

CHAPTER 5

Other CEQA Sections

This chapter presents the evaluation of other types of environmental impacts required by the California Environmental Quality Act (CEQA) that are not covered within the other chapters of this subsequent environmental impact report (SEIR) for the proposed Pacific Gas and Electric Company (PG&E) Topock Compressor Station Final Groundwater Remediation Project (Final Groundwater Remedy Project or proposed Project). The other CEQA considerations include environmental effects for which no mitigation is available to reduce the level of significance to less than significant, the irreversible and irretrievable commitment of nonrenewable resources as a result of the Project, and growth-inducing impacts of the Project.

5.1 Unavoidable Significant Impacts

As required by CEQA Guidelines Section 15126.2(b), an environmental impact report (EIR) must describe any significant impacts that cannot be avoided, including those impacts that can be mitigated but not reduced to a less than significant level. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons the project is being proposed, notwithstanding their effect, should be described. Chapter 4, “Environmental Analysis,” of this SEIR describes the potential environmental impacts of the proposed Project and recommends mitigation measures to reduce impacts, where feasible. As discussed in this SEIR, implementation of the proposed Project would result in potential impacts that would be mitigated below a level of significance with implementation of mitigation measures for aesthetics, air quality, biological resources, hazards and hazardous materials, hydrology and water quality, utilities, service systems, and energy, and water supply. Significant and unavoidable impacts would remain to cultural resources and noise, even after implementation of mitigation measures. Cumulatively considerable significant and unavoidable impacts would occur to aesthetics, cultural resources, and noise, even after implementation of mitigation measures.

5.1.1 Aesthetics

Cumulative Aesthetic Impacts

The geographic scope for potential cumulative impacts to aesthetics includes the foreground, which is defined as the zone within 0.25 miles to 0.5 miles from the Project Area, and the middle-ground, which is a zone that extends from the foreground up to 3 to 5 miles.

Projects that have already been implemented or may occur in the foreseeable future in the Project Area that could impact cultural resources are described in Chapter 6, “Cumulative Impacts.” The projects in the cumulative scenario have the potential to affect key views and sensitive aesthetic

resources in the geographic scope, including projects at and in the immediate vicinity of the Station. Elements of these projects (such as ground disturbing activities; installation of infrastructure; and introduction of additional vehicles, equipment, and personnel) would be visible to affected viewers in the geographic scope, including recreational, vehicular, and Tribal viewer groups. The proposed Project would represent an incremental change that would substantially alter the composition or character of existing landscape views, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, particularly the Soil Remediation and Potential Pilot Test Project. Thus, this impact would be cumulatively significant and the proposed Project's contribution to this impact would be cumulatively considerable (Impact CUM-1). This is a new significant cumulative impact from those identified in the Groundwater FEIR.

In order to reduce this impact, **Mitigation Measures AES-1** and **AES-2** shall be implemented (see Section 4.1 of this SEIR). Mitigation Measures AES-1 and AES-2 would reduce Project-level aesthetic impacts by including design requirements to ensure that Project facilities along the Colorado River and the associated scenic corridor do not significantly affect views. These measures would reduce the Project's contribution to significant cumulative aesthetic impacts; however, given overall cumulative changes to the visual resources, impacts would remain significant and unavoidable. One particular cumulative future project, the Soil Remediation and Potential Pilot Test Project, will also require compliance with CEQA, which will include consideration of that project's contribution to significant visual impacts and potential additional mitigation measures. However, for the purposes of this SEIR, the Project's contribution to this cumulative impact would remain cumulatively considerable (significant and unavoidable).

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

5.1.2 Cultural Resources

Historical Resources

Topock Traditional Cultural Property (TCP)

DTSC has determined that implementation of the proposed Project would result in a substantial adverse impact on the National Register of Historic Places-eligible Topock Traditional Cultural Property (TCP). Direct impacts to the Topock TCP include: a three-fold increase in soil disturbance from that previously considered in the Groundwater FEIR, as well as a Future Activity Allowance; an approximately 12 percent increase in the number of boreholes from that previously considered in the Groundwater FEIR, as well as Future Activity Allowance for boreholes. New direct impacts, not analyzed in the Groundwater FEIR, could occur as a result of: the importing of groundwater potentially containing increased levels of arsenic from Arizona to California; construction and operation of the Construction Headquarters, Long-Term Remedy

Support Area and Soil Processing Area near Moabi Regional Park; the use of portable generators and lighting to accommodate limited nighttime work activities; and the use of staging areas.

Direct impacts resulting from the Final Remedy Design to each of the seven contributing elements and the overall setting of the Topock TCP, in addition to the other ongoing activities within the Topock TCP, could cause a substantial adverse change in the significance of the TCP as a result of the physical destruction and alteration to the characteristics of the property that convey its historical significance and qualify it for inclusion in the California Register of Historical Resources as defined in CEQA Guidelines Section 15064.5. The substantial adverse change to the contributing elements to the Topock TCP would result from ground-disturbing activity that would directly and adversely affect the soil, landforms, and unknown prehistoric archaeological resources; alteration of groundwater dynamics and introduction of imported groundwater that could directly and adversely affect the water; pruning or alteration of the natural growth of native and traditional plant species; and construction and operation of infrastructure that would result in significant visual intrusion to the Topock TCP viewshed. These activities would also materially affect the cultural values ascribed to the TCP by some Native American Tribes. Therefore, impacts to the historical resource identified as the Topock TCP would be significant (Impact CUL-1a). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce these impacts, **Mitigation Measures CUL-1a-1 through CUL-1a-19** shall be implemented (see Section 4.4 of this SEIR). Implementation of Mitigation Measures CUL-1a-1 through CUL-1a-19 would reduce but not completely avoid the potential for significant impacts to the historical resources identified as the Topock TCP. The Project would result in the destruction or alteration of contributing elements which convey the historical significance of the Topock TCP. As a result, the impacts to the historical resource identified as the Topock TCP would remain significant and unavoidable.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Historical Resources (other than the Topock TCP)

A total of 124 known historical resources are located within the Project Area, including many resources that had not yet been identified at the time of certification of the Groundwater FEIR in 2011. In addition, there are nine historical resources (CA-SBR-2910H/AZ I:15:156 (ASM)/AZ L:7:72 (ASM), CA-SBR-6693H/AZ I:14:334 (ASM) (A&P/AT&SF/BNSF), CA-SBR-11862H, CA-SBR-11939, CA-SBR-11997H, CA-SBR-13791H, AZ L:7:16 (ASM), P-36-027678, and Æ-Topock-210) other than the Topock TCP that overlap planned Project components within the Project Area and may be subject to additional disturbances.

Because the Project involves ground-disturbing activities, there is the potential for such activities to disturb known and unknown potentially significant resources qualifying as historical under CEQA. Direct and indirect impacts could occur as a result of: construction of the Construction Headquarters/Long-Term Remedy Support Area and Soil Processing/Clean-Soil Storage Area near Moabi Regional Park, not previously considered in the Groundwater FEIR; construction of an Operations Building and other improvements at the Transwestern Bench, not previously considered in the Groundwater FEIR; construction of a Carbon Amendment Building and other improvements at the MW-20 Bench, not previously considered in the Groundwater FEIR; an approximately 12 percent increase in the number of boreholes from that previously considered in the Groundwater FEIR, as well as Future Activity Allowance; an approximately 50 percent increase in roadway improvements from that previously considered in the Groundwater FEIR, as well as a Future Activity Allowance; and increased disturbance resulting from the fact that remedy pipelines are to be constructed underground (versus aboveground which was assumed in the Groundwater FEIR), which will result in approximately 127,500 linear feet of underground piping, plus a Future Activity Allowance, all of which would result in a substantially more severe significant impact on unknown historical resources than was previously identified in the Groundwater FEIR. Therefore, the Final Groundwater Remedy Project has the potential to impact known and unknown historical resources other than the Topock TCP through ground disturbance, increased activity, and introduction of new visual intrusions to the landscape would alter the setting of these resources, and this impact is considered significant (Impact CUL-1b/c). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce these impacts to known and unknown historic resources, **Mitigation Measures CUL-1b/c-1, CUL-1b/c-3, CUL-1b/c-4, CUL-1b/c-5, CUL-1b/c-6, and CUL-1b/c-7** shall be implemented (see Section 4.4 of this SEIR). These measures would reduce impacts to historical resources other than the Topock TCP by requiring archaeological monitoring, evaluation and treatment of inadvertent discoveries, avoidance and preservation in place, implementation of additional protective measures. However, even after mitigation, Project-related impacts to known and unknown historical resources other than the Topock TCP would be significant and unavoidable. This is consistent with the conclusions presented in the Groundwater FEIR.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Unique Archaeological Resources

Since the certification of the Groundwater FEIR, the Project Area has been modified and additional studies conducted. As a result, a total of 117 known archaeological resources that could potentially qualify as unique archaeological resources under CEQA are located within the Project Area. There are five archaeological resources that are considered historical resources under

CEQA that may also qualify as unique archaeological resources (CA-SBR-11862H, CA-SBR-13791H, CA-SBR-11939, AZ L:7:16 (ASM), and Æ-Topock-210) that overlap planned Project components within the Project Area and may be subject to additional disturbances.

Because the Project involves ground-disturbing activities, there is the potential for such activities to disturb known and unknown potentially significant unique archaeological resources. Direct and indirect impacts could occur as a result of: construction of the Construction Headquarters/Long-Term Remedy Support Area and Soil Processing/Clean-Soil Storage Area near Moabi Regional Park; construction of an Operations Building and other improvements at the Transwestern Bench; construction of a Carbon Amendment Building and other improvements at the MW-20 Bench; and the construction of wells, underground pipelines, and roadway improvements, as well as part of the Future Activity Allowance. Therefore, the Final Groundwater Remedy Project has the potential to impact known and unknown unique archaeological resources through ground disturbance, increased activity, and introduction of new visual intrusions to the landscape would alter the setting of these resources, and this impact is considered significant (Impact CUL-2).

In order to reduce these impacts to known and unknown unique archaeological resources, **CUL-1b/c-1, CUL-1b/c-3, CUL1b/c-4, CUL-1b/c-5, and CUL-1b/c-6** shall be implemented (see Section 4.4 of this SEIR). These measures would reduce impacts to unique archaeological resources by requiring archaeological monitoring, evaluation and treatment of inadvertent discoveries, avoidance and preservation in place, implementation of additional protective measures. However, even after mitigation, Project-related impacts to known and unknown unique archaeological resources would be significant and unavoidable. This is consistent with the conclusions presented in the Groundwater FEIR.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Human Remains

Implementation of the proposed Project could disturb human remains, including those interred outside of formal cemeteries. The lack of any identified human remains in the Project Area does not preclude the possibility that unknown human remains may be present given the length of human occupation of the area. Impacts to human remains could occur as a result of: construction of the Construction Headquarters/Long-Term Remedy Support Area and Soil Processing/Clean-Soil Storage Area near Moabi Regional Park; construction of an Operations Building and other improvements at the Transwestern Bench; construction of a Carbon Amendment Building and other improvements at the MW-20 Bench; and the construction of wells, underground pipelines, and roadway improvements, as well as part of the Future Activity Allowance associated with all proposed Project components. Therefore, the proposed Project has the potential to disturb human

remains, and this impact would be significant (Impact CUL-4). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce these impacts, **Mitigation Measure CUL-4** shall be implemented (see Section 4.4). Mitigation Measure CUL-4 would reduce potential impacts to human remains through implementation of the requirements and protocols found in the CIMP and CHPMP, including notifying the appropriate Tribes regardless of land ownership. However, even after mitigation, impact to human remains is not reduced to a level below significance. As a result, any destruction or alteration of human remains to Native American Tribes in the extraordinary context of the Topock TCP would be significant. Therefore, impacts to human remains would remain significant and unavoidable. This is consistent with the conclusions presented in the Groundwater FEIR.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Cumulative Cultural Resources Impacts

The geographic scope for cumulative impacts to cultural resources (i.e., historical resources, unique archaeological resources, unique paleontological resources or geological features, and human remains) consists of the Lower Colorado River Valley. The Lower Colorado River Valley contains a number of important sites of cultural and/or archaeological importance that are integral to the cultural traditions of Native American Tribes located throughout the region.

Projects that have already been implemented or may occur in the foreseeable future in the Project Area that could impact cultural resources are described in Chapter 6, “Cumulative Impacts.” The projects in the cumulative scenario have the potential to involve ground-disturbing activities that would directly impact significant cultural resources and paleontological resources. These projects may also bring additional people (e.g., work crews, residents, tourists) into the area that may result in increased rates of vandalism or OHV use that may directly or indirectly impact resources. These projects may also result in visual, auditory, and other environmental impacts that may adversely affect the Topock TCP. For these reasons, the combined impacts on cultural resources in the geographic scope would be considered cumulatively significant. When considered in combination with the impacts of other projects in the cumulative scenario, the Project’s incremental contribution to impacts on cultural resources including historical resources (including the Topock TCP), unique archaeological resources, unique paleontological resources or geologic features, and human remains would be cumulatively considerable (Impact CUM-2). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce these impacts, **Mitigation Measure CUL-1a-1 through CUL-1a-19; Mitigation Measures CUL-1b/c-1, -3, -5, -6, and -7; Mitigation Measure CUL-3; and Mitigation Measures CUL-4** shall be implemented (see Section 4.4 of this SEIR). Although

implementation of these Mitigation Measures would reduce the significance of the impacts to the degree feasible, the only method to fully mitigate these impacts would be complete avoidance of any future Project activity; therefore, no feasible mitigation exists that would reduce the Project's contribution to less than considerable. The Project's contribution to this significant cumulative cultural impact would be cumulatively considerable (significant and unavoidable). This is consistent with the conclusions presented in the Groundwater FEIR.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

5.1.3 Noise

Long-term Operational-Related Non-transportation Noise and Vibration Impacts

DTSC has determined that construction activities associated with the Future Activity Allowance that could occur during long-term operation and maintenance of the proposed Project could result in noise levels that exceed applicable standards. The Future Activity Allowance would involve construction of new wells, pipeline segments, and access roads during the operation and maintenance phase of the Project at locations that are presently unknown. The additional allowance would use the same equipment and procedures as those involved in the construction of the Project, and maximum noise impacts would be similar. However, the activities involved with the Future Activity Allowance would be more sporadic and intermittent as they would be performed based on unforeseen malfunctions or needs throughout the 30 year operation and maintenance phase of the Project.

Construction activities associated with the Future Activity Allowance during operation and maintenance could exceed thresholds resulting in significant impacts as the Future Activity Allowance activities would involve the same equipment as construction activities (see Table 4.7-14). Activities related to construction would have significant impact. Therefore, activities related to the allowance would be significant (Impact NOISE-1). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce this impact **Mitigation Measure NOISE-2** shall be implemented (see Section 4.7). Implementation of Mitigation Measure NOISE-2 would ensure that investigation equipment is properly maintained per manufacturer specifications and fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps) and ensure coordination with the Tribes; however, impacts related to the allowance would remain significant and unavoidable.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the

historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Project-Generated Construction-Related Noise Levels

DTSC has determined that implementation of the proposed Project would result in intermittent construction activities associated boreholes, the Soil Processing/Clean-Soil Storage Area, pipelines, Staging Area 26 & 27, and the IM-3 Facility decommissioning, which would expose sensitive receptors to noise levels in excess of San Bernardino or Mohave County noise standards and/or result in a substantial increase in ambient noise levels.

In addition, the Future Activity Allowance would involve construction of new wells, pipeline segments, and access roads during the construction and operation and maintenance phases of the Project at locations that are presently not known. The additional allowance would use the same equipment and procedures as those involved in the construction of the Project, and maximum noise impacts would be similar. The Future Activity Allowance could result in construction of additional Project features during the initial 5-year construction phase of the Project and/or during the approximate 30-year operation and maintenance phase that constitutes active remediation. As shown in Table 4.7-14, activities related to construction would have significant impact. Therefore, project-generated construction-related noise levels are considered significant (Impact NOISE-3). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce this impact, **Mitigation Measure NOISE-2** shall be implemented (see Section 4.7 of this SEIR). Implementation of Mitigation Measure NOISE-2 would ensure that investigation equipment is properly maintained per manufacturer specifications and fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps) and ensure coordination with the Tribes; however, impacts to Project-generated construction-related noise levels would remain significant and unavoidable.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Land Use Compatibility of Future Project Noise Levels with the Topock Traditional Cultural Property

DTSC has determined that implementation of the proposed Project would result in result in future noise (construction, operation and maintenance, and decommissioning activities) that could result in conflicts with land use compatibility that exceed San Bernardino County standards for Places of Worship or conflict with Native American values associated with the Topock TCP.

Noise levels resulting from construction, operation and maintenance, and decommissioning phases of the Project could result in noise levels that would exceed applicable San Bernardino County standards for a place of worship and could consequently result in a temporary substantial increase in ambient noise levels, especially if Project activities would occur during the nighttime hours. As a result, this impact would be significant (Impact NOISE-4). This is consistent with the conclusions presented in the Groundwater FEIR.

In order to reduce this impact **Mitigation Measure NOISE-1** and **NOISE-2** shall be implemented (see Section 4.7). Mitigation Measures NOISE-1 and NOISE-2 would limit construction of Project features within 45 feet of sensitive receptors (Topock TCP), implement acoustic shields to limit noise to sensitive receptors, and require a disturbance coordinator. In addition, CUL-1a-12 would ensure specifically that accommodations for Tribal ceremonies are provided for during construction activities. However, due to the heightened sensitivity and use of the area, impacts are considered significant and unavoidable.

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

Cumulative Noise Impacts

The geographic scope for cumulative noise impacts is the Project Area and areas immediately adjacent, due to the attenuating effects of noise. Implementation of the proposed Project, in combination with related projects in the geographic scope, could cause a substantial adverse increase related to short-term construction-related noise and vibration, as well as compatibility with noise levels at the Topock TCP.

Projects that have already been implemented or may occur in the foreseeable future in the Project Area that could impact noise are described in Chapter 6, "Cumulative Impacts." Noise generated from the proposed Project could be compounded when taken in context with most other noise-generating projects in the geographic and temporal scope. The projects in the cumulative scenario have the potential to generate construction and/or operational noise in the geographic scope, particularly the Soil Remediation and Potential Pilot Test Project, which would be in close proximity to the Project and would be implemented during a similar timeframe. This impact is considered significant and the Project's incremental contribution to noise impacts would be cumulatively considerable (Impact CUM-3). This is a new significant cumulative impact from those identified in the Groundwater FEIR.

In order to reduce this impact, **Mitigation Measure NOISE-3** shall be implemented (see Chapter 6 of this SEIR). Mitigation Measures NOISE-3, a new measure from what was identified in the Groundwater FEIR, would ensure that during implementation of the proposed Project and the Soil Remediation and Potential Pilot Test Project, noise measurement exceedances would trigger

temporary barriers to reduce noise, and if unable to reduce noise adequately, the modification of either soil or groundwater remediation efforts near sensitive receptors. Although Mitigation Measure NOISE-3 would ensure reduction of cumulative noise impacts resulting from simultaneous construction of the proposed Project and the Soil Remediation and Potential Pilot Test Project, because the specific locations and timing of overlap is unknown, cumulative impacts would remain cumulatively considerable (significant and unavoidable).

The Project is being proposed notwithstanding these effects because the Final Groundwater Remedy Project is necessary in order to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives considered in the Groundwater FEIR.

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 (CEQA Guidelines Section 15126.2[c]).

Per Section 15126.2(c) of the CEQA Guidelines, a project would result in an irreversible and irretrievable commitment of resources if it:

- Involved a large commitment of nonrenewable resources;
- Created primary and secondary impacts that would generally commit future generations to similar uses;
- Involved uses in which irreversible damage would result from any potential environmental accidents associated with the project; or
- Proposed consumption of resources that were not justified (e.g., the project involves the wasteful use of energy).

The Final Groundwater Remedy Project is a long-term remediation project which is anticipated to last over 50 years. The Final Groundwater Remedy Project's active construction phase would occur for approximately 5 years, followed by approximately 30 years of active remediation, 10 years of long-term monitoring, and up to approximately 20 years of arsenic monitoring. Over the

50-year lifetime of the Project, nonrenewable resources would be used, as explained in Chapter 3, “Project Description,” Section 4.8, “Utilities, Service Systems, and Energy.” Temporary increases in energy consumption would occur during Project construction, operation and maintenance, and decommissioning. These would include the use of nonrenewable resources such as electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles.

Specifically, the proposed Project is anticipated to use about 149,283 gallons of diesel and 20,468 gallons of gasoline annually during the 5-year construction period. This is 0.0057 percent of the State’s usage in 2012 for diesel and 0.001 percent for gasoline. The Project includes a Future Activity Allowance which would result in additional diesel and gasoline to power construction equipment. However, it should be noted that during the construction phase, equipment and vehicles would already be mobilized on-site and that the 25 Percent Potential Future Activity Allowance during the construction period would generally not require 25 percent additional vehicles and equipment (requiring diesel and gasoline) on-site. Nevertheless, assuming a worst-case scenario, an additional 90,866 gallons of diesel and 8,507 gallons of gasoline could be used for the Future Activity Allowance. During operational activities, the proposed Project is anticipated to use 55,649 gallons of diesel and 46,705 gallons of gasoline annually. This is 0.0021 percent of the State’s usage in 2012 for diesel and 0.0003 percent for gasoline. Decommissioning is anticipated to use the same amount of nonrenewable resources as construction. See Appendix ENERGY for calculations.

Operation and maintenance would require up to 7.82 million KWh annually of electricity, most of which would be powered by on-site generators and solar panels (5.2 million kW/hour annually). Operation of the proposed Project would also include a Future Activity Allowance, which could potentially increase the amount of electricity required for the Project. The Future Activity Allowance is anticipated to require up to 2.37 million kWh annual as a worst case scenario with 1.96 million kWh annually coming from the City of Needles and 0.41 million kWh annually coming from the Mojave Electric Cooperative. This additional electrical usage would be approximately 3.74 percent of the utility’s 52.46 million kWh for the City of Needles and approximately 0.04 percent for of the 929 million kWh for the Mojave Electric Cooperative. As a result, the project’s commitment of nonrenewable resources would be offset by renewable resources like solar power, and would be within the current regional supply, and would not represent a large irreversible commitment of resources.

The consumption and use of nonrenewable resources, as contemplated in CEQA Guidelines Section 15126.2, subdivision (c), is not considered irreversible, since resources are justified to ensure protection of the environment through remediation of the contaminated groundwater plume. The Project does not commit substantial amounts of resources compared to existing annual allotments, and the amount of energy and equipment to be used is limited to that needed for the remedy, so there is no irreversible commitment of nonrenewable resources or related significant impact.

Activities associated with the Final Groundwater Remedy Project could potentially disturb cultural resources within the Project Area. The following activities have the potential to uncover

archaeological and paleontological resources, and human remains: construction of the Construction Headquarters/Long-Term Remedy Support Area and Soil Processing/Clean-Soil Storage Area near Moabi Regional Park; construction of an Operations Building and other improvements at the Transwestern Bench; construction of a Carbon Amendment Building and other improvements at the MW-20 Bench; and the construction of wells, underground pipelines, and roadway improvements, as well as facilities part of the Future Activity Allowance. Despite application of mitigation measures to reduce potential impacts to less than significant levels, including the priority to avoid cultural resources and preservation of resources in place, activities involving data recovery or capping of cultural resources discovered during soil investigation activities could result in irreversible losses. Data recovery requires removal of artifacts from their original context. Capping involves covering an archaeological site with fill such that Project activities could take place unimpeded over the area. Because both methods would disturb the overall Topock archaeological area to differing degrees, DTSC recognizes that there would be some irreversible and irretrievable impacts to cultural resources.

5.3 Growth Inducement

As required by CEQA, this SEIR 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 a 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. Southern California Association of Governments (SCAG) indicates that the population of San Bernardino County grew from 1,719,190 persons in 2000 to 2,111,258 in 2015 (U.S. Census Bureau 2016). This represents an increase of 392,068 persons, or a 23 percent increase over 15 years. Based on projections for San Bernardino County, population growth for the County is expected to continue at a rapid pace, increasing from 2015 to 2040 by approximately 29 percent (SCAG 2015). The City of Needles, located in California, is the closest urban community to the Project Area. Based on SCAG population data specific to Needles, the community experienced a much slower growth rate, from 4,830 persons in 2000 to 4,908 persons in 2014 (SCAG 2015). This represents an increase of 78 persons, or approximately a 1.6 percent increase. SCAG’s projections for San Bernardino County show continued population growth, increasing by almost 30% to over 2,731,321 by the year 2040 (SCAG 2015). Lake Havasu City in Arizona is also expected to grow approximately 28% from 52,527 to 66,968 persons in 2040. Mohave County is expected to grow approximately 36% from 205,716 to 280,765 persons by 2040.

The proposed Project would implement remediation efforts to clean up contaminated groundwater. Construction and treatment system start-up activities for the Final Groundwater Remedy Project would occur for approximately 5 years, including construction closeout.

Operation and maintenance would begin following the start-up of the various remedy systems, and would consist of approximately 30 years of active remediation followed by up to approximately 10 years of long-term monitoring and up to approximately 20 years of arsenic monitoring. During the construction phase, project mobilization would require approximately 80 workers in the Project Area for an estimated period of 4 months. Phase 1, lasting 19 months, and Phase 2, lasting 12 months, would require approximately 168 and 181 workers, respectively. Four technicians, four instrumentation specialists, and engineers would also be present during these two phases for functional testing.

Operation and maintenance of the groundwater remedy would require approximately 11 full-time employees or full-time equivalents (FTEs) for routine operation and maintenance of the groundwater remedy throughout the life of the Project, including two site managers and three groundwater monitors. Non-routine operation and maintenance activities would require a maximum of eight full-time FTEs for well rehabilitation and other non-routine activities such as well repairs and replacement. Decommissioning and removal of the IM-3 Facility and the Final Groundwater Remedy Project would require approximately 33 and 69 workers for a total of 15 and 12 months, respectively.

The proposed Project would implement remediation efforts to clean up contaminated groundwater in the Project Area. The proposed Project would not result in the creation of new residences on or adjacent to the Project Area. The anticipated employment, both direct and indirect, generated by the proposed project is presented in Chapter 3, "Project Description," of this SEIR. It is anticipated that workers would commute to the Project Area from surrounding counties, including San Bernardino County and counties in Arizona, and no new residents would be required to construct the proposed Project. The few residents necessary for operation and maintenance would also commute from surrounding counties. No new residents are anticipated as a result of the activities associated with the proposed Project, so no increase in growth would occur as a result.

The Project Area 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 and water supply 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 and water 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.

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CHAPTER 6

Cumulative Analysis

6.1 Introduction to the Cumulative Impacts Analysis

This chapter presents an analysis of the cumulative impacts of the proposed Pacific Gas and Electric Company (PG&E) Topock Compressor Station Final Groundwater Remediation Project (Final Groundwater Remedy Project or proposed Project) at the PG&E Topock Compressor Station (Station) and surrounding area (Project Area) in combination with other past, present, and reasonably foreseeable future projects within the Project Area and surrounding area that could cause related environmental impacts similar to those anticipated to occur under the proposed Project and discussed in this subsequent environmental impact review (SEIR). Similar to the Project impacts, cumulative impacts are also analyzed with regard to the potential for the proposed Project to contribute to new significant cumulative impacts or substantially more severe cumulative impacts than those identified as significant in the Topock Compressor Station Groundwater Remediation Project Final Environmental Impact Report (Groundwater FEIR; DTSC 2011).

California Environmental Quality Act (CEQA) Guidelines Section 15130 requires that an environmental impact report (EIR) shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable." "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." (CEQA Guidelines, Section 15355; see also Pub. Resources Code, Section 21083, subd. (b).) Stated another way, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines, Section 15130, subd. (a)(1) (emphasis added).) 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 SEIR, the proposed Project would cause a cumulatively considerable and therefore significant cumulative impact 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 would result in a cumulatively considerable contribution to the already significant effect. The standards used herein to determine whether the contribution is cumulatively considerable include the existing baseline environmental conditions, and whether the Project would cause a substantial increase in impacts, or otherwise exceed an established threshold of significance.

6.2 Geographic Scope

The geographic area affected by the proposed Project and its potential to contribute to cumulative impacts varies based on the environmental resource under consideration. Generally, the geographic area associated with the environmental effects of the Project as described in Chapter 4 define the boundaries of the area used for compiling the list of past, present and reasonably foreseeable future related projects considered in the cumulative impact analysis. The air quality analysis, however, includes consideration of regional air emissions (e.g., reactive organic gases [ROG]/nitrogen oxides [NO_x] and particulate matter [PM]) and therefore includes the entire air basin. Conversely, in the case of noise impacts, given the localized impact Area of Concern (AOC), a smaller more localized area surrounding the immediate Project Area is appropriate for consideration. **Table 6-1** presents the geographic areas included within this analysis for purposes of determining whether the Project's contribution to a particular impact would be cumulatively considerable and therefore significant. An explanation of the geographic scope selected for each resource is also briefly included below under the impact analysis.

**TABLE 6-1
GEOGRAPHIC SCOPE OF CUMULATIVE IMPACTS ANALYSIS**

Resource Issue	Geographic Scope
Aesthetics	The foreground zone that extends 0.25 miles to 0.5 miles from the Project Area and the middleground zone that extends from the foreground up to 3 to 5 miles
Agricultural Resources	Eastern San Bernardino County, California (Desert Regions)
Air Quality	Mojave Desert Air Basin; Global (greenhouse gases)
Biological Resources	Project Area and surrounding lands along with drainages that are connected to the Project Area, including the Colorado River
Cultural Resources	Lower Colorado River Valley
Energy Resources	Eastern San Bernardino County, California

**TABLE 6-1
GEOGRAPHIC SCOPE OF CUMULATIVE IMPACTS ANALYSIS**

Resource Issue	Geographic Scope
Geology and Soils	Project Area and areas immediately adjacent
Hazardous Materials	Mojave Desert Air Basin, watershed, groundwater basin, with focus on and in the vicinity of the Project Area
Hydrology and Water Quality	East Colorado River Basin (focus on downstream areas); Needles Valley groundwater basin
Land Use and Planning	San Bernardino County, California, and Mohave County, Arizona
Mineral Resources	Eastern San Bernardino County, California (Desert Regions)
Noise	Project Area and areas immediately adjacent
Population and Housing	Region (San Bernardino County, California, which includes the city of Needles, California, and neighboring Mohave County, Arizona)
Public Services	San Bernardino County, California
Recreation	Region (San Bernardino County, California, which includes the city of Needles, California, and neighboring Mohave County, Arizona, which includes the city of Lake Havasu City, Arizona.)
Transportation and Traffic	Park Moabi Road, Interstate 40 (I-40), and the National Trails Highway
Utilities, Service Systems, and Energy	Project Area and Eastern San Bernardino County, California
Water Supply	Lower Colorado River; Lower Colorado River Water Supply Project

6.3 Temporal Scope

This cumulative impact analysis considers other projects that have been recently completed, are currently under construction, or are reasonably foreseeable (e.g., for which an application has been submitted). Both short-term and long-term cumulative impacts of the proposed Project, in conjunction with other cumulative projects in the area, are evaluated in this chapter of the SEIR.

The major elements of the Project are (1) pre-construction, construction, and start-up (collectively referred to as construction), (2) operation and maintenance, and (3) decommissioning and restoration. The schedule and timing of the various phases of the proposed Project and other cumulative projects, however, is relevant to the consideration of cumulative impacts, given that the Project is a long-term groundwater remedy project. The cumulative impact analysis, therefore, pays particular attention to any cumulative projects with implementation schedules that could overlap with certain phases of the proposed Final Groundwater Remedy Project. The majority of the related projects included in this cumulative impact analysis and discussed in Section 6.4 are projects overseen by PG&E at the Station.

6.3.1 Pre-Construction, Construction, Start-Up

The pre-construction, construction, and start-up of the Project are estimated to occur over an approximately 5-year period, following the California Department of Toxic Substances Control (DTSC) and U.S. Department of the Interior (DOI) approval of the Final Remedy Design. This includes time for contracting, mobilization, construction, start-up, Interim Measure-3 (IM-3)

shutdown, and construction closeout activities, among other activities, some of which are not entirely field construction activities in the strict sense.

Construction and start-up of the remedy will be in phases, each of which involves active construction and ground disturbance. The first phase is projected to include pre-construction activities and construction of the National Trails Highway (NTH) in situ reactive zone (IRZ) and associated supporting infrastructure, installation of high priority wells, and key mobilization and site preparation activities such as construction of the Construction Headquarters (CHQ). Following construction and associated functional testing of the NTH IRZ and supporting systems, the Interim Measure (IM) is proposed to be turned off, consistent with the terms of the Settlement Agreement with the Fort Mojave Indian Tribe (FMIT). The estimated duration for the first phase of construction and start-up is approximately 2.5 years. The second phase is projected to include construction of the remaining systems (River Bank Extraction Wells, Inner Recirculation Loop, Topock Compressor Station (TCS) Recirculation Loop, and freshwater injection), and associated supporting infrastructure, remaining monitoring wells, and associated pipelines, access roadways, controls, and electrical and mechanical systems. The estimated duration for the second phase of construction and start-up is approximately 12 months. Phase 2 may overlap the end of Phase 1 by a month or two, depending on the progress of construction.

6.3.2 Operation & Maintenance

Operation and maintenance would begin following start-up of the various remedy systems. Within approximately 1 to 3 years of the beginning of remedy start-up, which is when remedy components have been constructed, tested, and found to be operational. Currently, the anticipated duration is approximately 30 years of active remediation followed by up to approximately 10 years of long-term monitoring and up to approximately 20 years of arsenic monitoring, which would occur concurrently with the long-term monitoring for the first 10 years. This estimated timeframe does not account for additional time for monitoring that may be required if monitored natural attenuation is selected for portions of the plume and extends past the 10 years of long-term monitoring.

6.3.3 Remedy Decommissioning and Restoration

Decommissioning of the groundwater remedy infrastructure would begin following the attainment of the cleanup objectives and/or the determination that the remedy facilities are no longer needed (estimated at around 40 years). Decommissioning and restoration of remedy components is projected to occur decades in the future and would be affected by information and conditions that become available prior to and at the time of decommissioning and restoration. However, some restoration activities may begin earlier, for example, some restoration activities would begin during Phase 1 (e.g., restoration of disturbed areas after well installation activities have been completed, revegetation to offset habitat loss that could not be avoided during construction). The majority of the restoration activities would likely not be completed until after the groundwater remedy has been completed and the groundwater remedy components have been removed.

6.4 Method of Analysis

CEQA Guidelines Section 15130 provides that the following approaches can be used to adequately address cumulative impacts:

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

For the purpose of this SEIR, both approaches are used. This is due to the localized and specific nature of the proposed Project, the previously certified Groundwater FEIR, and because the Project Area is located in an area that has and will continue to experience some regional growth. This allows for a thorough, project-based cumulative analysis within the relevant geographic areas and timing of the proposed Project activities. This SEIR does not, however, reconsider the impacts previously considered as part of the Groundwater FEIR.

Consistent with CEQA, a two-step approach was used to analyze cumulative impacts. The first step was to determine whether the combined effects from the proposed Project and other projects would be cumulatively significant. This was done by adding the proposed Project's incremental impact to the anticipated impacts of other probable future projects and/or reasonably foreseeable development. Where the combined effect of the projects and/or projected development was determined to result in a significant cumulative effect, the second step was to evaluate whether the proposed Project's incremental contribution to the combined significant cumulative impact would be cumulatively considerable as required by CEQA Guidelines Section 15130, subdivision (a).

It should be noted that CEQA Guidelines Section 15064, subdivision (h)(4) states that "[t]he mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Therefore, it is not necessarily true that, even where cumulative impacts are significant, any level of incremental contribution must be deemed cumulatively considerable by the lead agency. If the proposed project's individual impact is less than significant, however, its contribution to a significant cumulative impact could also be deemed cumulatively considerable depending on the nature of the impact and the existing environmental setting. If, for example, a proposed project is located in an air basin determined to be in extreme or severe nonattainment for a particular criteria pollutant, a project's relatively small contribution of the same pollutant could be found to be cumulatively considerable. Thus, depending on the circumstances, an impact that is less than significant when considered individually may still be cumulatively considerable in light of the impact caused by all projects considered in the analysis.

6.4.1 Regional Growth Projections

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

Regional and localized growth has the potential to result in numerous environmental impacts 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 shown in Table 6-2 and the more specific individual projects that are discussed in this chapter.

**TABLE 6-2
REGIONAL GROWTH PROJECTIONS**

Jurisdiction	Year				Percent Change (2015–2040)
	2015	2020	2030	2040	
California					
San Bernardino County, California ^a	2,111,258	2,399,219	2,858,202	2,731,321	29
Unincorporated San Bernardino County, California ^b	289,400 (2008)*	301,600	372,600 (2035)*	N/A	29 (2010–2030)
City of Needles, California ^b	5,658 (2008)*	6,000	8,000 (2035)*	N/A	41 (2010–2030)
Arizona					
Mohave County, Arizona ^c	205,716	220,678	250,599	280,765	36
Lake Havasu City, Arizona ^c	52,527	58,223	63,669	66,968	28

NOTE:

*SCAG dataset is presented for 2012 (instead of 2015) and for 2035 (instead of 2030).

SOURCES:

^a California Department of Finance 2013; SCAG 2015

^b San Bernardino County Economic Forecast

^c Arizona Department of Administration 2016

6.4.2 List of Related Projects in the Vicinity

A summary of the projects identified at or within the general vicinity of the Project Area is provided in **Table 6-3** and shown in **Figure 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 Project Area that may have some related environmental impact to the proposed Project and are: (1) recently 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 Area is located in an unincorporated area of the County of San Bernardino (California) and Mohave County (Arizona), it is in the general vicinity of the city of Needles, California 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 (BOR); U.S. Bureau of Land Management (BLM); U.S. Fish and Wildlife Service (USFWS); California Department of Transportation (Caltrans); the County of San Bernardino and the city of Needles, California; the County of Mohave and Lake Havasu City, Arizona; and PG&E.

The existing infrastructure within the Project Area, including roads, bridges, railroads, and utilities are not included in the Table 6-3. These past projects in the vicinity of the proposed Project are part of the baseline/existing conditions that are considered throughout Chapter 4 of this SEIR. Likewise, the marinas in California and Arizona and nearby industrial facilities, such as the six natural gas transmission lines in the vicinity of the Project Area, are part of the baseline/existing conditions of this SEIR. Additionally, PG&E has conducted ongoing maintenance, investigation, and decommissioning projects for the past 12 years on-site, including tests and studies to evaluate technologies to reduce groundwater contamination. Some PG&E past projects have been included in Table 6.3 and described in Section 6.4.2.1 to the extent such information is relevant to the understanding of past activities which have occurred on-site, although the effects of those activities have become part of the existing environment (or “baseline”) from which the potential effects of the proposed Project have been identified.

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	Project Location	Land Owner/ Land Manager	Jurisdiction	Approximate Distance from Project Area (miles)	Implementation Status
1. PG&E							
1A	PG&E Gas Department Improvement Projects at Topock	Station and pipeline improvements based on available budget	Within the Station fenceline and surrounding PG&E facilities	PG&E	DOI/DTSC	On-site	2011-2016; Ongoing
1B	IM-3 Groundwater Extraction and Management	Interim groundwater treatment that provides extraction rate of 135 gallons per minute from extraction wells	North of Burlington Northern Santa Fe (BNSF) Railroad	PG&E	FMIT/DOI/DTSC	On-site	Construction 2004-2005; Operation and Maintenance Ongoing
1C	Groundwater Monitoring	Monitoring programs, including site-wide surface water monitoring and IM-3 performance monitoring	Immediate vicinity of the Station and in Arizona near Topock	PG&E	FMIT/DOI/DTSC / BOR/Havasu National Wildlife Refuge (HNWR)/ Caltrans	On-site	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	Project Location	Land Owner/ Land Manager	Jurisdiction	Approximate Distance from Project Area (miles)	Implementation Status
1D	Well Maintenance and Decommissioning	Maintenance activities required to keep existing wells operational and/or in compliance with applicable regulatory standards	Station and surrounding areas	PG&E	DOI/DTSC/FMIT / Caltrans	On-site	Ongoing
1E	Soil Investigation Activities	Soil investigation activities to determine nature and extent of soil contamination on-site	Station and surrounding areas	PG&E	DOI/DTSC/FMIT / BNSF	On-site	Initial soil sampling completed 2016; 2016-2018 for as-needed data gaps bench-scale tests, pilot studies, geotechnical evaluations, and plant or biota sampling
1F	Soil Remediation and Potential Pilot Test Project	Remediation, as necessary, of contaminated soil in the Project Area. Could include excavation and off-site disposal; excavation and on-site treatment; soil flushing; solidification/stabilization; in situ chemical reduction; capping; and/or institutional controls	Station and surrounding areas	PG&E	DOI/DTSC/USFWS	On-site	Anticipated to begin no earlier than 2018
2. U.S. Bureau of Reclamation (BOR)							
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 over 400 miles along Colorado River from Lake Meade to southerly international border with Mexico	Multiple federal agencies	Multiple federal agencies	Less than 1 mile	Ongoing
2B	Quarry Operations	Stockpiled materials are used by BOR for maintenance and construction of bank lines, river control structures, levees, canals, and reservoirs along the Lower Colorado River	Parcel located directly north of the Moabi Regional Park footprint	BOR	BOR	Approximately 1 mile	Ongoing
2C	Mohave Valley Conservation Area Backwater Project	Creation of backwater channel and associated backwater habitat connected to the Colorado River in Moabi Regional Park	Directly adjacent to the Colorado River North of I-40 and Pirate's Cove Restaurant & Bar.	BOR	BOR	Approximately 1 mile	Ongoing

TABLE 6-3
LIST OF PROJECTS LOCATED AT OR WITHIN THE VICINITY OF THE PROPOSED PROJECT

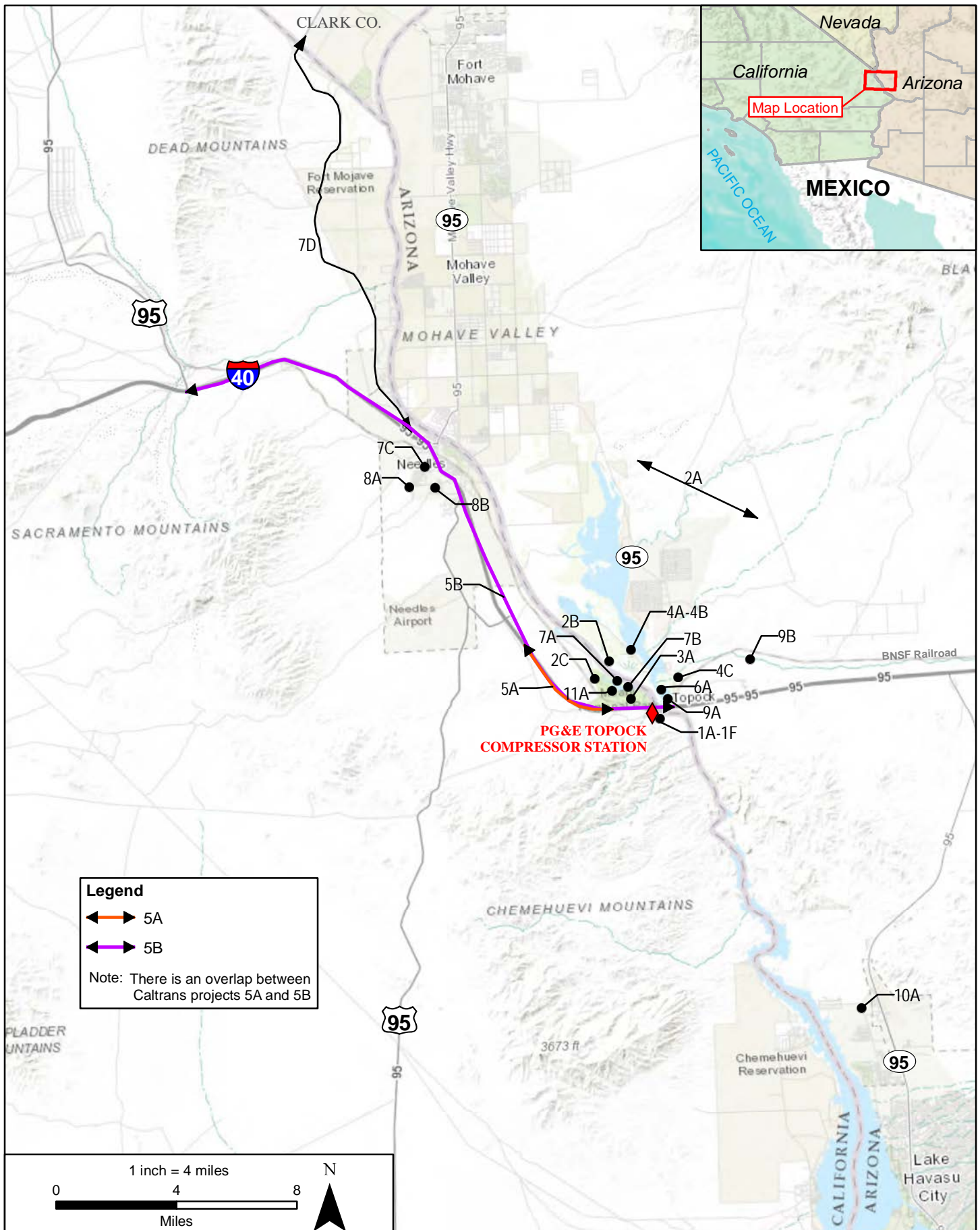
Exhibit 6-1 Map Key	Project Name	Description of Project	Project Location	Land Owner/ Land Manager	Jurisdiction	Approximate Distance from Project Area (miles)	Implementation Status
3. U.S. Bureau of Land Management (BLM)							
3A	Cathodic Protection System	Installation of cathodic protection system for a gas pipeline by Southern California Gas. Recent testing conducted on gas pipeline and will involve additional repair work.	North of I-40 and west of Colorado River	BLM	BLM	Approximately 2,000 feet	Cathodic repair work completed in 2012; gas pipeline repair work planned to be completed by end of 2016.
4. U.S. Fish and Wildlife Service (USFWS)							
4A	Lower Colorado River National Wildlife Refuges Comprehensive Management Plan	Management plan for refuges along Lower Colorado River, including HNWR	30 river miles (300 miles of shoreline) within the HNWR between Needles, CA, and Lake Havasu City, AZ	USFWS	USFWS	Less than 1 mile	Plan approved in 2014; proposed actions pending federal approval as of 2016
4B	Topock Marsh Water Infrastructure Improvement Project on the HNWR	Replacement and rehabilitation of the HNWR main water delivery system for the Topock Marsh unit. Phase II involved non-gravity flow infrastructure.	Along floodplain of the Colorado River, with a small portion on BLM land	USFWS	USFWS/BLM	Less than 1 mile	Phase I completed in 2011; Phase II completed in 2014
4C	Sacramento Wash Improvements	Redirect flow from the Sacramento Wash through existing vegetation to restore historical drainage patterns of the wash	Within HNWR	USFWS	USFWS	Less than 1 mile	Environmental Assessment (EA) under development as of June 2016
5. California Department of Transportation (Caltrans)							
5A	Pavement Enhancement Project	Pavement Enhancement	Pavement activities along I-40 for approximately 3 miles	Caltrans District 8	San Bernardino County	Less than 1 mile	Completion targeted for September 2017
5B	I-40 Improvement Project	Regrading along 29.6 miles from 4.5 miles east of Homer Wash Bridge to the California/Arizona State Line. Realignment of existing I-40 and replacement of existing Colorado River Bridge	Along I-40, and immediately adjacent to Project Area; bridge replacement located east of Project area and terminates near Topock Road on Arizona side.	Caltrans District 8	San Bernardino County	Less than 1 mile	Project start-up targeted for 2023

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	Project Location	Land Owner/ Land Manager	Jurisdiction	Approximate Distance from Project Area (miles)	Implementation Status
6. Arizona Department of Transportation (ADOT)							
6A	Oatman Highway Crossing at Sacramento Wash Project	Construction of a bridge as part of Oatman Highway (Historic Route 66) over the Sacramento Wash in Topock, Arizona, providing a 110-foot clear span that will pass the 2-year, 30-minute storm event for the abutments and superstructure.	Along Sacramento Wash	ADOT/Mohave County	ADOT/Federal Highway Administration (FHWA)	Less than 1 mile	Project initiated in February 2016
7. San Bernardino County							
7A	Moabi Regional Park Improvements	Construction utility hookups, sewer treatment plant facility, pavement, lane widening, and drainage improvements	Along Colorado River	San Bernardino County	San Bernardino County	1 mile	Sewer treatment plant completed in 2012; Remaining improvements pending as of 2016
7B	Pirate Cove Resort	667 additional recreational vehicle (RV) and/or cabin sites; off-highway vehicle (OHV) area	Along Colorado River and immediately adjacent to Project Area, north of NTH.	San Bernardino County	San Bernardino County	Less than 1.5 miles from the Station	OHV Area completed in 2013; RV/schedule for cabins is pending as of 2016
7C	Verizon Wireless Communication Facility	Installation of an antenna on an existing 157 foot pole and construction of an equipment shelter	City of Needles, west of U.S. Route 95 (US 95)	San Bernardino County	San Bernardino County	10 miles	Permit was submitted in 2013; implementation schedule pending as of 2016
7D	Needles Highway Improvement Project	Improvement and/or rehabilitation along a 16-mile corridor of the Needles Highway. Project includes two phases (Phase N and Phase 1A). The N phase would take one and a half months to complete (surface rehabilitation) and Phase 1 will take 3 months (Realignment and Horizontal work).	16-mile corridor improvement area from N" Street in City of Needles to California/ Nevada state line	San Bernardino County	San Bernardino County/Caltrans/ Federal Highway Administration	12 miles	Phase N scheduled to begin in early 2017. Phase 1A will begin in Spring of 2017.
8. City of Needles, California							
8A	I-40 Needles Connection Project	Roadway and bridge improvements along various streets and roads in City of Needles to improve traffic flows.	Alignment of various local streets in City of Needles with connections to I-40	City of Needles	City of Needles	10 miles	Planning completed in 2009; Construction planned to start in late 2016/early 2017
8B	ATP Concrete Sidewalks Project	Street improvement project	City of Needles, north of Project Area	City of Needles	City of Needles	10 miles	2016-2017

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	Project Location	Land Owner/ Land Manager	Jurisdiction	Approximate Distance from Project Area (miles)	Implementation Status
9. Mohave County, Arizona							
9A	Topock Marina Improvements	Construction of a new restaurant (Phase I) and hotel (Phase II)	Approximately 5.6 acres along Colorado River, north of Project Area	Mohave County	Mohave County	Less than 1 mile	Phase I completed in 2013; Phase II schedule is undetermined as of 2016
9B	Sterling Solar Project	Development of a solar power generation facility	To be situated on approximately 10,000 acres	Mohave County	Mohave County	Approximately 5 miles	Zoning approved in 2012; implementation schedule is undetermined as of 2016
10. Lake Havasu City, Arizona							
10A	Airport Business Park	Development of a light industrial business park development	Approximately 80 acres	Lake Havasu City/Private Development Partnerships	Lake Havasu City	Approximately 14 miles	Phase 1 completed in 2013. Phase 2 on hold as of 2016
11. Southwest Gas							
11A	Distribution System Upgrades	Upgrade to existing distribution system that runs along the Colorado River up to Laughlin.	Improvements limited to Moabi Regional Park area	San Bernardino County	San Bernardino County	1 mile	Construction completed in December 2011



Location of Cumulative Projects

Figure 6-1

The following further describes each of the cumulative projects (listed above in Table 6-3) that were considered in this SEIR as part of the cumulative impacts analysis. PG&E activities at the Station are described first, followed by a description of activities by agencies and other parties.

6.4.2.1 PG&E Topock Compressor Station Projects

PG&E Gas Department Improvement Projects at Topock (1A)

PG&E's Gas Department staff regularly develops an annual "wish list" of improvement projects involving Station infrastructure and nearby pipeline infrastructure. These projects are implemented based on the availability of funding and the priority assigned to the projects. The projects described here are limited to the existing footprint of the Station and the nearby PG&E gas pipeline infrastructure and do not involve new facilities or the expansion of plant operations or capabilities.

The following are the Station's current and reasonably foreseeable future projects (past projects, such as the original development of the Station, are accounted for in the description of the existing conditions presented throughout this SEIR):

- Hydrotested nearly two (2) miles of Line 300A from the Station to the west;
- Repaired three soil transitions on Line 300A pipeline segments to the west of the Topock Compressor Station Evaporation Ponds (TCS Evaporation Ponds);
- Installed two new deep well cathodic protection anodes just to the north of the Transwestern Intertie Station;
- Install a new foundation for compressor engine K-4 within the Compressor Building (anticipated in the fall of 2016); and
- The Arch Bridge will be retrofitted with reinforcing structural components (anticipated in the fall of 2016).

The following projects are planned for 2017:

- Construct a new building near the Tech Shop to house new air compressors;
- Replace gas detectors in the Auxiliary Building;
- Install a new foundation for compressor engine K-2 within the Compressor Building;
- Replace valves and piping for a valve nest;
- Modify Station piping and valves to accommodate cross-tie, low flow, flow meters, and in-line inspection needs;
- Begin construction on Station switchgear to accommodate connection to Remedy power distribution system; and
- Begin construction of additional power generation units within the Auxiliary Building.

IM-3 Groundwater Extraction and Management (1B)

PG&E implemented operation of a groundwater remediation facility to address hydraulic control of contaminated groundwater and prevent contaminated groundwater from entering the Colorado River. The treatment facility, known as the IM-3 Facility, was designed to treat 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. The Board Orders have since expired and the continued operation of the IM-3 Facility is under DOI oversight of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) exemption. PG&E is currently operating the IM-3 Facility which is located north of the BNSF Railroad. The IM-3 Facility 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 DTSC.

Currently, the IM-3 Facility includes a groundwater extraction system (four installed 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, TW-3D is the primary well and is supplemented by the other wells as needed. The groundwater treatment system is a continuous, multi-step process that involves reduction of hexavalent chromium (Cr[VI]) to the less soluble trivalent form (trivalent chromium (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. Ongoing maintenance activities include treatment plant maintenance, pipeline maintenance, and well maintenance.

Groundwater Monitoring (1C)

PG&E conducts continual monitoring at the Station and surrounding areas, which was initiated as part of a Resource Conservation and Recovery Act (RCRA) and the CERCLA facility investigation/remedial investigation groundwater investigation. The three monitoring programs include a Site-wide Groundwater Monitoring Program, Site-wide Surface Water Monitoring Program, and IM-3 Performance Monitoring Program. Monitoring wells that are part of the Groundwater monitoring Program are sampled at frequencies ranging from monthly to quarterly, semi-annually, annually, and bi-annually. Site-wide Surface Water Monitoring Program samples are collected on a quarterly basis, with an additional winter low river level event.

The complete Groundwater Monitoring Program includes 143 groundwater monitoring wells, which consist of:

- One hundred twenty-four monitoring wells in California
- Eight monitoring wells in Arizona

- Four water supply wells at Moabi Regional Park
- Two active IM-3 extraction wells
- Five test wells

The Surface Water Monitoring Program consists of:

- Ten river channel surface water monitoring locations
- Four shoreline surface water monitoring locations
- Two other surface water monitoring locations

Well Maintenance and Decommissioning (1D)

The existing well network at the Project Area is comprised of wells associated with the groundwater remedy, which includes some wells that were initially constructed as part of past Station operations. Well maintenance tasks outside of those anticipated as part of the future operation of the groundwater remedy subject of this SEIR, which are required to maintain well operation and/or condition in accordance with regulatory requirements, have included repair of existing monitoring wells (e.g., MW-38S and MW-38D) and the decommissioning of historic wells associated with past Station operations that were not suitable for monitoring network incorporation (e.g., TCS-4, and potentially other wells). Detailed description of current and potential future well maintenance activities are provided in the following descriptions.

Well TSC-4 Decommissioning

Based on the findings of reconnaissance activities performed in 2013 and 2014 (as described above), a work plan was developed to decommission well TCS-4. DOI approval of, and DTSC concurrence with, the work plan was received by PG&E on December 15, 2015. The work plan was implemented in February and March 2016 and included the following primary field activities:

- Exposing the well head through excavation such that it could be modified to facilitate well decommissioning. Opportunistic soil samples were collected from the sidewalls of the excavation to supplement the Topock Soil Resource Conservation and Recovery Act Facility Investigation and Remedial Investigation Report (RFI/RI) investigation data set.
- The well was decommissioned by perforating the casing, clearing any remaining blockages within the well casing, and injecting neat cement sealing material. This work was conducted using a roto sonic drill rig.
- Decommissioning the well head 5 feet below ground surface in accordance with applicable well standards.

Management of Historic TCS Wells

A May 22, 2014 letter from DTSC and July 18, 2014 response from PG&E identified additional work that will be conducted to address certain historic well(s) associated with past Station operations. Tasks that might be required to address the location and/or condition of historic wells include non-intrusive surface geophysical surveys, potholing to verify the results of the

geophysical surveys, evaluations with well casings and/or well decommissioning. This work is planned for 2016, or in subsequent years, as historic wells are identified.

Monitoring Well Repair and Maintenance

As part of the standard operating procedure for well sampling, monitoring wells are inspected each time the wells are sampled. Necessary repairs and maintenance activities will be implemented to ensure the physical integrity of the wells to the extent possible. Such activities could include replace lock, reinforce or replace concrete well pads/ protective bollards, repair the aboveground portion of a well casing, etc.

Soil Investigation Activities (1E)

2008 Part A Soil Investigation

The Part A soil investigation addresses 15 Solid Waste Management Unit (SWMU), AOCs, and other Undesignated Areas (UAs) outside the Station fence line. Additional sampling was performed in 10 of the 15 areas, and only un-intrusive investigation in 1 of the 10 areas. Field activities for the Soil Part A Phase 1 soil investigation were implemented between August and November 2008. The Part A Phase 1 soil investigation encompassed the following 10 investigation areas outside of the Station fence line:

- SWMU 1 – Former Percolation Bed
- AOC 1 – Area Around Former Percolation Bed
- AOC 4 – Debris Ravine
- AOC 9 – Southeast Fence Line
- AOC 10 – East Ravine
- AOC 11 – Topographic Low Areas
- AOC 12 – Fill Areas
- AOC 14 – Railroad Debris Area
- UA 1 – Pipeline Disposal Area
- UA 2 – Former 300B Pipeline Liquids Tank Area

In total, 659 soil samples, 7 white powder material samples, and 4 debris/wood samples were collected (sample counts do not include duplicate samples collected for quality control purposes). Two samples were also collected from one location in an area of Bat Cave Wash where soil is transitioning into sediment near the mouth of Bat Cave Wash. DTSC also directed the collection of three soil samples of white powder at locations in AOC 10.

2015/2016 Soil Investigation Activities

Soil investigation activities conducted within the Project Area indicate that contaminants have been released to soils through past management practices such as those associated with hazardous materials handling/disposal, waste discharges, spills, and leaks of cooling water and other fluids at the Station. On August 24, 2015, DTSC approved the Topock Soil Investigation Project based

on the Topock Compressor Station Soil Investigation Project FEIR (August 2015). The primary purpose of the Soil Investigation Project is to gather sufficient soil samples to be able to reliably characterize the nature and extent of soil and sediment contamination within the Project Area. The soil investigation project includes soil sampling and analysis as described in the Soil Work Plan (CH2M Hill 2013), and the potential need for additional activities such as bench scale tests, pilot studies, and geotechnical evaluations to support a future Soil Corrective Measures Study/Feasibility Study (Soil CMS/FS) and plant or other biota sampling activities to support an ecological risk assessment within, and in the vicinity of, the Station.

The Soil Work Plan sampling began in November 2015 and continued through March 2016. Additional activities, similar to those described above associated with investigation have not yet been completed, and will depend on the results of soil sampling. If additional activities are to be completed, they would occur from 2016 to 2018. In addition, DTSC might need to conduct additional borings beyond the scope of the analysis that was included in the Soil Investigation Project FEIR; if this is determined necessary, compliance with CEQA, which may involve preparation of an addendum, would be conducted. All work would be conducted within the timeframe mentioned above. Implementation of the Soil Investigation Project will provide DTSC with sufficient data for the completion of the RFI/RI process that is consistent with state and federal guidance for site investigations and would support evaluation of possible soil cleanup action(s) if determined necessary. The results of the investigation activities will be compiled and combined with past Station investigation data sets for the preparation of the Final RFI/RI Report Volume 3 (Soil), which will enable the evaluation and selection of corrective measures, if necessary, in a future Soil CMS/FS. If any soil remedy is proposed, it would be implemented following completion of the Soil CMS/FS and associated environmental review as required by CEQA.

Soil Remediation and Potential Pilot Test Project (1F)

With the soil data gaps evaluation associated with the Soil Investigation Activities (1E) still ongoing and soil risk assessment still forthcoming, key information that will influence potential remediation methods and timeframes is unknown at this time. For the purposes of this analysis, it is assumed that early phases of soil remediation (likely pilot studies) could overlap with the construction activities associated with the proposed Project. Although type(s) of soil remediation is reasonably foreseeable, the scope and process of the remediation are not. For informational purposes, potential remediation methods and technologies are described below.

Potential Remediation Methods and Technologies

Cleanup of chemicals of concern in soils at and around the Topock site could 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

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.

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. The soil would be excavated, 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
- Cr(VI) —chemical reduction.

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.

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.

Solidification/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, which results 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 cement-like 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.

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.

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.

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.

Institutional Controls

Land use controls or other forms of institutional controls are expected to 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 associated with technology used for soil remediation, and access restrictions such as road closures or vehicular barriers.

6.4.2.2 U.S. Bureau of Reclamation

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

The Lower Colorado River Multi-Species Conservation Program (LCR 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 50-year plan was completed in 2005 and is currently being implemented to create more than 8,100 acres of riparian, marsh, and backwater habitat for 4 listed species and 16 other species native to the Lower Colorado River. The program extends over 400 miles 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 includes various current and planned activities within the reach of the Colorado River (Reach 3) that is located just east of the Station. The Beal Lake Conservation Area is an LCR MSCP project on the Arizona side of the Colorado River northwest of the Project Area within Reach 3. The conservation project was completed in 2012, and monitoring activities were initiated to manage the conservation objectives, including water quality and plankton monitoring, and periodic remote sensing to track the small population of Razorback Sucker. Monitoring efforts were completed in 2014. Future monitoring objectives post-2014 will be dictated by management recommendations (BOR 2013). The Insectivore Prey Base Abundance and Diversity on Conservation Areas project includes surveys to determine the presence of insect and arachnid species within the Topock Marsh and Beal Lake Conservation Area. Following ongoing research and monitoring priorities, this study was cancelled (BOR 2016b). In 2015 the BOR started planning a backwater project on a parcel north of the Moabi Regional Park footprint as part of the LCR MSCP. This project would involve land-based excavation, which would break the levee and run a channel into the Moabi Regional Park footprint, creating habitat along the channel. Project construction is expected to start in 2017 and continue for a two-to three-year period (BOR 2016b).

Quarry Operations (2B)

The BOR operates quarry sites intermittently (when needed) along the Lower Colorado River, including one directly north of the Moabi Regional Park footprint (Section 7 Quarry – California Side), as stockpiles for riprap and other bank-line materials (BOR 2016a). The stockpiled materials are used by BOR for maintenance and construction of bank-lines, river control structures, levees, canals, and reservoirs along the Lower Colorado River. Quarry operations for the Manchester Quarry were recently closed in 2015 (BOR 2016b).

Mohave Valley Conservation Area Backwater Project (2C)

The BOR has proposed to excavate soil to create approximately 50 acres of backwater channel and associated backwater habitat on a 149-acre portion of a vacant parcel located approximately 1 mile northwest of the Project Area on the west side of the Colorado River. The backwater channel would be connected to the Colorado River by the construction of inlet and outlet water control

structures. The Project would be carried out in the following four phases: Vegetation Clearing, Excavation and Construction, Establishment/Re-Vegetation; and Habit Management, Operations, and Maintenance. The improvements are planned to begin in 2017 for an approximate two-to-three year construction period (BOR 2016b).

6.4.2.3 U.S. Bureau of Land Management

Cathodic Protection System (3A)

The Southern California Gas Company installed a cathodic protection system along approximately 235 feet of gas pipeline, to control corrosion of the pipeline in 2012. This protection system comprises a 500-foot well that would connect to the gas pipeline. A buried underground anode wire was connected to a small rectifier to relay the electrical current from an existing power pole to the gas pipeline. Recently, Southern California Gas Company conducted additional testing on the gas pipeline and is expected to complete repairs of the gas pipeline by the end of 2016 (BLM 2016).

6.4.2.4 U.S. Fish and Wildlife Service

Lower Colorado River National Wildlife Refuges Comprehensive Management Plan (4A)

The USFWS, in cooperation with BOR, prepared a comprehensive management plan (CMP) for the four National Wildlife Refuges that are located along the Lower Colorado River. This includes the HNWR, which is located along the Colorado River and is adjacent to the 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 from 1994 to 2014. 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.

There is no current funding in place to update the CMP; however, components of the plan will likely be used in future management decisions (USFWS 2014). USFWS is currently awaiting direction and funding from Congress in order to move forward with the CMP (USFWS 2016b).

Topock Marsh Water Infrastructure Improvement Project on the Havasu National Wildlife Refuge (4B)

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. BOR is acting as a cooperating agency under the National Environmental Policy Act (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. Phase I of the project was

completed in the fall of 2011 and includes gravity flow infrastructure consisting of the following components: a 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). Phase II was completed in 2016 based on engineering studies as part of the design phase and involved non-gravity flow infrastructure (USFWS 2016a).

Sacramento Wash Improvements (4C)

The USFWS and HNWR plan to redirect flow from the Sacramento Wash through the existing vegetation to restore historical drainage patterns of the wash along Oatman Highway. The primary purpose of this project is to restore Sacramento Wash to its historical drainage pattern in order to reduce the significant sediment transported and deposited at the Sacramento Wash. Through reducing sedimentation and improving the water quality, this project will improve habitat within Topock Marsh. This project will also improve water quality of the water ultimately the Colorado River. The project would include the removal of the existing dike to redirect flows to restore historical drainage patterns of Sacramento Wash; excavation of three channels to convey flows west of Oatman Highway; and construction of a training dike near the historical wash crossing; and removal of vegetation required for construction (Needles Desert Star 2016).

6.4.2.5 California Department of Transportation

I-40 Pavement Enhancement Project (5A)

Caltrans (District 8) is planning to conduct pavement enhancement activities along I-40 and US 95 from Havasu Lake Road to Needles (EA #1G69). The pavement enhancement activities are planned to begin in September 2017. The portion of pavement activities planned along the I-40 would extend for 3 miles, beginning west of west of Park Moabi Road and adjacent to the Station. The project will take approximately ten days to complete (Caltrans 2016).

I-40 Improvement Project (5B)

Caltrans (District 8) is proposing two separate projects along I-40 which include regrading activities along 29.6 miles of the existing I-40 median, from 4.5 miles east of Homer Wash Bridge to the California/Arizona State Line (EA-OR142). The portion of regrading activities planned along I-40 would be located immediately north of the Station and within the Project Area. The second project includes the proposed replacement of the Colorado River Bridge (EA-OR380K). The existing Colorado Bridge is located east of the Station (Caltrans 2016). The projects are scheduled to start construction in 2023.

6.4.2.6 Arizona Department of Transportation

Oatman Highway Crossing at Sacramento Wash Project(6A)

ADOT is proposing the construction of a bridge over the Sacramento Wash in Topock, Arizona. The new crossing will provide a 110-foot clear span over the Sacramento Wash. Project construction was initiated in February of 2016 (USDOT 2016).

6.4.2.7 San Bernardino County

Moabi Regional Park Improvements (7A)

San Bernardino County is implementing improvements to the Moabi Regional Park north of the Station. Improvements include full utility hookups at the recreational vehicle campsites, 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. The improvements to the sewer treatment facility were completed in 2012; however, the work to the main entrance of the park and utility hookups has been delayed. Based on information provided by the County of San Bernardino, project initiation for the park improvements and utility hookups is still pending (County of San Bernardino Regional Parks 2016).

Pirate Cove Resort (7B)

Pirate Cove Resort is a vacation resort that features 14 waterfront cabins, a 300-slip marina, commercial and restaurant development (bar and grill), RV hookups, 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 on the Colorado River. 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. The Moabi Regional Park is leased land that falls under the purview of the BLM. The Pirate Cove Peninsula Master Plan identifies 667 additional RV and/or cabin sites to be constructed over six phases (County of San Bernardino 2012). No construction has begun on the facilities proposed as part of the Pirate Cove Master Plan (BLM 2016). In 2013, an OHV area was partially opened to the public. When fully opened, the OHV area will not constitute the full 146.5 acres as planned for in the Pirate Cove Peninsula Master Plan (BLM 2016).

Verizon Wireless Communication Facility (7C)

In 2013, Verizon Wireless submitted a site plan permit to San Bernardino County to collocate an antenna on an existing AT&T monopole in Needles, California, along the west side of Highway 95. This would involve installation of an antenna on an existing 157-foot pole originally installed by AT&T, and construction of an equipment shelter.

Needles Highway Improvement Project (7D)

The Needles Highway Improvement Project involves the improvement and/or rehabilitation of a 16-mile corridor of the Needles Highway, from Needles north to the California/Nevada state line. The project would accommodate existing and reasonable forecast travel demand as safely as possible. Phase N of the project includes surface rehabilitation and is anticipated to begin in early 2017. Resurfacing activities will take approximately 1.5 months. The County of San Bernardino is currently obtaining environmental permit approvals for Phase 1A of the project, which includes realignment and horizontal work. The improvements will occur on an approximately 1.5 mile portion of the highway, extending from the City of Needles up to Park Road (County of San Bernardino Public Works 2016).

6.4.2.8 City of Needles

I-40 Connection Project (8A)

The I-40 Connection project is a street improvement project that will align existing streets in the City of Needles with connections to I-40, thereby improving traffic flow. The project would improve truck-turning radius at various intersections, improve signal placement and pavement. Final design and construction bid materials are currently being prepared (City of Needles 2016).

ATP Concrete Sidewalks Project (8B)

The City of Needles obtained funding through the Active Transportation Program (ATP) to improve existing street network. This street improvement project would construct concrete sidewalks along select streets. Project construction is expected to begin in late 2016 (City of Needles 2016).

6.4.2.9 Mohave County

Topock Marina Improvements (9A)

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. The project was approved on January 11, 2013. The retail and restaurant buildings, and swimming as pool part of Phase I, were constructed in 2013 (Mohave County 2016). Phase II includes plans for the hotel; however, as of 2016 no site plans for subsequent phases have been submitted to the county for approval, and construction has not yet been implemented (Mohave County 2016).

Sterling Solar Project (9B)

The Sterling Solar Project was initially a proposed master-planned community located north of I-40 approximately three miles from the California/Arizona state line and five miles northeast of the Project Area. The Sterling Solar Project was replaced by a proposed concentrated solar development on the same property. Conditional zoning approvals were issued in 2012 for this solar development; however, as of 2016 the project has not yet been implemented (Mohave County 2016).

6.4.2.10 Lake Havasu City

Airport Business Park (10A)

The Airport Business Park (10A) is an approximately 80-acre light industrial business park development. Phase I was completed in 2013, which consists of approximately 19 acres of retail space. Phase II of the project would include a motor sports facility. A site plan was approved for Phase II in 2013; however, the project is currently on hold (Lake Havasu City 2016).

6.4.2.11 Southwest Gas

Distribution System Upgrades (11A)

Southwest Gas operates a gas pipeline that runs along the Colorado River in the vicinity of the Project Area, terminating in Laughlin, Nevada. Southwest Gas completed upgrades in 2011 to a portion of the pipeline segment in Moabi Regional Park, approximately 1 mile from the Station.

6.5 Analysis of Cumulative Impacts

As previously described in Section 6.2 of this chapter, the cumulative scenario under each environmental discipline differs depending upon the resource and 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 scale, while the cumulative impacts for noise would be limited to a more local scale for activities in the vicinity of the Project Area. The cumulative setting and analysis for each discipline are discussed in the following pages.

Consistent with CEQA, a stepped approach was used to analyze cumulative impacts. The first step was to determine whether the combined effects of the probable projects within the geographic scope of an environmental issue area would result in a cumulatively significant impact. Then, the Project's incremental impact was added to the anticipated effects of these probable projects. The final step was to evaluate whether the proposed Project's incremental contribution to the combined effect would be cumulatively considerable, as required by CEQA Guidelines Section 15130, Subdivision (a).

The amount of infrastructure (number of wells, length of pipeline, built structures, etc.) analyzed in the Groundwater FEIR, when considered in addition to other projects in the cumulative scenario, resulted in cumulatively considerable impacts to cultural resources even after implementation of mitigation measures. All other resource areas analyzed in the Groundwater FEIR were found not to be cumulatively considerable (less than significant). The cumulative impacts identified in the Groundwater FEIR are not considered again in this cumulative impact analysis; all analysis presented in this chapter reflects the changes and modifications presented in the Final Remedy Design and Project as proposed in this SEIR.

6.5.1 Aesthetics

The geographic scope for potential cumulative impacts to aesthetics includes the foreground, which is defined as the zone within 0.25 miles to 0.5 miles from the Project Area, and the middle-ground, which is a zone that extends from the foreground up to 3 to 5 miles. In desert areas, such as the vicinity of the proposed Project, landscape detail is typically most noticeable and objects generally appear most prominent when seen in the foreground. At middle-ground viewing distances, the texture of landscape features such as of rock outcropping surfaces and vegetation as well as built elements may be noticeable but are increasingly unrecognizable. At background viewing distances, which would extend from about 3 to 5 miles from the Project Area to infinity, visible detail is limited to landscape patterns or visual contrasts. Consideration is given to

background views; however the effects of the proposed Project activities and any associated changes in visual contrast would generally be visible at foreground viewing distances and not beyond 3 to 5 miles from the Project Area.

As described in Section 4.1.2.1, the Project Area is located at the southern end of the Mohave Valley where the Colorado River meets the Chemehuevi Mountains and veers east past the dramatic Needles rock formations. The visual character of the landscape within the Project Area and surrounding vicinity is portrayed in terms of the contrasts between natural and constructed elements: steep rocky slopes south of the Station giving way to the meandering bank of the river and Topock Marsh, along with the HNWA, to the north and east, with the western portion of the Project Area surrounded by largely undeveloped alluvial plateaus and shallow drainage washes. In addition to the Station, visible built features traversing the Project Area included I-40, the BNSF rail line and natural gas transmission facilities, along with related infrastructure including steel bridges, pipelines, roadbeds and engineered cut slopes. Developed land in the vicinity of the Project Area includes Moabi Regional Park, a mobile home development, and a recreation facility, both located immediately northwest of the Project Area.

When combined, projects in the cumulative scenario listed above (Table 6-3) have the potential to affect key views and sensitive aesthetic resources in the geographic scope. In particular, this includes projects at and in the immediate vicinity of the Station. Particularly relevant to the immediate visible Project Area is implementation of the Soil Remediation and Potential Pilot Test Project (1F), which could involve substantial earthwork, and which could also overlap with construction activities associated with the proposed Project. Additionally, projects along the Colorado River in San Bernardino and Mohave Counties, which include the BLM Quarry Operations (2B), the Mohave Valley Conservation Area Backwater Project (2C), the Topock Marsh Water Infrastructure Improvement Project on the HNWR (4B), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), the Pirate Cove Resort (7B), the Topock Marina Improvements (9A), and the Distribution System Upgrades (11A). These projects are all within the 3 to 5 mile viewing distance and could cumulatively affect existing scenic resources.

Elements of these projects (such as ground disturbing activities; installation of infrastructure; and introduction of additional vehicles, equipment, and personnel) would be visible to affected viewers in the geographic scope, including recreational, vehicular, and Tribal viewer groups. Depending on the project element and viewing location, intervening landscape elements, and other factors, such as the presence of vegetation, screening could minimize the actual visibility. The projects anticipated at the Moabi Regional Park (7A), the Havasu National Wildlife Refuge (4B), the Pirate Cove Resort (7B), and the Verizon Wireless Communication Facility (7C) are fairly minimal in the context of existing development, but could be highly visible to sensitive recreational viewers along the Colorado River and to Tribal viewer groups. Similarly, the hotel and restaurant proposed as part of the Topock Marina Improvements (9A) could be more substantial in nature and of more visual contrast compared to the surroundings. These recreational developments are of a nature that is consistent in the region and are not anticipated to result in visual effects that would be significant, either in combination with other projects or individually.

There is a potential that the construction phase of the Project could overlap with the Soil Investigation Activities (1E). In addition, based on the results of the investigation activities, a soil remedy may be required (1F), which could involve extensive amounts of soil disturbance in the Project Area, depending on the type of soil remedy selected after completion of the Soil Investigation Activities and additional environmental review. There is the potential for the Soil Remediation Project, once approved, and the proposed Project to overlap, though it would most likely be nearing the completion of Project construction and initial soil remediation activities (i.e., pilot tests, which are less intensive in nature). The potential soil remedy, if needed and depending on the type of remedy selected as outlined in Section 6.4.2.1 above, could result in substantial visual changes to the Project Area in combination with those visual changes associated with the proposed Project. Project-related visual changes would be in place through decommissioning and likely could extend beyond. It is not known how long a soil remedy would take, but it could commence during the 5-year construction schedule for the proposed Project, and have long-lasting visual changes that could be considered significant.

When added to the cumulative scenario described above, the effects of the proposed Project would contribute incrementally to the cumulative impacts on aesthetic resources. As documented in the set of Figures 4.1-5 through 4.1-16 visual simulations, and summarized in Table 4.1-5, the proposed Project would represent an incremental change that would substantially alter the composition or character of existing landscape views, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, particularly the Soil Remediation and Potential Pilot Test Project. The Project's incremental contribution to aesthetic impacts and, particularly with respect to the potential to substantially degrade the existing visual character or quality of the site and its surroundings, is considered cumulatively considerable and a significant cumulative impact. This is a new significant cumulative impact from those identified in the Groundwater FEIR.

Mitigation Measures AES-1 and AES-2 include design requirements to ensure that development and alterations along the Colorado River and the associated scenic corridor do not significantly affect views. These measures would reduce the Project's contribution to significant cumulative aesthetic impacts but not to a level of less than significant. In addition, the Soil Remediation and Potential Pilot Test Project (1F) would also require compliance with CEQA, including preparation of an EIR and consideration of that project's contribution to significant visual impacts which could impose additional specific mitigation measures that would be highly dependent on the locations and types of remediation that are implemented. However, it is assumed that cumulative impacts would remain significant and unavoidable.

IMPACT CUM-1 Cumulatively Considerable Impacts to Aesthetic Resources. Implementation of the proposed Project, in combination with other projects in the geographic scope, could cause a substantial adverse change to scenic vistas, scenic resources, and the existing visual character and quality of the site and its surroundings. This impact would be **cumulatively significant** and the proposed Project's contribution to this impact would be **cumulatively considerable**.

Timing:	Implementation of AES-1 and AES-2 prior to and during construction, operations and maintenance, and decommissioning.
Responsibility:	PG&E would be responsible for the implementation of these measures. DTSC would be responsible for ensuring compliance.
Significance after Mitigation:	The impact would be significant and unavoidable after implementation of the mitigation measures detailed above. The Project, in combination with other projects causing related visual impacts in the area, would contribute considerably to a cumulatively significant impact to aesthetic resources.

6.5.2 Agriculture and Forestry Resources

The geographic scope for agricultural resources is Eastern San Bernardino County where agricultural activities would be similar. As explained in the Modified Initial Study (Appendix IS), the Project would have no impact with respect to Farmland, Williamson Act contracts, land zoned for agricultural use, forest land, or timberland. Therefore, it could not contribute to cumulative effects related to these resources (no impact).

6.5.3 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 Project-related activities and greenhouse gas (GHG) emissions.

6.5.3.1 Short-Term Project-Related Impacts

The geographic scope for potential cumulative impacts to air quality from short-term Project-related impacts is the MDAB, which is the air shed the Project Area is located in. The MDAB comprises the eastern portion of Kern County, the northeastern portion of Los Angeles County, all of San Bernardino County, and the eastern portion of Riverside County.

The MDAB is in nonattainment status for ozone, Particulate Matter 10 (PM₁₀), and Particulate Matter 2.5 (PM_{2.5}) within a portion of San Bernardino County. However the Project does not fall within the MDAB nonattainment area for PM_{2.5}. This is a result of the cumulative development in the basin, as well as transport of pollutants from other basins. The Mojave Desert Air Quality Management District (MDAQMD) has established daily significance thresholds for criteria pollutants and ozone precursors for projects within San Bernardino County designed to reduce the impacts of development on the air quality of the region. To this end, the Project-related thresholds have been established to ensure that if they are not exceeded, then there is no potential for the Project to result in regional emissions above the state or federal thresholds, or significant increases in daily/annual emissions where existing conditions already exceed the thresholds. Since these state and federal thresholds are cumulative in nature, and the MDAQMD thresholds were developed to ensure/enable compliance with these state and federal thresholds, then project

compliance with MDAQMD thresholds would ensure a project does not have the potential to result in a cumulatively significant impact on air quality.

In addition, San Bernardino County is currently designated as a nonattainment area for ozone and PM_{10} due to the cumulative projects in the county. Projects in the cumulative scenario, in particular, projects at the Station (1A through 1F) and the projects along the Colorado River in San Bernardino and Mohave counties, which include the BLM Quarry Operations (2B), the Mohave Valley Conservation Area Backwater Project (2C), the Topock Marsh Water Infrastructure Improvement Project on the Havasu National Wildlife Refuge (4B), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), the Pirate Cove Resort (7B), the Topock Marina Improvements (9A), and the Distribution System Upgrades (11A), could contribute to air quality impacts in the geographic scope through the generation of criteria pollutants from activities such as vegetation clearing; earth-moving activities; dust entrainment from travel by equipment, trucks, and employee vehicles (especially on unpaved surfaces); and exhaust from equipment, trucks, and employee vehicles. For these reasons, the existing combined air quality conditions within the geographic scope of the air basin are considered cumulatively significant with respect to Ozone and PM_{10} .

When added to the existing environment and cumulative scenario described above, the effects of the proposed Project would contribute incrementally to the cumulative impacts on air quality, but the incremental contribution would not be cumulatively considerable. As described in Section 4.2, “Air Quality,” the proposed Project would violate the MDAQMD air quality standard for oxides of nitrogen (NO_x) during construction and decommissioning activities which would result in significant impacts, but would not exceed daily or annual thresholds of significance for other criteria pollutants (volatile organic compounds [VOCs] or reactive organic gases [ROG]; PM_{10} ; $PM_{2.5}$; carbon monoxide [CO]; and oxides of sulfur [SO_x]). The proposed Project would violate the MDAQMD NO_x air quality standard; therefore it could result in a cumulatively considerable net increase for this pollutant (NO_x) without mitigation. Mitigation Measure AIR-1a would reduce NO_x emissions to below regulatory thresholds for all construction activities and therefore, with mitigation would result in less than cumulatively considerable impacts.

As demonstrated in Section 4.2 “Air Quality” of this SEIR, operational emissions are shown to have less than significant impacts with respect to all criteria pollutants. Therefore, the incremental increase in emissions from operation of the Project would not be cumulatively considerable. The proposed Project would not emit CO in quantities that would pose health effects. Further, the duration of construction and decommissioning of the proposed Project would constitute a small percentage of the total 70-year sensitive receptor exposure period for toxic air contaminants.

Therefore, when considered in conjunction with the MDAQMD project thresholds as well as the anticipated impacts of other projects in the cumulative scenario, the Project’s incremental contribution to air quality impacts would not be cumulatively considerable (less than significant).

6.5.3.2 Greenhouse Gas Emissions

GHG emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would have a cumulatively considerable impact on global climate change; therefore, the geographic scope of cumulative impacts related to GHG emissions and climate change is global. Because GHG emissions, as discussed in Section 4.2 of this SEIR, are considered cumulative pollutants, the cumulative analysis reflects that of the Project analysis. Therefore, the discussion here summarizes the GHG emissions analysis as presented in Section 4.2.

The proposed Project would contribute GHG emissions during construction and decommissioning primarily through exhaust from equipment, trucks, and employee vehicles, and during operations primarily through electricity consumption and solid waste generation. This would result in an incremental contribution to global climate change and, when combined with the cumulative contributions of all other sources of GHGs, would contribute to climate change. As discussed in Section 4.2.5.3, the combined operational emissions plus the amortized construction-related emissions would result in a net emissions increase of approximately 5,979 metric tons per year of CO₂ equivalents (CO₂e), or approximately 179,380 MT CO₂e over the life of the Project. This would not exceed the MDAQMD's threshold of 90,719 metric tons per year of CO₂e.¹

Because the Project would not exceed the MDAQMD threshold for emissions of GHGs, it would not result in GHG emissions that would conflict with California's ability to achieve 1990 levels of GHG emissions by 2020 as required by Assembly Bill (AB) 32 and would be consistent with all other applicable plans, policies, and regulations. It also would not result in a substantial increase in GHG emissions or exceed a threshold of significance adopted by the MDAQMD. Therefore, the Project's incremental contribution to GHG emissions would not be cumulatively considerable, and would not present a significant cumulative impact (less than significant).

6.5.4 Biological Resources

The geographic scope for biological resources consists of the Project Area and surrounding lands along with drainages that are connected to the Project Area, including the Colorado River. The limits of the geographic scope were determined based on the presence of contiguous habitat types supporting, or capable of supporting, the sensitive biological resources potentially affected by the Project. This setting generally consists of a mix of disturbed and relatively pristine natural landscape that supports a variety of biological communities consisting predominantly of upland desert scrub interspersed with desert washes.

The projects considered in this cumulative analysis have varying effects on biological resources in the geographic scope, ranging from direct adverse impacts on sensitive species and habitat, to beneficial impacts resulting from implementation of conservation measures and land management practices. Impacting activities from projects included in Table 6-3 would include, but are not

¹ While the 100,000 ton (90,719 MT) CO₂e MDAQMD annual threshold is not as conservative as the Federal reporting limit of 25,000 MT CO₂e annually or the SCAQMD's 10,000 MT CO₂e annual threshold, the Project would still be below both of these thresholds.

limited to, activities at the Station (1A through 1F), Quarry Operations (2B), Cathodic Protection System (3A); Moabi Regional Park Improvements (7A); Pirate Cove Resort (7B); Topock Marina Improvements (9A); Distribution System Upgrades (11A).

Because these activities are anticipated to or have occurred within or near naturalized areas or undisturbed habitats, potential impacts to biological resources would include removal and/or disturbance to water, riparian, or sensitive habitats protected by federal or state regulations; removal and/or damage to special-status plants, including indigenous plants of biological and cultural significance; injuring, killing, harassing, or otherwise harming special-status wildlife, including desert tortoise; ring-tailed cat; Yuma clapper rail, southwestern willow flycatcher, and other nesting birds and raptors; Nelson's bighorn sheep; special-status bat species; and disruption of native wildlife nursery sites wildlife movement corridors. Within the geographic scope, the aforementioned projects contribute only a limited amount of development and activity compared with the overall amount of undisturbed and available open space.

Other projects, such as the LCR MSCP (2A), the Mohave Valley Conservation Area Backwater Project (2C), the LCR National Wildlife Refuges CMP (4A), and Topock Marsh Water Infrastructure Improvement Project on the HNWR (4B), have contributory beneficial effects to biological resources. The LCR MSCP is a program implemented and overseen by multiple federal agencies to conserve and work toward recovery of endangered species and protect and maintain habitat along the Colorado River. The Mohave Valley Conservation Area Backwater Project (2C) entails creation of a backwater channel and associated backwater habitat connected to the Colorado River in Moabi Regional Park. The CMP at HNWR is a management plan overseen by USFWS for wildlife refuges along Lower Colorado River, including the HNWR. The Topock Marsh Water Infrastructure Improvement Project includes the replacement and rehabilitation of the HNWR main water delivery system for the Topock Marsh unit. These projects provide stipulations for habitat restoration, creation of new habitat, augmentation of existing wildlife populations, protection and monitoring of existing habitat for special-status species, and protection of special-status species and their habitats within the geographic scope, among others. Because of the limited amount of development and activity proposed within the geographic scope and the implementation of the aforementioned beneficial projects, the combined effects to biological resources from the projects listed in Table 6-3 would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would contribute incrementally to impacts on biological resources. As described in Section 4.3.5.3 of this SEIR, the proposed Project would have potentially significant impacts, including potential fill of ephemeral non-wetland waters under U.S. Army Corps of Engineers (USACE) and California Department of Fish and Wildlife (CDFW) jurisdiction; direct disturbance of and loss of habitat for special-status birds, desert tortoise, ring-tailed cat, Nelson's bighorn sheep, special-status bats, and special status plants; and substantial interference nursery sites (i.e., active maternity roosts for special-status bat species). Mitigation measures have been identified for the proposed Project to avoid and/or minimize impacts to biological resources (Mitigation Measures BIO-1a, BIO-1b, BIO-2b through BIO-2h, and HYDRO-1). These measures would be implemented during planned activities, as well as implementation of any unplanned facilities associated with the Future Activity Allowance.

Mitigation Measures BIO-2a and BIO-2b, which require on-site restoration and compensation to address temporal loss of jurisdictional features, would reduce potentially significant impacts to ephemeral non-wetland waters under USACE and CDFW by ensuring no net loss of jurisdictional resources in the region. Mitigation Measure HYDRO-1 would reduce potentially significant indirect impacts on fish species and their aquatic habitat by requiring implementation of best management practices (BMPs) to reduce water quality impacts related to erosion and pollutant runoff. Mitigation Measures BIO-2b through BIO-2h would reduce potentially significant impacts to special-status species, including special-status birds, desert tortoise, ring-tailed cat, Nelson's bighorn sheep, special-status bats, and special status plants, by requiring seasonal avoidance where necessary, establishing avoidance buffers around known occurrences, and other impact minimization measures (e.g., 20 mile-per-hour speed limit on access roads).

Overall, mitigation measures requiring implementation would ensure, at a minimum, no-net-loss of habitat value or function and avoidance and minimization of disturbance to special-status species would reduce impacts associated with the proposed Project to a less than significant level. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to impacts to biological resources would not be cumulatively considerable (less than significant).

6.5.5 Cultural Resources

The geographic scope for cumulative impacts to cultural resources (i.e., historical resources, unique archaeological resources, unique paleontological resources or geological features, and human remains) consists of the Lower Colorado River Valley. This geographic scope of analysis is appropriate because the historical resources, unique archaeological resources, and human remains within this area are linked or connected to the five Interested Tribes, all of whom have a vested interest in the Project Area. For paleontological resources, the geographic scope of analysis is appropriate because the formations within this area are expected to be similar. The Topock Traditional Cultural Property (Topock TCP), although its full geographic boundary is currently undefined, likely comprises a large part of the geographic cumulative scoping area, and, as such, there are undoubtedly many archaeological resources, landforms, water sources, and similar features that contribute to the Topock TCP. For paleontological resources, similar geology within this vicinity would likely yield fossils of similar sensitivity and quantity. The temporal scope for cumulative impacts to cultural resources encompasses both short-term and long-term cumulative impacts of the proposed Project, in conjunction with other cumulative projects in the area.

The Project Area and surrounding vicinity contains a significant archaeological and historical record that, in many cases, has not been well documented or recorded. The Lower Colorado River Valley contains a number of important sites of cultural and/or archaeological importance that are integral to the cultural traditions of Native American Tribes, and their relationship to the Colorado River. These resources include, but are not limited to, archaeological sites, geoglyphs, rock art, trails, and dance paths/circles. There are also important historic-period resources, such as Route 66 and its associated features and archaeological sites, located throughout the region. In addition, geological units with moderate to high paleontological sensitivity, such as Quaternary

Alluvium, the Bouse Formation, and the Chemehuevi Formation, have yielded significant vertebrate and microvertebrate fossils in the surrounding vicinity. Thus, there is a potential for ongoing and future development projects in the Project vicinity to disturb areas that may contain cultural resources.

Many of the cultural resources within the geographic scope have already been subjected to impacts as a result of past projects, including the introduction of transportation, energy, and recreational facilities, expansion of population centers, flood control management and water supply, as well as through construction of the PG&E projects at the Station and within surrounding areas and other ground-disturbing activities undertaken in developing the Final Groundwater Remedy Project. Projects undertaken before environmental laws such as CEQA were in place may not have considered, or mitigated, significant impacts to cultural resources, and may have resulted in damage to important cultural resources such as geoglyphs, trails, and other resources that retain significant cultural value to Interested Tribes, as well as historic-period resources, paleontological resources, and human remains. Projects that have already been implemented or may occur in the foreseeable future at or near the Project Area could impact cultural resources. These projects include PG&E projects at the Station (1A through 1F), BLM Quarry Operations (2B), the LCR National Wildlife Refuges CMP (4A), the Topock Marsh Water Infrastructure Improvement Project on the HNWR (4B), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), Pirate Cove Resort (7B), Topock Marina Improvements (9A), the Sterling Solar Project (9B), and Distribution System Upgrades (11A). These projects have the potential to involve ground-disturbing activities that would directly impact significant cultural resources. These projects may also bring additional people (e.g., work crews, residents, tourists) into the area that may result in increased rates of vandalism or OHV use that may directly or indirectly impact resources. These projects may also result in visual, auditory, and other environmental impacts that may adversely affect the Topock TCP. For these reasons, the combined impacts on cultural resources in the geographic scope would be considered cumulatively significant. This conclusion is consistent with the certified Groundwater FEIR which also found a significant and unavoidable impact to cultural resources.

When considered in combination with the impacts of other projects in the cumulative scenario, the proposed Project's incremental contribution to impacts on cultural resources including historical resources (including the Topock TCP), unique archaeological resources, unique paleontological resources or geologic features, and human remains would remain cumulatively considerable and therefore significant. Although Mitigation Measures CUL-1 through CUL-4 which are described in detail in Section 4.4, "Cultural Resources," would reduce the significance of the impacts to the degree feasible, the only method to fully mitigate these impacts would be complete avoidance of any future project activity; therefore, no feasible mitigation exists that would reduce the Project's contribution to less than considerable. The Project's contribution to this significant cumulative cultural impact would remain cumulatively considerable (significant and unavoidable).

IMPACT CUM-2 **Cumulatively Considerable Impacts to Cultural Resources.** Implementation of the proposed Project, in combination with other projects in the geographic scope, could cause a substantial adverse change in the significance of the historical resource identified as the Topock TCP; cause a substantial adverse change in the significance of unknown historical or unique archaeological resources; result in a substantial adverse change to a unique paleontological resource or unique geologic feature; and disturb human remains, including those interred outside of formal cemeteries. This impact would be **cumulatively significant** and the proposed Project's contribution to this impact would remain **cumulatively considerable** as identified in the Groundwater FEIR.

Timing: Implementation of CUL-1 through CUL-4 prior to and during construction, operation and maintenance, and decommissioning.

Responsibility: PG&E would be responsible for the implementation of these measures. DTSC would be responsible for ensuring compliance.

Significance after Mitigation: The impact would remain **significant and unavoidable** after implementation of the mitigation measures detailed above. The Project in combination with other projects in the area would continue to contribute considerably to a cumulatively significant impact to the integrity of those physical characteristics that convey the significance of the Topock TCP and to historical resources unique and important to the region.

6.5.6 Geology and Soils

As explained in the Modified Initial Study (Appendix IS), the Project would have less than significant impacts after implementation of mitigation measures with respect to geology and soils. The geographic scope of the cumulative impact analysis for geology and soils includes the Project Site and areas immediately adjacent. The projects listed in Table 6-3 that have the potential to impact geology and soils include certain PG&E projects at the Station (1A, 1E and 1F), Quarry Operations (2B), Mohave Valley Conservation Area Backwater Project (2C), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), Pirate Cove Resort (7B), Topock Marina Improvements (9A), and the Distribution System Upgrades (11A). These projects, in particular projects 1E and 1F, would potentially result in substantial earthmoving activities 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 proposed 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 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 (see Appendix IS), 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. As described in Section 4.6.5.3, the Project would implement standard operating procedures (SOPs) and BMPs, as well as adhere to the substantive provisions of the state Construction General Permit to avoid and/or minimize the potential for impacts related to extensive soil excavation, alteration of drainage patterns and erosion quality. These provisions would become conditions of approval for the Project. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to soil disturbance, drainage and erosion impacts would not be cumulatively considerable (less than significant). Additionally, the Project is not located in proximity to a known earthquake fault; the Project Site is not located in a geologic unit or soil that is unstable; and the Project Site is not located on expansive soils. Therefore, the Project would not contribute to or combine with the impacts of other projects in the cumulative scenario to cause significant cumulative impacts related to these criteria (no impact).

6.5.7 Hazards and Hazardous Materials

The geographic scope of the cumulative impact analysis for hazards and hazardous materials includes the Project Site and areas immediately adjacent. The geographic scope would also include transportation haul routes used for the transportation of hazardous materials to and from the Project Area including the disposal of hazardous soils and building debris. Note that air quality impacts are addressed in Section 6.5.3, "Air Quality," and water quality impacts address in Section 6.5.8, "Hydrology and Water Quality."

Several cumulative projects in the geographic scope could cause impacts related to hazards or hazardous materials. The PG&E projects are restricted to the area local to the Station, and would not be expected to be compounded by other projects in the area due to the physical separation. In addition, the investigation and construction activities are temporary and localized. The BOR LCR MSCP (2A) Quarry Operations (2B) would require the use of vehicles for transport of workers, materials, and equipment but would not include construction activities. The Cathodic Protection System (3A) to install cathode protection wiring was completed in 2012. The LCR National Wildlife Refuges CMP (4A) is a management plan that would only require trucks to transport

workers and equipment; no construction activities are proposed. The Moabi Regional Park Improvements (7A) would include the construction of roads and utility hookups associated with a previously completed sewer treatment plant improvements. Although not yet scheduled, the work would include asphalt pavement, fuels, lubricants and oils, and paint, and the paving equipment and support trucks for equipment, materials, and workers. The Pirate Cove Resort (7B) would add RV and cabin sites and would include grading and paving equipment using fuels, lubricant cleaners, and paint. The Topock Marina Improvements (9A) would involve construction of a hotel and restaurant. Although no plans have been submitted, the future construction would require construction equipment and support trucks, workers, and materials, including fuels and lubricants, paints, and cleaners. These projects could result in the release of hazardous materials from the use of equipment (fuels, oils and grease, solvents). Those projects that are expected to occur within a similar time frame as the proposed Project would result in an increased potential for the release of hazardous materials. Cumulative hazards and hazardous materials impacts could occur if activities related to the Project combined with the activities of other existing and proposed cumulative projects such as simultaneous accident conditions along the haul route from the Project Area or further out on I-40. Although the potential exists for releases to occur in connection with the proposed Project and other cumulative projects, there is no way of predicting whether any such releases would occur or whether they would occur in a way that could be considered cumulatively considerable. The likelihood that more than one of the cumulative projects would have a substantial hazardous materials release that affects the same resources within the same temporal period is relatively low.

Hazards from the routine use or accidental release of hazardous materials, hazardous materials that would be used on the Project Area are described in the impacts discussion for Impact HAZ-1. In the event of a release, state and local hazardous materials regulations and standards, which are described in the Regulatory Background for each resource section, have been established to address and reduce the potential for such impacts to occur and to establish response plans to limit the extent of releases that do occur. The Project and the listed cumulative projects would all be required to comply with the same applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for releases of hazardous materials would be reduced and the required responses would limit the extent of releases largely to the individual sites. In addition, the U.S. Department of Transportation (DOT) regulations that provide required procedures for the containerization and transportation of hazardous materials that apply to the proposed Project would also apply to each of the cumulative projects. Each of the cumulative projects would also be required to prepare and implement a Health and Safety Plan and a Hazardous Materials Business Plan that would describe the requirements for the proper containerization and transportation of hazardous materials.

When added to the cumulative scenario described above, the effects of the proposed Project would not substantially contribute incrementally to the cumulative impacts on hazards and hazardous materials. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to hazards and hazardous materials impacts would not be cumulatively considerable (less than significant).

In terms of an increased risk of wildland fire, the California Department of Forestry and Fire Protection fire hazard severity zone map identifies the Project Area and its surroundings in the lowest level of its fire hazard severity zones, which is the lowest possible risk category. Nonetheless, wildfires are possible as demonstrated by the wildland fire that originated on April 6, 2016, 10 miles southeast of Needles and 2 miles west of Golden Shores. The fire was fueled by riparian fuels including Salt Cedar. Although this fire demonstrates the ability for riparian areas within the Project Area to burn, no permanent residences are proposed as part of the Project that would result in loss, injury or death. While workers would be on-site intermittently for the duration of construction, operation, and decommissioning activities, the proposed facilities would not pose an increase in threat due to wildland fires. In addition, as discussed in Section 4.5, “Hazards and Hazardous Materials,” the California Vehicle Code requires spark arrestors on off-highway vehicles. Therefore, the Project would not result in new significant impacts or substantially increase the severity of impacts previously identified in the Groundwater FEIR. Cumulative projects in the geographic scope (see Table 6-3) that involve the use of mechanized equipment with internal combustion engines could cause a wildfire and expose people or structures to wildfire risk. However, the cumulative projects would also be required to comply with the substantive provisions of federal and state regulations and the relative low level of fire hazard severity in the area of these projects would ensure that the combined effects of these projects is less than significant. The Project would also adhere to provisions of federal and state regulations that address potential wildland fire impacts, even with the low level of fire risk. Thus, the Project’s incremental contribution to wildland fire impacts would not be cumulatively considerable (less than significant).

6.5.8 Hydrology and Water Quality

The geographic scope for potential cumulative impacts to hydrology and water quality is the East Colorado River Basin (focused on downstream areas) for surface water resources, and the Mojave Valley Groundwater Basin, Needles Subbasin (California), and Sacramento Valley Groundwater Basin (Arizona) for groundwater resources. The area around the Station is drained by a network of ephemeral washes that eventually flow into the Colorado River to the east of the Project Area. The section of the Colorado River in the vicinity of the Project Area is not on the list of impaired water bodies required by Section 303(d) of the federal Clean Water Act and therefore does not have any established Total Maximum Daily Loads (TMDLs).

Certain PG&E projects (1A, 1E and 1F), the Quarry Operations (2B), the Mohave Valley Conservation Area Backwater Project (2C), the Topock Marsh Water Infrastructure Improvement Project on the HNWR (4B), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), and Pirate Cove Resort (7B) could result in impacts to hydrology and water quality through ground disturbing activities, infrastructure development, discharge activities, and leaks or spills from equipment and vehicles (fuels, oils and grease, solvents). The PG&E projects, however, are restricted to the area local to the Station, and would not be expected to be compounded by other projects in the area due to the physical separation. The Quarry Operations (2B) include the maintenance and construction of improvements to river control structures, which in the long-term will improve water quality of the river. The Sacramento Wash Improvements

(4C), the future hotel and restaurant part of the Pirate Cove Resort (7B), and the paving and utility hookups for the Moabi Regional Park Improvements (7A) would all consist of ground-disturbing activities with limited footprints. All of these cumulative projects would require the short-term use of equipment (e.g., drilling rigs, support trucks) and some chemicals (e.g., fuels, oils, lubricants, paint, cleaners) during construction. However, all of the cumulative projects would be required to meet applicable local, state, and federal laws intended to avoid and minimize impacts to hydrology and water quality. In particular, the projects would be required to comply with construction general permits in both California and Arizona that would require controlling site runoff from construction sites through the use of BMPs and stormwater pollution prevention plans (SWPPPs). With proper adherence to these regulations and proper construction site management using BMPs, there is no anticipation that concurrent construction of the cumulative projects listed in Table 6-3 would result in cumulative impacts.

During the construction phase, the proposed Project would include use of fuel, lubricants, paint, glue, and solvents, and an increase in the volume of disturbed soil that could result in additional erosion/water quality impacts in combination with other cumulative projects in the geographic scope, which would contribute incrementally to impacts on hydrology and water quality. The Project would implement SOPs and BMPs, as well as adhere to the substantive provisions of the state Construction General Permit to avoid and/or minimize the potential for impacts related to hydrology and water quality. These provisions would become conditions of approval for the Project if the Project is approved. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to hydrology and water quality would not be cumulatively considerable (less than significant).

6.5.9 Land Use and Planning

As explained in the Modified Initial Study (Appendix IS), the Project would have no impacts with respect to land use and planning. The geographic scope for land use and planning is San Bernardino County and eastern parts of Mohave County, Arizona, to encompass any potential large-scale planning efforts with multiple federal and state agency oversight. The Project would have no impact with respect to the physical division of an established community, or any conflict with applicable land use plans or policies or with adopted habitat conservation plans or natural community conservation plans. Therefore, it could not cause or contribute to cumulative effects related to these land use and planning issues (no impact).

6.5.10 Mineral Resources

As explained in the Modified Initial Study (Appendix IS), the Project would have no impacts with respect to mineral resources. The geographic scope for cumulative impacts analysis to mineral resources is eastern San Bernardino County (Desert Regions) where the geologic mineral resources and users of the resources are similar.

The Project Area is classified as a Mineral Resource Zone (MRZ)-4, which is defined as an area where geologic information does not rule out either the presence or absence of mineral resources. Sand and gravel, known as “saleable mineral resources” within the MRZ-4 designation are known

to exist at the Project Area and surrounding areas. Metallic, rare, and leasable minerals may also be present, but their existence in the Project Area is unknown at this time. No other mineral resource extraction activities occur within the areas adjacent to the Project Area. The BOR currently utilizes quarry sites along the Lower Colorado River, including one directly north of the Moabi Regional Park footprint, as stockpiles for riprap and other bankline materials (2B). The stockpiled materials are used by BOR for maintenance and construction of banklines, river control structures, levees, canals, and reservoirs along the Lower Colorado River. No other saleable mineral resources are mined or anticipated to be mined within the geographic scope. The Quarry Operations (2B) would not impact mineral resources in the area because the location is only used to stockpile fill materials. For these reasons, the combined effects to mineral resources within the geographic scope would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, could contribute incrementally to mineral resource issues. Although there is the potential for some mineral resources to exist in and around the Project Area, the potential is limited; therefore 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 Area and none permitted on the federal lands located within the Project vicinity. The Project would have very minor impacts with respect to the loss of availability of a locally important mineral resource recovery site. Therefore, this impact is not cumulatively significant and the proposed Project would not cause or contribute to cumulative effects related to mineral resources (less than significant).

6.5.11 Noise

The geographic scope for cumulative noise impacts is the Project Area and areas immediately adjacent, due to the attenuating effects of noise. Noise is generated from an activity that is in turn experienced by receptors close to the noise source. Noise from the 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 BNSF railway line.

The projects listed in Table 6-3 that have the potential to generate construction and/or operational noise in the geographic scope include the PG&E projects (1A through 1F), Quarry Operations (2B), Pavement Enhancement Project (5A), I-40 Improvement Project (5B), Mohave Valley Conservation Area Backwater Project (2C), Topock Marsh Water Infrastructure Improvement Project on the HNWR (4B), Sacramento Wash Improvements (4C), Moabi Regional Park Improvements (7A), Pirate Cove Resort (7B), the Topock Marina Improvements (9A), and the Distribution System Upgrades (11A).

In particular, overlapping work at and in the vicinity of the Station could result in increased cumulative noise for activities that occur simultaneously and within 500 feet of the Project Area. As such, the combined noise effects from the projects listed in Table 6-3 within the geographic scope of the noise analysis could be cumulatively significant on sensitive receptors. The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would contribute incrementally to noise and vibration impacts. The analysis for the proposed

Project indicates that significant groundborne vibration impacts and project-generated construction-related noise levels would result from construction. In addition, the proposed Project would generate noise that could expose the Topock TCP (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.

Noise generated from the proposed Project could be compounded when taken in context with most other noise-generating projects in the geographic and temporal scope. In particular, activities associated with the PG&E soil investigation activities (1E) and soil remediation activities (1F), the Pavement Enhancement Project (5A), and the I-40 Improvement Project (5B), which would all be in close proximity to the Project and are likely to be implemented during a similar timeframe. While these activities are only expected to overlap with the Project for a short period of time, the Project's incremental contribution to noise impacts could be cumulatively considerable and therefore significant considering the projects in the cumulative scenario. This is a new significant cumulative impact from those identified in the Groundwater FEIR.

Mitigation Measures NOISE-1 and NOISE-2 have been identified to reduce construction-related noise and vibration impacts associated with the Groundwater Remedy Project. Mitigation Measure NOISE-2 would require construction equipment specifications and restrictions to reduce noise impacts to sensitive receptors, and Mitigation Measure NOISE-1 would site Project wells away from sensitive receptors. Both mitigation measures would require a disturbance coordinator to manage noise and vibration complaints. These measures would reduce the Project's contribution to significant cumulative noise and vibration impacts; however, impacts would remain significant even after mitigation.

The following Mitigation Measures NOISE-3 is a new measure from what was identified in the Groundwater FEIR that has been identified to reduce the potential for cumulative noise impacts associated with the PG&E efforts directly within the Project Area. The measure would ensure that during implementation of the proposed Project and the Soil Remediation and Potential Pilot Test Project (1F), noise measurement exceedances would trigger temporary barriers to reduce noise, and if unable to reduce noise adequately, the modification of either soil or groundwater remediation efforts near sensitive receptors. Mitigation Measure NOISE-3 would ensure that the cumulative noise impacts resulting from simultaneous construction of the proposed Project and the Soil Remediation and Potential Pilot Test Project; however because the specific locations and timing of overlap is unknown, impacts are considered significant and unavoidable.

IMPACT CUM-3 Cumulatively Considerable Impacts Related to Noise and Vibration.

Implementation of the proposed Project, in combination with Soil Remediation Activities in the Project Area that are in the geographic scope, could cause a substantial adverse increase related to short-term construction-related noise and vibration, as well as compatibility with noise levels at the Topock TCP. This impact would be **cumulatively significant** and the proposed Project's contribution to this impact would be **cumulatively considerable**.

Mitigation Measure NOISE-3: Cumulative Noise Increases from Remedial Activities (New Measure). Coordination between teams implementing soil remedial activities (including investigation, pilot testing, and remediation) and groundwater remediation shall occur as to avoid cumulative noise impact to any sensitive receptor. If concurrent activities must occur near common sensitive receptors, real time noise measurements of representative activities shall be conducted by a qualified acoustical consultant (or contractor trained by an appropriate qualified acoustical consultant) at the nearest noise-sensitive land use with a sound level meter that meets the standards of the American National Standards Institute (ANSI Section S14 1979, Type 1 of Type 2). If exceedances are not observed, monitoring can be discontinued. If exceedances are experienced, temporary barriers shall be erected as close to the construction activities as feasible, breaking the line of sight between the source and receptor where noise levels exceed applicable standards. If noise cannot be effectively mitigated, one or more of the concurrent activities shall be modified to result in appropriate noise levels.

Timing:	Implementation of NOISE-3 prior to and during construction, operation and maintenance, and decommissioning.
Responsibility:	PG&E would be responsible for the implementation of these measures. DTSC would be responsible for ensuring compliance.
Significance after Mitigation:	The impact would remain significant and unavoidable after implementation of the mitigation measures detailed above. The Project in combination with other projects in the area would continue to contribute considerably to a cumulatively significant impact related to construction noise and vibration.

6.5.12 Population and Housing

As explained in the Modified Initial Study (Appendix IS), the Project would have no impacts with respect to population and housing. The geographic scope for cumulative impacts to population and housing is the larger region in which the Project is located where Project employees are expected to originate from: San Bernardino County, California, which includes the city of Needles, California, and neighboring Mohave County, Arizona which includes the city of Lake Havasu City, Arizona.

The population in San Bernardino County is anticipated to grow 67 percent by 2040. The City of Needles is anticipated to grow 41 percent by 2030. In Arizona, Mohave County is anticipated to grow 73 percent by 2040 while Lake Havasu City is anticipated to grow 28 percent within the same timeframe. Regional growth projections indicate that the area surrounding the proposed Project will experience significant growth within the next 20-30 years.

The majority of the projects included in the cumulative scenario are infrastructure projects involving a limited permanent employee base. No current projects are planned in the vicinity of the proposed Project that would support population increase. The Moabi Regional Park Improvements (7A) involve infrastructure improvements that would enhance the overall

population's experience within the regional park; however no full-time residential structures would be built. The Pirate Cove Resort (7B) would involve 667 RV sites and/or cabin sites. These additions would not support year-round residential units and would not generate the need for new housing. The Topock Marina Improvements (9A) would involve construction of a restaurant and hotel. The Distribution System Upgrades (11A), which is completed, involved replacement of existing pipeline infrastructure in the Project vicinity. Similarly, the Project would support temporary recreational users and not provide year-round residential units, thereby not inducing substantial population growth. For these reasons, the combined effects to population and housing within the geographic scope would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would not contribute incrementally to population- or housing-related issues. The proposed Project does not involve displacement of existing housing or people. Construction for the Project would last approximately 5 years, and it is estimated that the operation and maintenance phase will take place over about 40 years, with the decommissioning phase following. As shown within Table 3-10 of the Project Description of this SEIR, the construction phase of the Project would require approximately 349 temporary employees. Some of these workers would only be at the Project Area for activities lasting 2-3 months. The operation and maintenance phase of the Project would require 10-12 employees over about 40 years. During the decommissioning phase, the Project would employ about 102 people. The limited duration of the construction and decommissioning phases of the Project and the temporary nature of employees during these phases would not result in population growth, the displacement of housing or people, or the need for new housing. The limited number of employees during the operation and maintenance phase would also not result in population growth, the displacement of housing or people, or the need for new housing. Therefore, this impact is not cumulatively significant and the proposed Project could not cause or contribute to cumulative effects related to population and housing issues (less than significant).

6.5.13 Public Services

As explained in the Modified Initial Study (Appendix IS), the Project would have no impacts with respect to public services. The geographic scope for cumulative impacts to public services is the larger region in which the Project is located and services are provided, which is San Bernardino County, California.

Public services in the vicinity of the Project Area and surrounding areas are provided by local agencies. Fire protection is provided by the San Bernardino County Fire Department on a contract basis to the City of Needles which operates as the City of Needles Fire Department. The Needles Fire Department serves the Project Area. Police protection is provided by the San Bernardino County Sheriff's Department. The Needles Unified School District serves approximately 6,000 square miles in eastern San Bernardino County. Moabi Regional Park, the Colorado River, and the National Wildlife Refuge provide recreational opportunities near the Project Area. The majority of the projects included in this cumulative scenario are infrastructure projects involving a limited permanent employee base. None of the projects are commercial or residential projects

that would require increased public services to the area. For these reasons, the combined effects to public services within the geographic scope would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would not contribute incrementally to impacts on public services. Construction for the Project would last approximately 5 years, and it is estimated that the operation and maintenance phase will take place over about 40 years and decommissioning following. As shown within Table 3-10 of the Project Description of this SEIR, the construction phase of the Project would require approximately 349 temporary employees. Some of these workers would only be at the Project Area for activities lasting 2-3 months. The operation and maintenance phase of the Project would require 10-12 employees over about 40 years. During the decommissioning phase, the Project would employ about 102 people. The limited duration of the construction and decommissioning phases of the Project and the temporary nature of employees during these phases would not result in population growth, the displacement of housing or people, or the need for new housing. The limited number of employees during the operation and maintenance phase would also not result in population growth, the displacement of housing or people, or the need for new housing. The proposed Project does not include residential development and would not bring enough, full-time employees to the Project Area to require the expansion of public facilities. Because the Project would not create impacts with respect to new or physically altered fire protection, police protection, school, parks, or other public service facilities, it would not contribute to or combine with the impacts of other projects in the cumulative scenario to cause significant cumulative impacts related to these services. Therefore, this impact is not cumulatively significant and the proposed Project could not cause or contribute to cumulative effects related to public services (less than significant).

6.5.14 Recreation

As explained in the Modified Initial Study (Appendix IS), the Project would have no impacts with respect to recreation. The geographic scope for cumulative impacts to recreation is the larger region in which the Project is located where Project where employees are expected to originate from: San Bernardino County, California, which includes the city of Needles, California, and neighboring Mohave County, Arizona which includes the city of Lake Havasu City, Arizona.

The recreational opportunities in the vicinity of the Project Area include the Moabi Regional Park, The Pirates Cove Resort along the Colorado River, the Colorado River itself, and the Havasu National Wildlife Refuge. The majority of the projects included in this cumulative scenario are infrastructure projects involving a limited permanent employee base. No current projects are planned in the vicinity of the proposed Project that would increase population in such a way as to induce substantial deterioration of existing recreational facilities. The Moabi Regional Park Improvements (7A) involve infrastructure improvements that would enhance the overall population's use of the regional park; no degradation of the existing park would occur. The Pirate Cove Resort (7B) would involve 667 additional RV sites and/or cabin sites. These additions would provide for planned increase of recreational facilities offered; however the increase would not result in substantial physical deterioration of the site. The Topock Marina Improvements (9A) involves construction of a restaurant and hotel. Similarly, the proposed Project would not

substantially increase the use of neighborhood and regional parks to the point of substantial degradation. For these reasons, the combined effects to recreation from the projects listed in Table 6-3 within the geographic scope would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would not contribute incrementally to impacts to recreation. The proposed Project would not generate enough additional residents to the area to increase the use of existing neighborhood and regional parks or other recreational facilities. The Project does not propose construction of any new recreational facilities. 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, this impact is not cumulatively significant and the proposed Project could not cause or contribute to cumulative effects related to recreation (less than significant).

6.5.15 Transportation and Traffic

As explained in the Modified Initial Study (Appendix IS), the Project would have less than significant impacts with respect to transportation and traffic. The geographic scope for cumulative impacts to transportation and traffic is Park Moabi Road, I-40, and the National Trails Highway. Traffic conditions in the geographic scope are operating within an acceptable range. The Park Moabi Road segments north and south of I-40 are well below San Bernardino County's threshold of 7,000 average daily traffic (ADT). The two Park Moabi Road/I-40 intersections under existing conditions (in Year 2016) are operating within the 0–10 seconds/vehicle range (Level of Service [LOS A]) during the A.M. and P.M. peak hours, and below the County threshold of 15 to 25 seconds (LOS C).

The projects in this cumulative scenario are a mixture of infrastructure, roadway improvement and recreational projects. The infrastructure and roadway projects, including the PG&E projects at the Station (1A through 1F), particularly the Soil Remediation and Potential Pilot Test Project (1F) would involve a substantial amount of truck trips to and from the Project Area. The majority of those projects is ongoing and contributes to the traffic baseline; however, the Soil Remediation and Potential Pilot Test Project (1F) could be constructed during the construction phase of the proposed Project, and could involve truck trips, depending on the type of soil remedy selected.

The Pirate Cove Resort (7B) would involve 667 RV sites and/or cabin sites. Currently, up to 663 RV sites can be utilized on peak weekends. Construction would involve worker and truck trips; however operation of the recreational site would increase the vehicles that can be accommodated by the site by only 4 vehicles, and no additional operational impacts are anticipated (County of San Bernardino 2012). The Topock Marina Improvements (9A) involves construction of a restaurant and hotel. Construction and operational traffic are anticipated to increase as a result of this project. The Sterling Solar Project (9B) would involve construction of solar generating facilities that would increase construction employee-related traffic in Mohave County, AZ. The Airport Business Park (10A) would construct a light industrial business development park, which would include construction and operational traffic increases in Lake Havasu City. It is assumed

that workers for all projects in the cumulative scenario listed in Table 6-3 would drive one vehicle to and from work each day, and would arrive during the morning peak period (7:00 A.M. to 9:00 A.M.) and depart during the evening peak period (4:00 P.M. to 6:00 P.M.). Most workers would drive to projects in the cumulative scenario from nearby communities, including Needles, Laughlin, and Lake Havasu City. In addition, six transportation projects, the Pavement Enhancement Project (5A), the I-40 Improvement Project (5B), the Oatman Highway Crossing at Sacramento Wash Project (6A), the Needles Highway Improvement Project (7D), the I-40 Needles Connection Project (8A), and the ATP Concrete Sidewalks Project (8B) would contribute to the cumulative traffic baseline during construction. Once operational, these projects would alleviate traffic conditions in and around the Project Area. Due to the relative distance between these roadway improvement projects from each other and from the Project Area, and given the timeframes proposed in Table 6-3, the combined effects to transportation and traffic from the projects listed in Table 6-3 within the geographic scope would not be considered cumulatively significant.

The effects of the proposed Project, in combination with other cumulative projects in the geographic scope, would contribute incrementally to transportation and traffic impacts. Based on the maximum work scenario, the proposed Project is projected to generate 76 inbound vehicle trip ends and zero (0) outbound vehicle trip ends during the weekday AM peak hour, and zero (0) inbound vehicle trip ends and 58 outbound vehicle trip ends during the weekday PM peak hour. This results in 166 vehicles on a daily basis during construction, up to 104 vehicles on a daily basis for operation and maintenance, and up to 63 vehicles on a daily basis during decommissioning activities.

The construction traffic generated as a result of the proposed Project would occur for up to 5 years, which would be short-term, consistent with the length of Project activities, and intersections and roadway segments would continue to operate below County thresholds during Project activities. The addition of 104 vehicles on a daily basis generated during the 30 years of operations would be minimal. As a result, the Project would not add traffic to a roadway segment or intersection that would degrade the operation to an unacceptable level, or conflict with any applicable plan establishing measures of effectiveness of performance of the circulation system. Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to transportation and traffic impacts would not be cumulatively considerable (less than significant).

6.5.16 Utilities, Service Systems, and Energy

The geographic scope for cumulative impacts to utilities, service systems, and energy resources is the local and regional utility service provider service areas in eastern San Bernardino County, California. The Project is not located in an incorporated city; no municipal laws or regulations related to utilities and service systems are applicable to the proposed Project. Therefore, it would not cause or contribute to significant cumulative impacts in these criteria.

The Project Area and vicinity are located within unincorporated San Bernardino County. Solid waste in the Project vicinity is managed by Allied Waste, a refuse handler in Bullhead City,

Arizona. The nearest hazardous waste disposal sites are the Kettleman Hills Landfill in Kings County, California, and the Clean Harbors Buttonwillow Landfill in Buttonwillow, California. Water supply in the Project vicinity is provided by a combination of private and municipal groundwater wells. Public utilities serving the Needles area are managed by the Needles Public Utility Authority, which oversees electricity and groundwater supply and the Needles Wastewater Department, which oversees wastewater and sewer services. The Project Area in California is also currently served by PG&E's on-site generation of electricity and use of natural gas for fuel. The Mohave Electric Cooperative would supply power for the freshwater supply well in Arizona. There is no municipal sewer system in the vicinity of the Project Area; the Moabi Regional Park's wastewater treatment facility, which is the largest facility near the Project Area in California, consists of a raw sewage lagoon treatment system. Wastewater at the Project Area is processed on-site, or trucked off-site when necessary.

PG&E is currently disposing of both on-site hazardous and non-hazardous wastes at the Kettleman Hills Landfill and the Clean Harbors Buttonwillow Landfill. As discussed in Section 4.8, "Utilities, Service Systems, and Energy" of this SEIR, the following landfills have capacity and are available to accept wastes.

- Kettleman Hills Landfill (hazardous waste disposal)
- Clean Harbors Buttonwillow Landfill (hazardous waste disposal)
- Mohave Valley Landfill (non-hazardous waste disposal)
- Landers Sanitary Landfill (non-hazardous waste disposal)
- Barstow Sanitary Landfill (non-hazardous waste disposal)
- California Street Landfill (non-hazardous waste disposal)
- Victorville Sanitary Landfill (non-hazardous waste disposal)

The PG&E projects at the Station (1A through 1F) would utilize these landfills. Water would be supplied via existing entitlements specific to the Project Area, and wastewater would be treated using on-site facilities. Electricity would be provided by the Needles Public Utility Authority (City of Needles) electrical distribution system or self-generated by the Station. The Moabi Regional Park Improvements (7A) and the Pirate Cove Resort (7B) would utilize the same solid waste disposal services and electricity provider. As stated above, the Moabi Regional Park includes its own wastewater treatment facility and water wells. The cumulative projects listed above would generally be served by individual water and wastewater treatment facilities that would not be affected by other cumulative projects. However, solid waste would be generated for disposal and electricity would be consumed by the same utilities, both of which could contribute incrementally to impacts to landfills and electricity generation, but would not be considered cumulatively considerable. As noted above, there are a number of landfills all with available capacity to accept waste, and much of the electrical usage by the Project would be generated on-site by the Station. For these reasons, the combined effects to utilities and service systems from the projects listed in Table 6-3 within the geographic scope would not be considered cumulatively significant.

Construction, operation and maintenance of the proposed Project would result in the installation of three septic tanks, each with a capacity of 10,000 gallons. No leach fields would be constructed; the sanitary waste would be hauled to an off-site sanitary and septic waste facility.

The estimated total volume of remedy-produced water produced during operation of the proposed Project is 7.6 MG per year. Water not managed on-site due to quality or quantity issues would be transported off-site to a permitted facility for treatment, disposal or reuse. Because this effluent is disposed of by the wastewater contractor and handled consistent with applicable requirements and regulations, it is assumed that it would not exceed applicable water treatment standards and does not exceed existing treatment capacity.

Nonhazardous incidental wastes such as trash and construction debris generated during construction (empty cement and sand bags, pallets and scrap material, empty drink and food containers, and plastic sheeting) would typically be either hauled off-site at the end of the day or placed in dumpsters or roll-off bins that would be hauled off-site periodically by truck to an appropriately permitted municipal solid waste or recycling facility located within approximately 200 miles of the Project Area. The maximum projected waste stream for the Project is approximately 6,347 cubic yards which would not exceed the available capacity of the Mohave Valley Landfill. As noted above, there are four additional nonhazardous waste facilities that could also accept the solid waste if needed. Hazardous waste would be disposed of at either Kettleman Hills or Clean Harbors Buttonwillow landfill, both of which have 6,000,000 cubic yards and 9,000,000 remaining capacity. Solid waste generated during operation and maintenance would include incidental trash (i.e., used personal protective equipment, empty drums, bottles, and cans, paper bags, cardboard boxes, basic household and office debris, food containers, and other routine waste) generated by personnel, and construction materials from repair of constructed facilities. Based on current Project design information, the projected waste streams of non-hazardous waste for the Project would be 520 cubic yards per year. Based on current and foreseeable landfill capacities, these waste streams are anticipated to be minimal and not exceed the available capacity at existing landfills.

Therefore, when considered in addition to the anticipated impacts of other projects in the cumulative scenario, the Project's incremental contribution to impacts to utilities and public services would not be cumulatively considerable (less than significant).

6.5.17 Water Supply

The geographic scope for cumulative impacts to water supply is the Lower Colorado River and the Lower Colorado River Water Supply Project (LCWSP), the East Colorado River Basin (focus on downstream areas), the Mojave Valley Groundwater Basin, Needles Subbasin (California), and the Sacramento Valley Groundwater Basin (Arizona). Water supply for the proposed Project is from the Lower Colorado River, and is administrated through the LCWSP. The Station currently uses water for operations that comes from water supply wells in Arizona and is pumped across the Colorado River to two aboveground water tanks located south of the Station. Water diverted at these wells is counted as part of California's LCWSP water allocation because the

water is used in California, and water removed from the wells is recharged naturally by the Colorado River and the Sacramento Valley Basin.

The PG&E projects at the Station (1A through 1F) would utilize water included in PG&E's existing annual entitlement. Other projects included in Table 6-3 that could potentially impact water supply include the Pirate Cove Resort (7B) which includes expansion that would increase the water demand of the facility, the Topock Marina Improvements (9A), which include the addition of a restaurant, and the Airport Business Park (10A), which would include the addition of businesses that would increase water demand. The cumulative projects listed above would generally be served by individual water facilities separate from the station's water allocation that would not be affected by other cumulative projects. For this reasons, the combined effects on water supply from the projects listed in Table 6-3 within the geographic scope would not be considered cumulatively significant.

Implementation of the proposed Project would require an amount of water during the construction, operation and maintenance, and decommissioning phases that is less than PG&E's full entitlement of 422 acre-feet per year. 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. Water supply impacts associated with the Project could result in a potentially significant impact to nearby non-Project supply wells and, therefore, Mitigation Measure HYDRO-6 is required, which involves measurement of groundwater levels in the area around the freshwater supply wells throughout the decades-long operation and maintenance phase of the Project. With implementation of Mitigation Measure HYDRO-6, which would reduce the proposed Project's impacts to less than significant, the Project's potential contribution to impacts on water supply would not be cumulatively considerable (less than significant).

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CHAPTER 7

Alternatives to the Proposed Project

7.1 Introduction

This chapter presents the alternatives analysis as required by the California Environmental Quality Act (CEQA) for the proposed Pacific Gas and Electric Company (PG&E) Topock Compressor Station Final Groundwater Remediation Project (Final Groundwater Remedy Project or proposed Project) as specifically defined in the *Basis of Design Report/Pre-Final (100%) Design Submittal for the Final Groundwater Remedy, PG&E Topock Compressor Station, Needles, California, November* (Final Remedy Design; CH2M Hill 2015a). The Final Remedy Design and its associated appendices A through L, as well as the *Construction/Remedial Action Work Plan for the Final Groundwater Remedy* (C/RAWP; CH2M Hill 2015b) and its associated appendices A through X, are incorporated by reference throughout this subsequent environmental impact report (SEIR) and are found collectively as Appendix BOD as an electronic appendix to this SEIR. The Final Groundwater Remedy Project is being undertaken at the PG&E Topock Compressor Station (Station) and surrounding area (Project Area).

The proposed Project has been described and analyzed in the previous chapters of this SEIR with an emphasis on new potentially significant adverse environmental impacts or a substantial increase in significant impacts previously identified in the Topock Compressor Station Groundwater Remediation Project Final Environmental Impact Report (Groundwater FEIR; DTSC 2011), as well as any additional feasible mitigation measures needed to avoid or reduce those impacts. The proposed Project as analyzed in the SEIR is the outcome of a multi-year collaboration between the California Department of Toxic Substances Control (DTSC), as the lead agency, PG&E, the U.S. Department of the Interior (DOI), Interested Tribes, landowners, and other stakeholders. This chapter's purpose is to describe and analyze a range of reasonable alternatives that could feasibly attain most of the proposed Project's objectives while avoiding or substantially lessening one or more of the significant adverse impacts of the Project (CEQA Guidelines, Section 15126.6[a]). This chapter evaluates the respective alternatives' impacts and compares the potential impacts of the alternatives with those of the proposed Project. Based on this analysis, this chapter also identifies the environmentally superior alternative. Finally, it describes other alternatives that were considered but eliminated from detailed consideration and the reasons for their elimination.

7.2 Requirements for Alternatives Analysis

CEQA does not prescribe fixed rules governing the type of alternatives to a project that should be analyzed in an environmental impact report (EIR); the nature of alternatives varies depending on

the context of the project being analyzed. As expressed by the California Supreme Court: “CEQA establishes no categorical legal imperative as to the scope of alternatives to be analyzed in an EIR. Each case must be evaluated on its facts, which in turn must be reviewed in light of the statutory purpose” (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564).

Section 15126.6(a) of the CEQA Guidelines provides that:

[a]n EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.

Under these principles, an EIR needs to describe and evaluate only those alternatives necessary to permit a reasonable choice and “to foster meaningful public participation and informed decision making” (CEQA Guidelines Section 15126.6[f]). Consideration of alternatives focuses on those that can either eliminate significant adverse environmental impacts or substantially reduce them; alternatives considered in this context may include those that are more costly and those that could impede to some degree the attainment of the project objectives (CEQA Guidelines Section 15126.6[b]). CEQA does not require the alternatives to be evaluated at the same level of detail as the proposed project. Rather, the discussion of alternatives must include sufficient information about each alternative to allow “meaningful evaluation, analysis, and comparison with the proposed project” (CEQA Guidelines Section 15126.6[d]).

The range of alternatives required in an EIR is therefore governed by a “rule of reason” that requires an EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6 [f]). An EIR need not consider every conceivable alternative to a project. Alternatives may be eliminated from detailed consideration in the EIR if they fail to meet most of the basic project objectives, are not feasible, or do not avoid or substantially lessen any significant environmental effects (CEQA Guidelines Section 15126.6[c]). Moreover, under CEQA, a lead agency may structure its alternatives analysis around a reasonable definition of a fundamental underlying purpose, and need not study alternatives that cannot achieve that basic goal (*In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* [2008] 43 Cal.4th 1143, 1165).

CEQA also requires that alternatives evaluated in an EIR be potentially feasible. Feasible is defined in CEQA as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors” (PRC Section 21061.1). The CEQA Guidelines elaborate that factors that may be taken into

account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, and jurisdictional boundaries and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (CEQA Guidelines Section 15126.6[f]). Finally, alternatives should also avoid or substantially lessen one or more significant environmental impacts that would occur under the proposed project.

In addition to the requirements described above, CEQA requires evaluation of the “No Project Alternative,” which analyzes the environmental effects that would occur if the project were not to proceed (CEQA Guidelines Section 15126.6[e]). The purpose of describing and analyzing the No Project Alternative is to allow DTSC the opportunity to compare the impacts of approving the proposed Project with the impacts of not approving the proposed Project. An EIR is also required to identify the environmentally superior alternative. “If the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives” (CEQA Guidelines Section 15126.6[e]).

7.3 Background

The Groundwater FEIR, certified on January 31, 2011 (SCH No. 2008051003), provided both a programmatic and, in certain instances, a project-level analysis for the conceptual technical methods selected for the final remedy that would remediate contaminated groundwater at the Station. In accordance with Section 15126.6 of the CEQA Guidelines, a range of reasonable alternative remedy options that could feasibly accomplish most of the basic project objectives was considered in the Groundwater FEIR. The *Final CMS/FS for Solid Waste Management Unit 1 (SWMU 1)/Area of Concern 1 (AOC 1) and AOC 10* (Final CMS/FS) presented the identification and evaluation of various remedial alternatives to address the remedial action goals for groundwater contamination associated with the historic discharges to Bat Cave Wash—Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1—and within AOC 10 (East Ravine) at the Station.

The rationale for DTSC’s consideration of alternatives was based on DTSC’s review and participation in the Final CMS/FS process, which provided an exhaustive consideration of potential options and technologies for remediation of the contaminated groundwater plume while meeting the Remedial Action Objectives (RAOs) and other requirements, including the applicable statutory requirements of the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the associated Corrective Action Consent and Administrative Consent Agreements for Topock. As such, the range of alternatives considered in the Groundwater FEIR was based on feasible remediation alternatives that fell within the parameters of the RAOs identified in the Final CMS/FS.

The Final CMS/FS identified Alternative E – In Situ Treatment with Freshwater Flushing as the proposed final remedy, which was selected by DTSC upon adoption of the Groundwater FEIR in 2011, because it would achieve the RAOs while substantially reducing, through chemical change and physical precipitation, the amount of hexavalent chromium (Cr[VI]) in the groundwater

(which is the principal threat in groundwater at the site). The selected technology was also identified as the preferred alternative among the nine alternatives evaluated in the Groundwater FEIR and CMS/FS, to complete cleanup in a reasonable time frame while achieving best balance with the adverse effects to cultural resources and biological resources than other alternatives considered. DTSC's selection of Alternative E – In Situ Treatment with Freshwater Flushing was due in part to its acceptance by certain Tribal members and stakeholders who objected to other treatment options during the CMS/FS phase of the remedy investigation pursuant to the community acceptance criterion of the National Contingency Plan as codified in 40 CFR, Section 300.430 e(9)(I).

In full, implementation of the selected groundwater remedy (Alternative E) would consist of several phases, including design, construction and start-up, operation and maintenance, decommissioning, and restoration. The remedial design phase is now complete and resulted in the proposed Project that is the subject of this SEIR. The proposed Project is a culmination of an extensive preliminary (30%), intermediate (60%), pre-final (90%), and final design (Final Remedy Design) process, undertaken by PG&E as directed by DTSC and DOI with review and comment by stakeholders, including Native American Tribes. Tribal involvement was integral to the design process in all stages. DTSC and DOI have issued direction to PG&E prior to the start of each stage of the Project design, and at various times throughout the process.

On November 18, 2011, PG&E submitted the Draft Basis of Design Report/Preliminary (30%) Design Submittal (CH2M Hill 2011) for review and comment. More than 300 comments were received. Comment resolution occurred from late February through mid-May 2012. Technical Working Group (TWG) meetings were held to discuss the responses to comments.

On April 5, 2013, PG&E submitted the revised 60% Basis of Design (BOD) (CH2M Hill 2013) for review and comment. The comment period was approximately 4.5 months, from April 8 through August 23, 2014. More than 800 comments were received. Comment resolution occurred over a 7.5-month period from early September 2013 through mid-April 2014. Multiple venues for discussion and resolution of comments were held, including monthly TWG meetings, site walks, and ad hoc meetings.

On September 8, 2014, PG&E submitted the revised 90% BOD (CH2M Hill 2014) for review and comment. Based on DTSC direction, a supplement to the 90% BOD (Supplemental 90% BOD; CH2M Hill 2015c) was submitted on February 5, 2015, to present additional information regarding certain items included in the 90% BOD. The comment period for the 90% BOD and Supplemental 90% BOD was approximately 6.5 months, from September 10, 2014, through April 2, 2015. More than 1,210 comments were received. Discussion and resolution of comments occurred over a 4-month period from early April 2015 through end of August 2015.

After DTSC and DOI issued final design directives (i.e., directives for proceeding with the final design) to PG&E, on November 18, 2015, PG&E submitted the Final BOD, referred to as the Final Remedy Design (which includes the Operation & Maintenance Manual as Appendix L), and the Construction/Remedial Action Work Plan (C/RAWP; CH2M Hill 2015b) to DTSC and DOI for approval consideration. This Draft SEIR is based on the Final Remedy Design and C/RAWP,

which reflect modifications and clarifications by PG&E as a result of the collaborative and iterative design process.

This multi-year collaborative process has allowed DTSC to foster meaningful Tribal and stakeholder participation and informed decision making throughout the development of the Project, resulting in continuous refinement of the Project to avoid or lessen impacts, while also addressing many of the concerns of stakeholders, Tribal, and trustee and responsible agencies. This alternatives analysis is therefore focused on specifically reducing the identified significant environmental impacts of the Project (per the intent of CEQA), and does not revisit the alternatives previously considered in the 2011 EIR or those suggested during the Project's design phase which are not potentially feasible or which would involve substantially redesigning the Project.

7.4 Alternatives Selection

This section describes the basis for determining the range of CEQA alternatives and identifies the specific alternatives that are analyzed in this SEIR.

7.4.1 Project Objectives

As presented in Chapter 3, "Project Description" of this SEIR, the objectives of the proposed Project, reiterated below, are consistent with the objectives of the Groundwater FEIR certified in 2011. These objectives were used in the identification and selection of alternatives. As noted above, an EIR need only consider alternatives that would feasibly accomplish most of the Project's basic objectives.

The following are the Project RAOs for groundwater:

- Reduce the mass of total chromium (Cr[T]) and Cr(VI) in groundwater at the Project Area to achieve compliance with the applicable or relevant and appropriate requirements,¹ which will be achieved through the cleanup goal of the regional background concentration of 32 µg/L of Cr(VI).
- Ensure that the geographic location of the target remediation area (contaminated groundwater plume) does not permanently expand following completion of the final remedy.
- Prevent ingestion of groundwater as a potable water source having Cr(VI) in excess of the regional background concentration of 32 micrograms per liter (µg/L).
- Prevent or minimize migration of Cr(T) and Cr(VI) in groundwater to ensure concentrations in surface water do not exceed water quality standards that support the designated beneficial uses of the Colorado River (11 µg/L Cr[VI]).

¹ CERCLA Section 121 requires cleanups to meet ARARs: any "legally applicable or relevant and appropriate standard, requirement, criteria or limitation" that has been promulgated under federal or state environmental laws. The ARARs include such things as the federal and state "Safe Drinking Water Act" and the Solid Waste Control Act's land disposal restrictions.

In addition to the objectives stated above, the following objectives were defined by DTSC pursuant to CEQA Guidelines Section 15124(b):

- Provide consistency with the Remedial Design/Remedial Action Consent Decree between PG&E and the United States which was approved by the U.S. District Court for the Central District of California (November, 2013), the DOI/DTSC Memorandum of Understanding concerning the coordination in overseeing the implementation of the groundwater response action (November 22, 2011), and any other legal agreements applicable to the Project, including the 2006 and 2012 Settlement Agreements entered into between DTSC and the Fort Mojave Indian Tribe (FMIT).
- Achieve the cleanup levels or performance goals delineated in the DTSC's Statement of Basis and the DOI's Record of Decision for the final groundwater remedy.
- Protect biological, historical, and cultural resources by minimizing ground disturbance to the extent feasible.
- Minimize aesthetic impact to the extent feasible by limiting the amount of aboveground infrastructure.
- Consider public safety, ensuring efficiency, compliance with health and safety standards.
- Ensure remedy achieves compliance with RAO's within a reasonable time frame as required by California State Water Resources Control Board Resolution No. 92-49.

7.4.2 Summary of Significant Impacts

As stated in the CEQA Guidelines, alternatives to a project must substantially lessen or avoid any of the significant environmental impacts associated with the project. **Table 7-1** summarizes the Project's new significant impacts and any substantial increase in significant impacts identified in the Groundwater FEIR. Table 7-1 also shows where potentially significant impacts have been reduced to a level of less than significance with mitigation implementation, or where impacts remain significant and unavoidable even with implementation of mitigation). Table 7-1 also includes impacts resulting from the proposed Project that are cumulatively considerable, which have been identified in Chapter 6, "Cumulative Analysis."

**TABLE 7-1
SUMMARY OF SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT**

Impacts	Significant and Unavoidable	Less than Significant after Mitigation
Direct and Indirect Impacts		
<i>Aesthetics</i>		
Impact AES-1: Substantial Adverse Effects on Scenic Vistas. The proposed Project could introduce additional wells, roads, pipelines, and other associated infrastructure, including the Future Activity Allowance, which could have a substantial adverse effect on a scenic vista.		X
Impact AES-2: Substantial Damage to Scenic Resources within a Scenic Corridor. The proposed Project could introduce new features in the Colorado River floodplain, at the Topock Compressor Station (TCS) Evaporation Ponds, and near the existing HNWR-1A well site in Arizona that could adversely impact scenic resources within a scenic corridor.		X
Impact AES-3: Substantial Degradation of Existing Visual Character or Quality. The proposed Project could introduce additional wells, roads, pipelines, and other associated infrastructure, including the Future Activity Allowance, which could substantially degrade existing visual character or quality.		X
Impact CUM-1: Cumulatively Considerable Impacts to Aesthetic Resources. Implementation of the proposed Project, in combination with other projects in the geographic scope, could cause a substantial adverse change to scenic vistas, scenic resources, and the existing visual character and quality of the site and its surroundings.	X	
<i>Air Quality</i>		
Impact AIR-1: Short-term Construction-Related Emissions of Criteria Pollutants and Precursors. The proposed Project could violate the Mojave Desert Air Quality Management District air quality standards for NO _x during construction activities.		X
Impact AIR-2: Result in a Cumulatively Considerable Net Increase. The proposed Project could result in a cumulatively considerable net increase in criteria pollutant emissions with respect to NO _x emissions during construction activities.		X
<i>Biological Resources</i>		
Impact BIO-1: Potential Fill of Wetlands and Other Waters of the United States/California, and Disturbance or Removal of Riparian Habitat. Implementation of the proposed Project could result in disturbance to ephemeral waters under United States Army Corps of Engineers and California Department of Fish & Wildlife (CDFW) jurisdiction.		X
Impact BIO-2: Direct Disturbance of and Loss of Habitat for Special-Status Birds, Desert Tortoise, Ring-Tailed Cat, Nelson's Bighorn Sheep, Special-Status Bats, Northern Mexican Gartersnake, and Special-Status Plants. Implementation of the proposed Project could affect special-status species either directly or through habitat modifications.		X
Impact BIO-3: Fish Mortality, Interference with Spawning Habitat, and Other Adverse Aquatic Effects. Increased sedimentation and turbidity, the release of contaminants, and standing during construction activities could also adversely affect fish habitat and movement in the Colorado River.		X

TABLE 7-1
SUMMARY OF SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

Impacts	Significant and Unavoidable	Less than Significant after Mitigation
Impact BIO-4: Substantial Interference with Fish or Wildlife Movement Corridors or Nursery Sites. The Project could impede the use of bat maternity roosts, which are considered a type of native wildlife nursery site. Modifying, destroying or impeding the use of active maternity roosts of special-status bat species could result in substantial interference to the species reproduction and distribution.		X
Cultural Resources		
Impact CUL-1: Cause Substantial Adverse Change in the Significance of a Historical Resource as Defined in CEQA Guidelines Section 15064.5. Construction, operation and maintenance, and decommissioning activities of the proposed Project could result in substantial adverse changes to historical resources in the Project Area, including: (1) the Topock Traditional Cultural Property (TCP); (2) other historical resources listed in Table 4.4-2; and (3) historical resources that could be identified during construction. Impacts could occur through ground disturbance and other Project-related activities or through the introduction of out-of-character visual or auditory intrusions to historical resources that gain their significance in part because historical associations or aesthetic values.	X	
Impact CUL-2: Cause a Substantial Adverse Change in the Significance of a Unique Archaeological Resource. Many of the cultural resources listed in Table 4.4-3 may meet the CEQA criteria for a unique archaeological resource. Construction, operation and maintenance, and decommissioning activities of the proposed Project could result in substantial adverse changes to one or more unique archaeological resource in the Project Area through ground disturbance and other project-related activities.	X	
Impact CUL-3: Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature. Construction, operation and maintenance, and decommissioning activities of the proposed Project could result in substantial adverse changes to a unique paleontological resource or unique geologic feature in the Project Area through ground disturbance and other project-related activities.		X
Impact CUL-4: Disturb Any Human Remains, Including Those Interred Outside of Formal Cemeteries. Ground-disturbing activities required for all project phases may disturb as-yet undiscovered human remains, including Native American burial remains (i.e., human remains and grave goods).	X	
Impact CUM-2: Cumulatively Considerable Impacts to Cultural Resources. Implementation of the proposed Project, in combination with other projects in the geographic scope, could cause a substantial adverse change in the significance of the historical resource identified as the Topock TCP; cause a substantial adverse change in the significance of unknown historical or unique archaeological resources; result in a substantial adverse change to a unique paleontological resource or unique geologic feature; and disturb human remains, including those interred outside of formal cemeteries.	X	

TABLE 7-1
SUMMARY OF SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

Impacts	Significant and Unavoidable	Less than Significant after Mitigation
<i>Hazards and Hazardous Materials</i>		
Impact HAZ-1: Spills or Releases of Contaminants during Construction, Operation and Maintenance, and Decommissioning Activities from Routine Transport, Use, and Disposal or the Reasonably Foreseeable Accidental Release of Hazardous Materials that could Expose Workers, the Public, or the Environment. Construction, operation and maintenance, and decommissioning of the proposed Project could result in the potential release of hazardous materials during use or delivery of hazardous materials as a result of component failure (e.g., valve, flange, or pipe), tank failure, or human error (e.g., tank overfilling).		X
<i>Hydrology and Water Quality</i>		
Impact HYDRO-1: Exceedance of Water Quality Standards, Violation of Waste Discharge Requirements, or Degradation of Water Quality. The ground disturbing activities associated with constructing the Final Groundwater Remedy Project, use of carbon substrate to be injected into the aquifer or the use of Arizona freshwater, the generation of byproducts above water quality objectives, the discharge of remedy-produced water to the TCS Evaporation Ponds, and runoff associated with the soils stockpiling could result in the exceedance of water quality standards, violation of waste discharge requirements, or substantial degradation of water quality.		X
Impact HYDRO-2: Drainage Pattern Alterations. The proposed Project would require the construction of wells, piping corridors, buildings, and associated infrastructure that could alter the existing drainage system that could result in a substantial increase of erosion and siltation or flooding on and off the Project Area.		X
Impact HYDRO-3: Polluted Stormwater Runoff. The proposed Project does not include discharge to an existing or planned stormwater drainage system. The Project does have the potential to contribute substantial additional sources of polluted runoff if materials and operations are not properly handled.		X
<i>Noise</i>		
Impact NOISE-1: Long-Term Operational-Related Non – Transportation Noise and Vibration Impacts. Construction activities associated with the Additional Activity Allowance that could occur during long-term operation and maintenance could result in noise levels that exceed applicable standards.	X	
Impact NOISE-2: Groundborne Vibration Impacts Caused by Construction Activities. Implementation of the proposed Project would result in the exposure of sensitive receptors to groundborne vibration levels that exceed the applicable standards of the San Bernardino County Development Code (83.01.090) and the Mohave County Zoning Ordinance. These groundborne vibration levels could result in annoyance or architectural/structural damage.		X
Impact NOISE-3: Project-Generated Construction-Related Noise Levels. Implementation of the proposed Project would result in intermittent construction activities associated with the installation of new wells, roadways, water conveyance, utilities, water filtration facilities, and structures. These construction activities could potentially expose sensitive receptors to noise levels in excess of the applicable noise standards and/or result in a substantial increase in ambient noise levels.	X	

TABLE 7-1
SUMMARY OF SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

Impacts	Significant and Unavoidable	Less than Significant after Mitigation
Impact NOISE-4: Land Use Compatibility of Future Project Noise Levels with the Topock Traditional Cultural Property. Implementation of the proposed Project could result in future noise (construction, operation and maintenance, and decommissioning activities) that could result in conflicts with land use compatibility that exceed San Bernardino County standards for Places of Worship or conflict with Native American values associated with the Topock TCP.	X	
Impact CUM-3: Cumulatively Considerable Impacts Related to Noise and Vibration. Implementation of the proposed Project, in combination with Soil Remediation Activities in the Project Area that are in the geographic scope, could cause a substantial adverse increase related to short-term construction-related noise and vibration, as well as compatibility with noise levels at the Topock TCP.	X	
Utilities and Service Systems and Energy		
Impact UTIL-1: Potential to Exceed Wastewater Treatment Requirements or Require a New Wastewater Facility. The proposed Project includes several wastewater improvements in order to operate successfully that would not exceed requirements or require new facilities. The proposed Project does, however, include two new septic tank systems that could exceed requirements or require new facilities.		X
Impact UTIL-2: Potential to Exceed Landfill Capacity. The Project would generate incidental non-hazardous waste and hazardous waste during construction and operation activities, which would not exceed the available daily capacity of relevant landfills. Decommissioning of the Project, including the IM-3 Facility, would generate a variety of construction debris, including concrete, metal sheeting, and pipe, which could exceed the available daily capacity of relevant landfills.		X
Water Supply		
Impact WATER-1: Depletion of Groundwater Supplies. The Project would require the use of freshwater from water supply wells in Arizona. Localized effects on the groundwater table and the availability of groundwater supplies to other groundwater users near the freshwater water supply wells are possible.		X

7.5 Alternatives Considered and Rejected

After completing a review of the proposed Project, as presented in Chapter 4, “Environmental Analysis” of this SEIR, along with all of the potentially significant adverse environmental impacts, this SEIR reflects consideration of a total of seven alternatives, in addition to the No Project Alternative, initially considered for evaluation. It should be noted that several of the alternatives presented in this section grew out of the iterative design review process. Of these, it was determined that three of the Project alternatives would: (1) meet most of the Project’s objectives, (2) be considered potentially feasible, and (3) would avoid or substantially reduce one or more potentially significant impacts of the proposed Project. The alternatives considered but rejected from further consideration for being not feasible are described below. As required by CEQA, the No Project Alternative is described and analyzed in Section 7.6.4.

7.5.1 Alternative Remedial Technology

Nine alternative remedial technologies were evaluated in the 2011 Groundwater FEIR following DTSC's review and participation in the Final CMS/FS process. The remedy selection and design process provided an exhaustive consideration of all potential options and technologies for remediation of the contaminated groundwater plume while meeting the RAOs and other requirements, including the applicable statutory requirements of RCRA/CERCLA and the associated Corrective Action Consent and Administrative Consent Agreements for Topock. Section 21154 of the California Public Resources Code prescribes that "[w]henver any state agency, board, or commission issues an order which requires a local agency to carry out a project which may have a significant effect on the environment, any [EIR] which the local agency may prepare shall be limited to consideration of those factors and alternatives which will not conflict with such order". The reasoning behind DTSC's selection of alternatives is consistent with this mandate to local agencies, in that DTSC's decision whether to pursue the proposed Project and the selection of alternatives must not conflict with the applicable provisions of RCRA/CERCLA and the Consent Agreements issued for the Project site. The nine remedial technologies identified in the CMS/FS included the following:

- Alternative A – No Action
- Alternative B – Monitored Natural Attenuation (MNA)
- Alternative C – High-volume In-situ Treatment
- Alternative D – Sequential In-situ Treatment
- Alternative E – In-situ Treatment with Fresh Water Flushing
- Alternative F – Pump and Treat
- Alternative G – Combined Floodplain In-situ/Pump and Treat
- Alternative H – Combined Upland In-situ/Pump and Treat
- Alternative I – Continued Operation of Interim Measure

The screening of these remedial technologies was accomplished in three steps under the RCRA/CERCLA process. The first step in the process involved screening an initial list of technologies and process options against the criterion of technical implementability. This first screening eliminated those technologies or process options that are not applicable or not implementable because of the type and extent of contaminants and/or site characteristics found at the site. A second screening of the remaining process options against the criteria of effectiveness, implementability (both technical and administrative), and relative cost further reduced the list of remedial alternatives through a formal evaluation process. The last step involved selecting representative process options for each technology type to simplify the subsequent development and evaluation of remedial alternatives. The CMS/FS also ranked the nine alternatives using the following criteria:

- Protection of human health and the environment, attain media cleanup goals, and control sources of releases

- Compliance with applicable or relevant and appropriate requirements (ARARs)
- Long-term effectiveness, permanence, and reliability
- Reduction of toxicity, mobility, or volume of containment through treatment
- Short-term effectiveness
- Implementability
- Cost
- State/support agency acceptance
- Community acceptance

Using this ranking system, Alternatives C, D, E, F, G, and H ranked high because they would all provide for protection of human health from exposure due to use of groundwater as a drinking water supply in both the short term and long term and would protect the Colorado River as a result of floodplain cleanup and/or through hydraulic control. Alternatives C, D, E, F, G, and H also ranked high because the DOI determined that as a threshold matter; none of these alternatives could be eliminated based on the alternative's inability to satisfy cultural resources ARARs or the National Wildlife System Administration Act.

After thorough consideration through the CMS/FS and Groundwater FEIR process, DTSC selected Alternative E – In Situ Treatment with Freshwater Flushing because it would achieve the RAOs while substantially reducing, through chemical change and physical precipitation, the amount of Cr(VI) in the groundwater (which is the principal threat in groundwater at the site). The selected technology (now the proposed Project) was determined to complete cleanup in a reasonable time frame while achieving best balance with the adverse effects to cultural resources and biological resources than other alternatives considered. Furthermore, Alternative E met both the threshold criteria of (1) protecting human health and the environment, attaining media cleanup goals (over a reasonable timeframe), and controlling sources of releases, and (2) compliance with the identified chemical-, location-, and action-specific applicable or relevant and appropriate requirements (ARARs).

The other alternative remedial technologies were rejected for the following reasons for either their inability to meet the basic project objectives or for their feasibility.

Project Objectives. Although the other alternative remedial technologies would meet most of the project objectives, including the reduction of the mass of Cr(T) and Cr(VI) in groundwater at the Project Area, the alternatives were determined to result in greater ground disturbance or result in longer cleanup timeframes. For example, Alternative D - Sequential In-situ Treatment, would have more wells but fewer pipelines, and would generate more in-situ treatment by-products than Alternative E. Alternative B – MNA, was rejected because of the long time required to attain cleanup goals, long-term use of institutional controls, and the uncertainty of the treatment effectiveness.

Feasibility. Since the certified Groundwater FEIR included the evaluation of several alternative remedial technologies, which were deemed either as not feasible, not meeting project objectives, or resulting in greater impacts than the proposed Project, alternative remedial technologies were rejected from further analysis in this SEIR.

Given the thorough investigation and evaluation of other potential remedial alternatives through the development of the certified Groundwater FEIR, the CMS/FS, and the joint decision between DTSC and DOI in 2011 to select Alternative E – In Situ with Freshwater Flushing, for which the CEQA statute of limitations has run and all prior litigation has been settled, it is not necessary for this SEIR to consider or revisit other remedial technologies as viable alternatives to the proposed Project.

7.5.2 Colorado River Freshwater Source Alternative

The Groundwater FEIR evaluated three separate options for a freshwater supply source including the use of surface water from the Colorado River. Based on the Final CMS/FS evaluation, this option would obtain water from the Colorado River and would have sufficient capacity and low concentrations of arsenic and dissolved salts. The use of Colorado River water could be done either by taking water directly from the river through an intake structure on the river bank, or by extracting water from beneath the river bottom through an infiltration gallery.

Water drawn directly from the river via an intake structure would likely require filtration and disinfection prior to injection into the aquifer, which would require filters and chemical feed equipment that would increase the size and amount of remedial infrastructure to be constructed and maintained. Organic carbon would potentially need to be removed from the river water prior to injection, which is difficult to remove using conventional water treatment methods. The additional construction footprint needed for the direct river intake infrastructure would also disturb a larger area than would the Project.

Use of a shallow infiltration gallery beneath the river bottom would avoid the need for filtration and disinfection of water from a direct river intake. Under this option, the sand in the river bottom would provide filtration, removing suspended solids and microbes. However, the groundwater in the shallow zone beneath the river contains water that is geochemically reduced and contains elevated concentrations of iron and manganese, which could foul the injection wells. It is also likely that a conditioning system would be needed, at least during the first few years, to remove iron and manganese from groundwater that is extracted from more reduced portions of the aquifer beneath the river such that the potential for fouling of the associated injection wells is minimized.

Project Objectives. Although most of the objectives of the Project would be met by this alternative, greater biological resource impacts are associated with this option due to the implementation and operation of the river intake structure/shallow infiltration gallery and potential direct impacts to special status fish species that occur in the Topock area, specifically the razorback sucker and the bonytail chub. Both are federally-listed and state-listed as endangered species; the razorback sucker is also a California Fully Protected Species. The CDFW indicated that approval of a fish screen and intake structure that would avoid incidental take of the razorback sucker may be difficult to obtain. Additional infrastructure impacts would also occur

with the construction of necessary water treatment facilities to remove suspended solids, potentially organic carbon, and disinfection to remove microbes required prior to injection to protect wells.

Feasibility. Because this Freshwater Source alternative would result in new and more severe significant impacts to aquatic resources, and there is uncertainty of the treatment effectiveness, this alternative was rejected for not being potentially feasible and therefore warranting of a full alternative analysis in the SEIR.

7.5.3 Elimination of Project Components in the Moabi Regional Park Area

The proposed Project includes a Construction Headquarters and Long-Term Remedy Support Area, Temporary Construction Laydown Area, and Soil Processing Area/Clean Soil Storage Area near Moabi Regional Park that were not considered in the Groundwater FEIR. These facilities would be located in areas that were identified in the Groundwater FEIR as a potential location for one or more freshwater wells to be used in the remedy; however the location for the proposed facilities represents a larger area which required the SEIR Project Area to be increased.

This alternative would require: (1) eliminating soil storage on-site and exporting all or a significant majority of excavated materials off-site, and (2) relocating the Construction Headquarters and Long-Term Remedy Support Area and laydown areas to another location. The elimination of soil storage at Moabi Regional Park is addressed in Section 7.6.2 below. The only potential location identified in the Project Area for the Construction Headquarters and Long-Term Remedy Support Area would be the Transwestern Bench (TW Bench), as was shown in the 60% BOD. However, PG&E has indicated that there is not enough room at the TW Bench to accommodate the current needs for the Headquarters and Long-Term Remedy Support Area and laydown areas. As a result, the Construction Headquarters and Long-Term Remedy Support Area would need to be located off-site.

Project Objectives. The objectives of the Project would mostly be met by this alternative. One of the project objectives is to “consider public safety” and to “ensure efficiency,” which would not be met if the main Construction Headquarters and Long-Term Remedy Support Area were to be located farther from the Project activities, which would require longer worker trips, increased potential for hazardous material spills, and increased construction duration, etc. In addition, locating the Construction Headquarters and Long-Term Remedy Support Area near the TW Bench would increase visual impacts, and potentially biological resource impacts, in the Colorado River floodplain.

Feasibility. Because of the geographic site constraints and engineering infeasibility of including the Construction Headquarters and Long-Term Remedy Support Area at the TW Bench, and increased aesthetic and biological resource impacts, this alternative was rejected from further consideration in the SEIR.

7.5.4 Reduction of Project Footprint and Project Components

The Final Remedy Design evaluated in this SEIR is a culmination of an extensive preliminary (30%), intermediate (60%), pre-final (90%), and final (100%) design process, undertaken by PG&E as directed by DTSC and DOI with review and comment by stakeholders. For a summary of the design submittals, and summary of number of comments received and review time, refer to Chapter 2, “Introduction” of this SEIR, Subsection 2.4.6. Each subsequent design submittal went through extensive revision after stakeholder review. This substantive process allowed for consideration of many different remedy design components and compositions of infrastructure. The Final Remedy Design reflects the extensive design review process undertaken over four years by PG&E and stakeholders, and includes modifications and clarifications by PG&E as a result of the collaborative and iterative design process.

This alternative considers reduction of the Project footprint and associated pipelines, wells and appurtenant facilities to be installed and operated. This alternative would result in less ground disturbance and fewer facilities. However, based on the extensive design review process which identified the exact amount of infrastructure needed to operate the groundwater remedy properly and successfully, it is not guaranteed that this alternative would include enough infrastructure to successfully manage the groundwater plume.

Project Objectives. It is assumed that this alternative would not meet most of the Project objectives, since the type and amount of remedial components included in the Final Remedy Design was based on multiple design iterations and is assumed to include the exact amount of infrastructure required to operate the remedy successfully. For example, it is assumed that any reduction of wells may not guarantee that the contaminated groundwater plume does not permanently expand. Further, the proposed Project evaluated in this SEIR includes a Future Activity Allowance to allow for instances where the infrastructure identified in the Final Remedy Design is not enough to operate the groundwater remedy successfully over time. Because this alternative would not definitively meet all of the project objectives, this alternative was rejected from further consideration in the SEIR.

Feasibility. This alternative would involve reduction of the Project footprint, and associated pipelines, wells and appurtenant facilities to be installed and operated. Accordingly, this alternative would result in less ground disturbance and fewer facilities, which would generally result in fewer impacts than the proposed Project presented in the Final Remedy Design. However, because the alternative would not meet all of the project objectives, and may not result in successful operation of the groundwater remedy, this alternative was rejected from further consideration in the SEIR.

7.6 Alternatives to the Proposed Project

The following sections provide a comparative analysis of four alternatives to the proposed Project: (1) Aboveground Pipeline Infrastructure, (2) Elimination of On-site Soil Storage, (3) Freshwater Supply in California, and (4) No Project Alternative.

The three alternatives were determined to adequately represent the range of feasible alternatives required under CEQA for this Project. These alternatives (Alternatives 1, 2, and 3) were identified as the potentially feasible options that would likely meet most of the Project objectives. Descriptions of each alternative are presented below, along with an evaluation of their environmental impacts. These alternatives would either avoid or lessen significant adverse impacts related to air quality, noise, and/or cultural resources that are expected to occur with the proposed Project. The No Project Alternative is included as required by CEQA Guidelines Section 15126.6(e) even though it would not meet the basic project objectives.

7.6.1 Alternative 1 - Aboveground Pipeline Infrastructure

The proposed Project, as described in Chapter 3, “Project Description” of this SEIR, includes an extensive network of fluid conveyance pipelines to implement the remediation system. The vast majority of piping would be located underground in subsurface trenches. The exception is the segment of pipeline that crosses the Colorado River on the arched bridge.

The Groundwater FEIR and preliminary 30% and 60% BODs situated the majority of pipelines underground. Interested Tribes indicated in their review of the 30% and 60% BOD and in discussions during the response to comment process that their preference was for all piping associated with the remedy to be situated aboveground instead of underground. Interested Tribes explained that further subterranean intrusion into the land resulting from belowground pipelines was objectionable. During the 30% BOD comment resolution, DOI committed to evaluate other options for aboveground piping in the areas adjacent to Old Route 66 and the Station. DOI developed a pipeline matrix detailing the varying alternatives for above/below ground pipelines and evaluation criteria to be considered during the selection process, which was submitted with DOI comments in April 2013 on the 60% BOD (Final Remedy Design, Appendix I; CH2M Hill 2015a). The matrix addressed portions of the remedy infrastructure referred to as Pipeline A and Pipeline B. The purpose of the matrix was to memorialize the multiple criteria considered in evaluating pipeline options and to facilitate the submission of stakeholder input. DOI worked with Interested Tribes and the TRC members on the development of the matrix evaluation criteria and the various pipeline placement alternatives.

On March 7, 2014, DOI received a letter from the FMIT providing a revised position on the preference for portions of Pipeline A. The most significant change was the revised preference for belowground piping for the area adjacent to Maze Loci B, instead of aboveground piping which had previously been requested. The FMIT, however, restated a preference for aboveground placement of the remaining portions of the Pipeline A. A similar letter was received from the Hualapai Tribe on March 10, 2014 with the same position regarding the first segment of the pipeline. However, the Hualapai Tribe identified either above or below ground would be acceptable for the remaining Pipeline A segments. Finally, a letter from the Cocopah Tribe was received on March 13, 2014, noting the acceptance of above or belowground infrastructure for all segments of Pipeline A.

In the evaluation of aboveground versus belowground pipeline alternatives, DOI and DTSC considered all input received from PG&E, Interested Tribes and stakeholders, as well as other significant criteria, such as aesthetic impacts, cultural resources impacts, biological resources

impacts, construction-related impacts, long-term maintenance requirements, and safety concerns for construction and operation and maintenance workers. After extensive stakeholder input, evaluation and consideration of all influential factors, the agencies directed PG&E to continue to design the pipeline system, as presented in the proposed Project, belowground, following the alignment in PG&E's 60% BOD proposal.

The Aboveground Pipeline scenario as presented to the Interested Tribes is shown in **Figure 7-1** and is evaluated herein as the Aboveground Pipeline Infrastructure Alternative. As described in the 60% BOD, this alternative provides a scenario in which segments of the pipeline would be placed aboveground on pipe supports for the upland areas:

- Immediately west of the Interim Measure 3 (IM-3) Facility entrance for access to injection well IRL-1;
- Along the existing access road near injection well IRL-4; and
- Along the existing access road to injection well FW-1.

For safe access to these injection wells with no cut into the existing slope, the pipeline/conduits would be required to be installed belowground, similar to the proposed Project. However, otherwise, piping would be installed aboveground. The Final Remedy Design includes approximately 43,200 linear feet of trenches for fluid conveyance piping (about 8.2 miles) with most of the conveyance piping placed belowground in trenches. The Aboveground Pipeline Infrastructure Alternative would include 4,800 linear feet of aboveground fluid conveyance piping and 800 linear feet of underground trenching (less than 1 mile) which is substantially less trenching than the 43,200 linear feet of underground trenching that would be required by the proposed Project. All other wells/boreholes, and Project infrastructure would be located in the same locations as described in the proposed Project.

Electrical power would be taken from the City of Needles power line located east of the IM-3 Facility and then run on poles to each of the injection wells, requiring approximately 360 feet of underground conduit. This is substantially less than the Final Remedy Design, which includes 124,000 linear feet of conduits in 43,200 linear feet of trenches. Communication and control wires would be run along the same poles as the electrical power.

Key design elements applicable to the aboveground piping include the following:

- All aboveground piping would be steel;
- The crossing of Bat Cave Wash would be completed with a bridge structure (herein called the northern aerial crossing);
- Two grade separation structures would span the access roads to the remediation and monitoring wells located west of IM-3 Facility; and
- A retaining wall would be built along the access road to injection well IRL-4.

As it was described in the response to comment process on the 60% BOD, the Aboveground Pipeline Infrastructure Alternative would have increased maintenance requirements than the

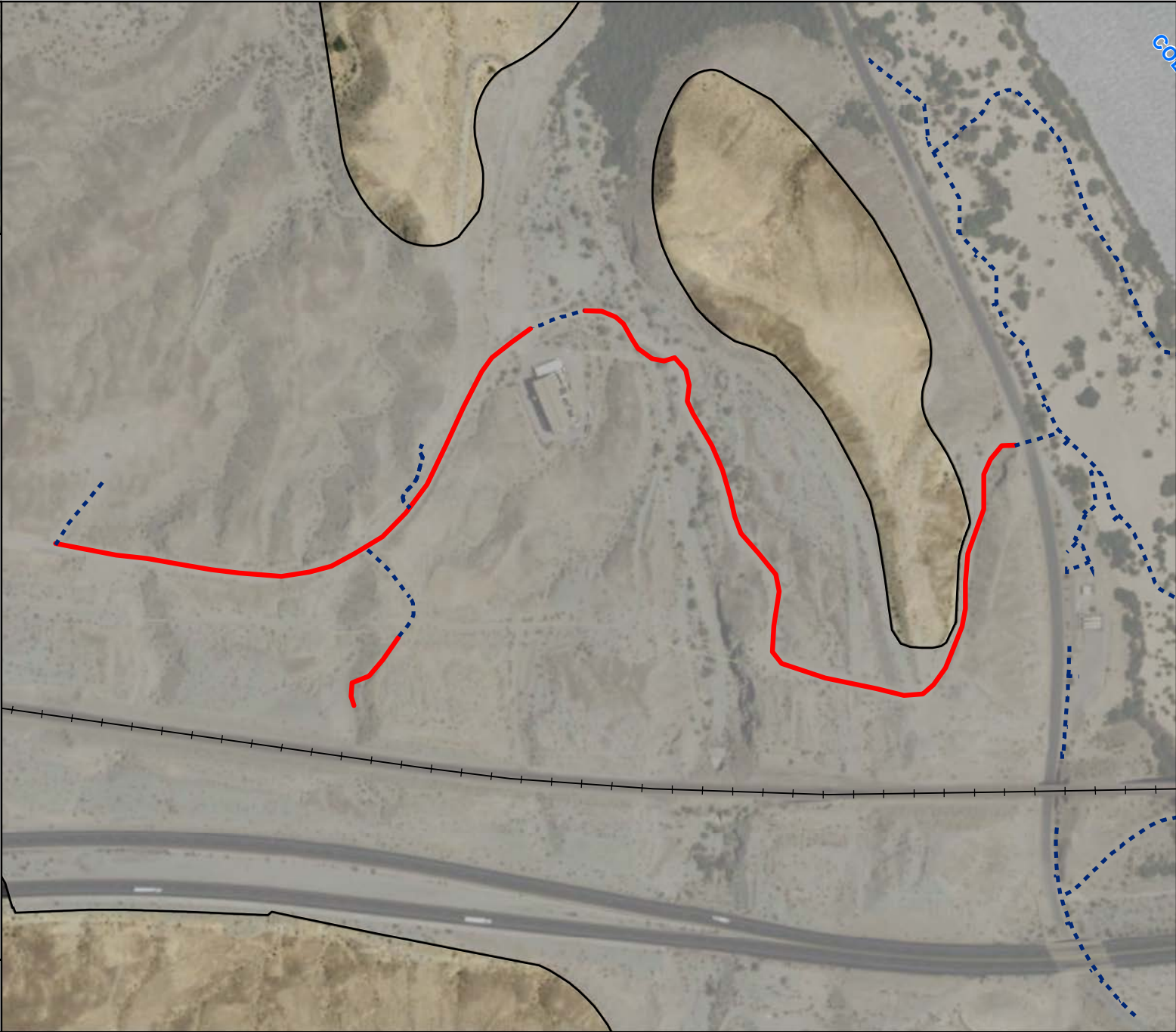
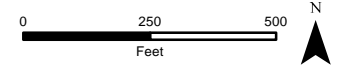
proposed Project, given the extreme heat conditions of the Project Area. Thermal design considerations would require additional area to allow for expansion/contraction loops as well as potentially large support structures (e.g., pipe racks, conduits or cable tray, shade assemblies). There would also be increased worker safety and risk during construction and operation of the Aboveground Pipeline Infrastructure Alternative. For example, given the Project Area's topography and steep slopes, there is limited work space available. Attempting to conduct work on steep slopes would increase safety risks to on-site personnel, including during operation and maintenance activities, and while lifting or working in vaults, or working near existing natural gas pipelines. The alternative could also include the use of bollards to protect the vault at the bottom of steep slopes. This would potentially result in a safety hazard for motorists while traveling on National Trails Highway. Long-term maintenance of the aboveground pipeline structures would require sand blasting and painting every 10 years. Placement of the aboveground pipeline would increase construction activity by 20 days, which is a negligible increase in the overall construction schedule in comparison to the proposed Project. The Aboveground Pipeline Alternative would result in 1,869 cubic yards of soil disturbance, which is substantially less than the proposed Project disturbance of 45,200 cubic yards. **Table 7-2** compares the infrastructure differences between the Final Remedy Design and the Aboveground Pipeline Infrastructure Alternative.

TABLE 7-2
COMPARISON OF INFRASTRUCTURE ASSOCIATED WITH THE ABOVEGROUND PIPELINE
INFRASTRUCTURE ALTERNATIVE

Infrastructure Component	Final Remedy Design	Aboveground Pipeline Alternative
Fluid Conveyance Piping and Trenches	<ul style="list-style-type: none"> 127,500 linear feet of piping in 43,200 linear feet of trenches 	<ul style="list-style-type: none"> 4,800 linear feet of piping (3,970 linear feet aboveground/ 830 linear feet of trenches).
Total Volume of Soil Disturbance	<ul style="list-style-type: none"> 45,200 cubic yards 	<ul style="list-style-type: none"> Displaced soil volume: 1,869 cubic yards Ground disturbance: 209 linear feet
Electrical/Communications Conduits and Trenches	<ul style="list-style-type: none"> 124,000 linear feet of conduits in 43,200 linear feet of trenches 10 power poles 	<ul style="list-style-type: none"> 26 power poles for electrical and communications cable 3 radio towers for transmitting control and signals to Remedy SCADA



- LEGEND**
- Groundwater SEIR Project Area
 - Alternate Aboveground Pipeline
 - Underground Pipe/Conduit



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7.6.1.1 Ability to Meet Most of the Project Objectives

As noted above, the project objectives are to ensure the Final Groundwater Remedy Project achieves cleanup levels and/or performance goals and compliance with RAO's within a reasonable time frame; minimize ground disturbance to protect biological, historical, cultural resources and aesthetic impacts to the extent feasible; and to ensure efficiency and compliance with health and safety standards in consideration of public safety. These primary Project objectives would not be attained with implementation of the Aboveground Pipeline Infrastructure Alternative. The construction and long-term operation and maintenance of the Aboveground Pipeline Alternative would result in greater worker and public safety issues associated with an increased risk of injury or even death associated with worker/visitor falls due to the Project Area's topography and steep slopes. Further, the Aboveground Pipeline Alternative would require increased maintenance requirements, such as sand blasting and painting every 10 years. Therefore, the increased worker and public safety issues would not meet the Project's objectives.

7.6.1.2 Comparison of Environmental Impacts

Aesthetics

The Aboveground Pipeline Alternative would introduce permanent views of steel aboveground pipelines, as well as utility poles, retaining walls, and grade separation structures that would be located within the same general viewshed as the proposed Project, including Needles Rock, Topock Maze Loci A, B & C, Chemehuevi Mountains, Colorado River, Bureau of Land Management (BLM) Area of Critical Environmental Concern (ACEC) and the Havasu National Wildlife Refuge (HNWR). Baseline views also include manmade features including Interstate 40 (I-40), Burlington Northern Santa Fe (BNSF) Railroad, the pipeline bridge, Topock Marina, Moabi Regional Park, the Station and the IM-3 Facility. Views of the 4,800 linear feet of aboveground pipelines and associated infrastructure would be visible from these key viewsheds, resulting in greater visual intrusion to the natural landscape than the proposed Project. Similar to the proposed Project, the alternative would include surface treatment (i.e., muted earth-tone color pallet) of aboveground structures; however, visual intrusions under the Aboveground Pipeline Alternative would be substantially higher than that of the proposed Project, and would substantially degrade the existing visual character and quality of the site and its surroundings, resulting in greater significant aesthetic impacts than the Project.

Air Quality

The Aboveground Pipeline Alternative would use similar types of equipment as the proposed Project at all phases including: water trucks, backhoes, concrete pumps, cranes, bulldozers, drill rigs and associated equipment, excavators, forklifts, loaders, man lifts, crushing equipment, compactors, and scrapers. Because this alternative would result in less soil excavation (1,869 cubic yards vs 45,200 cubic yards), haul trips for soil import/export construction activities would be less than the proposed Project. Therefore, the daily and annual air pollutant emissions associated with the proposed Project would be less than the proposed Project. Air quality impacts for the proposed Project were determined to be less than significant with mitigation, and under this alternative, emissions would be reduced from those of the proposed Project during construction. Due to increased operation and maintenance requirements of the aboveground

pipeline system, there would likely be increased vehicle trips to and from the Project Area resulting in increased emissions (though still anticipated to be below thresholds). Overall, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project in regard to air quality.

Biological Resources

Placement of aboveground pipelines in this alternative would occur primarily in previously disturbed roads and open creosote bush scrub community. As shown in the table above, the alternative would result in 1,869 cubic yards of soil excavation and 830 linear feet of trenching, resulting in an overall reduction of 43,335 cubic yards of soil disturbance in comparison to the proposed Project. This reduction in soil excavation would likely minimize habitat loss and potentially reduce impacts to upland habitat, riparian vegetation at the Bat Cave Wash crossing, and impacts to nesting birds. The Project Area contains suitable bat maternity roosting areas for a number of common and special-status bat species, particularly within Bat Cave Wash and the East Ravine, and the proposed Project may result in impacts to active bat maternity roosts. While the decrease in soil excavation activity associated with the installation of aboveground structures may reduce impacts to the bat maternity roosts, potentially significant impacts to bat species may still occur given that construction of the aboveground structures would still result in increased noise and human activity around maternity roost sites.

The proposed Project was determined to not have a significant impact on wildlife movement corridors or linkages. However, the Aboveground Pipeline Infrastructure Alternative would potentially increase impacts on wildlife movement corridors and linkages due to the introduction of the aboveground infrastructure, including the pipeline and associated retaining walls and structures. While the ultimate height of the aboveground pipelines off the ground would likely vary based on underlying topography and land cover, it is assumed that there would be no significant impediment of movement for smaller wildlife and avian species, and that the greatest impact would be to large wildlife such as the bighorn sheep. Particular impacts to desert tortoise could be increased depending on the overall clearance of the pipelines. Overall, impacts to wildlife movement corridors or linkages would therefore be greater under this alternative.

Cultural Resources

Proposed Project activities involving ground disturbance and the installation of belowground infrastructure would directly and adversely affect the soil and landforms identified by some Interested Tribes as contributing elements of the Topock TCP. Because the land itself is essential to the significance of the Topock TCP, the disturbance of soil is considered a profound disruption in the belief system of some Interested Tribes and would affect the Topock TCP long after the Project is completed. Likewise, disturbances in areas of Tribal importance for their association with clay materials are also considered a significant intrusion of the Tribal values in Arizona. The use of aboveground pipeline infrastructure would potentially reduce cultural resource impacts to the Topock TCP by reducing overall ground disturbing activities (42,370 fewer linear feet of subsurface trenches would be needed).

Potential impacts to unknown historical and unique archaeological resources from the Aboveground Pipeline Infrastructure Alternative would be greatly lessened relative to the

proposed Project because soil and ground disturbance would be reduced. However, because there still remains a potential to impact unknown historical or unique archaeological resources from installation, maintenance and replacement of aboveground infrastructure, and because of the overall impacts to landscapes within the Topock TCP, the difference in soil disturbance would not change the conclusion that the impacts of the Aboveground Pipeline Alternative to unknown historical and unique archaeological resources would be significant and unavoidable.

Potential impacts to paleontological resources from the Aboveground Pipeline Alternative would be greatly lessened relative to the Project because the soil and ground disturbance would be substantially reduced. However, because there is still a potential to impact as yet unknown paleontological resources, this difference would not alter the conclusion that the impacts of the Aboveground Pipeline Alternative to paleontological resources would be significant and unavoidable.

Potential impacts to human remains from the Aboveground Pipeline Alternative would be greatly lessened relative to the Project because the soil and ground disturbance would be substantially reduced. However, because there still is a potential to impact as yet unknown human remains, this difference would not change the conclusion that the impacts of the Aboveground Pipeline Alternative to human remains would be significant and unavoidable.

Hazards and Hazardous Materials

The Aboveground Pipeline Infrastructure Alternative has the potential to increase public health and safety impacts during both construction, and operation and maintenance of the Project. There would be greater worker safety and risk hazards during construction and operation of the Aboveground Pipeline Alternative than the proposed Project. Because of the Project Area's topography and steep slopes, there is limited work space to install aboveground infrastructure which increases worker safety risk associated with accidental falls and injury. During operation and maintenance activities, there would be an increased risk of incidents while working on steep slopes, or working near a high pressure natural gas pipeline. The placement of the aboveground piping would therefore result in greater significant hazards to the public or the environment through transport and potential release of hazardous materials than the proposed Project. Since the proposed Project's impacts related to hazards and hazardous materials were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Hydrology and Water Quality

During construction, the Aboveground Pipeline Infrastructure Alternative would substantially reduce the amount of soil excavation and storage of soils, thereby minimizing potential runoff impacts associated with the stockpiling of soil material. However, the alternative would introduce new aboveground infrastructure that would potentially increase impervious surface that could affect the natural drainage patterns. Operation and maintenance activities, which include sandblasting activities, would potentially increase water quality impacts. Since the proposed Project's impacts related to hydrology and water quality were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Noise

Long-term operational noise impacts are expected to be greater than the proposed Project since the Aboveground Pipeline Infrastructure Alternative would require additional and more frequent operation and maintenance requirements, and potentially more periodic replacement. Pipeline construction associated with the proposed Project would likely be slightly reduced from the proposed Project at nearby sensitive receptors (Topock Maze, Moabi Regional Park, and Pirate Cove) as the trenching and excavation equipment use would be reduced from the proposed Project. Construction-related noise in Arizona to the sensitive receptors located along the south side of I-40 in Arizona and the sensitive receptors along the Topock 66 Spa and Resort would be expected to be similar. There still remains a potential to impact sensitive receptors during the aboveground pipeline construction and operation, the difference in soil disturbance would not change the conclusion that the noise impacts of the Aboveground Pipeline Alternative would be significant and unavoidable.

Utilities, Service Systems, and Energy

The Aboveground Pipeline infrastructure Alternative would require far less soil disturbance than the proposed Project. As a result, impacts related to off-site soil disposal (and associated traffic and air quality emissions) would be significantly reduced under this alternative. Similar to the proposed Project, the Aboveground Pipeline Infrastructure Alternative would obtain power from the City of Needles, the Mohave Electric Cooperative, as well as various on-site sources of electricity, including the use of on-site generators and solar panels. The alternative would also include the use of radio as a transmission method for control and communication, which was identified at the 60% BOD as being less reliable than a cable or wired connection. The alternative would require the installation of 23 power poles, which is an additional increase of ten power poles required for the proposed Project. Therefore, this alternative would result in slightly greater utility and energy impacts than the proposed Project. Proposed Project impacts relative to utilities and energy were determined to be less than significant with mitigation, so this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the proposed Project.

Water Supplies

The use of water for construction and the decommissioning of the IM-3 Facility under the proposed Project is estimated to be approximately 152 to 192 acre feet annually (afa). During construction, the Aboveground Pipeline Infrastructure Alternative would potentially decrease the consumption of construction water for dust control since less soil excavation and soil storage would be required. However, the long-term maintenance activities associated with the Aboveground Pipeline Infrastructure Alternative would require sandblasting every ten years, which would potentially increase the consumption of water for the alternative. Consumptive water use during operation of the proposed Project would consist of about 2.8 acre-feet per year (0.91 mg per year) of water to the TCS Evaporation Ponds, off-site disposal, and miscellaneous water use. This amount was determined to be within PG&E's 422 acre-feet per year of allotted capacity. Since this alternative is not expected to result in a substantial increase in water use and because the sources of water already exists and the entitlement volume has not changed since certification of the Groundwater FEIR, impacts related to water use would not be significant,

similar to the proposed Project. Since the proposed Project would not result in significant impacts to water supplies and would not require mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the proposed Project.

7.6.2 Alternative 2 - Elimination of On-site Soil Storage

A major component of the proposed Project, which was a result of Tribal input during the iterative design review process, was the retention of all disturbed on-site soils (i.e., through trenching, grading, well cuttings, road improvements, etc.) for reuse within the Project Area. The Final Remedy Design was modified to include use of on-site soil storage areas near Moabi Regional Park that were not anticipated when the Groundwater FEIR was certified. The soil would be processed and stored at the Soil Processing Area/Clean Soil Storage Area north of National Trails Highway, southwest of Moabi Regional Park. The Elimination of On-site Soil Storage Alternative would involve eliminating soil storage entirely at the Soil Processing Area/Clean Storage Area, and exporting all, or a significant majority of, excavated materials off-site. The intent of this alternative is to minimize construction-related impacts to sensitive receptors at the nearby Moabi Regional Park, and to potentially reduce overall construction-related efforts.

While this alternative would eliminate soil storage, a location near the Project Area would still be required for temporary soil staging for import soil, reusable site soil, and soil to be disposed of off-site. For purposes of this alternative, the existing U.S. Bureau of Reclamation (BOR) quarry area, which is located between the Station and TCS Evaporation Ponds, could be used (see **Figure 7-2**). The BOR quarry area would require site preparation, including access road improvements and grading to provide a workable surface to unload, temporarily stage, and load soil. The existing approximately 1,400-foot long access road that provides access to the BOR quarry from the TCS Evaporation Pond access road would require additional upgrades to allow on-road vehicles to access the quarry. Road upgrade work would likely be similar to the access road upgrade planned west of the Station, near Bat Cave Wash. The BOR quarry area would be graded to provide an even workable surface. Quarry area hydrology would be evaluated to determine whether site drainage features would need to be installed to maintain adequate drainage in a manner compliant with Project requirements. Assuming a 25-foot wide and 1,400-foot long access road to the soil quarry, access road improvements would result in approximately 35,000 square feet of new road improvements. Assuming a worst-case scenario, it is expected that approximately one acre would provide a sufficient area to allow soil management.

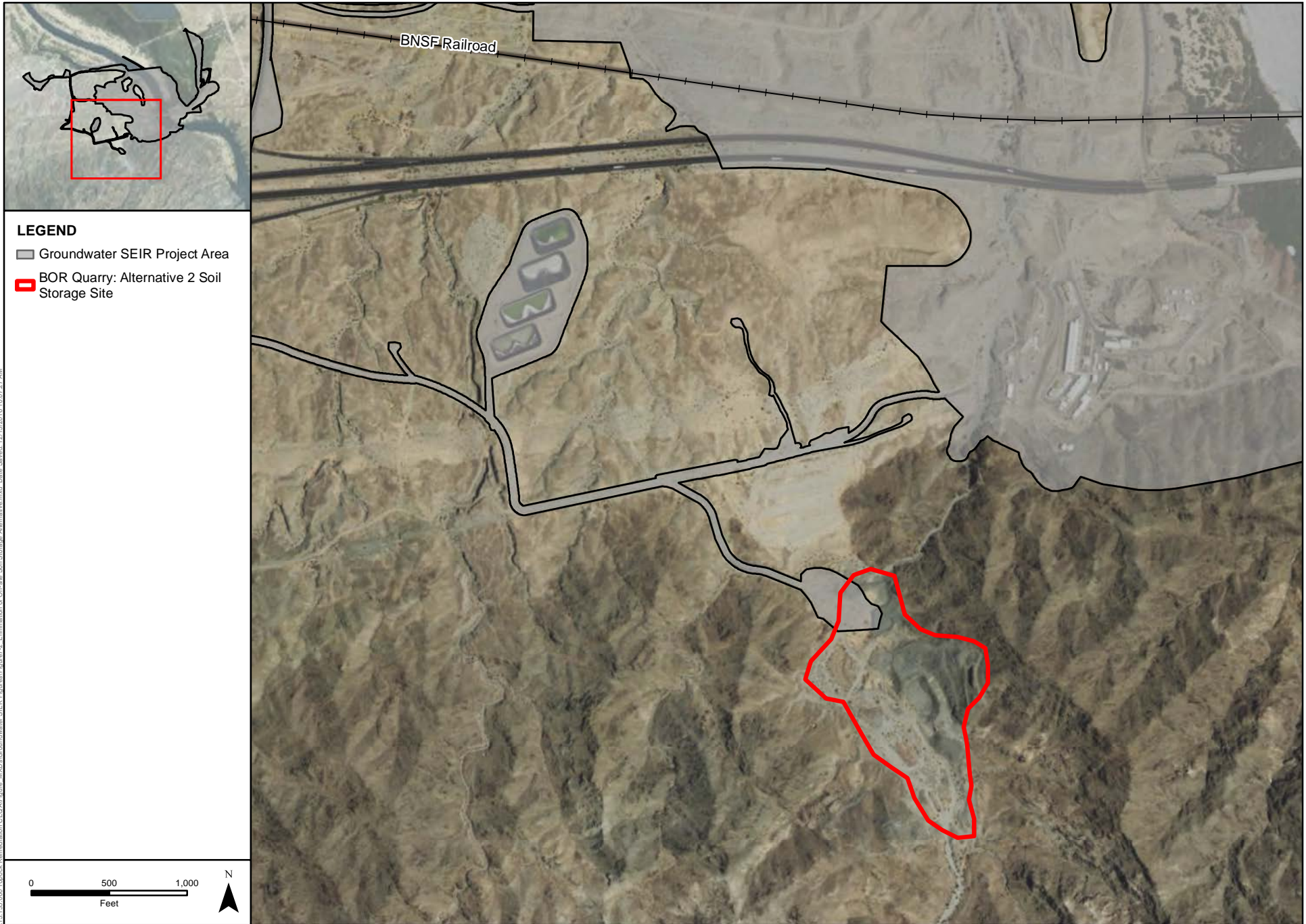
Under the Elimination of On-site Soil Storage Alternative, all soil excavated during construction that would require processing (screening, sorting, or similar) prior to reuse on-site (as pipeline trench backfill or access road embankment material) would be disposed of off-site. This is most applicable to soils excavated in the upland (interior) parts of the Project Area, as the soils vary in their composition and makeup (and potential for contamination). It is likely that sandy soil excavated from the floodplain area (along the National Trails Highway [NTH] in situ reactive zone [IRZ] or Riverbank extraction wells) could be reused on-site, since the soil is of a consistent suitable material that is easily used to backfill excavated areas without processing. The soil

estimated to be excavated from the floodplain, and therefore likely reused on-site not requiring export, is 11,000 cubic yards. However, no other excavated soil is expected to be reusable and would require all non-floodplain soil to be disposed of off-site. This alternative would increase both the volume of soil to be exported off-site for disposal, as well as soil needed to be imported to the site for pipeline backfill, access road embankment material or other needs. The proposed Project assumes the total amount of soil disturbance would be 45,200 cubic yards. Excluding the soil excavated from the floodplain (which would be reused on-site), the total amount of soil that would be exported under this alternative would be approximately 34,200 cubic yards.

This alternative would assume that non-contaminated soil exported for disposal could be used for daily cover at a municipal landfill, although geotechnical characteristics of exported soil (particularly the presence of large aggregate) may preclude it from being useful as daily cover. In addition, landfills commonly have a limited capacity for the quantity of daily cover soil required, and a landfill may stop accepting soil for daily cover based on short-term site capacity or lack of need, in which case soil would need to be stockpiled on-site for delivery to the landfill at a frequency and quantity acceptable to the landfill. As a result, this alternative assumes temporary on-site staging of export soil would be required. The nearest landfill to the Project Area is the Mohave Valley Landfill, which is a 54-mile round trip from the Project Area. Current capacity at the landfill is approximately 3,032,445 cubic yards (Mohave Valley Landfill 2016), which would accommodate the 45,500 cubic yards exported under the Elimination of On-site Soil Storage Alternative (although not all excavated soil can be accepted by local landfills).

Without the ability to process and screen excavated floodplain soil for use as road embankment (11,000 cubic yards), soil would need to be imported. As a result, the Project soil import estimate would increase from approximately 12,400 cubic yards assumed for the proposed Project to approximately 14,900 cubic yards for the Elimination of On-site Soil Storage Alternative. Assuming a 21-ton export truck load, the daily cover off haul would require approximately 153 additional export truck trips between the site and landfill over the course of the Project. The Project currently assumes that 3,200 tons of access road embankment soil would be required.

The use of the BOR quarry location for temporary management of site soil would increase soil transit time to work areas within the Project Area compared to the soil management procedures of the proposed Project using the Soil Processing Area/Clean Soil Storage Area near Moabi Regional Park. Given the location of the BOR, which is further away from the majority of Project components within Project Area than the proposed Soil Processing Area/Clean Soil Storage area, an overall increase in the construction schedule would occur. In addition, well drilling could be affected if drill cuttings cannot be removed from the (generally constricted) drilling site at a sufficient rate. This could be partially mitigated by increasing the number and capacity of soil delivery vehicles, but the constricted pipeline and well drilling work areas would likely not allow more than one soil truck to be active at a work site/temporary staging area.



As described above, additional soil delivery (import and export) trucks would be required. Internal Project Area truck trips from the BOR quarry to work locations could be expected to double in comparison to the proposed Project. Soil screening and processing equipment and activities would not be required, as soil would no longer be processed for reuse on-site. Soil excavation and loading equipment requirements would be the same as the proposed Project.

The Final Remedy Design assumes that power for the Soil Processing Area would be routed from the existing overhead service line to the area via a new overhead distribution line. It is anticipated that the new overhead distribution will consist of 2 to 3 electrical poles in the area between the existing distribution line and the Soil Processing Area. The electrical load for the Moabi Regional Park facilities (which is inclusive of the Soil Processing Area) was estimated to be 1.3 million kilowatt hours (kWh) annually during remedy construction and 0.85 million kWh during remedy operation. The Elimination of On-site Soil Storage Alternative could potentially decrease electricity use given the reduced area of the quarry location relative to the Soil Processing Area/Clean Soil Storage Area, assuming that site lighting is the primary consumption of electrical power at these areas. Electrical power to the BOR quarry would be provided by diesel generators.

The use of the BOR quarry as a temporary soil staging area would likely increase consumption of construction water for dust control along unpaved roads, whereas the Soil Processing Area/Clean Soil Storage Area proposed for the Project is accessed primarily via paved roads. The approximately 1,400-foot access road extension to the quarry area would require continuous dust control. Over the course of the Final Remedy construction phase the additional extent of dust control could be expected to increase water consumption by approximately 10 percent. The quarry location site itself is expected to require a similar degree of construction water for dust control as the Soil Processing Area/Clean Soil Storage Area for maintaining stockpiled soils.

7.6.2.3 Ability to Meet Most of the Project Objectives

As noted above, the project objectives are to ensure the Final Groundwater Remedy achieves cleanup levels and/or performance goals and compliance with RAO's within a reasonable time frame; minimize ground disturbance to protect biological, historical, cultural resources and aesthetic impacts to the extent feasible; to ensure efficiency and compliance with health and safety standards in consideration of public safety. The primary project objectives could potentially be attained with the Elimination of On-site Soil Storage Alternative; however, given the additional construction time, this alternative would increase the amount of time needed to achieve the timely management of cleanup goals.

7.6.2.4 Comparison of Environmental Impacts

Aesthetics

The Elimination of On-site Soil Storage Alternative would eliminate views of a soil processing and storage area near Moabi Regional Park, including views of the soil staging area, a truck waiting area, and an approximately 12-foot high shade structure and elevated water tank. The proposed BOR quarry is located between the Station and the TCS Evaporation Ponds and in proximity to the Topock Maze, which represents a view from a location of tribal sensitivity. The access road improvements would be even closer to the Topock Maze, approximately 920 feet.

However, the BOD quarry is situated in a ravine and may not be completely visible from the resource. Nevertheless, the constant stream of trucks during construction and operation of the BOD quarry as a soil storage location could result in additional aesthetic impacts from the Topock Maze. As stated in Section 4.1, “Aesthetics,” visual impacts associated with the Project’s Soil Processing Area/Clean Soil Storage Area would be minor and the activities would not obstruct distant views of Mohave Valley and surrounding peaks. However, aesthetic effects associated with the Soil Processing Area/Clean Soil Storage Area were determined to be less than significant with mitigation, so this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Air Quality

The Elimination of On-site Soil Storage Alternative would result in an overall increase in approximately 153 additional export truck trips between the site and landfill over the course of the Project construction phases, as well as additional off road trips internal to the Project Area in order to access the BOR area. The overall increase in truck trips would result in additional annual air pollutant emissions; however, they would be spread over the course of construction activities and therefore would result in negligible daily emissions. This alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Biological Resources

The Elimination of On-site Soil Storage Alternative would result in less ground disturbance at the current Soil Processing/ Clean Soil Storage Area. However, the use of the BOR quarry may occur within or adjacent to sensitive habitat, potentially resulting in both direct and indirect impacts to biological resources. For the proposed Project, construction activities would occur throughout the Project Area within and adjacent to habitat for several special-status species, including special-status bird species, desert tortoise, ring-tailed cat, Nelson’s bighorn sheep, special-status bats, and special-status plants. The Project would impede the use of active bat maternity roosts. However, Soil Processing Area/Clean Soil Storage Area impacts for the Project were determined to be less than significant with mitigation, so this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Cultural Resources

The BOR quarry activities proposed under this alternative would occur in proximity to the Topock Maze. Therefore, potential impacts to unknown historical and unique archaeological resources from the Elimination of On-site Soil Storage Alternative would be similar to the Project. Because there remains a potential to impact unknown historical or unique archaeological resources, this incremental difference would not change the conclusion that the impacts of the Elimination of On-site Soil Storage Alternative to unknown historical and unique archaeological resources which would be significant and unavoidable.

The off-site disposal of soils is considered a highly sensitive Tribal issue since on-site soil and landforms are identified by some Interested Tribes as contributing elements of the Topock TCP. Because the land itself is essential to the significance of the Topock TCP, the disturbance of soil

is considered a profound disruption in the belief system of some Interested Tribes and would affect the Topock TCP long after the Project is completed. The Elimination of On-site Soil Storage Alternative would therefore, result in greater cultural resource impacts than the proposed Project.

Hazards and Hazardous Materials

The Elimination of On-site Soil Storage Alternative would result in the relocation of the Soil Processing Area/Clean Storage Area to the BOR quarry location. The proposed BOR quarry area would be smaller in size (1.0 acre vs 2.8 acres) and the level of soil processing activity would be reduced. The BOR quarry would be used to temporarily store excavated soil pending sampling to determine the appropriate management of that soil. The alternative would use the same preventative measures included in the Soils Management Plan and best management practices (BMPs) as the Project to minimize the potential hazards of the routine use, storage, disposal, or accidental spills to less than significant levels. Since the Project's impacts related to hazards and hazardous materials were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Hydrology and Water Quality

Since the Elimination of On-site Soil Storage Alternative requires the relocation of the temporary storage area to the BOR quarry location, the potential for runoff impacts associated with the stockpiles would be similar to the proposed Project. As the BOR quarry is located in a ravine, the quarry area hydrology would have to be evaluated to determine whether site drainage features would need to be installed to maintain adequate drainage in a manner compliant with Project requirements. This alternative would use the same preventative measures detailed in the Project's Operations and Maintenance Manual, the Soil Management Plan, and BMP Plan for construction to reduce impacts to hydrology and water quality to a level less than significant. Since the Project's impacts related to hydrology and water quality were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Noise

The Elimination of On-site Soil Storage Alternative would remove some, but not all, activities from the Moabi Regional Park area which contains sensitive residential receptors. The equipment used to construct the Construction Headquarters would remain the same despite elimination of the Soil Processing Area/Clean Soil Storage Area. Construction of the Soil Processing Area/Clean Soil Storage Area would involve less noise generation than the Construction Headquarters since no buildings are being constructed, therefore while elimination of this facility near Moabi Regional Park would not completely eliminate noise impacts to the area, it would be reduced. Furthermore, the elimination of the Soil Processing Area/Clean Soil Storage Area from Moabi Regional Park would eliminate a constant stream of truck trips depositing clean soil during construction. While this alternative would work to reduce operational noise resulting from soil truck trips, the majority of noise-producing truck trips associated with the Construction Headquarters/Long-Term Remedy Support Area would remain during operation. Given that the

Construction Headquarters/ Long-Term Remedy Support Area would still remain near Moabi Regional Park, removal of the Soil Processing Area/Clean Soil Storage Area would have a slight reduction in noise to the nearby residential sensitive receptors. The Project's impacts related to noise and vibration were determined to be significant and unavoidable even with the implementation of mitigation measures, and while noise levels would be slightly reduced by eliminating the Soil Processing Area/Clean Soil Storage Area, it would not avoid the significant and unavoidable impact identified for the proposed Project. As a result, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Utilities, Service Systems, and Energy

The alternative could potentially decrease electricity use given the reduced area of the quarry location relative to the Soil Processing Area/Clean Soil Storage Area. The Soil Processing Area/Clean Soil Storage Area is 2.68 acres whereas the BOR quarry site is estimated to be 1 acre. This reduction in surface area would require less electricity to illuminate than was required at the Soil Processing Area/Clean Soil Storage Area. Diesel generators would provide electrical power; therefore the electrical power that would be supplied by the City of Needles for the current Soil Processing Area/Clean Soil Storage Area would not be required. The alternative would result in greater impacts to existing landfills since it would increase the amount of soil exported for use as daily cover at a municipal landfill, which is estimated to be approximately 45,500 cubic yards of soil. This may result in a new impact since landfills have a limited capacity for the quantity of daily cover soil required. All other utility and energy impacts would be similar to the proposed Project. Project impacts relative to utilities and energy were determined to be less than significant; however, this alternative has the potential to result in a greater impact to existing landfills than the proposed Project.

Water Supplies

This alternative would increase water consumption by 10 percent since the use of the BOR quarry as a temporary soil staging area would increase consumption of construction water for dust control. Despite the increase in water supply required by this alternative, impacts to water supplies would be similar to that required by the proposed Project. Since the Project would not result in significant impacts to water supplies, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

7.6.3 Alternative 3 - Freshwater Supply in California Alternative

A primary component of the proposed Project is the use of freshwater injection to control and confine the plume migration to the west (away from the Colorado River), assist with flushing the chromium plume through the NTH IRZ, and to constrain westward spread of carbon-amended water and in-situ byproducts from the Inner Recirculation Loop. The proposed Project includes the use of well(s) in and near the HNWR (namely Well HNWR-1A, Well HNWR-1, Topock 2/3 wells, or Site B) in Arizona as the freshwater source to inject freshwater upgradient of the contaminant plume and drive the contaminated groundwater through the treatment zone (see Chapter 3, "Project Description," subsection 3.6.1.7; Figure 3-4).

This freshwater source is relatively close to the treatment zones and would provide a sufficient volume of freshwater needed to meet remedy goals. As shown on Figure 3-3e, these wells are located off the Topock-Oatman Highway in Arizona. Freshwater from these sources would require the construction of subsurface pipelines to deliver the freshwater from Arizona to California (over the Colorado River) and through pipelines to injection wells. The length of ground disturbance required to install the pipeline from existing wells in Arizona to the IRZ well cluster would be up to 2.13 miles. This takes into consideration the 0.35 miles of pipeline to be installed on the bridge crossing the Colorado River which will not require ground disturbance. As indicated in Section 3.6.1.7 of the Project Description, the freshwater from Arizona may have arsenic at concentrations that exceed water quality objectives for the Colorado River groundwater basin in California and may require pretreatment prior to injection in California (through the construction and use of a contingent freshwater treatment system). The State Water Resources Control Board (SWRCB) has required conditions for allowing the injection of water with naturally occurring arsenic above the maximum contaminant levels (MCLs), including additional groundwater monitoring requirements in California (see Section 3.6.1.7 of the Project Description for more information). DTSC has also directed PG&E to include an arsenic pre-treatment contingency as part of the Final Remedy Design. The use of water from wells in Arizona was investigated in the adopted Addendum to the Groundwater FEIR in 2013, and the results of that investigation concluded that there is water of sufficient quantity (between 450 and 900 gpm [gallons per minute]) and quality to be used in the remedial system. The proposed Project assumes a freshwater injection rate of 450 gpm from these wells.

The Freshwater Supply in California Alternative would involve installation of freshwater supply well(s) in California as opposed to Arizona. Preliminary analysis indicates that freshwater obtained in California would not require treatment for arsenic; however pre-treatment for other constituents such as total dissolved solids (TDS), iron and manganese would likely still be required. Under this alternative, freshwater would be obtained from a primary well with future backup well options, similar to the freshwater wells in Arizona associated with the proposed Project. This alternative would limit the amount of infrastructure in Arizona to monitoring wells X and Y. All freshwater supply wells and supporting infrastructure would be located in California. The installation of freshwater supply wells on the California side of the Colorado River would require locating the wells far enough from the contaminated groundwater plume so that the drawdown created by freshwater pumping would not adversely affect the operation of the remedy by drawing the plume away from the IRZ line. To maintain adequate distance from the plume, the freshwater wells installed under the Freshwater Supply in California Alternative would be located approximately 2.9 miles north of the IRZ well cluster (see **Figure 7-3**). As shown in **Table 7-3**, which presents a comparison of pipeline lengths and total ground disturbance between the proposed Project and the alternative, the length of freshwater pipelines in California to be installed would result in more ground disturbance than the proposed Project pipeline in Arizona. The data from existing wells in this area suggest the aquifer near Moabi Regional Park is much less productive than that on the Arizona side of the river. Due to the less productive aquifer conditions, the volume of water obtained for use in the remedy would be greatly reduced, which would lengthen the amount of time it would take to clean up groundwater contamination. Based on conceptual modeling conducted for the Freshwater Supply in California Alternative, freshwater injection rate would be reduced from the 450 gpm for the proposed

Project to 60 gpm. As a result, this would extend the active portion of the remedy timeframe from 30 years to 90 years.

**TABLE 7-3
PIPELINE LENGTHS AND GROUND DISTURBANCE COMPARISON**

Pipeline Segment	Pipeline Distance (miles)	Pipeline Bridge Length (not included in ground disturbance total)	Total Ground Disturbance (miles)
Proposed Project - Arizona			
Freshwater pipe from Well HNWR-1A and Well HNWR-1 to IRZ wells	1.78	(0.35)	1.43
Freshwater pipe from Site B to IRZ wells	2.48	(0.35)	2.13
Freshwater Supply in California Alternative			
From location north of Project Area to IRZ wells	2.9	N/A	2.9

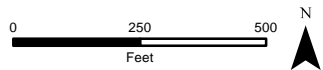
Despite the reduction in available pumping volume, preliminary modeling results indicate that the plume would not expand as a result of implementing the Freshwater Supply in California Alternative. This alternative would not change the number/location of remediation wells that are identified as part of the proposed Project. There is the potential to reduce the extraction/injection rates at several of the remedial wells, because there is a lower volumetric flux of groundwater through the aquifer, but the well locations would still be adequate. Hydraulic capture analyses indicate that the riverbank extraction well rates could be reduced as the capture zone has the potential to expand further eastward under the Colorado River and the capture zone would potentially negatively impact the shallow reducing ring as there is less flux coming from the west. A reduction in riverbank extraction rates would therefore directly result in a decrease in IRL injection at IRL-1 and IRL-2. The simulated NTH IRZ injection/extraction wells at nominal rates still indicate an adequate distribution of carbon to treat the contaminated Cr(VI) plume and no simulated plume breakthrough along the line was observed. TCS loop wells (TCS injection and Transwestern Bench extraction) would still be appropriately located and rates could potentially be reduced to achieve similar hydraulic influence under this lower simulated flow regime. Modeling indicates that TCS loop wells from East Ravine extraction could be maintained at current rates as there is minimal hydraulic response in bedrock associated with a reduction in freshwater injection in the aquifer.



LEGEND

- Groundwater SEIR Project Area
- Alternative 3: California Freshwater Supply Locations

Notes: California Fresh Water Supply Locations are located approximately 1.75 miles north of Moabi Regional Park



Early indications and information about the groundwater table in California indicate that water obtained from a well or wells near Moabi Regional Park in California are unlikely to have arsenic elevated above the MCL; however further exploration and testing would be required. It is also likely that the TDS of the water from a high capacity well would be greater than 3,000 mg/L, making it undesirable, without some level of pretreatment, for injection into the less saline, upper portions of the aquifer in the Project Area. Early investigations also indicate that the water may contain iron and manganese at concentrations that would require conditioning prior to injection (*Final Implementation Plan for Evaluation of Alternative Freshwater Sources in Topock Remediation Project Area* [CH2M 2012b]). As such, similar to the proposed Project, additional pre-treatment prior to injection would be required, although not at the extent of the arsenic treatment for the proposed Project.

7.6.3.1 Ability to Meet Most of the Project Objectives

As noted above, the project objectives are to ensure the Final Groundwater Remedy achieves cleanup levels and/or performance goals and compliance with RAO's within a reasonable time frame; minimize ground disturbance to protect biological, historical, cultural resources and aesthetic impacts to the extent feasible; to ensure efficiency and compliance with health and safety standards in consideration of public safety. The primary project objectives could potentially be attained with the Freshwater Supply in California Alternative, however, the timeframe for cleanup under this alternative would increase from 30 years for the proposed Project to 90 years for the alternative. Given the extended timeframe for cleanup, this alternative would not achieve the Project's objective to achieve the timely management of cleanup goals.

7.6.3.2 Comparison of Environmental Impacts

Aesthetics

The Freshwater Supply in California Alternative would introduce views of construction activities for supporting infrastructure, including equipment such as backhoes, concrete trucks and soil compactors, from the IRZ wells to a location approximately 2.9 miles north along the Colorado River. The viewshed area north of the Project Area is similar in nature and context to the Project Area, with exposure to similar foreground, middle ground, and background viewing distances. The alternative would introduce temporary construction views of pipeline installation along the Colorado River, as well as permanent views of a water supply well(s) with security fencing, though based on the current conceptual location, it is unlikely that the structures would be visible to sensitive receptors, including from the Colorado River. The area north of the Project Area is not as elevated as some upland portions within the Project Area. The area is part of the overall Colorado River valley that has a unique visual character that is of particular importance to Native American Tribes, as well as to recreational, pedestrian and vehicular viewers. Assuming the freshwater well infrastructure at the California site would incorporate façade colors which are consistent with that of the surrounding topography and vegetation, as specified in the Final Remedy Design and as defined in mitigation measures AES-1 and AES-2, the resulting impact on the surrounding quality and character of the landscape would be less than significant. Therefore, visual impacts associated with construction of the freshwater well infrastructure at the California site are expected to be similar to the Project. As stated in Section 4.1, "Aesthetics," visual impacts associated with the Project would be less than significant, so this alternative would not serve the

purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Air Quality

The freshwater well proposed in California would require approximately 2.9 miles of freshwater pipeline to connect the freshwater source with the IRZ wells in the floodplain. Total ground disturbance resulting from Project freshwater wells in Arizona would be up to 2.13 miles if Site B were used, and 1.43 miles if wells near HNWR-1A were used. Although the types of construction equipment used under this alternative use would be similar to the Project, the increased distance of installation of freshwater pipeline in California would increase the duration of construction activity which would increase overall emissions. The air pollutant emissions during construction, operation and maintenance, and decommissioning activities would be greater than the proposed Project. This alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Biological Resources

The Freshwater Supply in California Alternative would result in greater ground disturbing impacts associated with freshwater pipeline installation in California since the pipeline would cover a greater length than the proposed Project. In addition, pipeline installation in California north of the Project Area would occur in densely vegetated habitat, whereas the proposed Project's Arizona alignment would be primarily installed within the Topock-Oatman highway ROW. In addition, the use of the Freshwater Supply location in California is located in an unnamed wash near the Colorado River and is within proximity to a BLM-designated Area of Critical Concern (Beale Slough). Similar to the proposed Project, this alternative site may occur within or adjacent to sensitive habitat, potentially resulting in both direct and indirect impacts to biological resources. Both the proposed Project and the Freshwater Supply in California Alternative would involve construction activities that would occur within and adjacent to habitat for several special-status species, including special-status bird species, desert tortoise, ring-tailed cat, Nelson's bighorn sheep, special-status bats, and special-status plants. However, the overall ground disturbance would be greater under the Freshwater Supply in California Alternative than the proposed Project, which would result in more severe impacts to biological resources. This alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Cultural Resources

Potential impacts to unknown historical and unique archaeological resources from the Freshwater Supply in California Alternative are expected to be similar to the Project. Because there remains a potential to impact unknown historical or unique archaeological resources, the Freshwater Supply in California Alternative would not change the conclusion that the impacts would be significant and unavoidable. While the freshwater infrastructure in Arizona and associated impacts would be avoided by this alternative, this alternative would not influence the installation of MW-X and MY-Y. Any freshwater well site and associated infrastructure connections would require cultural survey and appropriate management as described throughout the Cultural Resources mitigation measures that are identified in this SEIR. Potential impacts to paleontological resources from the

Freshwater Supply in California Alternative would be similar to the Project given its location and proximity to the Project Area, though additional surveys and documentation would be required. Potential impacts to human remains would also be similar to the Project because there still would be a potential to impact as yet unknown human remains at the alternate freshwater well location. CEQA impacts and determinations of their significance for known and unknown historical and unique archaeological resources, paleontological resources, and human remains would therefore be the same as described for the proposed Project. The Freshwater Supply in California Alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Hazards and Hazardous Materials

The Freshwater Supply in California Alternative would result in similar pipeline infrastructure construction impacts given its proximity to the existing pipeline route along National Trails Highway; however the construction impacts would be prolonged due to the greater length of the California freshwater well. The construction, operation and maintenance, and decommissioning of the Project under the Freshwater Supply in California Alternative could still result in the potential release of hazardous materials during use or delivery of hazardous materials as a result of component failure (e.g., valve, flange, or pipe), tank failure, or human error (e.g., tank overfilling). Potential impacts related to hazards and hazardous materials would be similar to the Project. Since the Project's impacts related to hazards and hazardous materials were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Hydrology and Water Quality

Freshwater obtained from a primary well with future backup well options in California under this alternative would likely not have arsenic elevated above the MCL. Therefore, the Freshwater Supply in California Alternative would avoid potential water quality impacts related to freshwater that may contain arsenic above water quality objectives set by the State of California, or Cr(VI) above the 32µg/L water quality objective. However, given that TDS would likely be greater than 3,000 mg/L, additional pre-treatment would be required prior to injection. Early investigations also indicate that the water at the alternative California site may contain iron and manganese at concentrations that would require conditioning prior to injection. This would require additional pre-treatment prior to injection, similar to the proposed Project. The primary drawback of this alternative is related to the aquifer near Moabi Regional Park, which was determined to not be capable of delivering a sufficient quantity of water for the remedial action without adversely affecting the quality and quantity of water available from the existing non-Project related supply wells that are used by Moabi Regional Park.

Similar to the proposed Project, this alternative would also result in the use of carbon substrate to be injected into the aquifer, the potential generation of byproducts above water quality objectives, the discharge of remedy-produced water to the TCS Evaporation Ponds, and runoff associated with the soils stockpiling. Therefore, similar to the proposed Project, this alternative could result in the exceedance of water quality standards, violation of waste discharge requirements, and/or substantial degradation of water quality.

Similar to the proposed Project, the potential presence of manganese under the Freshwater Supply in California Alternative would require treatment in a purpose-built treatment system if the concentrations of manganese exceed the basin water quality objective of 0.05 mg/L. Similar to the proposed Project, this alternative would require the construction and operation of the manganese treatment system as a contingency. However, given the reduced levels of arsenic in California freshwater compared to Arizona, impacts to water quality associated with this alternative would be slightly reduced compared to the proposed Project. Since the Project's impacts related to hydrology and water quality were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Noise

The Freshwater Supply in California Alternative would relocate freshwater infrastructure to the California side of the Colorado River, approximately 2.9 miles north of the IRZ wells. Extending north from Moabi Regional Park, the pipeline for the Freshwater Supply in California Alternative would be primarily installed through unpopulated and densely vegetated land not in close proximity to any sensitive noise receptors; however a portion of the pipeline would most likely be installed near Moabi Regional Park, which is a sensitive residential and recreational receptor. The proposed Project's planned freshwater supply wells in Arizona would be installed in the Topock-Oatman Highway in close proximity (180 feet) to Topock Marina recreational and residential sensitive receptors. Under this alternative, the only Project components to be located in Arizona would be MW-X and MW-Y, which would significantly reduce noise-generating activities near the Topock Marina. The location of a freshwater pipeline in California to connect the freshwater wells to the Project Area would likely be located near Moabi Regional Park. Unlike the Project freshwater pipeline in Arizona which is relegated to the Topock-Oatman Highway due to the adjacent HNWR, there are several possible routes for a freshwater pipeline in California that could lessen impacts to sensitive receptors in Moabi Regional Park. A possible route could be located on the western border of the park near the Soil Processing Area. Regardless of where the pipeline would be located, it would not likely be closer to residential and recreational receptors than the Project freshwater pipeline in Arizona, which is 180 feet from sensitive receptors. As a result, the alternative would constitute a decrease in construction and maintenance-related noise that affects sensitive receptors near the Topock Marina. Since the Project's impacts related to noise and vibration were determined to be significant and unavoidable even with the implementation of mitigation measures, this alternative would serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Utilities, Service Systems, and Energy

Similar to the proposed Project, the Freshwater Supply in California Alternative would obtain power from the City of Needles, as well as various on-site sources of electricity, including the use of on-site generators and solar panels. Overall, this alternative would result in similar utility and energy impacts as the proposed Project. Project impacts relative to utilities and energy were determined to be less than significant with mitigation, so this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Water Supplies

Conceptual modelling conducted for the Freshwater Supply in California Alternative indicates that pumping at the proposed maximum 900 gpm rate would not be achieved due to the less productive aquifer conditions. The pumping rate for the Freshwater Supply in California Alternative would be substantially decreased to 60 gpm. At this rate, the Freshwater Supply in California Alternative would not produce adequate groundwater supplies to achieve adequate levels of freshwater to flush the remedy system. Since the Project's impacts related to water supply were determined to be less than significant with mitigation, this alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

7.6.4 Alternative 4 – No Project

The No Project Alternative represents what would reasonably be expected to occur in the foreseeable future if the Project is not approved. Pursuant to Section 15126.6(e)(2) of the CEQA Guidelines, the No Project Alternative shall:

...discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

The existing condition at the time the notice of preparation (NOP) for the proposed Project was published in June 2015 included ongoing operation of the Station and related PG&E facilities in the Project Area as discussed below. Reasonably foreseeable future activities are associated with the ongoing operation of the Station as well as soil sampling and analysis at the Project Area, which is being implemented independently of the proposed Project. These projects form the baseline for the No Project Alternative analysis presented in this section, which characterizes the activities occurring in the Project Area if the Project analyzed in this SEIR were not to occur.

On August 24, 2015, DTSC approved the Topock Soil Investigation Project based on the Topock Compressor Station Soil Investigation Project FEIR. The primary purpose of the Soil Investigation Project is to gather sufficient soil samples to be able to reliably characterize the nature and extent of soil and sediment contamination within the Project Area. The soil investigation project includes soil sampling and analysis as described in the Soil Work Plan (CH2M Hill 2013), and the potential need for bench scale tests, pilot studies, and geotechnical evaluations to support a future Soil Corrective Measures Study/Feasibility Study (Soil CMS/FS) and plant or other biota sampling activities to support an ecological risk assessment within, and in the vicinity of, the PG&E Station. The Soil Work Plan sampling began in October 2015 and continued through April 2016; additional activities described above associated with investigation have not yet been completed, but are anticipated to occur from late 2016 through 2018, if needed. Implementation of the soil investigation project will provide DTSC with sufficient data for the completion of the RFI/RI process that is consistent with state and federal guidance for site

investigations and would support evaluation of possible soil cleanup action(s) if determined necessary.

At the time the NOP for this SEIR was published in June 2015, PG&E also installed and tested wells at the East Ravine and Station locations. These activities were conducted to support the groundwater remedy design. In addition, PG&E has been operating and maintaining the IM-3 extraction and treatment system at the Project Site since July 2005.

For the No Project Alternative, the Final Remedy Design identified under the proposed Project would not be implemented. The fundamental objective of the proposed Project as presented in the Groundwater FEIR certified in January 2011, is to clean up the groundwater contamination related to the historical release of chemicals at the Station, including into Bat Cave Wash and the East Ravine near the Station, in a manner that would be consistent with all applicable regulatory requirements and to do so within a reasonable period of time when compared between viable alternatives. Groundwater contamination would continue to exist at the Project Area and would continue to pose a risk to human health and the environment if the No Project Alternative were implemented. Under the No Project Alternative, the operation of the IM-3 Facility would continue to occur. If the Final Remedy Design was not implemented, PG&E must still protect the beneficial water resource of the Colorado River from the potential impacts of the Cr(VI) plume contamination. Thus, the interim measure to continue extraction of contaminated groundwater, treatment, and reinjection of the treated water would continue to be required by DTSC under Section IV.A of the 1996 Correction Action Consent Agreement, which was entered into pursuant to California Health and Safety Code, Section 25187, until such treatment is properly mitigated. Therefore, it would not be feasible to abandon the IM-3 Facility under the No Project Alternative.

7.6.4.1 Ability to Meet Most of the Project Objectives

The No Project Alternative would not meet any of the Project objectives. This alternative would not provide adequate protection of human health or the environment, and does not meet defined RAOs. No active remediation would occur, and no institutional controls would exist to prohibit groundwater use for potable water supply. The existing contaminated groundwater plume would be left on surrounding landowner property without ongoing oversight. This alternative would result in potentially significant environmental impacts related to potential ingestion of groundwater known to be contaminated with Cr(VI), and long-term presence of contaminated groundwater. In addition, improper handling of existing infrastructure that has been used to monitor and remediate the contamination through the lack of a formal decommissioning process could result in significant environmental impacts. Therefore, the No Project Alternative would not meet the primary and fundamental project objective.

7.6.5 Comparison of Environmental Impacts

Aesthetics

The introduction of new facilities within potentially scenic corridors associated with the proposed Project would not occur under this alternative. The No Project Alternative would not impact scenic vistas or the visual character of the Project Area. However, the visual effects of the proposed Project were determined to be less than significant with mitigation. Under the No

Project Alternative, the Project Area would not be affected by Final Remedy Design activities that may alter the religious and cultural experience of Native American Tribes on-site. Thus, the No Project Alternative would result in fewer aesthetic impacts compared to the proposed Project.

Air Quality

The No Project Alternative would not increase air quality impacts from existing conditions. The proposed Project would result in significant air quality impacts, which would be reduced to less than significant levels with mitigation measures. The No Project Alternative would result in fewer air quality impacts when compared to the proposed Project. Thus, the No Project Alternative would result in fewer air quality impacts compared to the proposed Project.

Biological Resources

The No Project Alternative would not alter the existing site condition. Final Remedy construction, operation and maintenance, and decommissioning activities would not be conducted, including construction of new buildings, roads, pipelines, and wells. Therefore, the No Project Alternative would result in fewer biological resource impacts than the proposed Project.

However, if the No Project Alternative were implemented, potentially harmful contaminated groundwater that remains on the Project Area would remain unmitigated, which could pose a threat to the protection of health, safety, and the environment including a risk to aquatic resources, plant and animal species that depend on uncontaminated desert habitat for survival. Thus, the No Project Alternative would result in greater biological resource impacts compared to the proposed Project.

Cultural Resources

The No Project Alternative would not involve activities that could impact significant archaeological, historic, or paleontological resources, or human remains. The proposed Project would result in significant and unavoidable adverse change to historical resources, including the Topock TCP. The No Project Alternative would not alter existing conditions and would therefore not cause impacts to cultural resources. Because the No Project Alternative would cause no adverse change to archaeological, historical resources, human remains, or paleontological resources, it would not cause or contribute to any cumulative effect on cultural resources. Therefore, the No Project Alternative would avoid the significant adverse effects to historical and cultural resources that would occur under the Project.

Hazards and Hazardous Materials

The No Project Alternative would not involve the excavation and ground disturbance of the Project Area. There would be no disruption of soil and no related potential for disruption or exposure of hazardous materials. If the No Project Alternative were implemented, however, potentially harmful contaminated groundwater that remains on the Project Area would remain unmitigated, which could pose a threat to the protection of health, safety, and the environment as the contaminant may spread as a result of weather conditions or other human-related disturbances which could occur in the Project Site. Thus, the No Project Alternative would result in greater hazards and hazardous materials impacts compared to the proposed Project.

Hydrology and Water Quality

The No Project Alternative would not involve the excavation and related ground-disturbing activities on the Project Site. There would be no disruption of soil or water use and therefore no resulting impacts to hydrology or water quality. If the No Project Alternative were implemented, however, contaminated groundwater would remain which would increase the risk to water quality in particular as a result of weather conditions or other human-related disturbances, which could occur in the Project Area. Thus, the No Project Alternative would result in greater hydrology and water quality impacts compared to the proposed Project.

Noise

The No Project Alternative would not involve activities that would generate noise. The proposed Project would result in significant and unavoidable impacts to ambient noise levels even after implementation of mitigation. As a result, the No Project Alternative would not alter the existing condition and would have fewer noise impacts than the proposed Project, but noise in the Project Area would not completely be avoided. For example, the existing noise environment associated with the IM-3 Facility would remain under the No Project Alternative. However, the No Project Alternative would result in fewer noise impacts compared to the proposed Project.

Utilities, Service Systems, and Energy

The No Project Alternative would continue to use existing utilities, services and electricity currently provided at the Project Area. Project impacts relative to utilities and energy would not occur with the No Project Alternative. However, these impacts were determined to be less than significant with mitigation, so the No Project Alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

Water Supplies

The No Project Alternative would not involve water consumption activities or the depletion of groundwater resources and therefore no resulting impacts to water supply would occur. However, these impacts were determined to be less than significant with mitigation, so the No Project Alternative would not serve the purpose of avoiding or substantially lessening a significant adverse environmental effect of the Project.

7.7 Environmentally Superior Alternative

CEQA requires that an EIR identify the environmentally superior alternative of a project other than the No Project Alternative (CEQA Guidelines Section 15126.6(e)(2)). As discussed in Section 7.6.1, the Aboveground Pipeline Infrastructure Alternative would result in minor reductions in environmental effects when compared to the proposed Project. The Aboveground Pipeline Infrastructure Alternative is therefore considered the Environmentally Superior Alternative. While the Aboveground Pipeline Infrastructure Alternative would potentially reduce air quality, biological and cultural resource impacts, it would not avoid them. In comparison, under the On-site Soil Storage Alternative, potential noise impacts would be slightly reduced relative to the proposed Project because the activities would be relocated away from sensitive receptors. However, the Elimination of On-site Soil Storage Alternative would result in greater impacts to existing landfills due to the substantial increase in soil export quantities, and would

result in greater impacts to the Topock TCP and Tribal resources because native soil would be removed from the site.

It is important to note that the Aboveground Pipeline Alternative would not achieve the fundamental Project objectives. The Project objectives are to ensure the Final Groundwater Remedy achieves cleanup levels and/or performance goals and compliance with RAO's within a reasonable time frame; minimize ground disturbance to protect biological, historical, cultural resources and aesthetic impacts to the extent feasible; to ensure efficiency and compliance with health and safety standards in consideration of public safety. The construction and long-term operation and maintenance of the Aboveground Pipeline Alternative would result in greater worker and public safety issues associated with an increased risk of injury or even death associated with worker/visitor falls due to the Project Area's topography and steep slopes. Further, the Aboveground Pipeline Alternative would require increased maintenance requirements, such as sand blasting and painting every 10 years. Since the construction and long-term maintenance and operation of the Aboveground Pipeline Alternative would result in greater risks to worker and public safety issues as well as greater aesthetic impacts, this alternative would not meet the objectives of the Project.

CHAPTER 8

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CHAPTER 9

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CHAPTER 10

Glossary

Acre-Foot: An acre-foot is defined as the volume of water that would cover 1 acre to a depth of 1 foot. It is equivalent to about 325,851 gallons.

Aquifer: A water-bearing layer of rock or sediment that is capable of yielding useable amounts of water.

Area of Concern (AOC): Areas in and around a project site that either have shown high levels of contamination or may have been contaminated from past operations, making them focus areas of the site investigation.

Berms: A curb, ledge, wall, or mound made of various materials, used to prevent the spread of contaminants.

Best Management Practice (BMP): Acceptable practices that prevent the release of toxic and/or hazardous chemicals, and may include operational changes, materials substitution, materials and water conservation, and other measures.

Bureau of Land Management (BLM): An agency within the Department of the Interior that administers and manages the subsurface mineral estate underlying federal, state, and private lands.

California Department of Toxic Substances Control (DTSC): A department within the California Environmental Protection Agency in charge of regulating hazardous waste from generation to final disposal and overseeing the investigation and cleanup of hazardous waste sites.

California Environmental Quality Act (CEQA): Enacted in 1970 to provide long-term environmental protection, this law requires that governmental decision makers and public agencies study the environmental effects of proposed activities and that significant adverse effects be avoided or reduced where feasible.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A law enacted by the U.S. Congress on December 11, 1980, as amended on October 17, 1986, to provide broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

Chemicals of Potential Concern (COPC): Chemical elements or compounds (e.g., chromium) that may or may not be present at a project area.

Chromium: The additive of concentrations from all forms of chromium, mainly comprising hexavalent and trivalent forms. The California drinking water standard for total chromium is 50 micrograms per liter (or parts per billion), while the Federal standard is 100 micrograms per liter.

Compressor Station: A compressor station is a facility which helps the transportation process of natural gas from one location to another

Corrective Action Process: A process designed to evaluate the nature and extent of a release of a hazardous substance and implement appropriate measures to protect public health and the environment.

Corrective Measure Study/Feasibility Study (CMS/FS): A study conducted by the facility owner/operator to identify and evaluate alternative cleanup options to address contamination at a project site.

Cumulative Impacts: Total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or actions of federal, non-federal, public, and private entities.

Data Quality Objectives: Systematic planning approach used to prepare plans for environmental data collection activities.

Decommissioning: The planned shut-down or removal of a building, equipment, plant, etc. from operation or usage.

Department of the Interior (DOI): The United States department charged with conservation and development of natural resources. The U.S. Department of the Interior uses sound science to manage and sustain America's lands, water, wildlife, and energy resources, honors our nation's responsibilities to tribal nations, and advocates for America's island communities.

Environmental Impact Report (EIR): A report designed to examine the potential environmental impacts of proposed activities as required by the California Environmental Quality Act.

Extraction Wells: Wells that are used primarily to remove contaminated groundwater from the ground. Water level measurements and water samples can also be collected from extraction wells.

Final Remedy: The final cleanup action proposed for dealing with contaminants at a site.

Groundwater: Water beneath the earth's surface that flows through soil and rock openings.

Groundwater Plume: A body of contaminated groundwater. The movement of a groundwater plume can be influenced by such factors as local groundwater flow patterns, the character of the aquifer in which the groundwater is contained, and the density of contaminants.

Growth Inducement: The effects of a proposed project could have on economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

Hexavalent Chromium: One of several chemical forms of the element chromium. Chromium is a metal naturally found in rocks, soil and the tissue of plants and animals. Hexavalent chromium is used in industrial products and processes and is a known carcinogen when inhaled (i.e., through breathing) and ingested in unsafe concentrations.

Independent Utility: A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area.

In Situ Treatment: Technology that treats contaminants in place within the soil or in groundwater. It typically involves injection of a material such as air, gases, chemical or biological

reagents, or solid material (e.g., molasses or lactose) to chemically alter the contaminant or to encourage bacteria in the soil to aid in the treatment.

Interim Measures: Cleanup actions taken to protect public health and the environment while long-term solutions are being developed.

Interested Tribes: The five Native American Tribes that actively participate in the Topock project are the Chemehuevi Indian Tribe, Cocopah Indian Tribe, Colorado River Indian Tribes, Fort Mojave Indian Tribe, and the Hualapai Indian Tribe.

Lead Agency: A public agency with the principal responsibility for ordering and overseeing site investigation and cleanup.

Mitigation Measures: Actions designed to minimize significant impacts from project-related activities.

Mitigation Monitoring & Reporting Program (MMRP): A MRMP is a document or a matrix identifying mitigation actions to be taken and the outcomes of mitigation measure implementation when significant environmental impacts have been identified.

Molybdenum: A metallic element widely distributed in the Earth's crust and is used in industrial products and processes.

Monitoring Wells: Specially constructed wells used exclusively for testing groundwater.

Nitrate: Nitrates and nitrites are nitrogen-oxygen chemical compounds that combine with various organic and inorganic compounds. Once taken into the body, nitrates are converted into nitrites.

Notice of Determination (NOD): A formal notice filed with the California State Clearinghouse after the final EIR has been certified and a project approved.

Notice of Preparation (NOP): A CEQA document to be sent by the lead agency to notify the public, responsible agencies, trustee agencies, and involved federal agencies that the EIR is being prepared.

Parts per Billion (ppb): A unit of measure used to describe levels or concentrations of contamination. (a measure of concentration equaling 0.0000001%). Most drinking water standards are expressed in ppb concentrations.

Percolation: The downward flow or filtering of water or other liquids through subsurface rock or soil layers, usually continuing to groundwater.

Plume: A body of contaminated groundwater. The movement of a plume in groundwater can be influenced by such factors as local groundwater flow patterns, the character of the aquifer in which the groundwater is contained, and the density of contaminants.

Precipitate: A substance separated from a solution or suspension by chemical or physical change usually as an insoluble amorphous or crystalline solid.

Regional Water Quality Control Board (RWQCB): A California agency that maintains water quality standards for a specific geographic jurisdiction and enforces state water quality laws.

Remediation: Cleanup or other methods used to remove or contain a toxic spill or hazardous materials from a site.

Resource Conservation and Recovery Act (RCRA): A federal law that establishes a regulatory system to track and provide safe procedures for management of hazardous wastes from the time of generation to final disposal.

Resource Conservation Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI): An investigation that occurs in the corrective action process following a Facility Assessment under RCRA and/or a Site Inspection under Comprehensive Environmental Response, Compensation, and Liability Act. It is an in-depth study designed to gather data needed to determine the nature and extent of contamination at a site.

Reverse Osmosis: A treatment process used in water and wastewater systems by adding pressure to force water through a semi-permeable membrane. Reverse osmosis removes most drinking water contaminants, including salts.

Risk Assessment: Qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

Scoping: A process to gain input from agencies and the public regarding the content of an EIR.

Scoping Meeting: Meeting to gain input from the public, the local community, government agencies, and tribal government agencies regarding selection of the final remedy.

Sediments: The soil, sand, and minerals at the bottom of surface waters, such as streams, lakes, and rivers. The term may also refer to solids that settle out of any liquid.

Selenium: A nonmetallic element abundant in the Earth's crust that is used in industrial products and processes.

Solid Waste Management Unit (SWMU): Any discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released (Title 40 of the Code of Federal Regulations, Section 265.501).

Standard Operating Procedures (SOP): A set of step-by-step instructions compiled by an organization to help workers carry out routine operations.

Statement of Basis: A document that describes the basis for DTSC's proposed remedy and cleanup standards.

Subsequent Environmental Impact Report (EIR): A report prepared when substantial changes are proposed which require major revisions to a certified EIR, per CEQA Guidelines Section 21166.

Subsurface Containment Barrier: Barriers used to contain or control the flow of contaminated groundwater or subsurface liquids. They are constructed by digging a trench around a contaminated area and filling the trench with a material that tends not to allow water to pass through it.

Surface Water: All water naturally open to the atmosphere such as rivers, lakes, reservoirs, ponds, streams, impoundments, seas, and estuaries.

Total Chromium: The additive of concentrations from all forms of chromium, mainly comprising hexavalent and trivalent forms. The California drinking water standard for total chromium is

50 micrograms per liter (or parts per billion), while the federal standard is 100 micrograms per liter.

Trivalent Chromium: A form of chromium and a metal naturally found in rocks, soil, and the tissue of plants and animals. Trivalent chromium is considered an essential nutrient and is relatively harmless. It does not dissolve in groundwater and tends to bind to soil; thus it does not travel readily in the environment.

Work Plan: A document that presents key elements of the approach for a proposed action. These may include health and safety, waste management, data collection, construction activities and methods, the schedule, approvals, a reporting plan and reporting schedule.

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