to characterize soil conditions. Slope stabilization and erosion control measures will also be implemented following removal of the materials. The removal action is scheduled to be complete in the summer of 2010.

Upland In Situ Pilot Test, Aquifer Testing, Groundwater Well Maintenance and Well Decommissioning (1F)

PG&E submitted three work plans to DTSC: (1) In situ Hexavalent Chromium Reduction Pilot Test Work Plan—Upland Plume Treatment, (2) Work Plan for Hydraulic Testing Bedrock Wells, and (3) Well PGE-6 Revised Decommissioning Work Plan. The purpose of the pilot test was to evaluate the feasibility and effectiveness of using an in situ technology to reduce hexavalent chromium in groundwater to the less soluble trivalent form directly within the subsurface. The aquifer tests provided additional information on the migration of contaminated within the project area. The third work plan proposed decommissioning of a fourth well (PGE-6) at the site.

Site Work Plan for Additional Groundwater Characterization under the Colorado River (1G)

DTSC approved a Corrective Action Work Plan that authorized the drilling of up to four slant boreholes from the California shoreline of the Colorado River. Following the drilling and testing of the boreholes, six groundwater

monitoring wells were constructed in the boreholes. The project provided measurable data with respect to the location of the southern boundary of the existing hexavalent chromium groundwater plume at the project site, and to confirm the effectiveness of an interim measure (i.e., IM-3) being implemented to control the hydraulic gradient of the groundwater plume away from the Colorado River.

In Situ Hexavalent Chromium Reduction Pilot Test Work Plan (1H)

PG&E requested DTSC approval of an in situ pilot study work plan that describes field activities for pilot tests to be conducted to evaluate in situ technologies to reduce hexavalent chromium to trivalent chromium in groundwater in the Colorado River floodplain adjacent to the compressor station. The results of the pilot test were used to evaluate the effectiveness and persistence of selected in situ reductants under actual site conditions, provide additional information on site conditions necessary to determine the feasibility of in situ reduction of the Cr(VI) plume, and assist with the selection of preferred in situ reductant(s) for possible long-term site management.

Pore Water and Seepage Study Work Plan (1I)

PG&E requested DTSC approval of a pore water and seepage study. The purpose of the study was to assess chromium concentrations in pore water at multiple locations within the zone that has been historically down-gradient of the existing chromium plume observed in the floodplain and historically up-gradient of Bat Cave Wash, during the next seasonal low river stand. In addition, the study assessed whether the geotechnical conditions in shallow sediments below the Colorado River favor chromium reduction.

Installation of Conveyance Piping and Power Supply for Extraction Well PE-1 (1J)

PG&E's Extraction well PE-1 required water conveyance piping and electrical power supply. Extraction Well PE-1 is a component of the Corrective Action Work Plan addressing prevention of contaminated groundwater from entering the waters of the Colorado River.

Interim Measures 1 and 2 Emergency Groundwater Extraction and Management (1K)

PG& E initiated the pumping, transport, and disposal of groundwater from existing groundwater monitoring wells at the MW20 cluster at the compressor station. This immediate action was required to prevent and/or mitigate any possible future impacts to the Colorado River. Interim measures 1 and 2 were needed because sampling activities have indicated levels of Cr(VI) are higher than previously measured and action was needed to avoid further groundwater flow toward the Colorado River.

Interim Measure 3 Emergency Groundwater Extraction and Management (1L)

PG&E proposed operation of a groundwater remediation facility for implementation of IM-3 to address hydraulic control of contaminated groundwater and prevent contaminated groundwater from entering the Colorado River. The design flow of the treatment facility is 135 gallons per minute (gpm) with a maximum capacity of 150 gpm. Three Board Orders (Board Order No. R7-2004-0080, Board Order No. R7-2004-0103, and Board Order No. R7-2004-0100) were approved by the regional water quality control board addressing the remediation facility.

Currently, PG&E is implementing IM-3 at the Topock compressor station. IM-3 consists of groundwater extraction for hydraulic control of the groundwater plume boundaries in the Colorado River floodplain treatment of extracted groundwater and reinjection of treated water. Operation of the current groundwater treatment and injection system began in July 2005. The groundwater pumping, transport and disposal activities are considered an IM pursuant to Section IV.A of the Corrective Action Consent Agreement (CACA) entered into by PG&E and the California Environmental Protection Agency (Cal/EPA), and DTSC.

The purpose of the IM is to maintain hydraulic control of the groundwater plume boundaries until such time a final corrective action is in place at the site. As defined by DTSC, the performance standard for IM-3 is to "establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that Cr[VI] concentrations at or greater than 20 micrograms per liter (µg/L) in the floodplain are contained for removal and treatment."

Currently, the IM facilities include a groundwater extraction system (four extraction wells TW-2D, TW-3D, TW-2S, and PE-1), conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. Of the four extraction wells, two are currently in operation (TW-3D and PE-1). The groundwater treatment system is a continuous, multi-step process that involves reduction of Cr(VI) to the less soluble trivalent form, Cr(III), precipitation and removal of precipitate solids by clarification and microfiltration, and lowering the naturally occurring total dissolved solids (TDS) using reverse osmosis. Treated groundwater is returned to the aquifer through an injection system consisting of two injection wells, IW-2 and IW-3. The existing groundwater extraction, treatment, and injection systems, collectively, are referred to IM-3.

~~East Ravine/TCS Hydrogeologic Characterization Program (1M)~~

~~DTSC approved a work plan that authorized the drilling wells at locations within East Ravine. Following the drilling and testing of the boreholes, groundwater monitoring wells were constructed in the boreholes and groundwater samples were analyzed. The project provided measurable data with respect to the location of the southeastern boundary of the existing Cr (VI) groundwater plume at the project site. A second phase of work is currently being planned that will include additional wells in East Ravine plus wells within the compressor station.~~

Arizona Drilling and Hydrogeologic Characterization Program (1N)

The federal agencies and Arizona Department of Environmental Quality (ADEQ) approved a work plan that authorized the drilling of wells at three locations in Arizona, including slant boreholes from the Arizona shoreline of the Colorado River. Following the drilling and testing of the boreholes, eight groundwater monitoring wells were constructed in the boreholes. The project provided measurable data with respect to the location of the eastern boundary of the existing Cr(VI) groundwater plume at the project site, and confirmed that a groundwater divide exists near the Colorado River (i.e., groundwater flows to the west in Arizona).

Pilot Study for well TW-1 on the Compressor Station (1O)

PG&E installed an extraction well near the compressor station to determine hydraulic influence of extraction to the Cr(VI) plume. The pilot study proposed the treatment, and reuse, and disposal of treated water from TW-1, all occurring within the compressor station property.

6.3.2.2 U.S. BUREAU OF RECLAMATION

Lower Colorado River Multi-Species Conservation Program (2A)

The Lower Colorado River Multi-Species Conservation Program (MSCP) is a long-term multiagency effort to conserve and work toward the recovery of endangered species, and protect and maintain wildlife habitat on the Lower Colorado River. This project was completed in 2005 and is currently being implemented as a 50-year plan to create more than 8,100 acres of riparian, marsh, and backwater habitat for four listed species and 16 other species native to the Lower Colorado River. The program extends along the Lower Colorado River from Lake Mead to the U.S.-Mexico Southerly International Border and includes the full pool elevations of Lakes Mead, Mohave, and Havasu and the historic floodplain of the river. This program is currently being implemented and includes the reach of the Colorado River that is located just east of the compressor station.

Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (2B)

Starting in 2005, Reclamation developed additional strategies for improving coordinated management of the reservoirs of the Colorado River system. Reclamation initiated a public process to develop and adopt interim operational guidelines that can be used to address the operations of Lake Powell and Lake Mead during drought and low reservoir conditions.

Each year, the Secretary of the Interior is required to declare the Colorado River water supply availability conditions for the Lower Basin States in terms of Normal, Surplus, or Shortage. While regulations and operations criteria have been developed for Normal and Surplus conditions, detailed guidelines for a water supply shortage had not been established. The development of these guidelines was spurred by the current multiyear drought, decreasing system storage, and growing demands for Colorado River water. Reclamation prepared an EIS to analyze and consider tradeoffs between the frequency and magnitude of shortages and to describe potential effects on water shortages in Lake Powell and Lake Mead and on water supplies, power production, recreation and other environmental resources in the Lower Colorado River. The record of decision was signed December 2007.

U.S. Bureau of Reclamation Quarry Operations (2C)

In 2007, Reclamation prepared an environmental assessment/finding of no significant impact to evaluate the use of nine operating quarry sites, the reopening of five previously used quarry sites, and the establishment of two new quarry sites to provide materials for use along the Lower Colorado River. The materials would be used for maintenance and construction of banklines, river control structures, levees, canals, and reservoirs. One of the existing quarry sites evaluated is known as Bat Cave No. 1. This site is an existing and active 40-acre site located less than a mile southwest of the compressor station.

6.3.2.3 U.S. Fish and Wildlife Service

Lower Colorado River National Wildlife Refuges Comprehensive Management Plan (1994-2014) (3A)

The USFWS, in cooperation with Reclamation prepared a comprehensive management plan (CMP) for the four National Wildlife Refuges that are located along the Lower Colorado River. This includes Havasu National Wildlife Refuge, which is located along the Colorado River and is adjacent to the compressor station. This planning effort integrated three perspectives to result in a holistic management approach for the Lower Colorado River refuges over the 20-year planning period. The plan includes a:

- broad perspective for the Area of Ecological Concerns,
- narrower perspective for refuge-related policy issues that affect the four refuges, and
- focused perspective for management-related activities and strategies that affect defined management units and subunits.

Topock Marsh Water Infrastructure Improvement Project on the Havasu National Wildlife Refuge (3B)

The USFWS plans to replace and rehabilitate approximately 63 acres of the HNWR's main delivery system for the Topock Marsh Unit of the Refuge. The project is located within the historic floodplain of the Colorado River, with a small portion on BLM land. Reclamation is acting as a cooperating agency under NEPA for this project. This project would improve the HNWR's capacity to control delivery of water to the Topock Marsh Unit, with environmental benefit to at least 4,000 acres of refuge land. The project consists of the following components: fire

break canal, fire break canal water diversion structure, fire break canal terminus water control structure, farm ditch water diversion structure, and Topock inlet canal (internal water control structure).

6.3.2.4 ARIZONA DEPARTMENT OF TRANSPORTATION

Needle Mountain Rest Area Improvements (Interstate 40) (4A)

The Arizona Department of Transportation (ADOT) has identified a project that is currently programmed for construction as part of ADOT's 5-year construction program (2008–2012). This project consists of improvements to ADOT's existing Needle Mountain Rest Area on Interstate 40 (I-40) at Milepost 3, approximately 3 miles from the California/Arizona state line.

State Route 95 Passing Lanes (4B)

ADOT has programmed a passing lane/climbing lane project on State Route 95 between I-40 and Lake Havasu City. This project would be constructed as part of ADOT's 5-year plan (2008-2012). The lanes would be constructed in the vicinity of Milepost 190.

6.3.2.5 SAN BERNARDINO COUNTY

Moabi Regional Park Improvements (5A)

In October 2008, San Bernardino County approved an expenditure of $588,020 for constructing improvements at Moabi Regional Park north of the compressor station. The improvements will include full utility hookups at the recreational vehicle campsites. The county is also constructing improvements to the existing sewer treatment facility at Moabi Regional Park and replacing existing structures in and around the main entrance including pavement, lane widening, and drainage.

Pirate Cove Resort (5B)

Pirate Cove Resort is a vacation resort that features waterfront cabins, a 300-slip marina, commercial and restaurant development (bar and grill), and recreational vehicle sites. The Pirate Cove Resort also has camping sites and offers water activities including boating, jet and water skiing, kayaking, canoeing, and swimming. The Pirate Cove Resort is located within the boundary of Moabi Regional Park at 100 Park Moabi Road, in Needles, California, and was opened to the public in May 2009. There are plans for expansion within the current concession lease that is managed by the BLM; however, the extent of the expansion is unknown at the time of the preparation of this DEIR.

6.3.2.6 CITY OF NEEDLES

Holiday Inn (6A)

The City of Needles has approved a Holiday Inn Express hotel. The Holiday Inn is proposed to be a 46,209 square foot building with three stories and is zoned as C3—Highway Commercial. This hotel building located at the northwest corner of U.S. Highway 95 and Victory Road and is likely to begin construction in spring or summer of 2010.

Solar Project (6B)

A solar energy project is currently in the planning phase. The solar energy project would provide 5 megawatts of power and would cover 80 acres of land. The exact location of the project has not been determined but would likely be located in the northern part of the city.

Social Security Building (6C)

The City of Needles has approved a Department of Social Security building. This office building is 6,596 square feet with one story and is zoned as C1—Neighborhood Commercial. The Social Security building is located at 1502 Bailey Avenue and has been constructed.

6.3.2.7 MOHAVE COUNTY

Topock Marina Improvements (7A)

Topock Marina is a 20-acre facility located along the Colorado River approximately one-half mile north of I-40. The marina owners submitted a site plan to Mohave County, in August 2010, to develop a 102-room, four-story hotel and a three-story restaurant with retail uses on approximately 5.6 acres of the site. ~~owners are considering expanding their facilities to accommodate additional recreational vehicles spaces. At the present time, no development plans have been submitted to the county, but county staff members are expecting to receive such plans at some point in the future.~~ At the time of the preparation of this EIR, the project is undergoing review by Mohave County and federal agencies and the schedule for construction and operation are uncertain.

Unnamed 80-acre Residential Subdivision (7B)

The county has received a preliminary plan for an 80-acre residential subdivision and wastewater treatment plant to the north of I-40 and approximately 2 miles from the California/Arizona state line. This project is on hold due to economic conditions and issues involving the availability of water.

Sterling (7C)

The Sterling project is a proposed master-planned community located north of I-40 approximately three miles from the California/Arizona state line. This project is approximately 10,000 acres in size. Mohave County approved the project in 1999; however, the project has not yet been implemented. At the present time, other potential uses of the land are under consideration, including using the site for a concentrated solar power generation facility.

6.3.2.8 LAKE HAVASU CITY

Airport Business Park (8A)

The Airport Business Park project is an approximately 80-acre light industrial business park development. The project has been approved by the City of Lake Havasu and the grading and infrastructure have been completed for phase 1 of the proposed project, which consists of approximately 19 acres. The remaining phases will have to be zoned before development activities can commence.

Auto Mall (8B)

The Auto Mall project is an approximately 37-acre commercial and retail auto mall development. The project has been approved by the City of Lake Havasu and two of the twelve parcels associated with the project have been constructed. One parcel houses a Toyota dealership and the other parcel houses two chain restaurants. Once completed, the project will consist of nine auto dealership parcels and three restaurant/retail parcels.

Shopping Mall (8C)

The Shopping Mall project is an approximately 200-acre commercial and retail shopping mall development. The project has been approved by the City of Lake Havasu and the grading and the majority of the project has been

constructed. The anchor stores for the shopping mall include JC Penny's, Dillards, and Wal-Mart. All of the smaller commercial shops in the mall have been constructed but some are still vacant. The only portions that still need to be constructed are small out-parcels adjacent to the larger project.

6.3.2.9 U.S. BUREAU OF LAND MANAGEMENT

Cathodic Protection System (9A)

The Southern California Gas Company proposes to install a cathodic protection system, along approximately 235 feet of gas pipeline, to control corrosion of the pipeline. This protection system would be comprised of a 500-foot deep well anode bed that would connect to the pipeline with a buried underground anode wire, which would be connected to a small rectifier for the electrical current from an existing power pole.

6.4 ANALYSIS OF CUMULATIVE IMPACTS

The cumulative scenario under each environmental discipline differs depending upon the potential area of effect. For example, the cumulative conditions for regional air quality account for impacts within the entire Mojave Desert Air Basin (MDAB) because air quality impacts occur on a regional or basin-level scale, while the cumulative impacts for archaeology would be limited to a more local scale for ground-disturbing activities in the vicinity that could be affected by the cumulative projects. The cumulative setting, limitations and analysis for each discipline are discussed as appropriate below.

6.4.1 AESTHETICS

Potential effects to aesthetic conditions are primarily local- and community-level issues. Consideration of cumulative effects would take into account whether any of the effects of the proposed project would be viewed in combination with other projects that could affect or change the visual environment. In consideration of significant visual resources and vistas (I-40, Needles rock, Topock Maze, Chemehuevi Mountains, and the Colorado River) and the cumulative projects that are anticipated in the project area, the following projects are considered part of the cumulative setting: projects at the compressor station (1A, 1B, 1D, 1E, and 1L~~, and 1M~~) and the projects along the Colorado River in San Bernardino and Mohave counties, which are the Moabi Regional Park Improvements (5A), the Pirate Cove Resort (5B), and the Topock Marina Improvements (7A).

When considering the improvements at the compressor station, the cumulative projects would generally involve activities that are typical at the compressor station from a visual perspective, including ongoing operations and maintenance, improvement and updates to existing facilities, and soils remediation and cleanup. In particular, future projects including major plant refurbishment activities, soil investigation and remediation activities, and work in Debris Ravine (AOC 4) have the potential to be visible. In addition, past projects including construction of the IM-3 Facility, are currently visible. Visibility would depend on the exact locations of the project footprints and the nature of any new structures and supporting infrastructure that may be constructed. However, from a visual and aesthetics perspective, these projects would not change the overall visual character of the project area. Viewers of the project area would likely not be able to discern when these activities were taking place or any visual difference as a result of these projects and activities. Thus, the proposed project would not result in any contribution to a significant visual effect when considering views to the compressor station property. This conclusion applies to views from I-40, to and from Needles rock, and to and from Chemehuevi Mountain. However, implementation of the proposed project would introduce a strong degree of contrast to the existing visual character of the floodplain and result in an impact to pedestrian viewers to and from the Topock Maze (Locus B). Thus, the contribution of those projects identified about would have a cumulative impact on views to and from the Topock Maze Locus B, and is considered potentially significant. **Mitigation Measure AES-1** includes design criteria for to ensure that mature floodplain vegetation is protected and revegetation of disturbed areas occurs to reduce the overall change to the visual character of the view corridor along the Colorado River from the Topock Maze.

With regard to the visual experience from the Colorado River, several projects are proposed along the river that could contribute to a cumulative change in the visual experience of recreational users along the river as well as

other viewer groups that might experience this visual resource. These include the Moabi Regional Park Improvements (5A), the Pirate Cove Resort (5B), and the Topock Marina Improvements (7A). The Moabi Park Improvement project would not result in significant changes in views from the river as most of the improvements are internal to the park (e.g., utility hook-ups and campsites). The Pirate Cove Resort and Topock Marina Improvements ~~is a~~ are significant projects when considering the views from the river, as ~~it~~ these projects introduce~~s~~ a new resorts at the river's edge. The improvements to the Park Moabi Marina are nominal, and would likely include minor improvements to accommodate additional recreational vehicles, but are not expected to significantly change the visual experience of the site from the river. However, Topock Marina Improvements would introduce a new hotel behind the existing dock area with two new buildings, including signage and lighting. Thus, when considering these projects, the visual experience from the Colorado River would be most affected by the Topock Marina Improvements ~~Pirate Cove Resort~~.

The proposed project could also result in negative aesthetic affects along the Colorado River through the removal of floodplain vegetation, grading operations, and overall alteration of a scenic view corridor. If these effects were to occur, recreational viewers experience of the Colorado River and the associated scenic corridor could be cumulative impacted by the overall change that this and other river development, including the Pirate Cove Resort and Topock Marina Improvements. **Mitigation Measure AES-2** includes design requirements to ensure that development and alterations along the Colorado River do not significantly affect views from the Colorado River, or the recreational user's visual experience of the river. This mitigation measure would also address any potential contribution to a cumulative visual impact in consideration of this visual resource. With the implementation of **Mitigation Measures AES-1 and AES-2**, the project's potential contribution to cumulative aesthetic impacts would be reduced to a less than significant level.

6.4.2 AIR QUALITY

Cumulative air quality impacts must be considered from different perspectives of scale and type of activity depending on the air pollutant being considered. The following discussion describes impacts associated with short-term construction, long-term operations, and climate change.

6.4.2.1 SHORT-TERM CONSTRUCTION-RELATED IMPACTS

The MDAB is in nonattainment status for ozone, respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), and fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$). This is a result of past cumulative development in the basin, as well as transport of pollutants from other basins. New projects, including the proposed project, would be required to comply with Mojave Desert Air Quality Management District (MDAQMD) measures that would reduce potential new construction emissions of these pollutants. The MDAQMD has established daily significance thresholds for criteria pollutants and ozone precursors for projects within San Bernardino County. Project-generated, construction- related emissions of fugitive dust could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations. In addition, because San Bernardino County is currently designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, construction-generated emissions could contribute on a cumulative basis to pollutant concentrations that exceed the California ambient air quality standards due to other projects in the county.

Project 1D, future soil investigation and remediation at the compressor station, could involve substantial soil remediation activities including soil excavation and grading. Depending on the nature of the implementation and timing of these activities, these actions could contribute substantially to a violation of the ambient air quality standards. Because the details and exact timing of this project is unknown, it is not yet clear whether these types of impacts could occur. If implementation of the soils remediation projects occurred concurrently or without the implementation of measures to reduce construction-related emissions below the MDAQMD's standard, a significant contribution to air quality impacts may occur. Some of these projects, such as the soil investigation and remediation activities (1D), AOC4 (1E), the Topock Marina Improvements (7A), and the cathodic protection system (9A) involve substantial earthmoving activities that may further impact air quality. While unlikely, if significant activities associated with the proposed project and soil remediation activities occurred concurrently,

the proposed project may contribute to this potentially significant cumulative effect. However, the proposed project's contribution to this potential effect would not exceed the established thresholds of the MDAQMD which are established in consideration of potential concurrent projects, the project's contribution to this potential cumulative effect is not considered significant. In addition, implementation of **Mitigation Measure AIR-1** would further reduce construction-related impacts from emissions of PM_{10} associated with the proposed project.

6.4.2.2 LONG-TERM OPERATION-RELATED IMPACTS

Long-term operation of the proposed project would result in regional emissions of reactive organic gases, oxides of nitrogen, PM_{10} and $PM_{2.5}$ from area, stationary, and mobile sources. Long-term operation-related emissions generated by the project would not exceed the County's significance thresholds for reactive organic gases, oxides of nitrogen, PM_{10} and $PM_{2.5}$ and would not generate substantial operational emissions of toxic air contaminants. Further, the *County of San Bernardino 2007 General Plan* designates the site for public and semipublic uses; air quality attainment plans, which are required to reach attainment of federal and state air quality standards, are based in part on the land use plans for the agencies that are part of the air district. Consequently, the proposed project would not contribute to an increase in regional emissions that conflicts with the budget used for regional air quality planning.

Implementation of the proposed project would not result in significant or unavoidable project-level impacts. Further, it would comply with growth projections in the air quality attainment plan and would be required to implement all feasible measures in the plan aimed at attaining long-term air quality standards. The project's contribution to nonattainment of air quality standards would, therefore, not be considerable. The proposed project would result in a less than significant cumulative air quality impact.

6.4.2.3 CLIMATE CHANGE

No known individual project can generate enough greenhouse gas (GHG) emissions to significantly influence global climate change. The project participates in this potential impact by its incremental contribution, combined with the cumulative contributions of all other sources of GHGs, which, when taken together, cause global climate change impacts. See Section 4.2, Air Quality, for a discussion of the existing physical and regulatory setting related to climate change and GHG emissions.

The following discussion reviews the project's potential generation of GHGs and its incremental contribution to the cumulative effect resulting from emissions of GHGs. A two-tiered approach is used, as follows: (1) a discussion of project-generated GHG emissions and (2) project compliance with applicable state legislation.

In January 2010, the California Attorney General issued a paper for use by local agencies in carrying out their duties under CEQA as they relate to global climate change. Included were examples of various measures that may reduce the GHG emissions of individual projects that result in climate change (California Department of Justice 2010). Statewide GHG emission reduction strategies and measures would result in a substantial decrease in statewide GHG emissions to levels far below current background levels. Of the measures listed, very few apply to construction-generated GHG emissions. To the extent that the measures would be applicable to the proposed project, (e.g., enforce and follow limits idling time for commercial vehicles, including delivery and construction vehicles) the project would comply with those measures. The other measures are not applicable to the proposed project because they are directed at State entities (e.g., California Air Resources Board [ARB]), are operational or planning-level measures (e.g., for land use development projects or general plans), or apply to particular industries.

Project-Generated Greenhouse Gas Emissions

Short-term construction and long-term operation of the proposed project would generate emissions of GHGs. Construction emissions would be associated with vehicle engine exhaust from construction equipment, vendor trips, and employee compute trips. Operational emissions would be associated with area, mobile, and stationary sources. Mobile-source emissions of GHGs would include project-generated vehicle trips associated with maintenance of various components, employees, and deliveries to the project site. The project would also include the operation of stationary sources such as pumps, generators, treatment facilities, and any other emission source

that is involved in the remediation process. In addition, increases in stationary-source emissions could occur at off-site utility providers associated with electricity generation and water distribution that would supply the proposed project.

GHG emissions generated by the proposed project would predominantly consist of CO_2. In comparison to criteria air pollutants, such as ozone and PM_{10}, CO_2 emissions persist in the atmosphere for a substantially longer period of time. While emissions of other GHGs, such as CH_4, are important with respect to global climate change, emission levels of other GHGs are less dependent on the land use and circulation patterns associated with the proposed land use development project than are levels of CO_2.

Operation of the proposed project would add less than 70 vehicle trips per day to the project area (see the traffic analysis prepared for this project). If the total trips, as well as off-site stationary-source GHG emissions are considered, operation of the project would generate total GHG emissions of approximately 608 metric tons CO_2e annually during the lifetime of the project. As clarified in Section 4.2 (Air Quality), the total operational GHG emissions per year from the proposed project would be 1,739 MT CO_2e/yr, while total construction emissions would generate up to 2,618 MT CO_2e/yr. When the construction emissions are normalized over the four years of construction the total GHG emissions would be 2,394 MT CO_2e/yr for the first four years and then 1,739 MT CO_2e/yr after. Construction of the proposed project would generate finite quantities of approximately 2,618 metric tons (MT) of CO_2 in 2011 and 2014 (refer to Table 6-4). Construction would contribute GHG emissions to a lesser extent than operation of the proposed project for which emissions occur annually over the lifetime of the project.

Project Compliance with State Legislation

To establish additional context in which to consider the order of magnitude of project-generated construction GHG emissions, it may be noted that facilities (i.e., stationary, continuous sources of GHG emissions) that generate greater than 25,000 MT CO_2e/yr ~~MT CO_2/year~~ are mandated to report their GHG emissions to the ARB pursuant to AB 32. As shown in Table 6-4, the highest annual estimated GHG emissions associated with construction of the proposed project would be approximately 784 MT CO_2/yr. Absent any air quality regulatory agency–adopted threshold for GHG emissions, the proposed project would generate substantially fewer emissions than the 25,000 MT CO_2e/year required for mandatory reporting, the 10,000 MT CO_2e/yr ~~MT CO2e/yr~~ limit ~~under AB 32s~~ cap and trade program as defined under AB 32, the 10,000 MT CO_2e/yr threshold for industrial projects adopted by South Coast Air Quality Management District (SCAQMD), and the 3,000 MT CO_2e/yr threshold under consideration by the SCAQMD, and would slightly exceed the 1,100 MT CO_2e/yr operational emissions threshold under consideration by the Bay Area Air Quality Management District (BAAQMD) for development projects (BAAQMD 2009). This information is presented for informational purposes only, and it is not the intention of DTSC to adopt 25,000, 10,000, 3,000, or 1,100 MT CO_2e/yr as a numeric threshold. Rather, the intention is to put project-generated GHG emissions in the appropriate statewide context in order to evaluate whether the proposed project's contribution to the global impact of climate change is considered substantial. Because construction-related emissions would be temporary and finite in nature, and below the minimum standard for reporting requirements under AB 32, and below thresholds adopted and being considered by regulating agencies; the proposed project's GHG emissions would not be a considerable contribution to the cumulative global impact.

Local Regulations

San Bernardino County has adopted a series of policies designed to achieve a balance between development and environmental stewardship called Green County San Bernardino. Two of the policies include use of renewable energy and resource conservation. The San Bernardino policies are written to achieve, and if possible exceed, the measures proposed in AB 32.

As shown in Table 6-4 above, emissions from new mobile and stationary sources of GHG's associated with the proposed project would be ~~well~~ below adopted GHG significance thresholds (~~see~~ discussed above). The existing and proposed standards and thresholds are presented above to help build a better understanding of where the various regulatory agencies are regarding regulations and guidance of GHG emissions. If a threshold from an air

district were to be utilized by the MDAQMD, the most applicable would be the SCAQMD as part of San Bernardino County is within the jurisdiction of this adjoining air district, and the County policies have been developed to participate in the regional compliance with AB-32. The proposed project is being implemented to

Table 6-4
Summary of Modeled Greenhouse Gas (CO_2e) Emissions

Source	CO_2e Emissions
Direct Construction Emissions	**metric tons[1]**
2011	784
2012	781
2013	745
2014	308
Total Construction-Related Emissions	2,618
Direct and Indirect Operational Emissions	**metric tons/year[1]**
Mobile-Source Emissions	23
Stationary Source[2]	1131
Energy Consumption[3]	585
Total Annual Emissions	1739

Notes: CO_2e = carbon dioxide equivalent.

[1] Construction, area-source, stationary-source and mobile-source emissions were modeled using the URBEMIS 2007 (v9.2.4) (Rimpo and Associates 2008) computer model, based on trip generation rates contained in the traffic analysis prepared for the project (Fehr & Peers 2008), proposed land uses identified in the project description, and default model assumptions where detailed information was not available. URBEMIS accounts for emissions from vehicles and natural gas use. URBEMIS output is in units of tons carbon dioxide (CO_2) per year, whereas a standard unit for reporting greenhouse gas (GHG) emissions is in metric tons CO_2e/year. CO_2 emissions were increased by 5% to account for other GHG gases, and tons were converted to metric tons using the factor of 0.91 metric tons per ton.

[2] Assumes the additional generator will result in 5,700 hours of use per year at 320 kW to serve Alternative E during peak electrical demand periods.

[3] Indirect emissions associated with stationary sources (increased energy consumption) were calculated using the California Climate Action Registry General Reporting Protocol (version 3.0) and the assumption of 1.6 million kilowatt-hours per year for electrical use for Alternative E.

Notes: The values presented in above do not include the full life cycle of GHG emissions that may occur over the production/transport of materials used during construction of the project, solid waste disposal over the life of the project, or end of life of the materials and processes that would contribute to GHG emissions that occur as an indirect result of the project. Doing so would be speculative and would require analysis beyond the current state of the art in impact assessment and would lead to a false and misleading level of precision in reporting of project-related GHG emissions. Further, indirect emissions associated with in-state energy production, solid waste disposal, and wastewater treatment would be regulated under Assembly Bill (AB) 32 at the source or facility that would handle these processes. The emissions associated with off-site facilities in California would be closely controlled, reported, capped, and traded under AB 32 and California Air Resources Board programs. Therefore, this category of emissions would be consistent with AB 32 requirements.

Refer to Appendix AQ for detailed assumptions and modeling output files.

Source: Data modeled by AECOM in 2010.

remove Chromium VI from groundwater. This is consistent with San Bernardino County's policy to achieve compliance with AB 32 through resource conservation as remediation of the existing groundwater would potentially avail the groundwater for other uses in the future. Generally, it is important to note that 19% of the total energy consumed in the State of California is used to move water, maximizing the geographic range over which fresh water can be found for use in the State minimizes the need to move more water over greater

distances. PG&E anticipates being able to offset some of the energy demands of the project with solar panels, however, to be conservative, this EIR did not assume use of solar panels when calculating the potential air emissions from the project. PG&E's intent to use solar panels would be consistent with County policy. The GHG emissions are below the existing adopted applicable thresholds. The BAAQMD operational threshold of 1,100 MT CO_2e/yr for development projects does not apply to the proposed remediation project.

The GHG emissions from the proposed project would add to the overall GHG emissions for the state and the planet as a whole. As identified in Section 4.2 (Air Quality) and under a worst case scenario, the proposed project, including the use of an additional generator for up to 5,700 hours per year at 320 kW (to serve Alternative E during peak electrical demand periods and when the IM-3 Facility is still in use), would not generate GHG emissions (either direct or indirect) in such quantities as to result in a significant adverse impact on global climate change. Because it is unclear at this time how long Alternative E and the IM-3 Facilities would need to be operational, this DEIR has conservatively assumed 5,700 hours per year of generator use throughout the life of the project. Therefore, implementation of the proposed project would not result in a substantial net increase of short-term construction or long-term operation-related GHG emissions from mobile or stationary sources. Thus, project-generated emissions would not result in a cumulatively considerable net increase of GHGs. This cumulative impact would be less than significant.

6.4.3 BIOLOGICAL RESOURCES

The cumulative setting for biological resources consists of the project area and surrounding lands along with drainages that are connected to the project site, including the Colorado River. This setting generally consists of a mix of disturbed and relatively pristine natural landscape with a mix of biological communities consisting predominantly of upland desert interspersed with desert washes.

The projects considered in this cumulative analysis could have varying cumulative effects on biological resources ranging from direct impacts on sensitive species and habitat to beneficial impacts resulting from implementation of conservation measures. The PG&E projects at the compressor station (1A, 1B, 1D, and 1E~~, and 1M~~), Quarry Operations (2C), Moabi Regional Park Improvements (5A), Pirate Cove Resort (5B), Topock Marina Improvements (7A), and the cathodic protection system (9A) would have a contribution to biological impacts within the local cumulative setting. Other projects, such as the Lower Colorado River MSCP (2A), the CMP at HNWR (3A), and Topock Marsh Water Infrastructure Improvement Project (3B) have contributory beneficial effects.

Implementation of the proposed could result in impacts on biological resources. The proposed project would have potentially significant impacts related to development of project facilities in sensitive riparian habitats and waters protected under Section 404 of the Clean Water Act. Potentially significant impacts could also occur to sensitive species including special-status birds. Lastly, the proposed project could have significant impacts related to aquatic species in the Colorado River due to the potential use of freshwater intake. **Mitigation Measures BIO-1, BIO-2a**, **BIO-2b**, **BIO-2c**, **BIO-3a**, **BIO-3b** and **BIO-3c** would reduce these project impacts to less than significant.

The proposed project would contribute incrementally to the cumulative loss of sensitive habitats in the project area from this and other projects, specifically those projects listed above that may impact riparian and wetland areas. Mitigation that has been identified for the proposed project would fully mitigate any loss of habitat (**Mitigation Measures BIO-1, BIO-2a**, **BIO-2b**, and **BIO-2c**,); thus, the project's contribution to cumulative sensitive habitat impacts is compensated for by project mitigation.

Implementation of the project components would have potentially significant impacts on fish and fish habitat. This project would contribute incrementally to the cumulative impacts in the project area from this and other projects that may impact fish and their habitat. The other projects that could contribute incrementally would be

the other PG&E projects that would be implemented at the station and other projects such as the Moabi Regional Park and Topock Marina projects that may impact fish and their habitat. Mitigation that has been identified for the proposed project would fully mitigate any loss of fish and fish habitat (**Mitigation Measures BIO-3a** and **BIO-3b**); thus, the project's contribution to cumulative fish and fish habitat impacts is compensated for by project mitigation.

6.4.4 CULTURAL RESOURCES

To analyze the cumulative impacts associated with cultural resources, including unique paleontological resources, a tiered approach is required to adequately characterize these impacts because of the different contextual layers associated with these resources. The setting for this analysis must be viewed from the perspective of the resources that are physically present within the project area (local scale), are associated with the portion of the Topock Cultural Area consisting of the project area (local scale), and within the broader regional geography associated with the Lower Colorado River Valley. These perspectives are discussed below.

During the NACP, tribal representatives stated that the river tribes have cultural concerns for an integrated, inter-related cultural landscape that extends along the Colorado River corridor from Hoover Dam (and perhaps beyond) to the mouth of the river. Within this larger area, tribal representatives stated that there are many areas of particular significance in Native American cultural traditions, of which the Topock Cultural Area is one. Native Americans also have concern for the archaeological sites within this river corridor as they are testament to their ancestors' presence and history and for the regional landscape inclusive of landforms, water bodies (especially the river itself), groundwater, air quality, visual quality, and plants and animals. According to Native American tradition and religious beliefs, the Creator placed the tribes within this area as stewards of all creation. Many impacts have already occurred within the larger area, but Native American cultural representatives have reiterated that it is important to proceed with care, to avoid unnecessary impacts to previously undisturbed areas, and to consider the cumulative impacts projects have within this larger context.

Implementation of the proposed project has the potential to impact known and unknown cultural resources as well as known and unknown unique archeological resources, during construction, operations and maintenance, and decommissioning activities. Potential cultural resource impacts could occur to the Topock Cultural Area, some of the approximately 80 identified cultural resources in the project area, and to as-yet-unidentified resources that may exist in unsurveyed areas or in buried contexts. These impacts are considered significant and unavoidable (Topock Cultural Area) or potentially significant (other identified and as yet undiscovered historical resources). Mitigation would reduce impacts through avoidance, monitoring, and standard treatment options for most cultural resources (**Mitigation Measures CUL-1a, 1b, and 1c and CUL-2**). However, even with the implementation of mitigation such as provision of access to the tribes and use of previously disturbed areas and existing physical improvements, significant impacts to the Topock Cultural Area and other historical resources within the project area are expected to be significant and unavoidable. As such, the proposed project contributes to this significant and unavoidable cumulative impact.

For purposes of this cumulative impact analysis the Topock Cultural Area is considered at the local scale as described above. Project-related impacts on this resource can be reduced through implementation of **Mitigation Measures CUL-1a, 1b, and 1c and CUL-2**, but, as discussed in Section 4.4, cannot be fully mitigated due to the unique characteristics of this historical resource. The Topock Cultural Area has been subjected to many previous impacts, including the introduction of transportation, energy, and recreational facilities, as well as through construction of the IM-3 Facility and associated ground-disturbing activities undertaken in developing the Final Remedy.

Implementation of the proposed project could also result in impacts on unique paleontological resources that may occur in certain formations within the project area. **Mitigation Measure CUL-3** would reduce these potential impacts to a less-than-significant level through further investigation, monitoring by a qualified paleontologist, and

recovery, analysis, and curation of scientifically valuable fossil remains that may be discovered during ground-disturbing activities.

Finally, implementation of the proposed project could also result in impacts on human remains, including possible Native American burials and associated grave goods, which may occur in subsurface contexts within the project area. **Mitigation Measure CUL-4** would reduce these potential impacts, but because of the unique nature of these resources, this would remain a significant impact even after implementation of this mitigation measure.

As described above, there are several other projects that have already been implemented or may occur in the foreseeable future at or near the compressor station that are considered from the perspective of cumulative impacts as it relates to documented prehistoric and historic-era archaeological sites in the project area and surrounding vicinity. More broadly, the Lower Colorado River Valley contains a number of important geoglyphs or other cultural markers that are linked to Native American cultural traditions for tribes located throughout the region. These resources include intaglios, trails, dance paths/circles, dance staging areas, and "avenidas" (wide cleared paths) located throughout the region. Perhaps the most well-known geoglyphs in the region are the Blythe Intaglios, which include an anthropomoprphic and zoomorphic figure. Other intaglios in the Lower Colorado River Valley include the Black Point intaglios and geoglyphs in the Big Maria Mountains. According to certain tribes, the rituals and beliefs surrounding these geoglyph sites are integrated with one another and with the entire river corridor area. The ethnographic information strongly indicates that Yuman religious and cultural beliefs about the creation of the world, the history of Yuman culture, spiritual guidance about proper conduct, and the afterlife incorporate a range of landscape features, geoglyphs, and other cultural markers within this larger area. It has been suggested that the presence of intaglio features along the Colorado River between Pilot Knob and Spirit Mountain (of which the Topock Maze can be included) represents a pilgrimage route followed by Yuman-speakers in prehistory (Earle 2005:38).

Depending on the scope and locations of future projects within this region, the potential exists for cumulative impacts to occur with respect to identified and unidentified historical resources within the proposed project area, , and to alter the broader cultural features within the Lower Colorado River Valley. Some of these projects, such as the soil investigation and remediation activities (1D), AOC4 (1E), and the cathodic protection system (9A) involve substantial earthmoving activities that may further impact nearby known cultural resources at or near the station, as well as undocumented cultural resources that may occur in portions of the project area that have not yet been surveyed, or in buried contexts within the project area.

The recent past and possible future PG&E projects at the compressor station such as the soil investigation and remediation, as well as the continued Quarry Operations (2C), and the continuing use and improvements at the Moabi Regional Park Improvements (5A), Pirate Cove Resort (5B), and Topock Marina (7A) have the potential to: (1) involve ground disturbing activities that would directly and substantially alter significant historical and paleontological resources; (2) bring additional people (e.g., work crews, residents, tourists) into the area that may result in increased rates of vandalism or off highway vehicle use, resulting in ground disturbance; (3) result in other environmental impacts that may further disrupt the Topock Cultural Area ; and (4) results in other environmental impacts that may disrupt the resources within the Lower Colorado River Valley(e.g., visual, noise, air quality).

For example, development projects along the Colorado River (5A, 5B, and 7A) may bring relatively large numbers of new people into the area. Visitors associated with the development along the Colorado River may create ground disturbance or other environmental impacts in the Topock Cultural Area through recreational off-highway vehicle use, off-trail hiking, and loud music. Finally, the recent past and continuing operation of IM-3 (1L) has created an impact on the spiritual and cultural values associated with the Topock Cultural Area, as documented in the Final Settlement Agreement between PG&E and the Fort Mojave Indian Tribe (2006: 5).

While mitigation measures would likely be implemented for the other future projects in the area to reduce impacts on historical and paleontological resources, there are no feasible mitigation strategies that would reduce impacts

on the Topock Cultural Area. Therefore, implementation of the proposed project would have significant impacts on this historical resource, and other projects could contribute incrementally to these impacts. The proposed project would result in cumulatively considerable contribution to a cumulative impact on cultural resources. The only method to fully addresses these impacts is total avoidance of any future activity; therefore, no feasible mitigation exists that would reduce this impact below the level of significance. However, significant impacts can be reduced by implementation of the measures described in Section 4.4 of this EIR.

6.4.5 GEOLOGY AND SOILS

Potential effects to geologic and soil conditions are typically considered site specific. Therefore, the cumulative impact setting for geology and soils consists of the project area and immediately adjacent properties. The scope of potential cumulative impacts is limited to the area that is physically affected by the project.

Because of the limited extent of the cumulative setting for this resource topic, the projects listed in Table 6-3 that would be relevant to this analysis are the proposed PG&E activities at the compressor station and on adjacent properties (1A, 1B, 1D, and 1E~~, and 1M~~), the Topock Marina Improvements (7A), and the cathodic protection system (9A). The other listed projects would not be relevant to this analysis because the activities associated with those projects would not have any connection from a cumulative perspective, with the activities associated with this project.

As indicated in Section 4.5, "Geology and Soils," the site is located in an area considered to be a relatively low intensity ground shaking zone. The potential for seismic activity in this area is considered low because of the project area's substantial distance from active faults. As such, any project components that may be constructed would not be subject to the effects of strong ground shaking that could result in risks to people or damage to structures. Further, all proposed facilities would be constructed in accordance with the requirements of the Uniform Building Code (UBC), including requirements for seismic design, and the policies and implementation measures of the *County of San Bernardino 2007 General Plan* Safety Element. From a cumulative impacts perspective, other projects that would be implemented at the PG&E site or on adjacent properties would be subject to the same level of threat from seismic shaking and would also be required to adhere to UBC building requirements for seismic design and to San Bernardino County policies. Although new facilities and other projects would be constructed in the future in this general area, there would be a very minimal increase in risk to people or property from seismic events because of the low-level of potential threat and established standards and policies that have been implemented to minimize any potential impacts. Any contribution to cumulative impacts related to seismic shaking would not be cumulatively considerable.

A similar logic applies to cumulative impacts in the project region due to liquefaction. With the exception of areas along the banks of the Colorado River, the potential for liquefaction is minimal because of the deep groundwater table. Some facilities for the project and other projects on the above list will be constructed along the river banks where liquefaction has a higher potential to occur. Projects occurring along the riverbanks are relatively small projects (such as Moabi Regional Park) or consist of management plans for public lands that do not involve extensive development activities creating substantial new facilities. Any contribution to cumulative impacts related to liquefaction would not be cumulatively considerable.

Other projects that are likely to occur in the project area (1A, 1B, 1D, 1E, ~~1M,~~ 7A, and 9A), in particular project 1D, and 1E would potential result in substantial earthmoving activity as it relates to soil remediation and investigation activities, and would contribute to a significant cumulative impact to soil erosion in the project area. The proposed project also has the potential to result in increased soil erosion from wind and water during construction activities. The magnitude of this potential impact would be reduced by implementation of **Mitigation Measure GEO-1a**, which would include grading and erosion control plans, a stormwater pollution prevention plan, and consistency with local policies. These are standard requirements for construction sites and would be required for all other projects that would be located in the project area. Although the project may contribute

incrementally to cumulative erosion impacts, adherence to standard construction practices and requirements would limit the magnitude of cumulative impacts from this project and other future projects.

Project impacts involving differential compaction of soils and potential alterations of drainage patterns and erosion have been identified. This potential impact would be mitigated to less-than-significant levels through the implementation of **Mitigation Measure GEO-1b**. Considering the other projects that may be implemented at the compressor station, there is the potential for cumulative impacts to occur when the various PG&E projects are considered from a cumulative perspective. However, each of these individual projects would likely require implementation of similar measures and would be required to be in compliance with county standards, thereby reducing the potential for these potential impacts to be significant from a cumulative perspective.

With implementation of project-specific **Mitigation Measures GEO-1a** and **GEO-1b**, the proposed project's contribution to the overall cumulative effect would be reduced. Therefore, cumulative impacts related to differential compaction of soils and potential alterations of drainage patterns and erosion would be less than significant. The project would not cause any impacts related to expansive or unstable soils or subsidence and would therefore not contribute to any cumulative impacts.

6.4.6 HAZARDOUS MATERIALS

To assess cumulative impacts involving hazardous materials, the nature of the potential impacts would limit the cumulative setting to the project site itself and to other projects in the project vicinity. The PG&E projects listed in Table 6-3(1A, 1B, 1D, and 1E~~, and 1M~~) would be relevant. In addition, other relevant projects for this analysis include Quarry Operations (2C), Moabi Regional Park Improvements (5A), Pirate Cove Resort (5B), Topock Marina (7A), the cathodic protection system (9A), the Lower Colorado River MSCP (2A), and the Lower Colorado River MSCP CMP (3A).

The project impact analysis indicates that chemicals used during the operation and maintenance phase of the proposed project could have the potential of release or spill, which could present safety hazards to workers or the environment. Impacts related to the generation of hazardous materials during construction, and decommissioning of the proposed project would also be potentially significant. Potentially significant impacts involving localized exposure to hazardous materials during activities during construction and decommissioning activities could result in localized hazardous material spills or incidents. All phases of the proposed project could also result in the reasonably foreseeable releases of chemicals associated with excavated or disturbed soils. These impacts are also considered localized, and **Mitigation Measures HAZ-1**, **HAZ-2**, and **HAZ-3** would reduce these impacts to less than significant. All of these impacts are considered localized and would not contribute to other cumulative projects in the region.

Of particular note are the proposed PG&E projects which involve compressor station refurbishment and remediation of soil contamination. If these projects are to occur within a similar time frame as the proposed project, the potential for hazardous materials releases during these activities would increase. However, **Mitigation Measures HAZ-1**, **HAZ-2**, and **HAZ-3**, as well as future site-specific health and safety precautions associated with the other likely projects, would reduce their impacts. Therefore, the proposed project would not have a considerable contribution to significant impacts related to hazardous materials, and impacts would be less than significant.

Some of the other projects considered as part of this cumulative analysis would also have the potential to generate hazardous materials during construction. However, these projects would be required to comply with existing regulations that are designed to limit these kinds of impacts. Other projects on the compressor station and the improvement project at Moabi Regional Park have the potential to expose workers to hazardous materials because of their known presence at these two locations. These projects would require similar mitigation in the form of implementing health and safety plans that have the overall purpose of limiting the potential for exposure. Lastly,

during construction activities and potentially during operations and maintenance and decommissioning activities (when applicable), there is also a similar potential for the spill and release of hazardous materials during project implementation.

Although implementation of this project may incrementally contribute to cumulative impacts involving hazardous waste, the contribution would not be cumulatively considerable. Standard mitigation measures and practices required within the context of existing laws and regulations would individually limit these impacts for each project and minimize any potential for significant cumulative impacts.

6.4.7 HYDROLOGY AND WATER QUALITY

Cumulative water resources impacts are assessed both at a local level and a broader watershed/aquifer level. The local-scale cumulative setting is important for assessing some impacts, but because of the nature of water resources, most environmental impacts extend beyond a local level and have the potential to impact a more extensive area. This potentially impacted area can include the portion of a drainage area that is downslope from the project site; for example, a project may generate additional runoff that may contribute to downstream flooding when consider in combination with other projects within the same watershed.

The area around the compressor station is drained by a network of ephemeral washes that eventually flow into the Colorado River to the east of the project area. With respect to evaluating surface water quality and hydrology impacts, the PG&E projects (1A, 1B, 1D, and 1E~~, and 1M~~), the Quarry Operations (2C), the Topock Marina Improvements (7A), and the cathodic protection system (9A) are relevant to the cumulative analysis because they are located within the same drainage area. Impacts related to water quality from all phases of the proposed project could occur. Best management practices (BMPs) have been identified in **Mitigation Measures HYDRO-1**, **HYDRO-2**, **and HYDRO-3**, which would reduce impacts related to water quality to less than significant. The relevant cumulative projects described previously that would involve construction and operational activities that could have similar water resources impacts. The BMPs described in the impact analysis for this project would likely be similarly required as mitigation for water quality impacts for each of these other respective projects. Although it is possible than two or more of these projects may occur simultaneously, it is likely that these other projects may occur independently of one another and thus avoid the potential for compounding effects from simultaneous construction projects in the same area. For this reason, the proposed project may contribute incrementally to water quality impacts during the construction phase, but this impact is not cumulatively considerable.

6.4.8 LAND USE AND PLANNING

Cumulative land use impacts are generally assessed at both a local and a community scale. Land use compatibility issues are relevant at a local level as they involve the interrelationship between land uses associated with the project and neighboring properties. To assess cumulative impacts associated with plans, policies, or regulations, a community-level perspective is often used; however, for this project, a local-scale assessment would be appropriate. The compressor station site is bounded by HNWR property while PG&E property north of I-40 is bounded by Reclamation's property to the east and south and Moabi Regional Park to the west and north. Cumulative projects from Table 6-3 that are relevant to these properties are used in the cumulative land use impacts assessment.

The PG&E projects listed in Table 6-3 (1A, 1B, 1D, and 1E~~, and 1M~~) would be relevant. In addition, other relevant projects for this analysis include Quarry Operations (2C), Moabi Regional Park Improvements (5A), Pirate Cove Resort (5B), Topock Marina (7A), the Lower Colorado River MSCP (2A), the HNWR CMP (3A), and Topock Marsh Water Infrastructure Improvement Project (3B). The first four projects on this list consist of modifications, minor expansions, or a continuation of previously existing land uses. The last three projects are

plans for management of lands and resources near the Colorado River. Both of these have already been implemented to some degree. Some of the projects at the compressor station (1A, 1B, 1D, and 1E~~, and 1M~~) consist of operations and maintenance projects that are a continuation of existing operations. Projects related to remediation of soil investigation and remediation (1D) in the project area could have similar effects as the current proposed project, as much of it could be located on property managed by other land owners. Other projects in this area consist of either management plans for public lands and resources or improvements to existing land uses. When these projects are viewed from a cumulative perspective, potential cumulative land use impacts appear to be limited. None of these projects would result in changes to land use or nearby communities such that they would have a cumulative impact to land use.

The other projects that are being evaluated as part of the cumulative land use analysis are not likely to have substantial land use impacts because of the scope and location of the projects. In addition, when the cumulative projects are viewed in combination with the proposed project there are not anticipated land use effects that could be compounded or exacerbated through this combination. For these reasons, the proposed project would not contribute to a significant cumulative land use impact.

6.4.9 NOISE

The assessment of cumulative noise impacts is performed at a local scale. Noise is generated from an activity that is in turn experienced by receptors close to the noise source. In the case of the compressor station, noise from the plant is experienced in the immediate vicinity of the plant. Noise from the compressor station activities comprises a component of the overall noise environment in combination with other noise sources in the area, such as traffic noise from I-40 and train operations on the Burlington Northern and Santa Fe railway line.

From Table 6-3, projects that would be situated in the vicinity of the compressor station are evaluated as part of the cumulative noise analysis. This includes PG&E projects at the station (1A, 1B, 1D, and 1E), Quarry Operations (2C), and the improvements projects at Moabi Regional Park Improvements (5A), Topock Marina (7A), Pirate Cove Resort (5B), and the cathodic protection system (9A). These projects all have the potential to generate noise in the vicinity of the compressor station. However, measures would be in place for these projects to reduce impacts on a project-by-project basis such that noise remains localized and reduced to sensitive receptors.

The noise analysis for the proposed project indicates that significant noise impacts would result from construction, operations and maintenance, and decommissioning. **Mitigation Measures NOISE-1 and NOISE-2** have been identified that would reduce these impacts to a less-than-significant level. In addition, the proposed project would generate noise that could expose the Topock Cultural Area (a place of worship for Native Americans) to levels that exceed the County's standards or would conflict with Native American values associated with this resource. **Mitigation Measures NOISE-3** would reduce, but not completely avoid, impacts to this receptor, and impacts would remain significant and unavoidable.

The project site is located in an area that contains multiple noise sources, I-40 and the railroad in particular, that affect sensitive noise receptors in the area. Implementation of the proposed project has the potential to contribute to cumulative noise levels, when combined with the noise generated by other unrelated projects in this area. Projects at the compressor station will likely generate noise during construction, operations and maintenance, and decommissioning activities that may be comparable to the proposed project in magnitude. Depending on the timing for the implementation of these projects and the final form the projects take, these projects may have a significant cumulative noise impact on sensitive receptors in this area, depending on the effectiveness of noise mitigation measures and whether the projects are implemented concurrently. It is possible that the proposed project, if operating concurrently with other projects, could have a cumulative impact to sensitive noise receptors. However, mitigation measures proposed for the proposed project, as well as any other future activities at the project area related to future PG&E projects, would be reduced to less than significant through the implementation of mitigation measures.

6.4.10 TRANSPORTATION

Cumulative transportation impacts are evaluated from the perspective of the local transportation network and from the broader regional transportation network. The transportation network includes local roads that serve the compressor station, Moabi Regional Park, and adjacent lands; and I-40, a major regional highway that serves northern Arizona and the Mojave Desert region of southern California. These roadways comprise the cumulative setting for the cumulative transportation impacts analysis.

Traffic conditions for the Cumulative Year Horizon (2035) were assessed by applying a 1.7% annual growth rate to existing traffic volumes before adding project traffic to the roadway network. The growth rate was derived from the SCAG regional travel demand forecasting model. There are currently no plans for future roadway improvements along the study roadways or at study intersections, so no changes to the roadway network were assumed in the assessment of cumulative traffic conditions.

Consistent with standard and acceptable analysis of cumulative impacts related to traffic, future traffic scenarios without and with project-related traffic are considered, as described below.

- **Cumulative No Project.** This scenario provides the cumulative baseline for identifying cumulative impacts. The Cumulative No Project traffic volumes are developed by applying a growth factor to existing traffic volumes in the area and correspond to a 25-year planning horizon, or approximately the year 2035.

- **Cumulative (2035) plus Project.** This scenario adds traffic generated with operations and maintenance of the site under each of the project components, described in the "Project Description" chapter, to the Cumulative No Project traffic estimates.

The proposed project would generate additional traffic during the construction, operation and maintenance, and decommissioning phases. Based on the significance criteria described in Section 4.10, the project would result in a significant cumulative impact if the addition of project generated traffic would degrade intersection or roadway segment operations below an acceptable level of service. A significant impact would also occur if the proposed project added any traffic to an intersection or roadway segment projected to operate at an unacceptable level of service under the Cumulative No Project scenario.

As shown in Tables 6-5 and 6-6, all roadway segments and study intersections are projected to operate at an acceptable level of service under the Cumulative No Project scenario. When project-generated traffic is added to the future cumulative condition, as indicated in Tables 6-5 and 6-6, all project area roadway segments and intersections would continue to operate acceptably and at level of service A, during construction, operations and maintenance, and decommissioning phases. Since all roadway segments and intersections would operate at acceptable levels in the future, there would be no cumulative traffic impact. And the proposed project's contribution to future traffic levels is not considered to be considerable. Therefore no significant cumulative traffic impacts are anticipated.

6.4.11 UTILITIES AND SERVICE SYSTEMS

The compressor station currently discharges nonhazardous wastewater (i.e., domestic graywater and sewage) to on-site leach fields. Because of the limited extent of the cumulative setting for this resource topic, the projects that would be relevant are the proposed PG&E activities at the compressor station and on adjacent properties (1A, 1B, 1D, 1E, ~~1M,~~ and 9A). The construction, operation, and decommissioning of the proposed project facilities would not generate substantial amounts of domestic wastewater (sewage or gray water). In addition, the PG&E activities would similarly not be expected to generate substantial amounts of domestic wastewater. Because these are not wastewater-intensive facilities, cumulative wastewater impacts are not anticipated.

Table 6-5
Cumulative plus Project—Roadway Segment Analysis

Location	Acceptable Volume Threshold[1]	Volume	Acceptable?
Cumulative (No Project) Conditions			
Park Moabi Road north of I-40	7,000 ADT	592	Yes
Park Moabi Road south of I-40	7,000 ADT	65	Yes
Cumulative plus Construction Conditions			
Park Moabi Road north of I-40	7,000 ADT	648	Yes
Park Moabi Road south of I-40	7,000 ADT	85	Yes
Cumulative plus Construction plus O&M Conditions			
Park Moabi Road north of I-40	7,000 ADT	650	Yes
Park Moabi Road south of I-40	7,000 ADT	85	Yes
Cumulative plus O&M plus Decommissioning Conditions			
Park Moabi Road north of I-40	7,000 ADT	680	Yes
Park Moabi Road south of I-40	7,000 ADT	93	Yes
Cumulative plus Decommissioning Conditions			
Park Moabi Road north of I-40	7,000 ADT	792	Yes
Park Moabi Road south of I-40	7,000 ADT	131	Yes

Notes: ADT = average daily traffic; I-40 = Interstate 40; O&M = operation and maintenance

[1] Based on the threshold in the *County of San Bernardino 2007 General Plan*.

Source: Data compiled by Fehr & Peers in 2010

Table 6-6
Cumulative plus Project—Level of Service

Location	Control	Peak Hour	Delay (Seconds)[1]	LOS[3]
Cumulative (Baseline) Conditions				
Park Moabi Road and I-40 eastbound on-/off-ramps	SSSC	a.m.	9.0	A
		p.m.	9.0	A
Park Moabi Road and I-40 westbound on-/off-ramps	SSSC	a.m.	8.4	A
		p.m.	8.5	A
Cumulative plus Construction Conditions				
Park Moabi Road and I-40 eastbound on-/off-ramps	SSSC	a.m.	9.0	A
		p.m.	9.2	A
Park Moabi Road and I-40 westbound on-/off-ramps	SSSC	a.m.	8.7	A
		p.m.	8.6	A
Cumulative plus Construction plus O&M Conditions				
Park Moabi Road and I-40 eastbound on-/off-ramps	SSSC	a.m.	9.0	A
		p.m.	9.3	A
Park Moabi Road and I-40 westbound on-/off-ramps	SSSC	a.m.	8.7	A
		p.m.	8.7	A
Cumulative plus O&M plus Decommissioning Conditions				
Park Moabi Road and I-40 eastbound on-/off-ramps	SSSC	a.m.	8.8[2]	A
		p.m.	9.2	A
Park Moabi Road and I-40 westbound on-/off-ramps	SSSC	a.m.	8.6	A
		p.m.	8.6	A
Cumulative plus Decommissioning Conditions				
Park Moabi Road and I-40 eastbound on-/off-ramps	SSSC	a.m.	9.2	A
		p.m.	9.3	A
Park Moabi Road and I-40 westbound on-/off-ramps	SSSC	a.m.	8.9	A
		p.m.	8.7	A

Notes: LOS = level of service; SSSC = side-street stop-control intersection; O&M = operation and maintenance

[1] For side-street stop-controlled intersections, delay for worst movement was calculated using the 2000 *Highway Capacity Manual* methodology.

[2] LOS may improve at unsignalized intersections based on methodology applied for worst-approach delay.

[3] LOS A indicates little or no traffic delays (see Table 4.10-2).

Source: Data compiled by Fehr & Peers in 2009

An estimated 1.8 million kilowatts are consumed by the compressor station and the IM-3 Facility. The City of Needles currently supplies the IM-3 Facility (1L) with electricity via their electrical distribution system. PG&E is a commercial customer. A rented generator (Isuzu Model 6WG1X) is used at the site of IM-3 for backup electricity and is permitted as California portable equipment through the MDAQMD (CH2M Hill 2006:1-4). The generator was used in 2009 for approximately 119 hours. During preparation of the FEIR, PG&E provided supplemental information on how electricity would be supplied for the 1.6 million additional kilowatt-hours needed to serve the proposed remedy while IM-3 continues operating. Potential sources of electricity for the proposed project would be supplemental power from the compressor station, a dedicated portable diesel-fuel generator (approximately 320 kW), small solar panels, or a combination thereof. These sources of electricity would be used either individually or in combination to meet the electrical demands of the project (PG&E 2010). Therefore, because existing and proposed sources can meet the cumulative electricity demand of the overall project, impacts would be less than significant to existing infrastructure. ~~With regard to electricity, operation of the proposed project (primarily energy needed to move water through the remediation system) would require up to 1.6 million kilowatt-hours annually, in combination with the estimated 1.8 million kilowatts that are consumed with the past project IM-3 Facility. The City of Needles currently supplies the IM-3 Facility (1L) with electricity via their electrical distribution system. PG&E is a commercial customer. It is possible that the proposed project would generate electricity on-site using natural gas-fired generators that would draw fuel from the existing gas pipeline. If it is determined that the construction of new gas-fired generators on-site is necessary, they would be located within the project boundary. It is also possible that the proposed project could have an electric demand greater than what can be produced on-site, thereby requiring additional electric supply from the City of Needles. The amount of energy that would be supplied by the City of Needles, if any, is unknown at this time. However, if the demand is great enough, the system may require upgrades to improve reliability or expand capacity (generate additional electricity) from the City of Needles, which may result in environmental impacts. These impacts would need to be considered in light of anticipated projects that are expected to be served by the City of Needles. Because the extent of demand is not known, impacts related to electrical generation are considered potentially significant. **Mitigation Measure UTIL-1** would reduce this potentially significant impact to a less-than-significant level~~

Cumulative impacts involving solid waste disposal must be assessed at a broad regional level because levels of services and changes in those levels affect service areas associated with available landfills in the region in question. As described previously in this DEIR, landfill capacity is be evaluated in terms of the facilities available within a reasonable distance, available total capacity, and maximum daily capacity. Increased cumulative demand for solid waste disposal associated with a project would potentially affect the provision of this service to a region as a whole, and the overall capacity of the disposal systems and facilities within the service areas. The Topock compressor station is a longstanding activity in this unincorporated part of San Bernardino County with an ongoing demand for solid waste disposal along with other communities in this immediate area and in the larger region.

To evaluate cumulative impacts on solid waste disposal, the impacts associated with this project must be considered within the context of the regional growth trends presented previously in this section. A regional perspective is required for a couple of reasons. Of the landfills described in the solid waste disposal impact analysis, two of the facilities are anticipated to be closed in 3 to 4 years from the present time and the closest landfill has unknown capacity. Thus, a broader assessment of available facilities a greater distance from the compressor station and their respective capacities is necessary.

As shown in Table 6-2, substantial population growth is expected in the project region during the next 20 years. The population growth in San Bernardino County is expected to be approximately 36% and the rate of growth in Mohave County would be even higher at 49%. These high rates of growth will increase the demand for public

services and utilities in the two-county area and have the potential to accelerate the rate at which landfill capacity is consumed.

Implementation of the project components will contribute to the solid waste stream for the landfills in this region. The maximum expected contribution to the waste stream (from decommissioning of the proposed project) would comprise about 5% of the maximum daily capacity of the smallest landfill that may potentially be used (Barstow Sanitary Landfill). Based on this estimate, implementation of this project will contribute incrementally to the cumulative demand for solid waste disposal capacity. However, given the magnitude of this contribution compared to available future capacity, this would not be cumulatively considerable.

6.4.12 WATER SUPPLY

By virtue of its geographic location, water supply issues associated with the compressor station occur within a defined water setting associated with the Lower Colorado River in general and the Lower Colorado River Water Supply Project, specifically. The lack of available or feasibly obtainable water resources from outside the project area limits the analysis accordingly.

The Colorado River system is currently experiencing a multiyear drought and is facing increasing demands in managing the river for water supplies, power generation, and environmental protection. The effects of climate change will likely exacerbate the major challenges facing the river system. Stakeholders are actively seeking ways to address these challenges and Reclamation has developed interim guidelines for shortages and coordinated operation of reservoirs. Nonetheless, there will likely be a significant adverse cumulative effect on Colorado River water supply as a result of past, current, and future projects associated with those in Table 6-3 as well as overall growth projections outlined in Table 6-2, without consideration of the proposed project.

Implementation of the proposed project would require relatively modest amounts of water during the construction and decommissioning phases, and a negligible amount of water during operations. As a result of the decommissioning of the IM-3 Facility (1L), the project would result in a net reduction in water use compared to existing conditions. All of this water use is well within PG&E's existing (Lower Colorado River Water Supply Project) contracted entitlement of 422 acre-feet annually. Because the project does not require substantial amounts of water and would not generate a demand for water that exceeds existing entitlements, the project does not make a considerable contribution to cumulative impacts on water supply. While, from a water supply perspective, the consumptive use associated with the project is very small, localized effects on the groundwater table near the freshwater extraction wells are possible. Depending on how the extraction wells are sited, existing nearby supply wells could be adversely affected. **Mitigation Measure WATER-1** would require a hydrologic analysis during the design phase of the project to evaluate the proposed pumping rates for extraction, the potential cone of depression, and the extraction effect on any existing wells in proximity. With implementation of **Mitigation Measure WATER-1**, the project's potential contribution to cumulative localized effects on the groundwater would be reduced to a less–than-significant level.