JS-6

IGNACIA S. MORENO
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department Of Justice

KARL J. FINGERHOOD
Trial Attorney (PA Bar ID No. 63260)
Environmental Enforcement Section
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Tel: (202) 514-7519
Fax: (202) 514-2583
E-mail: karl.fingerhood@usdoj.gov

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
(Eastern Division - Riverside)

UNITED STATES OF AMERICA Plaintiff, v. PACIFIC GAS & ELECTRIC COMPANY, Defendant.	Civil No. 5:13-cv-00074-BRO-OP

REMEDIAL DESIGN / REMEDIAL ACTION CONSENT DECREE

TABLE OF CONTENTS

I. BACKGROUND

A. The United States of America ("United States"), on behalf of the United States Department of the Interior ("DOI"), Bureau of Land Management ("BLM"), Fish and Wildlife Service ("FWS"), and Bureau of Reclamation ("BOR") (collectively the "Federal Agencies"), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended ("CERCLA"), 42 U.S.C. §§ 9606, 9607.

B. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred by the Federal Agencies and the Department of Justice for response actions associated with the Pacific Gas & Electric Company Compressor Station ("Compressor Station"), a facility that is located approximately 15 miles southeast of Needles, California, together with accrued interest; and (2) performance by Pacific Gas & Electric Company ("PG&E" or "Settling Defendant") of response actions at the Site consistent with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, as amended ("NCP").

C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), DOI notified the State of California (the "State"), through the Department of Toxic Substances Control ("DTSC"), on April 27, 2011, of negotiations with PG&E regarding the implementation of remedial design and remedial action for the Site, and DOI has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree. The State is proceeding under state law and federally delegated Resource Conservation and Recovery Act ("RCRA") authority, and in accordance with a Corrective Action Consent Agreement ("CACA"), which DTSC entered into with PG&E on February 26, 1996.

D. In accordance with Section 122(j)(1) of CERCLA, 42

U.S.C. § 9622(j)(1), DOI notified the authorized official for the Federal Natural Resource Trustees on September 22, 2011, of negotiations with PG&E regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and invited the Federal Trustees to participate in the negotiation of this Consent Decree.

E. PG&E does not admit any liability arising out of the transactions or occurrences alleged in the complaint, nor does it acknowledge that the release or threatened release of hazardous substances at or from the Compressor Station constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

F. In response to a release or a substantial threat of a release of a hazardous substance at or from the Compressor Station, Settling Defendant commenced in 1996 a Remedial Facility Investigation ("RFI") and Corrective Measures Study ("CMS"), pursuant to the CACA with DTSC. In July 2005, Settling Defendant entered into an Administrative Consent Agreement ("Consent Agreement") with the Federal Agencies to perform a Remedial Investigation ("RI") and Feasibility Study ("FS") pursuant to 40 C.F.R. § 300.430. Pursuant to the terms of the Consent Agreement, the Federal Agencies agreed to coordinate the activities required by the Consent Agreement with those required by the CACA, and authorized PG&E to combine investigations and reports in the development of an integrated RFI/RI and CMS/FS that fulfilled the requirements of both State and Federal law.

G. Subsequent to entering the Consent Agreement, Settling Defendant and the Federal Agencies agreed to bifurcate the RI and the FS based on environmental media. The initial RI/FS addressed the investigation of contamination and evaluation of remedial alternatives related to groundwater. PG&E completed and the Federal Agencies approved "RI Volume 1 Site Background" on August 10, 2007, the "Revised RI Volume II Hydrological

Characterization and Results of Groundwater and Surface Water Investigation" on February 11, 2009, and a groundwater FS on December 16, 2009. The activities PG&E is required to perform pursuant to this Consent Decree are related to remedial action addressing contaminated groundwater. The terms of the Consent Agreement remain in effect for response actions associated with releases of hazardous substances at or from the Compressor Station other than the remedial action addressing contaminated groundwater. A second RI/FS that addresses contaminated soils will be completed pursuant to the Consent Agreement, and the final remedy for soil will be addressed pursuant to a future consent decree.

H. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, DOI published notice of the completion of the groundwater FS and issuance of the Proposed Plan for remedial action on June 4, 2010, in a major local newspaper of general circulation. DOI provided an opportunity for written and oral comments from the public on the Proposed Plan for remedial action. A copy of the transcripts of the public meetings held to solicit public comments is available as part of the administrative record upon which the Federal Agencies based the selection of the response action.

I. Pursuant to Section 106 of the National Historic Preservation Act ("NHPA"), 16 U.S.C.§ 470f, and the United States' trust responsibilities to Native American tribes, in 2008, BLM initiated consultation with the nine Native American tribes, the Advisory Council on Historic Preservation ("Advisory Council"), the California State Historic Preservation Office, the Arizona State Historic Preservation Office, and PG&E to develop a Programmatic Agreement for the proposed remedial action. From February 5, 2009 through March 20, 2009, the Federal Agencies formally consulted with the nine tribes on the CMS/FS, with written comments provided to DTSC and DOI. The Federal Agencies, through BLM, then held in-person consultation from April 27, 2009 through May 4, 2009 with the Hualapai, Chemehuevi, FMIT and CRIT. From March 11, 2010 through

July 19, 2010, the Federal Agencies, through the BLM, formally consulted with the nine tribes concerning DOI's Proposed Plan for undertaking remedial action to clean up contaminated groundwater at the Site. In October, 2010, BLM, on behalf of the Federal Agencies and following consultation with the nine tribes, executed a Programmatic Agreement with the California State Historic Preservation Officer, the Arizona State Historic Preservation Officer, and the Advisory Council identifying the stipulations and other measures to be undertaken in the design and implementation of Site remedial action to satisfy the substantive requirements of Section 106 of the NHPA, 16 U.S.C.§ 470f. Certain measures contained in the PA to protect cultural and historic properties are unrelated to the CERCLA cleanup or otherwise exceed what is required of the Selected Remedy to satisfy applicable or relevant and appropriate requirements ("ARARs").

J. The decision by DOI selecting the Remedial Action to be implemented is embodied in a Record of Decision ("ROD"), executed on January 20, 2011, on which the State had a reasonable opportunity to review and comment. The ROD includes a responsiveness summary to the public comments. Notice of the selection of Remedial Action was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b). DTSC also selected a groundwater remedy for the Topock Site, which is embodied in a Statement of Decision and Resolution of Approval for the PG&E Topock Compressor Station Groundwater Remediation Project, executed by DTSC on January 31, 2011. To the extent practicable, the Parties will use best efforts to coordinate the activities required by this Consent Decree with those required by the CACA, the Statement of Decision executed by DTSC, and the Topock Remediation Detailed Project Schedule ("Rainbow Schedule"). The Parties agree to attempt expeditiously to resolve disagreements concerning implementation of the Remedial Action informally with DTSC. To further facilitate coordination among the governmental entities, DOI and DTSC entered into a Memorandum of Understanding concerning Coordination in

Overseeing Implementation of Groundwater Response Actions at the Topock Site ("DOI/DTSC MOU").

K. Based on the information presently available to DOI, DOI believes that the Work will be properly and promptly conducted by Settling Defendant if conducted in accordance with the requirements of this Consent Decree and its appendices.

L. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the Remedial Action set forth in the ROD and the Work to be performed by Settling Defendant shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

M. PG&E contends that the Compressor Station is an operational facility necessary for approximately 36% of PG&E's normal delivery of natural gas to Northern and Central California to millions of people, and is regulated by the California Public Utilities Commission and the U.S. Department of Transportation. Based on the information presently available to DOI, DOI believes that Settling Defendant may continue its normal operations at the Compressor Station while performing the Work pursuant to this Consent Decree without posing an unacceptable risk to human health or the environment due to exposure to Waste Materials or interfering with or adversely affecting the implementation, integrity, or protectiveness of the Remedial Action.

N. The Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and implementation of this Consent Decree will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action

pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over Settling Defendant. Solely for the purposes of this Consent Decree and the underlying complaint, Settling Defendant waives all objections and defenses that it may have to jurisdiction of the Court or to venue in this District. Settling Defendant shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

2. This Consent Decree applies to and is binding upon the United States and upon Settling Defendant and its successors and assigns. Any change in ownership or corporate status of Settling Defendant including, but not limited to, any transfer of assets or real or personal property, shall in no way alter Settling Defendant's responsibilities under this Consent Decree.

3. Settling Defendant shall provide a copy of this Consent Decree to each contractor hired to perform the Work required by this Consent Decree and to each person representing Settling Defendant with respect to the Site or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Decree. Settling Defendant or its contractors shall provide written notice of the Consent Decree to all subcontractors hired to perform any portion of the Work required by this Consent Decree. Settling Defendant shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Consent Decree. With regard to the activities undertaken pursuant to this Consent Decree, each contractor and subcontractor shall be deemed to be in a contractual relationship with Settling Defendant within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

IV. DEFINITIONS

4. Unless otherwise expressly provided in this Consent Decree, terms

used in this Consent Decree that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply solely for purposes of this Consent Decree:

"CACA" shall mean the Corrective Action Consent Agreement entered into between Settling Defendant and DTSC with respect to the Compressor Station, on February 26, 1996.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq*.

"Consent Agreement" shall mean the Administrative Consent Agreement between Settling Defendant and the Federal Agencies entered in July, 2005, and any amendments thereto.

"Consent Decree" or "Decree" shall mean this Consent Decree and all appendices attached hereto (listed in Section XXVIII). In the event of conflict between this Consent Decree and any appendix, this Consent Decree shall control.

"Day" shall mean a calendar day unless expressly stated to be a working day. The term "working day" shall mean a day other than a Saturday, Sunday, or federal holiday. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

"Effective Date" shall be the date upon which this Consent Decree is entered by the Court as recorded on the Court docket, or, if the Court instead issues an order approving the Consent Decree, the date such order is recorded on the Court docket.

"DOI" shall mean the United States Department of the Interior and any successor departments or agencies of the United States.

"DTSC" shall mean the California Department of Toxic Substances Control

and any successor departments or agencies of the State.

"Federal Agencies" shall mean the United States Department of the Interior, Bureau of Land Management, United States Fish and Wildlife Service, and Bureau of Reclamation.

"Institutional Controls" shall mean federal, state, or local laws, regulations, ordinances, zoning restrictions, land use management plans, or other governmental controls or notices that: (a) limit land, water, and/or resource use to minimize the potential for human exposure to Waste Materials at the Site; (b) limit land, water, and/or resource use to implement, ensure non-interference with, or ensure the protectiveness of the Remedial Action; and/or (c) provide information intended to modify or guide human behavior at the Site.

"Interest" shall mean interest at the rate specified for interest on investments of the Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Operation and Maintenance" or "O&M" shall mean all activities required to maintain the effectiveness of the Remedial Action as required under the Operation and Maintenance Plan approved or developed by DOI pursuant to Section VI (Performance of the Work by Settling Defendant) and the SOW.

"Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter.

"Parties" shall mean the United States and Settling Defendant.

"Performance Standards" shall mean the cleanup standards and other measures of achievement of the goals of the Remedial Action, including Remedial Action Objectives set forth in Section II.H. of the ROD, attainment of ARARs, and any modified standards established pursuant to this Consent Decree.

"Plaintiff" shall mean the United States.

"Rainbow Schedule" shall mean the Topock Remediation Detailed Project Schedule for investigation and remedial activities at the Site.

"RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq*. (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" shall mean the Record of Decision relating to the Site issued by DOI on January 20, 2011, and all attachments thereto. The ROD is attached as Appendix A.

"Remedial Action" shall mean all activities Settling Defendant is required to perform under the Consent Decree to implement the ROD, in accordance with the SOW, the final Remedial Design and Remedial Action Work Plans, and other plans approved by DOI, including implementation of Institutional Controls, until the Performance Standards are met, and excluding performance of the Remedial Design, O&M, and the activities required under Section XXV (Retention of Records).

"Remedial Action Work Plan" shall mean the document developed pursuant to Paragraph 13 and approved by DOI, and any modifications thereto.

"Remedial Design" shall mean those activities to be undertaken by Settling Defendant to develop the final plans and specifications for the Remedial Action pursuant to the Remedial Design Work Plan.

"Remedial Design Work Plan" shall mean the final document developed pursuant to Paragraph 12 and approved by DOI, and any modifications thereto.

"Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the Federal Agencies and Department of Justice incur in

reviewing or developing plans, reports, and other deliverables submitted pursuant to this Consent Decree or the Consent Agreement, in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Consent Decree or the Consent Agreement, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Paragraph 10 (Notice to Successors-in-Title), Sections VII (Remedy Review), IX (Access and Institutional Controls) (including, but not limited to, the cost of attorney time and any monies paid to secure access and/or to secure, implement, monitor, maintain, or enforce Institutional Controls including, but not limited to, the amount of just compensation), XV (Emergency Response), Paragraph 49 (Funding for Work Takeover), and Section XXIX (Community Relations).

"Section" shall mean a portion of this Consent Decree identified by a Roman numeral.

"Selected Remedy" shall mean the remedial action alternative selected in the ROD.

"Settling Defendant" shall mean Pacific Gas & Electric Company.

"Site" shall mean the area subject to, or necessary to implement the, Remedial Action, depicted generally on the map attached as Appendix B.

"State" shall mean the State of California.

"Statement of Work" or "SOW" shall mean the statement of work for implementation of the Remedial Design, Remedial Action and O&M at the Site, as set forth in Appendix C to this Consent Decree and any modifications made in accordance with this Consent Decree.

"Supervising Contractor" shall mean the principal contractor retained by Settling Defendant to supervise and direct the implementation of the Work under this Consent Decree.

"Transfer" shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or

other disposition of any interest by operation of law or otherwise.

"United States" shall mean the United States of America and each department, agency and instrumentality of the United States.

"Waste Material" shall mean: (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (4) any "hazardous waste" under California Health and Safety Code Section 25117.

"Work" shall mean all activities and obligations Settling Defendant is required to perform under this Consent Decree, except the activities required under Section XXV (Retention of Records).

V. GENERAL PROVISIONS

5. Objectives of the Parties. The objectives of the Parties in entering into this Consent Decree are to protect public health or welfare or the environment by the design and implementation of the Remedial Action at the Site by Settling Defendant, to pay Response Costs of the Plaintiff, and to resolve the claims of the Federal Agencies against Settling Defendant as provided in this Consent Decree. Upon Court approval of this Consent Decree, the Federal Agencies agree that all activities required under the Consent Agreement with respect to addressing contaminated groundwater have been performed to the Federal Agencies' satisfaction. Settling Defendant shall continue to comply with the terms of the Consent Agreement in undertaking response actions other than the Remedial Action.

6. Commitments by Settling Defendant. Settling Defendant shall finance and perform the Work in accordance with this Consent Decree, the ROD, the SOW, and all work plans and other plans, standards, specifications, and schedules set forth in this Consent Decree or developed by Settling Defendant and approved by DOI pursuant to this Consent Decree. Settling Defendant shall pay

the United States for Response Costs as provided in this Consent Decree.

7. Compliance With Applicable Law. All activities undertaken by Settling Defendant pursuant to this Consent Decree shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Settling Defendant must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this Consent Decree, if approved by DOI, shall be deemed to be consistent with the NCP.

8. Intentionally blank.

9. Permits.

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site. Where any portion of the Work that is not on-site requires a federal or state permit or approval, Settling Defendant shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. Settling Defendant may seek relief under the provisions of Section XVIII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in Paragraph 9.a and required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

c. This Consent Decree is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

10. Notice to Successors-in-Title and Transfers of Real Property

a. For any real property owned or controlled by Settling Defendant located at the Site, Settling Defendant shall, within 30 days after the Effective Date, submit to DOI for review and approval a proposed notice to be

filed with the appropriate land records office that provides a description of the real property and provides notice to all successors-in-title that the real property is part of the Site, that DOI has selected a remedy for the Site, and that Settling Defendant has entered into a Consent Decree requiring implementation of the Selected Remedy. The notice also shall describe the land use restrictions, if any, established pursuant to Paragraphs 27.b and 28.b. Such notice(s) shall identify the United States District Court in which the Consent Decree was filed, the name and civil action number of this case, and the date the Consent Decree was entered by the Court. Settling Defendant shall record the notice(s) within thirty days of DOI's approval of the notice(s). Settling Defendant shall provide DOI with a certified copy of the recorded notice(s) within ten days of recording such notice(s).

b. Settling Defendant shall, at least 60 days prior to any Transfer of any real property located at the Site, give written notice: (i) to the transferee regarding the Consent Decree and any Institutional Controls regarding the real property; and (ii) to DOI and the State regarding the proposed Transfer, including the name and address of the transferee and the date on which the transferee was notified of the Consent Decree and any Institutional Controls.

c. Settling Defendant may Transfer any real property located at the Site only if Settling Defendant has obtained an agreement from the transferee, enforceable by Settling Defendant and the United States, to allow access and restrict land/water use, pursuant to Paragraphs 28.a and 28.b, and DOI has approved the agreement in writing. If, after a Transfer of the real property, the transferee fails to comply with the agreement provided for in this Paragraph 10.c, Settling Defendant shall take all reasonable steps to obtain the transferee's compliance with such agreement. The United States may seek the transferee's compliance with the agreement and/or assist Settling Defendant in obtaining compliance with the agreement. Settling Defendant shall reimburse the United States under Section XVI (Payments for Response Costs), for all costs incurred,

direct or indirect, by the United States regarding obtaining compliance with such agreement, including, but not limited to, the cost of attorney time.

d. In the event of any Transfer of real property located at the Site, unless the United States otherwise consents in writing, Settling Defendant shall continue to comply with its obligations under the Consent Decree, including, but not limited to, its obligation to provide and/or secure access, to implement, maintain, monitor, and report on Institutional Controls, and to abide by such Institutional Controls.

VI. PERFORMANCE OF THE WORK BY SETTLING DEFENDANT

11. Selection of Supervising Contractor.

a. All aspects of the Work to be performed by Settling Defendant pursuant to Sections VI (Performance of the Work by Settling Defendant), VII (Remedy Review), VIII (Quality Assurance, Sampling and Data Analysis), IX (Access and Institutional Controls), and XV (Emergency Response) shall be under the direction and supervision of the Supervising Contractor, the selection of which shall be subject to disapproval by DOI. Within thirty days after the lodging of this Consent Decree, Settling Defendant shall notify DOI in writing of the name, title, and qualifications of any contractor proposed to be the Supervising Contractor. With respect to any contractor proposed to be Supervising Contractor, Settling Defendant shall demonstrate that the proposed contractor has a quality assurance system that complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), by submitting a copy of the proposed contractor's Quality Management Plan ("QMP"). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by DOI. DOI will issue a notice of disapproval or an authorization to proceed regarding hiring of the

proposed contractor. If at any time thereafter, Settling Defendant proposes to change a Supervising Contractor, Settling Defendant shall give such notice to DOI and must obtain an authorization to proceed from DOI before the new Supervising Contractor performs, directs, or supervises any Work under this Consent Decree.

b. If DOI disapproves a proposed Supervising Contractor, DOI will notify Settling Defendant in writing. Settling Defendant shall submit to DOI a list of contractors, including the qualifications of each contractor, who would be acceptable to Settling Defendant within 30 days of receipt of DOI's disapproval of the contractor previously proposed. DOI will provide written notice of the names of any contractor(s) that it disapproves and an authorization to proceed with respect to any of the other contractors. Settling Defendant may select any contractor from that list that is not disapproved and shall notify DOI of the name of the contractor selected within thirty days of DOI's authorization to proceed.

c. If DOI fails to provide written notice of its authorization to proceed or disapproval as provided in this Paragraph and this failure prevents Settling Defendant from meeting one or more deadlines in a plan approved by DOI pursuant to this Consent Decree, Settling Defendant may seek relief under Section XVIII (Force Majeure).

12. Remedial Design.

a. On May 2, 2011, Settling Defendant submitted to DOI and DTSC a draft work plan for the design of the Remedial Action at the Site. Within 45 days after Settling Defendant's receipt of DTSC and DOI's direction to finalize the Remedial Design Work Plan, Settling Defendant shall submit the Remedial Design Work Plan to DOI and DTSC. The Remedial Design Work Plan shall provide the framework and process for the design of the Selected Remedy set forth in the ROD, in accordance with the SOW, and for achievement of the Performance Standards and other requirements set forth in the ROD, this Consent Decree, and/or the SOW. Upon its approval by DOI, the Remedial Design Work Plan shall

be incorporated into and enforceable under this Consent Decree.

b. The Remedial Design Work Plan shall include plans and schedules for implementation of all remedial design and pre-design tasks identified in the SOW, including but not limited to plans and schedules for the completion of: (1) design criteria and assumptions and conceptual treatment schemes; and (2) a Construction Quality Assurance Plan.

c. Upon approval of the Remedial Design Work Plan by DOI, after a reasonable opportunity for review and comment by the State, Settling Defendant shall implement the Remedial Design Work Plan. Settling Defendant shall submit to DOI and the State all plans, reports, and other deliverables required under the approved Remedial Design Work Plan in accordance with the approved schedule for review and approval pursuant to Section XI (DOI Approval of Plans and Other Submissions). Unless otherwise directed by DOI, and after coordination with DTSC as specified in the DOI/DTSC MOU, Settling Defendant shall not commence further Remedial Design activities at the Site prior to approval of the Remedial Design Work Plan.

d. The preliminary design submission shall include, at a minimum, the following: (1) design basis and design criteria report(s); (2) results of treatability studies, if applicable; (3) results of pre-design work; (4) project delivery strategy; (5) preliminary plans, drawings, sketches, and schematics; (6) preliminary list and anticipated format of required specifications in outline form; and (7) preliminary construction schedule.

e. The intermediate design submission shall be a continuation and expansion of the preliminary design, to include (1) revised design basis and design criteria report(s); (2) intermediate drawings and specification; (3) intermediate cost estimates; (4) a draft construction schedule; and (5) geotechnical analysis (appendix).

f. The pre-final/final design submission shall include, at a

minimum, the following: (1) pre-final/final Drawings and Specifications including complete specifications, complete drawings, and schematics; (2) Operation and Maintenance Plan and support appendices; (3) final design basis and design criteria report(s); (4) Construction Quality Assurance Project Plan ("CQAPP"); (5) Field Sampling Plan (directed at measuring progress towards meeting Performance Standards), including a Groundwater Monitoring Plan; (6) Contingency Plan; (7) IM-3 Decommissioning Plan; (8) pre-final/final remedial action cost estimate; and (9) pre-final construction schedule. The CQAPP, which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official, independent of the Supervising Contractor, to conduct a quality assurance program during the construction phase of the project.

13. Remedial Action.

a. Concurrently with the submittal of the pre-final/final design package, Settling Defendant shall submit to DOI and the State a work plan for the performance of the Remedial Action at the Site ("Remedial Action Work Plan"). The Remedial Action Work Plan shall provide for construction and implementation of the remedy set forth in the ROD and achievement of the Performance Standards, in accordance with this Consent Decree, the ROD, the SOW, and the design plans and specifications developed in accordance with the Remedial Design Work Plan and approved by DOI. Upon its approval by DOI and DTSC, the Remedial Action Work Plan shall be incorporated into and enforceable under this Consent Decree. At the same time as it submits the Remedial Action Work Plan, Settling Defendant shall submit to DOI and the State a Health and Safety Plan for field activities required by the Remedial Action Work Plan which conforms to the applicable Occupational Safety and Health Administration and DOI requirements including, but not limited to, 29 C.F.R. § 1910.120.

b. The Remedial Action Work Plan shall include the following: (1) schedule for completion of the Remedial Action; (2) method for selection of the

contractor; (3) schedule for developing and submitting other required Remedial Action plans; (4) sampling and monitoring during construction; (5) methodology for implementing the Operation and Maintenance Plan (including Contingency Plan); (6) methodology for implementing the Contingency Plan; (7) Final Construction Quality Assurance Plan; (8) Site Management Plan; (9) IM-3 Decommissioning Plan; (10) Protocol for documenting ARARs Compliance; (11) Project Management Plan; (12) Habitat Restoration Plan; and (13) procedures and plans for the decontamination of equipment and the disposal of contaminated materials. The Remedial Action Work Plan also shall include the methodology for overseeing and implementing the Construction Quality Assurance Plan and a schedule for implementing all Remedial Action tasks identified in the final design submission and shall identify the initial formulation of Settling Defendant's Remedial Action project team.

c. Upon approval of the Remedial Action Work Plan by DOI, after a reasonable opportunity for review and comment by the State, Settling Defendant shall implement the activities required under the Remedial Action Work Plan. Settling Defendant shall submit to DOI and the State all reports and other deliverables required under the approved Remedial Action Work Plan in accordance with the approved schedule for review and approval pursuant to Section XI (DOI Approval of Plans and Other Submissions). Unless otherwise directed by DOI, and after coordination with DTSC as specified in the DOI/DTSC MOU, Settling Defendant shall not commence physical Remedial Action activities at the Site prior to approval of the Remedial Action Work Plan.

14. Achievement of Performance Standards. Settling Defendant shall continue to implement the Remedial Action, including any required O&M, until the Performance Standards are achieved. In the event the Performance Standards are modified pursuant to CERCLA § 121(d)(4), Settling Defendant shall continue to implement Remedial Action until such modified Performance Standards are

achieved.

15. Modification of SOW or Related Work Plans.

a. If DOI determines that it is necessary to modify the work specified in the SOW and/or work plans developed pursuant to the SOW to achieve and maintain the Performance Standards or to carry out and maintain the effectiveness of the Remedial Action, and such modification is consistent with the scope of the remedy set forth in the ROD, then, after a reasonable opportunity for review and comment by the State and coordination with DTSC as specified in the DOI/DTSC MOU, DOI may issue such modification in writing and shall notify Settling Defendant of such modification. For the purposes of this Paragraph and Paragraph 51 (Completion of the Work) only, the "scope of the remedy set forth in the ROD" means all measures needed to attain Remedial Action Objectives, as described in Sections II.H. and II.L. of the ROD. If Settling Defendant objects to the modification it may, within 30 days after DOI's notification, seek dispute resolution under Paragraph 67 (Record Review).

b. The SOW and/or related work plans shall be modified: (i) in accordance with the modification issued by DOI; or (ii) if Settling Defendant invokes dispute resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this Consent Decree, and Settling Defendant shall implement all work required by such modification. Settling Defendant shall incorporate the modification into the Remedial Design or Remedial Action Work Plan under Paragraph 12 or 13, as appropriate.

c. Nothing in this Paragraph shall be construed to limit DOI's authority to require performance of further response actions as otherwise provided in this Consent Decree.

16. Nothing in this Consent Decree, the SOW, or the Remedial Design or Remedial Action Work Plans constitutes a warranty or representation of

any kind by Plaintiff that compliance with the work requirements set forth in the SOW and the Work Plans will achieve the Performance Standards.

17. Off-Site Shipment of Waste Material.

a. Settling Defendant may ship Waste Material associated with the implementation of the Selected Remedy from the Site to an off-Site facility only if it demonstrates to DOI's satisfaction, prior to the first shipment, and annually thereafter, that EPA has determined that the proposed receiving facility is operating in compliance with 42 U.S.C. § 9621(d)(3) and 40 C.F.R. § 300.440. In the event Settling Defendant knows or has reason to know that the receiving facility no longer meets the acceptability criteria established by 40 CFR § 300.440(b), as determined by EPA, Settling Defendant shall inform DOI and shall propose an alternate receiving facility prior to any subsequent shipments. In the event Settling Defendant proposes an alternate receiving facility for any reason, Settling Defendant shall satisfy the requirements of this Paragraph with respect to any such proposed alternate receiving facility.

b. Settling Defendant may ship Waste Material associated with implementation of the Selected Remedy from the Site to an out-of-state waste management facility only if it provides written notice to the appropriate State environmental official in the receiving facility's State and to the DOI Project Manager. Settling Defendant shall provide such notice prior to the first shipment of Waste Material, and shall comply with State law with regard to providing any further notifications. This notice requirement shall not apply to any off-Site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice shall include the following information: (i) the name and location of the receiving facility; (ii) the type and quantity of Waste Material to be shipped; (iii) the schedule for the shipment(s); and (iv) the method of transportation. Settling Defendant also shall notify the State environmental official referenced above and the DOI Project Manager of any major changes in the

shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility.

VII. REMEDY REVIEW

18. Periodic Review. Settling Defendant shall conduct any studies and investigations that DOI requests in order to permit DOI to conduct reviews of whether the Remedial Action is protective of human health and the environment at least every five years as required by Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and any applicable regulations.

19. DOI Selection of Further Response Actions. If DOI determines, at any time, that the Remedial Action is not protective of human health and the environment, DOI may select further response actions for the Site in accordance with the requirements of CERCLA and the NCP.

20. Opportunity To Comment. Settling Defendant and, if required by Sections 113(k)(2) or 117 of CERCLA, 42 U.S.C. § 9613(k)(2) or 9617, the public, will be provided with an opportunity to comment on any further response actions proposed by DOI as a result of the review conducted pursuant to Section 121(c) of CERCLA and to submit written comments for the record during the comment period.

21. Settling Defendant's Obligation To Perform Further Response Actions. If DOI selects further response actions addressing groundwater contamination at the Site, DOI may require Settling Defendant to perform such further response actions. Settling Defendant may invoke the procedures set forth in Section XIX (Dispute Resolution) to dispute (a) DOI's determination that the Remedial Action is not protective of human health and the environment, or (b) DOI's selection of the further response actions. Disputes pertaining to whether the Remedial Action is protective or to DOI's selection of further response actions shall be resolved pursuant to Paragraph 67 (Record Review).

22. Submission of Plans. If Settling Defendant is required to perform

further response actions pursuant to Paragraph 21, Settling Defendant shall submit a plan for such response action to DOI for approval in accordance with the procedures of Section VI (Performance of the Work by Settling Defendant). Settling Defendant shall implement the approved plan in accordance with this Consent Decree.

VIII. QUALITY ASSURANCE, SAMPLING AND DATA ANALYSIS

23. Quality Assurance.

a. Settling Defendant shall use quality assurance, quality control, and chain of custody procedures for all samples in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R5)" (EPA/240/B-01/003, March 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/240/R-02/009, December 2002), and subsequent amendments to such guidelines upon notification by DOI to Settling Defendant of such amendment. Amended guidelines shall apply only to procedures conducted after such notification.

b. Prior to the commencement of any sampling and analysis activities under this Consent Decree, Settling Defendant shall submit to DOI for approval, after a reasonable opportunity for review and comment by the State, a Quality Assurance Project Plan ("QAPP") that is consistent with the SOW, the NCP and applicable guidance documents. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by DOI shall be admissible as evidence, without objection, in any proceeding under this Consent Decree. Settling Defendant shall ensure that DOI personnel and its authorized representatives are allowed access at reasonable times to all laboratories (so long as the laboratories remain in business) utilized by Settling Defendant in implementing this Consent Decree. In addition, Settling Defendant shall ensure that such laboratories shall analyze all samples submitted by DOI or its contractor(s) pursuant to the QAPP for quality assurance monitoring.

Settling Defendant shall ensure that the laboratories it utilizes for the analysis of samples taken pursuant to this Consent Decree perform all analyses according to accepted EPA methods. Settling Defendant shall ensure that all laboratories it uses for analysis of samples taken pursuant to this Consent Decree participate in an EPA-equivalent QA/QC program. Settling Defendant shall use only laboratories that have a documented Quality System which complies with ANSI/ASQC E4-1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001, reissued May 2006) or equivalent documentation as determined by DOI. DOI may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") or the State of California Environmental Laboratory Accreditation Program ("ELAP") as meeting the Quality System requirements. Settling Defendant shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Consent Decree are conducted in accordance with the procedures set forth in the QAPP approved by DOI.

24. Upon request, Settling Defendant shall allow split or duplicate samples to be taken by DOI or its authorized representatives. Settling Defendant shall notify DOI not less than 28 days in advance of any sample collection activity unless shorter notice is agreed to by DOI. In addition, DOI shall have the right to take any additional samples that DOI deems necessary. Upon request, DOI shall allow Settling Defendant to take split or duplicate samples of any samples it takes as part of Plaintiff's oversight of Settling Defendant's implementation of the Work.

25. Settling Defendant shall submit to DOI one electronic copy (in PDF) of the Level 1 results of all sampling and/or tests or other data obtained or generated by or on behalf of Settling Defendant with respect to the Site and/or the implementation of this Consent Decree unless DOI agrees otherwise. Hard copies

of the Level 1 data package will be provided to DOI upon request.

26. Notwithstanding any provision of this Consent Decree, the United States retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

IX. ACCESS AND INSTITUTIONAL CONTROLS

27. If the Site, or any other real property where access or land/water use restrictions are needed, is owned or controlled by Settling Defendant:

a. Settling Defendant shall, commencing on the date of lodging of the Consent Decree, provide the United States and its representatives, contractors, and subcontractors, with access at all reasonable times to the Site, or such other real property, to conduct any activity regarding the Consent Decree including, but not limited to, the following activities:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to the United States;

(3) Conducting investigations regarding contamination at or near the Site;

(4) Obtaining samples;

(5) Assessing the need for, planning, or implementing additional response actions at or near the Site;

(6) Assessing implementation of quality assurance and quality control practices as defined in the approved Quality Assurance Project Plans;

(7) Implementing the Work pursuant to the conditions set forth in Paragraph 83 (Work Takeover);

(8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Settling

Defendant or their agents, consistent with Section XXIV (Access to Information);

(9) Assessing Settling Defendant's compliance with the Consent Decree;

(10) Determining whether the Site or other real property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Consent Decree; and

(11) Implementing, monitoring, maintaining, reporting on, and enforcing any Institutional Controls.

b. commencing on the date of lodging of the Consent Decree, Settling Defendant shall not use the Site, or such other real property, in any manner that DOI determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Materials or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action.

28. If the Site, or any other real property where access and/or land/water use restrictions are needed, is owned or controlled by persons other than any Settling Defendant, if requested by DOI, Settling Defendant shall use best efforts to secure from such persons:

a. an agreement to provide access thereto for the United States and Settling Defendant, and their representatives, contractors and subcontractors, to conduct any activity regarding the Consent Decree including, but not limited to, the activities listed in Paragraph 27.a;

b. an agreement, enforceable by Settling Defendant and the United States, to refrain from using the Site, or such other real property, in any manner that DOI determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Materials or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action. The

agreement shall include, but not be limited to, the land/water use restrictions required pursuant to Paragraph 27.b.

29. For purposes of Paragraph 28, "best efforts" includes the payment of reasonable sums of money to obtain access or an agreement to restrict land/water use. If, within 90 days of DOI's request for such an agreement, Settling Defendant has not obtained agreements to provide access and/or restrict land/water use, as required by Paragraph 28, Settling Defendant shall promptly notify the United States in writing, and shall include in that notification a summary of the steps that Settling Defendant has taken to attempt to comply with Paragraph 28. The United States may, as it deems appropriate, assist Settling Defendant in obtaining access or agreements to restrict land/water use. Settling Defendant shall reimburse the United States under Section XVI (Payments for Response Costs), for all costs incurred, direct or indirect, by the United States in obtaining such access or agreements to restrict land/water use, including, but not limited to, the cost of attorney time and any sums of money paid by the United States to obtain access or an agreement to restrict land/water use. Settling Defendant may invoke the procedures set forth in Section XIX (Dispute Resolution) to dispute DOI's or DOJ's costs incurred in obtaining such access or agreements to restrict land/water use.

30. If DOI determines that Institutional Controls in the form of federal, state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls are needed, Settling Defendant shall cooperate with DOI's efforts to secure and ensure compliance with such governmental controls.

31. Notwithstanding any provision of the Consent Decree, the United States retains all of its access authorities and rights, as well as all of its rights to require Institutional Controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

X. REPORTING REQUIREMENTS

32. In addition to any other requirement of this Consent Decree, Settling Defendant shall submit to DOI and the State one electronic copy of written monthly progress reports during remedy construction that: (a) describe the actions which have been taken toward achieving compliance with this Consent Decree during the previous month; (b) include a summary of available results of sampling and tests and all other data received or generated by Settling Defendant or its contractors or agents in the previous month; (c) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next six weeks and provide other information relating to the progress of construction, including, but not limited to, critical path diagrams, and Gantt charts; (d) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (e) include any modifications to the work plans or other schedules that Settling Defendant have proposed to DOI or that have been approved by DOI; and (f) if requested by DOI to assist in community involvement activities (as provided in Section XXIX Community Relations), describe all activities undertaken in support of the Community Involvement Plan during the previous month and those to be undertaken in the next six weeks. Hard copies will be provided to DOI upon request. Settling Defendant shall submit these progress reports to DOI and the State by the tenth day of every month following the lodging of this Consent Decree until DOI notifies Settling Defendant pursuant to Paragraph 51.b of Section XIV (Certification of Completion). If requested by DOI, Settling Defendant shall also provide briefings for DOI to discuss the progress of the Work.

33. Settling Defendant shall notify DOI of any change in the schedule described in the monthly progress report for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no

later than seven days prior to the performance of the activity, or as otherwise agreed to by Settling Defendant and DOI.

34. Upon the occurrence of any event during performance of the Work that Settling Defendant is required to report pursuant to Section 103(a) and (f) of CERCLA, 42 U.S.C. § 9603(a), (f), or Section 304(a) of the Emergency Planning and Community Right-to-know Act ("EPCRA"), 42 U.S.C. § 11004(a), Settling Defendant shall within 24 hours of the onset of such event orally notify the DOI Project Manager or one of the Bureau (BLM, FWS, or BOR) Project Managers (in the event of the unavailability of the DOI Project Manager). These reporting requirements are in addition to the reporting required by CERCLA Section 103 or EPCRA Section 304.

35. Within 30 days of the onset of such an event, Settling Defendant shall furnish to DOI a written report, signed by Settling Defendant's Project Manager, setting forth the events that occurred and the measures taken, and to be taken, in response thereto. Within 45 days of the conclusion of such an event, Settling Defendant shall submit a report setting forth all actions taken in response thereto.

36. Settling Defendant shall submit hard copies of draft documents as requested by DOI and a minimum of five (5) hard copies of all final plans, reports, data, and other deliverables required by the SOW, the Remedial Design Work Plan, the Remedial Action Work Plan, or any other approved plans to DOI in accordance with the schedules set forth in such plans. Settling Defendant shall submit in electronic form all or any portion of any deliverables Settling Defendant is required to submit pursuant to the provisions of this Consent Decree.

37. All deliverables submitted by Settling Defendant to DOI which purport to document Settling Defendant's compliance with the terms of this Consent Decree shall be signed by an authorized representative of Settling Defendant.

XI. DOI APPROVAL OF PLANS, REPORTS, AND OTHER

DELIVERABLES

38. Initial Submissions.

a. After review of any plan, report, or other deliverable that is required to be submitted for approval pursuant to this Consent Decree, DOI, after reasonable opportunity for review and comment by the State and after coordination with DTSC as specified in the DOI/DTSC MOU, shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

b. DOI, after coordination with DTSC as specified in the DOI/DTSC MOU, also may modify the initial submission to cure deficiencies in the submission if: (i) DOI determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable plan, report, or deliverable.

39. Resubmissions. Upon receipt of a notice of disapproval under Paragraph 38.a.(iii) or (iv), or if required by a notice of approval upon specified conditions under Paragraph 38.a.(ii), Settling Defendant shall, within 60 days or such longer time as specified by DOI in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval. After review of the resubmitted plan, report, or other deliverable, and after coordination with DTSC as specified in the DOI/DTSC MOU, DOI may: (a) approve, in whole or in part, the resubmission; (b) approve the resubmission upon specified conditions; (c) modify the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring Settling Defendant to correct the deficiencies; or (e) any combination of the foregoing.

40. Material Defects. If a resubmitted plan, report, or other deliverable

contains a material defect, and the plan, report, or other deliverable is disapproved or modified by DOI under Paragraph 38.b.(ii) or 39 due to such material defect, then the material defect shall constitute a lack of compliance for purposes of Paragraph 70. The provisions of Section XIX (Dispute Resolution) and Section XX (Stipulated Penalties) shall govern the accrual and payment of any stipulated penalties regarding Settling Defendant's submissions under this Section.

41. Approval and Implementation.

a. At such time as DOI provides its final comments on a plan, report, or other deliverable subject to an enforceable deadline under this Consent Decree, and after coordination with DTSC as specified in the DOI/DTSC MOU, DOI shall direct Settling Defendant to finalize the document in conformance with the comments and submit the document for approval by issuing a notification to proceed referencing this paragraph of the Consent Decree. Once DOI issues this notification to proceed, such notification shall trigger the time period established in Section XX (Stipulated Penalties) for submittal of the final document. Should DTSC or DOI require additional changes to a plan, report or other deliverable under this Consent Decree after a notification to proceed is issued by DOI, Settling Defendant may request that the time period for submittal of the final document be renewed or extended. DOI will, in coordination with DTSC, approve such request if, in DOI's opinion renewing or extending the applicable time period is warranted. Any agreement or refusal by DOI to renew, toll, or extend the applicable time period shall be provided to Settling Defendant in writing, and may be appealed by Settling Defendant pursuant to Section XIX (Dispute Resolution).

b. Upon approval, approval upon conditions, or modification by DOI under Paragraph 38 or 39, of any plan, report, or other deliverable, or any portion thereof: (a) such plan, report, or other deliverable, or portion thereof, shall be incorporated into and enforceable under this Consent Decree; and (b) Settling Defendant shall take any action required by such plan, report, or other deliverable,

or portion thereof, subject only to its right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) with respect to the modifications or conditions made by DOI. The implementation of any non-deficient portion of a plan, report, or other deliverable submitted or resubmitted under Paragraph 38 or 39 shall not relieve Settling Defendant of any liability for stipulated penalties under Section XX (Stipulated Penalties).

XII. PROJECT MANAGERS

42. Within 20 days of lodging this Consent Decree, Settling Defendant and DOI will notify each other, in writing, of the name, address, and telephone number of their respective designated Project Managers and Alternate Project Managers. DOI's Alternate Project Manager shall be a designated Bureau Project Manager. If a Project Manager or Alternate Project Manager initially designated is changed, the identity of the successor will be given to the other Parties at least five working days before the change occurs, unless impracticable, but in no event later than the actual day the change is made. Settling Defendant's Project Manager shall be subject to disapproval by DOI and shall have the technical expertise sufficient to adequately oversee all aspects of the Work. Settling Defendant's Project Manager shall not be an attorney for any Settling Defendant in this matter. He or she may assign other representatives, including other contractors, to serve as a Site representative for oversight of performance of daily operations during remedial activities.

43. Plaintiff may designate other representatives, including, but not limited to, DOI employees, and federal contractors and consultants, to observe and monitor the progress of any activity undertaken pursuant to this Consent Decree. DOI's Project Manager or designated Bureau Project Manager shall have the authority lawfully vested in a Remedial Project Manager (RPM) and an On-Scene Coordinator (OSC) by the NCP, 40 C.F.R. Part 300. DOI's Project Manager or Alternate Project Manager shall have authority, consistent with the NCP, to halt

any Work required by this Consent Decree and to take any necessary response action when he or she determines that conditions at the Site constitute an emergency situation or may present an immediate threat to public health or welfare or the environment due to release or threatened release of Waste Material. DOI's Project Manager will use best efforts to coordinate with DTSC, prior to halting any Work.

44. DOI's Project Manager and Settling Defendant's Project Manager will maintain communication in person or by phone, at a minimum, on a monthly basis.

XIII. PERFORMANCE GUARANTEE

45. In order to ensure the full and final completion of the Work, Settling Defendant shall establish and maintain a performance guarantee, initially in the amount of $184,000,000 (hereinafter "Estimated Cost of the Work"). The performance guarantee, which must be satisfactory in form and substance to DOI, shall be in the form of one or more of the following mechanisms (provided that, if Settling Defendant intends to use multiple mechanisms, such multiple mechanisms in combination shall be limited to surety bonds guaranteeing payment, letters of credit, trust funds, and insurance policies):

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. One or more irrevocable letters of credit, payable to or at the direction of DOI, that is issued by one or more financial institution(s) (i) that has the authority to issue letters of credit and (ii) whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of DOI that is administered by a trustee (i) that has the authority to act as a trustee and (ii) whose trust operations are regulated and examined by a federal or state agency;

d. A policy of insurance that (i) provides DOI with acceptable rights as a beneficiary thereof; and (ii) is issued by an insurance carrier (a) that has the authority to issue insurance policies in the applicable jurisdiction(s) and (b) whose insurance operations are regulated and examined by a federal or state agency;

e. A demonstration by Settling Defendant that Settling Defendant meets the financial test criteria of 40 C.F.R. § 264.143(f), or the financial test criteria the State of California has been authorized to implement consistent with 40 C.F.R. § 264.149 with respect to the Estimated Cost of the Work (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee), provided that all other requirements of 40 C.F.R. § 264.143(f) or the financial test criteria the State of California has been authorized to implement consistent with 40 C.F.R. §264.149, as applicable, are met to DOI's satisfaction; or

f. A written guarantee to fund or perform the Work executed in favor of DOI by one or more of the following: (i) a direct or indirect parent company of a Settling Defendant, or (ii) a company that has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with at least one Settling Defendant; provided, however, that any company providing such a guarantee must demonstrate to the satisfaction of DOI that it satisfies the financial test and reporting requirements for owners and operators set forth in subparagraphs (1) through (8) of 40 C.F.R. § 264.143(f), or the financial test criteria the State of California has been authorized to implement consistent with 40 C.F.R. § 264.149 with respect to the Estimated Cost of the Work (plus the amount(s) of any other federal or any state environmental obligations financially assured through the use of a financial test or guarantee) that it proposes to guarantee hereunder.

46. Settling Defendant has selected, and DOI has found satisfactory, as an initial performance guarantee the financial test pursuant to Paragraph 45.e, in the

form attached hereto as Appendix D and approved by DTSC under California regulations in the amount of $198,000,000. DOI has determined that the California mechanisms under which Settling Defendant has implemented the performance guarantee, including but not limited to the financial test chosen herein, are at least equivalent to the financial mechanisms specified in this Section XIII, and that 40 C.F.R. § 264.149 has been satisfied.

47. If, at any time after the Effective Date and before issuance of the Certification of Completion of the Work pursuant to Paragraph 51, Settling Defendant provides a performance guarantee for completion of the Work by means of a demonstration or guarantee pursuant to Paragraph 45.e or 45.f, Settling Defendant shall also comply with the other relevant requirements of 40 C.F.R. § 264.143(f), or equivalent requirements of the State of California relating to these mechanisms unless otherwise provided in this Consent Decree, including but not limited to: (a) the initial submission of required financial reports and statements from the relevant entity's chief financial officer ("CFO") and independent certified public accountant ("CPA"), in the form prescribed by EPA in its financial test sample CFO letters and CPA reports available at: http://www.epa.gov/compliance/resources/policies/cleanup/superfund/fa-test-samples.pdf ; (b) the annual re-submission of such reports and statements within 90 days after the close of each such entity's fiscal year; and (c) the prompt notification of DOI after each such entity determines that it no longer satisfies the financial test requirements set forth at 40 C.F.R. § 264.143(f)(1), or equivalent regulations of the State of California and in any event within 90 days after the close of any fiscal year in which such entity no longer satisfies such financial test requirements. For purposes of the performance guarantee mechanisms specified in this Section XIII, references in 40 C.F.R. Part 264, Subpart H, to "closure," "post-closure," and "plugging and abandonment" shall be deemed to include the Work; the terms "current closure cost estimate," "current post-closure cost estimate," and "current

plugging and abandonment cost estimate" shall be deemed to include the Estimated Cost of the Work; the terms "owner" and "operator" shall be deemed to refer to Settling Defendant; and the terms "facility" and "hazardous waste facility" shall be deemed to include the Site.

48. In the event that DOI determines at any time that a performance guarantee provided by Settling Defendant pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, or in the event that Settling Defendant becomes aware of information indicating that a performance guarantee provided pursuant to this Section is inadequate or otherwise no longer satisfies the requirements set forth in this Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, Settling Defendant, within 60 days of receipt of notice of DOI's determination or, as the case may be, within 60 days of Settling Defendant becoming aware of such information, shall obtain and present to DOI for approval, in coordination with DTSC, a proposal for a revised or alternative form of performance guarantee listed in Paragraph 45 that satisfies all requirements set forth in this Section XIII; provided, however, that if Settling Defendant cannot obtain such revised or alternative form of performance guarantee within such 60-day period, and provided further that Settling Defendant shall have commenced to obtain such revised or alternative form of performance guarantee within such 60-day period, and thereafter diligently proceeds to obtain the same, DOI shall extend such period for such time as is reasonably necessary for Settling Defendant in the exercise of due diligence to obtain such revised or alternative form of performance guarantee, such additional period not to exceed 60 days. On day 30, Settling Defendant shall provide to DOI a status report on its efforts to obtain the revised or alternative form of guarantee**.** In seeking approval for a revised or alternative form of performance guarantee, Settling Defendant shall follow the procedures set forth in

Paragraph 50.b.(2). Settling Defendant's inability to post a performance guarantee for completion of the Work shall in no way excuse performance of any other requirements of this Consent Decree, including, without limitation, the obligation of Settling Defendant to complete the Work in strict accordance with the terms of this Consent Decree. DOI shall coordinate with DTSC before requiring any alternative form of performance guarantee and shall take into consideration any amount provided by Settling Defendant under the CACA in establishing the amount of any alternative form of performance guarantee.

49. Funding for Work Takeover. The commencement of any Work Takeover pursuant to Paragraph 83 shall trigger DOI's right to receive the benefit of any performance guarantee(s) provided pursuant to Paragraphs 45.a, 45.b, 45.c, 45.d, or 45.f, and at such time DOI shall have immediate access to resources guaranteed under any such performance guarantee(s), whether in cash or in kind, as needed to continue and complete the Work assumed by DOI under the Work Takeover. Upon the commencement of any Work Takeover, if (a) for any reason DOI is unable to promptly secure the resources guaranteed under any such performance guarantee(s), whether in cash or in kind, necessary to continue and complete the Work assumed by DOI under the Work Takeover, or (b) in the event that the performance guarantee involves a demonstration of satisfaction of the financial test criteria pursuant to Paragraph 45.e or Paragraph 45.f.(ii), Settling Defendant (or in the case of Paragraph 45.f.(ii), the guarantor) shall immediately upon written demand from DOI deposit into a special account as DOI may specify, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of completing the Work as of such date, as determined by DOI. DOI shall coordinate with DTSC prior to any Work Takeover and on the use of such funds, using the process established in the DOI/DTSC MOU, to ensure that available resources in the amount provided by Settling Defendant under this Section XIII are adequate to

complete implementation of the Selected Remedy. In addition, if at any time DOI is notified by the issuer of a performance guarantee that such issuer intends to cancel the performance guarantee mechanism it has issued, then, unless Settling Defendant provide a substitute performance guarantee mechanism in accordance with this Section XIII no later than 30 days prior to the impending cancellation date, DOI shall be entitled (as of and after the date that is 30 days prior to the impending cancellation) to draw fully on the funds guaranteed under the then-existing performance guarantee, after coordination with DTSC. All DOI Work Takeover costs not reimbursed under this Paragraph shall be reimbursed under Section XVI (Payments for Response Costs).

50. Modification of Amount and/or Form of Performance Guarantee.

a. Reduction of Amount of Performance Guarantee. If Settling Defendant believes that the estimated cost of completing the Work has diminished below the amount set forth in Paragraph 45, Settling Defendant may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition DOI in writing to request a reduction in the amount of the performance guarantee provided pursuant to this Section so that the amount of the performance guarantee is equal to the estimated cost of completing the Work. Settling Defendant shall submit a written proposal for such reduction to DOI that shall specify, at a minimum, the estimated cost of completing the Work and the basis upon which such cost was calculated. In seeking approval for a reduction in the amount of the performance guarantee, Settling Defendant shall follow the procedures set forth in Paragraph 50.b.(2) for requesting a revised or alternative form of performance guarantee, except as specifically provided in this Paragraph 50.a. If DOI decides to accept Settling Defendant's proposal for a reduction in the amount of the performance guarantee, either to the amount set forth in Settling Defendant's written proposal or to some other amount as selected by DOI, DOI will notify the petitioning Settling Defendant of such decision in writing within 60

days. Upon DOI's acceptance of a reduction in the amount of the performance guarantee, the Estimated Cost of the Work shall be deemed to be the estimated cost of completing the Work set forth in DOI's written decision. After receiving DOI's written decision, Settling Defendant may reduce the amount of the performance guarantee in accordance with and to the extent permitted by such written acceptance and shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee(s) legally binding in accordance with Paragraph 50.b.(2). In the event of a dispute, Settling Defendant may reduce the amount of the performance guarantee required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XIX (Dispute Resolution). No change to the form or terms of any performance guarantee provided under this Section, other than a reduction in amount, is authorized except as provided in Paragraphs 48 or 50.b.

b. Change of Form of Performance Guarantee.

(1) If, after the Effective Date, Settling Defendant desires to change the form or terms of any performance guarantee provided pursuant to this Section, Settling Defendant may, on any anniversary of the Effective Date, or at any other time agreed to by the Parties, petition DOI in writing to request a change in the form or terms of the performance guarantee provided hereunder. The submission of such proposed revised or alternative performance guarantee shall be as provided in Paragraph 50.b.(2). Any decision made by DOI on a petition submitted under this Paragraph shall be made in DOI's sole and unreviewable discretion, and such decision shall not be subject to challenge by Settling Defendant pursuant to the dispute resolution provisions of this Consent Decree or in any other forum.

(2) Settling Defendant shall submit a written proposal for a revised or alternative performance guarantee to DOI which shall specify, at a

minimum, the estimated cost of completing the Work, the basis upon which such cost was calculated, and the proposed revised performance guarantee, including all proposed instruments or other documents required in order to make the proposed performance guarantee legally binding. The proposed revised or alternative performance guarantee must satisfy all requirements set forth or incorporated by reference in this Section. Settling Defendant shall submit such proposed revised or alternative performance guarantee to the DOI Project Manager in accordance with Section XXVI (Notices and Submissions). DOI will notify Settling Defendant in writing of its decision to accept or reject a revised or alternative performance guarantee submitted pursuant to this Paragraph. Within 60 days after receiving a written decision approving the proposed revised or alternative performance guarantee, Settling Defendant shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected performance guarantee legally binding in a form substantially identical to the documents submitted to DOI as part of the proposal, and such performance guarantee shall thereupon be fully effective. Settling Defendant shall submit copies of all executed and/or otherwise finalized instruments or other documents required in order to make the selected performance guarantee legally binding to the DOI Project Manager within 60 days of receiving a written decision approving the proposed revised or alternative performance guarantee in accordance with Section XXVI (Notices and Submissions) and to the United States and DOI as specified in Section XXVI.

c. Release of Performance Guarantee. Settling Defendant shall not release, cancel, or discontinue any performance guarantee provided pursuant to this Section except as provided in this Paragraph. If Settling Defendant receives written notice from DOI in accordance with Paragraph 51 that the Work has been fully and finally completed in accordance with the terms of this Consent Decree, or if DOI otherwise so notifies Settling Defendant in writing, Settling Defendant may

thereafter release, cancel, or discontinue the performance guarantee provided pursuant to this Section. In the event of a dispute, Settling Defendant may release, cancel, or discontinue the performance guarantee required hereunder only in accordance with a final administrative or judicial decision resolving such dispute pursuant to Section XIX (Dispute Resolution).

XIV. CERTIFICATION OF COMPLETION

51. Completion of the Work.

a. Within 90 days after Settling Defendant concludes that all phases of the Work, other than any remaining activities required under Section VII (Remedy Review), have been fully performed, Settling Defendant shall schedule and conduct a pre-certification inspection to be attended by Settling Defendant and DOI. After the pre-certification inspection, and after consultation with DTSC, DOI will issue, at its sole discretion, a notice to proceed with the Construction Completion Report, and Settling Defendant shall submit a written Construction Completion Report by a registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of this Consent Decree, consistent with the process set forth in Paragraph 41(a). The report shall contain the following statement, signed by a responsible corporate official of Settling Defendant or Settling Defendant's Project Manager:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If, after review of the written report, DOI, after reasonable opportunity for review

and comment by the State, determines that any portion of the Work has not been completed in accordance with this Consent Decree, DOI will notify Settling Defendant in writing of the activities that must be undertaken by Settling Defendant pursuant to this Consent Decree to complete the Work, provided, however, that DOI may only require Settling Defendant to perform such activities pursuant to this Paragraph to the extent that such activities are consistent with the "scope of the remedy set forth in the ROD," as that term is defined in Paragraph 15.a. DOI will set forth in the notice a schedule for performance of such activities consistent with the Consent Decree and the SOW or require Settling Defendant to submit a schedule to DOI for approval pursuant to Section XI (DOI Approval of Plans and Other Submissions). Settling Defendant shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to its right to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution).

b. If DOI concludes, based on the initial or any subsequent request for Certification of Completion of the Work by Settling Defendant and after a reasonable opportunity for review and comment by the State, that the Work has been performed in accordance with this Consent Decree, DOI will so notify Settling Defendant in writing.

XV. EMERGENCY RESPONSE

52. If any action or occurrence during the performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Settling Defendant shall, subject to Paragraph 53, immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall immediately notify DOI's Project Manager, or, if the Project Manager is unavailable, DOI's Alternate Project Manager. Settling Defendant shall take such actions in consultation with DOI's Project Manager or other

available authorized DOI officer and in accordance with all applicable provisions of the Health and Safety Plans, the Contingency Plans, and any other applicable plans or documents developed pursuant to the SOW. In the event that Settling Defendant fails to take appropriate response action as required by this Section, and DOI takes such action instead, Settling Defendant shall reimburse DOI all costs of the response action under Section XVI (Payments for Response Costs).

53. Subject to Section XXI (Covenants by Plaintiff), nothing in the preceding Paragraph or in this Consent Decree shall be deemed to limit any authority of the United States (a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or (b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site.

XVI. PAYMENTS FOR RESPONSE COSTS

54. Payments by Settling Defendant for Response Costs. Settling Defendant shall pay to DOI all Response Costs not inconsistent with the NCP.

a. Billing. On a periodic basis, DOI will send Settling Defendant a bill requiring payment, with a copy to the United States Department of Justice at the address listed below in Paragraph 54.b.i (referencing Department of Justice Number 90-11-3-07240/4), that includes a cost summary, which includes direct and indirect costs incurred by the Federal Agencies and their contractors and a DOJ case cost summary. DOI shall use its best efforts to submit bills requiring payment no less often than semi-annually. Failure by DOI to submit semi-annual bills shall not affect the Federal Agencies' right to reimbursement under this Consent Decree. Settling Defendant shall make all payments within 60 days of Settling Defendant's receipt of each bill requiring payment, or as otherwise agreed in writing by DOI with written confirmation provided to DOJ, except as otherwise

provided in Paragraph 56, in accordance with Paragraphs 54.b (Payment Instructions).

b. Payment Instructions. All payments made to DOI pursuant to Paragraph 54 shall be made by Settling Defendant in accordance with instructions provided to the Settling Defendant from the Financial Litigation Unit ("FLU") of the United States Attorney's Office for the Central District of California after the issuance of a bill requiring payment in accordance with Paragraph 54.a.

i. Settling Defendant shall send notification of payment referencing the amount of payment, the site name, and the time period for which reimbursement of response costs is being provided to the following individuals:

Pamela Innis
DOI Remedial Project Manager, Office of Environmental Policy and Compliance
Department of the Interior
Denver Federal Center
P.O. Box 25007, MS D108
Denver, CO 80225-0007

Courtney Hoover
Fund Manager, Central Hazardous Materials Fund
Department of the Interior
1849 C Street, N.W., Mail Stop 2342
Washington, D.C. 20240

Chief
Environmental Enforcement Section
U.S. Department of Justice
Environment & Natural Resources Division
P.O. Box 7611
Washington, D.C. 20044-7611

Casey S. Padgett, Esq.
Assistant Solicitor
Office of the Solicitor
1849 C Street, NW, MS 5530

Washington, D.C. 20240

If needed, Settling Defendant may obtain additional information for transferring funds pursuant to this Paragraph from the FLU or the United States Department of Justice, Environmental Enforcement Section.

55. Interest. In the event that any payment required by Paragraph 54 is not made within 60 days of Settling Defendant's receipt of a bill, or such time as otherwise agreed by DOI, interest on the unpaid balance shall be paid at the rate established pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), commencing on the 61st day after receipt of the bill and accruing through the date of the payment.

56. Settling Defendant may contest any Response Costs billed under Paragraph 54 if it determines that DOI has made a mathematical error or included a cost item that is not within the definition of Response Costs, or if it believes DOI incurred excess costs as a direct result of a DOI action that was inconsistent with a specific provision or provisions of the NCP. Such objection shall be made in writing within 45 days of receipt of the bill and must be sent to the United States pursuant to Section XXVI (Notices and Submissions). Any such objection shall specifically identify the contested Response Costs and the basis for objection. In the event of an objection, Settling Defendant shall pay all uncontested Response Costs to DOI within 60 days of DOI's issuance of the bill requiring payment, or such time as otherwise agreed by DOI. Simultaneously, Settling Defendant shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of California and remit to that escrow account funds equivalent to the amount of the contested Response Costs. Settling Defendant shall send to DOI, as provided in Section XXVI (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Response Costs, and a copy of the correspondence that establishes and funds the escrow account,

including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Settling Defendant shall initiate the Dispute Resolution procedures in Section XIX (Dispute Resolution). If the United States prevails in the dispute, Settling Defendant shall pay the sums due (with accrued Interest) to DOI within five days of the resolution of the dispute. If Settling Defendant prevails concerning any aspect of the contested costs, Settling Defendant shall pay that portion of the costs (plus associated accrued Interest) for which it did not prevail to DOI within five days of the resolution of the dispute. Settling Defendant shall be disbursed any balance of the escrow account. All payments to DOI under this Paragraph shall be made in accordance with Paragraph 58.b (Payment Instructions). The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIX (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Settling Defendant's obligation to reimburse the United States for its Response Costs.

XVII. INDEMNIFICATION AND INSURANCE

57. Settling Defendant's Indemnification of the United States.

a. The United States does not assume any liability by entering into this Consent Decree or by virtue of any designation of Settling Defendant as DOI's authorized representative under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). Settling Defendant shall indemnify, save and hold harmless the United States and its officials, agents, employees, contractors, subcontractors, or representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Settling Defendant, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this

Consent Decree, including, but not limited to, any claims arising from any designation of Settling Defendant as DOI's authorized representative under Section 104(e) of CERCLA. Further, Settling Defendant agrees to pay the United States all costs it incurs including, but not limited to, attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of Settling Defendant, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Consent Decree. The United States shall not be held out as a party to any contract entered into by or on behalf of Settling Defendant in carrying out activities pursuant to this Consent Decree. Neither Settling Defendant nor any such contractor shall be considered an agent of the United States.

b. The United States shall give Settling Defendant notice of any claim for which the United States plans to seek indemnification pursuant to Paragraph 57, and shall consult with Settling Defendant prior to settling such claim.

58. Settling Defendant covenants not to sue and agrees not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Settling Defendant shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Settling Defendant and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

59. No later than 15 days before commencing any on-Site Work, Settling

Defendant shall send to DOI a statement of self-insurance, following the form attached hereto as Appendix E, naming the United States as an additional insured with respect to all liability arising out of all activities performed by or on behalf of Settling Defendant pursuant to this Consent Decree and providing for commercial general liability insurance coverage with limits of $5,000,000, for any one occurrence, and automobile liability insurance coverage with limits of $1,000,000, combined single limit. The scope of the United States' coverage under PG&E's self insurance program, and the process for insurance claims submission and dispute resolution shall be specified in an Insurance Coverage and Claims Process Agreement between the Settling Defendant and the United States, attached hereto as Appendix F. In addition, for the duration of this Consent Decree, Settling Defendant shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Settling Defendant in furtherance of this Consent Decree. Prior to commencement of the Work under this Consent Decree, Settling Defendant shall provide to DOI, for Settling Defendant's contractor or subcontractors, certificates of such insurance. Settling Defendant shall resubmit, for Settling Defendant's contractor or subcontractors, such certificates each year on the anniversary of the Effective Date. If Settling Defendant demonstrates by evidence satisfactory to DOI that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Settling Defendant need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor through Settling Defendant's letter of self-insurance.

XVIII. FORCE MAJEURE

60. "Force majeure," for purposes of this Consent Decree, is defined as any event arising from causes beyond the control of Settling Defendant, of any

entity controlled by Settling Defendant, or of Settling Defendant's contractors, that delays or prevents the performance of any obligation under this Consent Decree despite Settling Defendant's best efforts to fulfill the obligation. The requirement that Settling Defendant exercises "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (1) as it is occurring and (2) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work or a failure to achieve the Performance Standards.

61. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree for which Settling Defendant intends or may intend to assert a claim of force majeure, Settling Defendant shall notify orally DOI's Project Manager or, in his or her absence, DOI's Alternate Project Manager within three working days of when Settling Defendant first knew that the event might cause a delay. Within seven days thereafter, Settling Defendant shall provide in writing to DOI an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Settling Defendant's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Settling Defendant, such event may cause or contribute to an endangerment to public health or welfare, or the environment. Settling Defendant shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. Settling Defendant shall be deemed to know of any circumstance of which Settling Defendant, any entity controlled by Settling Defendant, or Settling Defendant's contractors knew or should have known. Failure to comply with the above

requirements regarding an event shall preclude Settling Defendant from asserting any claim of force majeure regarding that event, provided, however, that if DOI, despite the late notice, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 60 and whether Settling Defendant has exercised its best efforts under Paragraph 60, DOI may, in its unreviewable discretion, excuse in writing Settling Defendant's failure to submit timely notices under this Paragraph.

62. If DOI agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this Consent Decree that are affected by the force majeure will be extended by DOI for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If DOI does not agree that the delay or anticipated delay has been or will be caused by a force majeure, DOI will notify Settling Defendant in writing of its decision. If DOI agrees that the delay is attributable to a force majeure, DOI will notify Settling Defendant in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

63. If Settling Defendant elects to invoke the dispute resolution procedures set forth in Section XIX (Dispute Resolution), it shall do so no later than 15 days after receipt of DOI's notice. In any such proceeding, Settling Defendant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Settling Defendant complied with the requirements of Paragraphs 60 and 61. If Settling Defendant carries this burden, the delay at issue shall be deemed not to be a violation by Settling Defendant of the affected obligation of this Consent Decree identified to DOI and the Court.

XIX. DISPUTE RESOLUTION

64. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes between the Parties regarding this Consent Decree. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of Settling Defendant that have not been disputed in accordance with this Section.

65. Any dispute regarding this Consent Decree shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed 30 days from the time the dispute arises, except as modified by written agreement of the parties to the dispute. The dispute shall be considered to have arisen when one party sends the other party a written Notice of Dispute.

a. In the event that the parties cannot resolve a dispute by informal negotiations, then the position advanced by DOI shall be considered binding unless, within 15 days after the conclusion of the informal negotiation period, Settling Defendant and DOI jointly determine to proceed with Alternative Dispute Resolution, with such mediation to be conducted pursuant to the International Institute for Conflict Prevention & Resolution Mediation Procedures, or the Mediation Process Agreement (attached hereto as Appendix G), as may be modified by agreement of the parties. Within 30 days of the parties' joint determination to proceed with Alternative Dispute Resolution, the parties shall select the mediator. If Alternative Dispute Resolution commences, such mediation shall be non-binding and shall not last longer than 30 days from the selection of the mediator unless extended by written agreement by both parties. If the dispute is resolved at the end of the mediation period, DOI shall provide a written statement of the joint resolution of the dispute to the Settling Defendant.

b. If agreement is not reached under informal negotiations and

DOI's position becomes binding, or if DOI provides a written statement of its final position after mediation, Settling Defendant shall begin to implement the activities required by the DOI decision no later than 30 days after the completion of the informal negotiations or after receipt of DOI's final position, unless formal dispute resolution is invoked. Except as specifically provided in this Section XIX, a dispute among the Parties under this Section shall not be cause for the delay of any work.

66. Statements of Position.

a. In the event that the parties cannot resolve a dispute by informal negotiations or mediation under the preceding Paragraphs, then the position advanced by DOI shall be considered binding unless, within 30 days after the conclusion of the informal negotiation period or the Alternative Dispute Resolution period, Settling Defendant invokes the formal dispute resolution procedures of this Section by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis or opinion supporting that position and any supporting documentation relied upon by Settling Defendant. The Statement of Position shall specify Settling Defendant's position as to whether formal dispute resolution should proceed under Paragraph 67 or Paragraph 68.

b. Within 15 days after receipt of Settling Defendant's Statement of Position, DOI will serve on Settling Defendant its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by DOI. DOI's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 67 or 68. Within 15 days after receipt of DOI's Statement of Position, Settling Defendant may submit a reply.

c. If there is disagreement between DOI and Settling Defendant as to whether dispute resolution should proceed under Paragraph 67 or 68, the parties

to the dispute shall follow the procedures set forth in the paragraph determined by DOI to be applicable. However, if Settling Defendant ultimately appeals to the Court to resolve the dispute, the Court shall determine which paragraph is applicable in accordance with the standards of applicability set forth in Paragraphs 67 and 68.

67. Record Review. Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation, the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by DOI under this Consent Decree, and the adequacy of the performance of response actions taken pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to allow any dispute by Settling Defendant regarding the validity of the ROD's provisions.

a. An administrative record of the dispute shall be maintained by DOI and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, DOI may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director, Office of Environmental Policy and Compliance ("OEPC"), DOI, will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 67.a. This decision shall be binding upon Settling Defendant, subject only to the right to seek judicial review pursuant to Paragraphs 67.c and 67.d.

c. Any administrative decision made by DOI pursuant to Paragraph 67.b. shall be reviewable by this Court, provided that a motion for

judicial review of the decision is filed by Settling Defendant with the Court and served on all Parties within 30 days of receipt of DOI's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Consent Decree. The United States may file a response to Settling Defendant's motion. Settling Defendant may file a reply after receipt of the United States' response, as currently authorized by the local rules of the Court.

d. In proceedings on any dispute governed by this Paragraph, Settling Defendant shall have the burden of demonstrating that the decision of the OEPC Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of DOI's decision shall be on the administrative record compiled pursuant to Paragraph 67.a.

68. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. Following receipt of Settling Defendant's Statement of Position submitted pursuant to Paragraph 66, the OEPC Director, DOI, will issue a final decision resolving the dispute. The Director's decision shall be binding on Settling Defendant unless, within 20 days of receipt of the decision, Settling Defendant files with the Court and serves on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the Consent Decree. The United States may file a response to Settling Defendant's motion.

b. Notwithstanding Paragraph L (CERCLA Section 113(j) Record Review of ROD and Work) of Section I (Background), judicial review of any

dispute governed by this Paragraph shall be governed by applicable principles of law.

69. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone, or affect in any way any obligation of Settling Defendant under this Consent Decree, not directly in dispute, unless DOI or the Court agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue, except as provided in Paragraphs 71(e) and (f), but payment shall be stayed pending resolution of the dispute as provided in Paragraph 76. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Consent Decree. In the event that Settling Defendant does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XX (Stipulated Penalties).

XX. STIPULATED PENALTIES

70. Settling Defendant shall be liable for stipulated penalties in the amounts set forth in Paragraph 71 to the United States for failure to comply with the requirements of this Consent Decree specified below, unless excused under Section XVIII (Force Majeure), or as otherwise provided herein. "Compliance" by Settling Defendant shall include completion of all payments and activities required under this Consent Decree, or any plan, report, or other deliverable approved under this Consent Decree, in accordance with all applicable requirements of law, this Consent Decree, the SOW, and any plans, reports, or other deliverables approved under this Consent Decree and within the specified time schedules established by and approved under this Consent Decree.

71. Stipulated Penalty Amounts.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 71.b:

Penalty Per Violation Per Day	Period of Noncompliance

$1,000	1st through 14th day
$2,000	15th through 30th day
$3,000	31st day and beyond

b. Compliance Milestones.

		Days to Complete following Notification issued pursuant to Paragraph 41
(1)	Final Remedial Design Work Plan	(45 days)
(2)	Final Remedial Design	(60 days)
(3)	Final Remedial Action Work Plan	(60 days)
(4)	Three to Five Compliance Milestones established in Remedial Action Work Plan Schedule	(Specified in RA Work Plan)
(5)	Construction Completion Report	(90 days)

c. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in 71.d.:

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 30th day
$1,000	31st day and beyond

d. Payment of Response Costs (60 days after receipt of bill)

e. Stipulated penalties under Paragraphs 71(a) and (b) and 72 shall not accrue, as provided in this Paragraph, if a court of competent jurisdiction orders Settling Defendant not to perform activities that are also required by the Selected Remedy at the Site. Settling Defendant shall notify DOI of such an order within 5 days of Settling Defendant's receipt of the order. If DOI agrees with Settling Defendant that the order prohibits Settling Defendant from performing activities required by the Selected Remedy, the Parties shall expeditiously seek

relief from this Court, or take such other action as the Parties, individually or collectively, deem appropriate. In the event that DOI disagrees with Settling Defendant's interpretation of such order, DOI will so inform Settling Defendant in writing. In the event Settling Defendant disputes DOI's determination, such dispute shall be initiated and resolved in accordance with Paragraph 68 of this Consent Decree. Notwithstanding Paragraph 73, stipulated penalties related to matters directly affected by such a dispute shall not begin to accrue until the completion of the dispute resolution process under Paragraph 68, and the stipulated penalties shall not be imposed if Settling Defendant's assertion of court direction not to perform activities is determined to be reasonable by the OEPC Director or the Court, as applicable.

f. In the event DOI and DTSC provide conflicting or inconsistent direction to Settling Defendant with regard to milestones identified in Paragraph 71(b), and Settling Defendant identifies such conflicts or inconsistencies pursuant to Paragraph III.C. of the DOI/DTSC MOU, stipulated penalties associated with any such milestone shall not accrue until either (i) the completion of the dispute resolution process established in Section III of the DOI/DTSC MOU, or (ii) the completion of the dispute resolution process under Paragraph 68 of the Consent Decree if Settling Defendant invokes such provision, whichever is later.

72. In the event that DOI assumes performance of a portion or all of the Work pursuant to Paragraph 83 (Work Takeover), Settling Defendant shall be liable for a stipulated penalty in the amount of $1,000,000, provided that such penalty shall accrue if DOI assumes performance of the Work, but such penalty is not payable until completion of the dispute resolution process provided for in Paragraph 68 of the Consent Decree or until a final order is issued by a court of competent jurisdiction. In any such proceeding, Settling Defendant may raise conflicting direction provided by DOI and DTSC that was not resolved and which made it impracticable for Settling Defendant to comply with both, as grounds for

contesting imposition of the stipulated penalty, and the stipulated penalty shall not be imposed if Settling Defendant's assertion of conflicting direction is determined to be reasonable by the OEPC Director or the court, as applicable. Stipulated penalties under this Paragraph are in addition to the remedies available under Paragraphs 49 (Funding for Work Takeover) and 83 (Work Takeover).

73. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Section XI (DOI Approval of Plans and Other Submissions), during the period, if any, beginning on the 31st day after DOI's receipt of such submission until the date that DOI notifies Settling Defendant of any deficiency; (b) with respect to a decision by the OEPC Director under Paragraph 67.b or 68.a of Section XIX (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that Settling Defendant's reply to DOI's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (c) with respect to judicial review by this Court of any dispute under Section XIX (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute. Nothing in this Consent Decree shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

74. Following DOI's determination that Settling Defendant has failed to comply with a requirement of this Consent Decree, DOI may give Settling Defendant written notification of the same and describe the noncompliance. DOI may send Settling Defendant a written demand for the payment of the penalties. Stipulated penalties shall accrue as provided in the preceding Paragraph regardless of whether DOI has notified Settling Defendant of a violation, except with respect

to violations associated with submissions of a document identified in Paragraph 71.b which is deficient. In such case, no stipulated penalties shall accrue until a notice of deficiency is provided by DOI.

75. All penalties accruing under this Section shall be due and payable to DOI within 30 days of Settling Defendant's receipt from DOI of a demand for payment of the penalties, unless Settling Defendant invokes the Dispute Resolution procedures under Section XIX (Dispute Resolution) within the 30-day period. All payments to DOI under this Section shall indicate that the payment is for stipulated penalties, and shall be made in accordance with Paragraphs 54 (Payment Instructions).

76. Penalties shall continue to accrue as provided in Paragraph 73 during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement of the Parties or by a decision of DOI that is not appealed to this Court, accrued penalties determined to be owed shall be paid to DOI within 15 days of the agreement or the receipt of DOI's decision or order;

b. If the dispute is appealed to this Court and the United States prevails in whole or in part, Settling Defendant shall pay all accrued penalties determined by the Court to be owed to DOI within 60 days of receipt of the Court's decision or order, except as provided in Paragraph 76.c;

c. If the District Court's decision is appealed by any Party, Settling Defendant shall pay all accrued penalties determined by the District Court to be owed to DOI into an interest-bearing escrow account within 60 days of receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days of receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to DOI or to Settling Defendant to the extent that they prevail.

77. If Settling Defendant fails to pay stipulated penalties when due,

Settling Defendant shall pay Interest on the unpaid stipulated penalties as follows: (a) if Settling Defendant has timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to Paragraph 76 until the date of payment; and (b) if Settling Defendant fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 75 until the date of payment. If Settling Defendant fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

78. The payment of penalties and Interest, if any, shall not alter in any way Settling Defendant's obligation to complete the performance of the Work required under this Consent Decree.

79. Nothing in this Consent Decree shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of Settling Defendant's violation of this Consent Decree or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), provided, however, that the United States shall not seek civil penalties pursuant to Section 122(*l*) of CERCLA for any violation for which a stipulated penalty is collected pursuant to this Consent Decree.

80. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Decree.

XXI. COVENANTS BY FEDERAL AGENCIES

81. Covenants for Settling Defendant by the Federal Agencies. In consideration of the actions that will be performed and the payments that will be made by Settling Defendant under this Consent Decree, and except as specifically provided in Paragraph 82 of this Section, the Federal Agencies covenant not to sue

or to take administrative action against Settling Defendant pursuant to Sections 106 and 107(a) of CERCLA for the Work and Response Costs. These covenants shall take effect on the Effective Date. These covenants are conditioned upon the satisfactory performance by Settling Defendant of its obligations under this Consent Decree. These covenants extend only to Settling Defendant and do not extend to any other person.

82. General Reservations of Rights. The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling Defendant with respect to all matters not expressly included within Plaintiff's covenant. Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against Settling Defendant with respect to:

a. claims based on a failure by Settling Defendant to meet a requirement of this Consent Decree;

b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Site;

c. liability based on the ownership or operation of the Site or any portion thereof by Settling Defendant when such ownership or operation commences after signature of this Consent Decree;

d. liability based on Settling Defendant's transportation, treatment, storage, or disposal, or the arrangement for the transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, other than as provided in the ROD, the Work, or otherwise ordered by DOI after signature of this Consent Decree;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. criminal liability;

g. liability for violations of federal or state law which occur during or after implementation of the Work;

h. liability, prior to achievement of Performance Standards in accordance with Paragraph 14, for additional response actions that DOI determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, but that cannot be required pursuant to Paragraph 15 (Modification of SOW or Related Work Plans);

i. liability for additional operable units at the Site or the final response action;

j. liability for costs that the United States will incur regarding the Site but which are not within the definition of Response Costs;

k. liability for costs incurred or to be incurred by United States' agencies, other than the Federal Agencies, regarding the Site.

83. Work Takeover.

a. In the event DOI determines that Settling Defendant (1) has ceased implementation of any portion of the Work, or (2) is seriously or repeatedly deficient or late in its performance of the Work, or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, DOI may issue a written notice ("Work Takeover Notice") to Settling Defendant. Any Work Takeover Notice issued by DOI will specify the grounds upon which such notice was issued and will provide Settling Defendant a period of ten days within which to remedy the circumstances giving rise to DOI's issuance of such notice. DOI shall coordinate with DTSC, as specified in the DOI/DTSC MOU, prior to any Work Takeover.

b. If, after expiration of the ten-day notice period specified in Paragraph 83.a, Settling Defendant has not remedied to DOI's satisfaction the circumstances giving rise to DOI's issuance of the relevant Work Takeover Notice, DOI may at any time thereafter assume the performance of all or any portion(s) of the Work as DOI deems necessary ("Work Takeover"). DOI will notify Settling Defendant in writing (which writing may be electronic) if DOI determines that

implementation of a Work Takeover is warranted under this Paragraph 83.b. Funding of Work Takeover costs is addressed under Paragraph 49.

c. Settling Defendant may invoke the procedures set forth in Paragraph 67 (Record Review), to dispute DOI's implementation of a Work Takeover under Paragraph 83.b. However, notwithstanding Settling Defendants' invocation of such dispute resolution procedures, and during the pendency of any such dispute, DOI may in its sole discretion commence and continue a Work Takeover under Paragraph 83.b until the earlier of (1) the date that Settling Defendant remedies, to DOI's satisfaction, the circumstances giving rise to DOI's issuance of the relevant Work Takeover Notice, or (2) the date that a final decision is rendered in accordance with Paragraph 67 (Record Review) requiring DOI to terminate such Work Takeover.

84. Notwithstanding any other provision of this Consent Decree, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANTS BY SETTLING DEFENDANT

85. Covenant Not to Sue by Settling Defendant. Subject to the reservations in Paragraph 87, Settling Defendant covenants not to sue and agrees not to assert any claims or causes of action against the United States with respect to the Work, past response actions regarding the Site, Response Costs, and this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund (established pursuant to the Internal Revenue Code, 26 U.S.C. § 9507) through CERCLA Sections 106(b)(2), 107, 111, 112, 113 or any other provision of law;

b. any claims against the United States, including any department, agency or instrumentality of the United States under CERCLA Sections 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Work,

past response actions or response costs regarding the Site, Response Costs, and this Consent Decree; or

c. any claims arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law.

86. Except as provided in Paragraph 93 (Res Judicata and Other Defenses), the covenants in this Section shall not apply if the United States brings a cause of action or issues an order pursuant to any of the reservations in Section XXI (Covenants by Plaintiffs), other than in Paragraphs 82.a (claims for failure to meet a requirement of the Decree), 82.f (criminal liability), and 82.g (violations of federal/state law during or after implementation of the Work), but only to the extent that Settling Defendant's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

87. Settling Defendant reserves, and this Consent Decree is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on DOI's selection of response actions, or the oversight or approval of Settling Defendant's plans, reports, other deliverables or activities.

88. Nothing in this Consent Decree shall be deemed to constitute preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXIII. EFFECT OF SETTLEMENT; CONTRIBUTION

89. Nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Decree. Each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action which each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto. Nothing in this Consent Decree diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

90. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and that Settling Defendant is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for "matters addressed" in this Consent Decree. The "matters addressed" in this Consent Decree are the Work and Response Costs.

91. Settling Defendant shall, with respect to any suit or claim brought by it for matters related to this Consent Decree, notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

92. Settling Defendant shall, with respect to any suit or claim brought against it for matters related to this Consent Decree, notify in writing the United States within ten days of service of the complaint on such Settling Defendant. In

addition, Settling Defendant shall notify the United States within ten days of service or receipt of any Motion for Summary Judgment and within ten days of receipt of any order from a court setting a case for trial.

93. Res Judicata and Other Defenses. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, Settling Defendant shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in Section XXI (Covenants by Plaintiffs).

XXIV. ACCESS TO INFORMATION

94. Settling Defendant shall provide to DOI, upon request, copies of all non-identical final (or last draft where no final document is available) records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) relating to past activities giving rise to its liability under CERCLA with respect to the Site or its performance of Work to design and implement the Selected Remedy, sampling analyses, laboratory analyses and supporting documentation, chain of custody records, manifests, trucking logs, receipts, reports, correspondence, or other documents, information, or data generated regarding the Work (hereinafter referred to as "Records") within its possession or control, or that of its contractors or agents. Settling Defendant shall also make available to DOI, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

95. Business Confidential and Privileged Documents.

a. Settling Defendant may assert business confidentiality claims covering part or all of the Records submitted to Plaintiff under this Consent Decree to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Records determined to be confidential by DOI will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to DOI , or if DOI has notified Settling Defendant that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Settling Defendant.

b. Settling Defendant may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendant asserts such a privilege in lieu of providing Records, it shall provide Plaintiff with the following: (1) the title of the Record; (2) the date of the Record; (3) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (4) the name and title of each addressee and recipient; (5) a description of the contents of the Record; and (6) the privilege asserted by Settling Defendant. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendant shall retain all Records that it claims to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendant's favor.

c. No Records created or generated pursuant to the requirements of this Consent Decree shall be withheld from the United States on the grounds that they are privileged or confidential.

96. No claim of confidentiality or privilege shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring,

hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XXV. RETENTION OF RECORDS

97. Until ten years after Settling Defendant's receipt of DOI's notification pursuant to Paragraph 51.b of Section XIV (Certification of Completion), Settling Defendant shall preserve and retain all Records (including Records in electronic form) now in its possession or control or which come into its possession or control. Settling Defendant must also instruct its contractors and agents to preserve, for the same period of time specified above, all Records (including Records in electronic form) now in its possession or control or which come into its possession or control. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

98. At the conclusion of this record retention period, Settling Defendant shall notify the United States at least 90 days prior to the destruction of any such Records, and, upon request by the United States, Settling Defendant shall deliver any such Records to DOI. Settling Defendant may assert that certain Records are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Settling Defendant asserts such a privilege, it shall provide the United States with the following: (a) the title of the Record; (b) the date of the Record; (c) the name, title, affiliation (e.g., company or firm), and address of the author of the Record; (d) the name and title of each addressee and recipient; (e) a description of the subject of the Record; and (f) the privilege asserted by Settling Defendant. If a claim of privilege applies only to a portion of a Record, the Record shall be provided to the United States in redacted form to mask the privileged portion only. Settling Defendant shall retain all Records that it claims to be privileged until the United States has had a reasonable opportunity to dispute the privilege claim and any such dispute has been resolved in the Settling Defendant's favor. However, no Records created or generated pursuant to the requirements of

this Consent Decree shall be withheld on the grounds that they are privileged or confidential.

99. Settling Defendant certifies that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since the earlier of notification of potential liability by the United States or the State or the filing of suit against it regarding the Site and that it has fully complied with any and all DOI requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XXVI. NOTICES AND SUBMISSIONS

100. Whenever, under the terms of this Consent Decree, written notice is required to be given or a report or other document is required to be sent by one Party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing or unless the Parties agree in writing to an alternate method of written notice, including via electronic transmission. All notices and submissions shall be considered effective upon receipt, unless otherwise provided. Written notice as specified in this Section shall constitute complete satisfaction of any written notice requirement of the Consent Decree with respect to the United States, DOI, and Settling Defendant, respectively. Notices required to be sent to DOI, and not to the United States, under the terms of this Consent Decree should not be sent to the U.S. Department of Justice.

As to the United States:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division

U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611

Re: DJ # 90-11-3-07240/4

As to DOI:

Pamela Innis
DOI Remedial Project Manager,
Office of Environmental Policy and Compliance

Department of the Interior
Denver Federal Center
P.O. Box 25007, MS D108
Denver, CO 80225-0007

Casey S. Padgett, Esq.
Assistant Solicitor
Office of the Solicitor
1849 C Street, NW, MS 5530
Washington, D.C. 20240

As to the Fund Manager:

Courtney Hoover
Central Hazardous Materials Fund
Department of the Interior
1849 C Street, N.W., Mail Stop 2342
Washington, D.C. 20240

As to Settling Defendant:

Yvonne Meeks
PG&E's Project Manager
4325 South Higuera Street
San Luis Obispo, CA 93401

Juan M. Jayo
PG&E Law Department
P.O. Box 7442
San Francisco, CA 94120

XXVII. RETENTION OF JURISDICTION

101. This Court retains jurisdiction over both the subject matter of this Consent Decree and Settling Defendant for the duration of the performance of the terms and provisions of this Consent Decree for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief

as may be necessary or appropriate for the construction or modification of this Consent Decree, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIX (Dispute Resolution).

XXVIII. APPENDICES

102. The following appendices are attached to and incorporated into this Consent Decree:

"Appendix A" is the ROD.

"Appendix B" is the description and/or map of the Site.

"Appendix C" is the SOW.

"Appendix D" is the performance guarantee.

"Appendix E" is the form of the Statement of Self-Insurance

"Appendix F" is the Insurance Coverage and Claims Process Agreement

"Appendix G" is the Mediation Process Agreement

XXIX. COMMUNITY RELATIONS

103. If requested by DOI, Settling Defendant shall participate in community relations activities pursuant to the Community Involvement Plan developed by DOI. DOI will determine the appropriate role for Settling Defendant under the Plan. Settling Defendant shall also cooperate with DOI in providing information regarding the Work to the public. As requested by DOI, Settling Defendant shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by DOI to explain activities at or relating to the Site. Costs incurred by the United States under this Section, including the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e), shall be considered Response Costs that Settling Defendant shall pay pursuant to Section XVI (Payments for Response Costs).

XXX. MODIFICATION

104. Except as provided in Paragraph 15 (Modification of SOW or Related

Work Plans), material modifications to this Consent Decree, including the SOW, shall be in writing, signed by the United States and Settling Defendant, and shall be effective upon approval by the Court. Except as provided in Paragraph 15 (Modification of SOW or Related Work Plans), non-material modifications to this Consent Decree, including the SOW, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and Settling Defendant.

105. Nothing in this Consent Decree shall be deemed to alter the Court's power to enforce, supervise or approve modifications to this Consent Decree.

XXXI. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

106. This Consent Decree shall be lodged with the Court for a period of not less than 30 days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations which indicate that the Consent Decree is inappropriate, improper, or inadequate. Settling Defendant consents to the entry of this Consent Decree without further notice.

107. If for any reason the Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXXII. SIGNATORIES/SERVICE

108. The undersigned representative of Settling Defendant to this Consent Decree and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such Party to this document.

109. Settling Defendant agrees not to oppose entry of this Consent Decree

by this Court or to challenge any provision of this Consent Decree unless the United States has notified Settling Defendant in writing that it no longer supports entry of the Consent Decree.

110. Settling Defendant shall identify, on the attached signature page, the name, address and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendant agrees to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including, but not limited to, service of a summons. Settling Defendant need not file an answer to the complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXXIII. FINAL JUDGMENT

111. This Consent Decree and its appendices constitute the final, complete, and exclusive agreement and understanding among the Parties regarding the settlement embodied in the Consent Decree. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Decree.

112. Upon entry of this Consent Decree by the Court, this Consent Decree shall constitute a final judgment between and among the United States and Settling Defendant. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

IT IS SO ORDERED.

Dated: November 21, 2013

By: _____

HON. BEVERLY REID O'CONNELL
United States District Court Judge

FOR THE UNITED STATES OF AMERICA:

11/1/12
Date

/s/ Ingnacia S. Moreno
IGNACIA S. MORENO
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

1/10/13
Date

/s/ Karl J. Fingerhood
KARL J. FINGERHOOD
Trial Attorney,
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611

7/25/12
Date

/s/ Laura Brown
LAURA BROWN
Associate Solicitor
United States Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

7/18/12
Date

/s/ Casey S. Padgett
CASEY S. PADGETT
Assistant Solicitor
United States Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

7/25/12
Date

/s/ Willie R. Taylor
WILLIE R. TAYLOR, Ph.D.
Director
Office of Environmental Policy and Compliance
United States Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

FOR PACIFIC GAS & ELECTRIC COMPANY

7/3/12
Date

/s/ Desmond Bell
Desmond Bell
Sr. Vice President Shared Services
Pacific Gas and Electric Company
32nd Floor
77 Beale Street
San Francisco, CA 94105

7/3/12

/s/ Juan Martin Jayo
Juan Martin Jayo
Director of Environmental Litigation
Pacific Gas & Electric Co., Law Dept.
P.O. Box 7442
San Francisco, CA 94120

Agent Authorized to Accept Service on Behalf of Above-Signed Party:

Juan Martin Jayo
Director of Environmental Litigation
Pacific Gas & Electric Co., Law Dept.
P.O. Box 7442
San Francisco, CA 94120
Jmj8@pge.com

Groundwater Record of Decision

Pacific Gas and Electric Company Topock Compressor Station, Needles, San Bernardino County, California

December 2010

U.S. Department of the Interior

Office of Environmental Policy and Compliance

This page intentionally left blank.

Groundwater Record of Decision

Table of Contents

This page intentionally left blank.

Groundwater Record of Decision
SWMU 1/AOC 1 and AOC 10
PG&E Topock Compressor Station
Needles, San Bernardino County, California

Part 1: Declaration

United States Department of the Interior

PART I: THE DECLARATION

A. Site Name and Location

Site Name: Pacific Gas and Electric Company (PG&E) Topock Compressor Station,

CERCLIS Identification Number: CAT080011729

Location: San Bernardino County, California (*See Part 2 – Figure 1*)

B. Statement of Basis and Purpose

This decision document ("Record of Decision" or "ROD") presents the Remedial Action ("Selected Remedy") addressing groundwater contamination resulting from past disposal practices at the PG&E Topock Compressor Station in San Bernardino County, California. The Selected Remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). The Selected Remedy was chosen by the United States Department of the Interior ("DOI") on behalf of the U.S. Fish and Wildlife Service ("USFWS"), the Bureau of Land Management ("BLM"), and the Bureau of Reclamation ("Reclamation") (collectively the "Federal Agencies") pursuant to the Federal Agencies' CERCLA lead agency authorities. This decision is based on the Administrative Record file for this site.

The State of California Environmental Protection Agency, Department of Toxic Substances Control ("DTSC"), concurs with the Selected Remedy. DTSC reviewed all site-related documents and identified its preferred alternative in DTSC's draft Statement of Basis. DOI and DTSC have coordinated fully in the selection of a final remedial action and the State concurs with the Selected Remedy.

C. Assessment of Site

The Selected Remedy presented in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Specifically, concentrations of total chromium ("Cr (T)") in groundwater are greater than federal and California regulatory standards and concentrations of hexavalent chromium ("Cr (VI)") in groundwater exceed background levels. The groundwater risk assessment has concluded that Cr (VI) is present in groundwater at concentrations that pose an unacceptable risk to human health if the groundwater were to be used as a drinking water source.

D. Description of Selected Remedy

The Selected Remedy was identified as "Alternative E – In Situ Treatment with Fresh Water Flushing" in the Corrective Measures Study/Feasibility Study ("CMS/FS") conducted for the site (*See Part 2 – Figure 2*). The Selected Remedy includes:

- Construction of an In-Situ Reactive Zone ("IRZ") along National Trails Highway using a line of wells that may be used as both injection and extraction wells to circulate groundwater and distribute an organic carbon source to promote bacteriological reduction of the Cr (VI) to trivalent chromium ("Cr (III)").
- Flushing accomplished through a combination of potable water injection and injection of carbon amended water in wells upgradient of the plume.
- Extraction wells near the Colorado River to provide hydraulic capture of the plume, accelerate cleanup of the floodplain, and enhance the flow of contaminated groundwater through the IRZ line.
- Bedrock extraction wells in the eastern (downgradient) end of the East Ravine to provide hydraulic capture of contaminated groundwater in bedrock. Extracted water will be treated and managed using the same active treatment system that will be used to treat and manage contaminated groundwater extracted from the Alluvial Aquifer.
- Institutional controls to restrict surface land uses and prevent the use of groundwater.
- Monitored natural attenuation as *a long term* component to address residual Cr (VI) that may remain in recalcitrant portions of the aquifer after *in-situ* treatment.

A more detailed description of the Selected Remedy is presented in Section L of the Decision Summary of this ROD.

E. Statutory Determinations

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

The Selected Remedy also satisfies the statutory preference for treatment as a principal element of the remedy.

Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unrestricted use, a statutory review will be conducted within five years after initiation of remedial action, and every five years thereafter until cleanup standards are achieved to ensure that the remedy is, or will be, protective of human health and the environment.

PG&E Topock Compressor Station – Groundwater ROD

G. Data Certification Checklist

The following information is included in the Record of Decision:

1. Chemicals of concern ("COCs") and their respective concentrations.....Section G
2. Baseline risk represented by the COCs.....Section G
3. Cleanup levels established for COCs and the basis for these levels.....Section H
4. How source materials constituting principal threats will be addressed....Section D
5. Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD.....Section F
6. Potential land and groundwater use that will be available at the site as a result of the Selected Remedy.....Section F
7. Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.....Section L
8. Key factor(s) that led to selecting the remedy.....Section L

H. Authorizing Signature

Rhea S. Suh
Assistant Secretary for Policy, Management and Budget
U.S. Department of the Interior

1/20/11
Date

Groundwater Record of Decision
PG&E Topock Compressor Station
Needles, California

Part 2: Decision Summary

United States Department of the Interior

PART 2: THE DECISION SUMMARY

The Decision Summary describes the Selected Remedy, explains how the remedy fulfills statutory and regulatory requirements, and provides a substantive summary of the Administrative Record file that supports the remedy selection decision.

A. Site Name, Location, and Description

Pacific Gas and Electric Company ("PG&E") Topock Compressor Station, Needles, CA

The PG&E Topock Compressor Station (the "Compressor Station") is located adjacent to the Colorado River in eastern San Bernardino County, California, approximately 12 miles southeast of Needles, California, south of Interstate 40, in the north end of the Chemehuevi Mountains [*See Figure 1*]. The Compressor Station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. The PG&E property is surrounded by the Havasu National Wildlife Refuge (the "Refuge") and lies directly south of land managed by BLM and under the jurisdiction of the DOI [*See Figure 2*].

The Compressor Station is not listed as a National Priorities List ("NPL") site. The site is listed in the U.S. Environmental Protection Agency's ("EPA") Comprehensive Environmental Response, Compensation and Liability Information System – CERCLIS EPA ID No. CAT080011729.

B. Site History and Enforcement Activities

PG&E began operations at the Compressor Station in December 1951 to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California. Historic records indicate that PG&E held rights to operate a gas pipeline and compressor station dating back to the Federal Act of 2/25/1920 (41 Stat. 449, as amended). Based on available title records, PG&E gained full ownership of the land in 1965.

Current operations at the Compressor Station are very similar to the operations that occurred from the start of facility operations in 1951. The operations consist of six major activities: compression of natural gas, cooling of the compressed natural gas and compressor lubricating oil, water conditioning, wastewater treatment, facility and equipment maintenance, and miscellaneous operations. The greatest use of chemical products involves treatment of cooling water, and the greatest volume of waste produced consists of blowdown from the cooling towers.

From 1951 to 1985, Cr (VI) based corrosion inhibitors and biocides were added to the cooling water. Several different corrosion inhibitors were used during this period; however, all are believed to have contained Cr (VI). Product specification sheets available for one of the additives indicate that it contained 30 percent sodium chromate.

In the early 1960s, a separate biocide containing Cr (VI) was also apparently added to assist in the control of algae, fungi, and/or bacteria.

Until approximately 1970, cooling tower blowdown was discharged directly into percolation beds located in Bat Cave Wash, an unlined arroyo immediately west of the Compressor Station, and either percolated into the ground or evaporated at the surface. Wastewater discharged to percolation beds consisted primarily of cooling tower blowdown (about 95%) and a minor volume of effluent from an oil/water separator and other facility maintenance operations (about 5%). Beginning in 1964, PG&E treated the cooling tower blowdown to remove chromium prior to discharge. Around 1970, PG&E began discharging treated cooling tower blowdown to four single-lined evaporation ponds located approximately ½ mile southwest of the Compressor Station. PG&E replaced the Cr (VI)-based cooling water treatment products with phosphate-based products in 1985. Use of the four, single-lined evaporation ponds continued until 1989. In 1989, the single-lined ponds were replaced with four new, Class II (double-lined) ponds, located approximately 1.2 miles to the northwest. The cooling tower blowdown treatment system and the single-lined ponds were physically removed and clean-closed from 1988 to 1993. The four Class II double-lined ponds, which are on BLM-managed property, are still in use and are operated pursuant to a permit issued by the State of California Regional Water Quality Control Board, Colorado River Basin Region (PG&E 2009).

Previous Groundwater Actions

In 1988, PG&E completed a soil investigation in the Bat Cave Wash area at the request of the California Department of Health Services (now known as DTSC) and the EPA. The soil investigation documented chromium releases to the environment. In 1989, a "Comprehensive Ground Water Monitoring Evaluation" prepared by the California Regional Water Quality Control Board identified chromium releases in groundwater.

By letter dated May 29, 1995, PG&E reported the presence of chromium in groundwater samples taken on the east side of Bat Cave Wash near the north boundary of the PG&E facility. In response, on February 26, 1996, DTSC and PG&E executed a Corrective Action Consent Agreement ("CACA") pursuant to State law under which DTSC directed PG&E to perform a "RCRA Facility Investigation" ("RFI") and a Corrective Measures Study ("CMS") as well as certain "Interim Measures" determined to be necessary to address immediate or potential threats to human health and/or the environment.

In 2003, the Federal Agencies notified PG&E that it was a potentially responsible party ("PRP") pursuant to Section 107 of CERCLA, 42 U.S.C. § 9607, as an owner and operator of a facility from which hazardous substances had been released into the environment. As the CERCLA lead agency for land under its jurisdiction, custody, or control, DOI initiated negotiations with PG&E on an administrative order by which PG&E would implement a remedial investigation and feasibility study ("RI/FS") and other response actions pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604. In July of 2005, the Federal Agencies and PG&E entered into an Administrative Consent

Agreement under which PG&E agreed to implement an RI/FS and certain removal actions, as directed and approved by the Federal Agencies, to protect public health or welfare or the environment from hazardous substances on or under land under the Federal Agencies jurisdiction. Pursuant to the terms of the Administrative Consent Agreement, the parties agreed to coordinate, to the extent practicable, CERCLA response actions with actions required by DTSC pursuant to the requirements of the CACA. In particular, the parties agreed to coordinate the CERCLA RI/FS with the RFI and CMS required under the CACA, and to coordinate any CERCLA removal actions selected by DOI with any Interim Measures required by DTSC.

In the course of the groundwater investigation at the site, PG&E has documented an extensive plume of groundwater contaminated with Cr (VI) that stretches from the PG&E facility under the Refuge and lands managed by BLM toward the Colorado River. On February 3, 2004, PG&E reported concentrations of Cr (VI) of 111 parts per billion ("ppb") in groundwater taken from monitoring well MW34-80 located on BLM-managed property within 100 feet of the Colorado River.

Based on this finding, DTSC ordered PG&E to prepare and submit Interim Measures ("IM") Work Plan No. 2 ("IM No. 2") "to immediately begin pumping, transport and disposal of groundwater from existing monitoring wells at the MW20 cluster." These monitoring wells located on or near the "MW20 bench" are on BLM-managed lands. By Action Memorandum issued March 3, 2004, BLM selected a time-critical removal action under CERCLA and directed PG&E to implement this action, consistent with IM No. 2, to prevent or abate the release of Cr (VI) into the Colorado River. The scope of this removal action was to extract contaminated groundwater from existing or, if necessary, new wells to maintain a landward hydraulic gradient and ensure that Cr (VI) did not reach the Colorado River.

On May 20, 2004, BLM issued a second Action Memorandum selecting a subsequent time-critical removal action and authorizing PG&E to operate, for a limited period of time, a batch treatment system on the MW20 bench. The purpose of this removal action was to reduce the volume of hazardous waste being shipped offsite by allowing treatment of contaminated groundwater onsite prior to offsite transport and disposal as non-hazardous waste.

On September 17, 2004, BLM issued a third Action Memorandum, in coordination with DTSC, authorizing PG&E to install conveyance piping, monitoring wells, and associated needed improvements to roads to facilitate the implementation of a larger-scale groundwater treatment system (known as "IM No. 3") that DTSC directed PG&E to install and operate on land acquired by PG&E.

C. Community Participation

Community Involvement Plan

The Federal Agencies prepared and issued a Community Involvement Plan ("CIP") in accordance with the requirements of CERCLA and the NCP, and the CIP is included in the Administrative Record file and information repositories. The CIP serves as a guide for DOI to inform, include, and engage community members, environmental groups, government officials, the media, and other interested parties in the environmental assessment and cleanup activities at this Site.

The Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 2 - Hydrogeological Characterization and Results of Groundwater and Surface Water Investigations Report ("RFI/RI Report") was made available to the public in February 2009. The Final Groundwater Corrective Measures Study/Feasibility Study Report for SWMU 1/AOC 1 and AOC 10 ("CMS/FS Report") was made available to the public in December 2009. These documents are included in the Administrative Record and may be found in the information repositories maintained at the Needles Public Library, Lake Havasu City Library, Parker Public Library, Chemehuevi Indian Reservation, Colorado River Indian Tribes Public Library, and the Golden Shores/Topock Station Library.

The Proposed Plan identifying the Federal Agencies preferred alternative was issued for public review and comment on June 4, 2010. The public comment period was held from June 4, 2010 to July 19, 2010. Public meetings to present the Proposed Plan and to solicit oral and written public comments were held on June 22 at the Parker Community/Senior Center in Parker California, on June 23 at the Lake Havasu Aquatic Center in Lake Havasu City, Arizona, on June 29 at the Needles High School in Needles, California, and on June 30 at the Topock Elementary in Topock, Arizona.

Comments received from the public and DOI's responses to those comments are included within the Responsiveness Summary of this ROD (Part 3).

Coordination with DTSC Community Outreach

In addition to specific community involvement activities regarding the evaluation of a preferred alternative, DOI has and will continue to coordinate with DTSC on the following site-specific community participation activities.

- Participation in the Consultative Workgroup ("CWG")

The CWG is an outreach effort initiated by DTSC in 2000. The CWG is made up of representatives of agencies and stakeholders interested in participating in the investigation of Site contamination and development and evaluation of measures to protect human health and the Colorado River and surrounding environment. The CWG

meets regularly to discuss project activities and plans. The Federal Agencies have participated in the CWG since 2003.

- Participation in the Clearinghouse Task Force ("CTF")

The CTF was formed by DTSC in 2008 to develop and implement processes and tools to improve communications and enhance stakeholder understanding of project technical and regulatory information. The goal is to foster timely and effective project management and decision making for the final remedy. The CTF communicates progress to the Topock Leadership Partnership and the CWG, and integrates feedback and direction from these groups into process improvement efforts.

- Communication with Tribal Leadership and Senior Management of Stakeholders at Key Decision Points

DTSC and DOI have implemented a process to reach out to affected tribes and stakeholders to engage tribal leaders and senior management at key decision points in the cleanup process. The Topock Leadership Partnership ("TLP") comprises senior officials (or their authorized representatives) acting in their official capacities. The purpose of the TLP is to exchange information relating to the development, evaluation, selection, and implementation of remedial and corrective action at the Topock site.

Tribal Consultation

Nine federally-recognized Native American tribes - the Chemehuevi Indian Tribe, Cocopah Tribe of Arizona, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Havasupai Indian Tribe, Hualapai Indian Tribe, Quechan Tribe of the Fort Yuma Indian Reservation, Twenty-Nine Palms Band of Mission Indians, and Yavapai-Prescott Tribe (hereinafter "the tribes") - have ties to the area in which the Selected Remedy will be implemented. The federal government has a trust responsibility to these tribes and has consulted with the tribes on the CERCLA RI, the CERCLA FS, and the Proposed Plan, including on a government-to-government basis throughout the groundwater remedy selection process. The BLM also represents the Federal Agencies for purposes of consulting with the tribes pursuant to Section 106 of the National Historic Preservation Act ("NHPA"), and other federal laws and Executive Orders, concerning potential adverse effects on cultural and historic properties that may result from the Selected Remedy.

As the development of CERCLA remedial action alternatives was initiated, the BLM determined that the evaluation, selection, and implementation of a groundwater remedy for the Topock site constitutes an "undertaking" as defined by the NHPA. The NHPA Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agencies and other parties, including tribes. The goal of the consultation is to identify historic properties potentially affected by the undertaking, assess the undertaking's effects, and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

In 2008, the BLM initiated consultation with the tribes, the Advisory Council on Historic Preservation ("ACHP"), the California State Historic Preservation Office ("SHPO"), the Arizona SHPO, and PG&E to develop a Programmatic Agreement ("PA"), as described in 36 CFR §800.14(b), to establish a management framework for consultation under the NHPA. The PA was determined by the parties to be an appropriate vehicle for fulfilling Section 106 consultation responsibilities given the long term nature of remedial action addressing groundwater at the site and the anticipated need to provide for ongoing consultation as new information is developed through the design and implementation of remedial action.

On March 11, 2010, BLM initiated consultation with nine tribes concerning the DOI Proposed Plan. The Proposed Plan was provided to all Topock Project Tribal Executives, Tribal Cultural Resource Management Staff, and California and Arizona SHPO in advance of that public review and comment period as part of the ongoing tribal government consultation for the CERCLA remedy selection undertaking. Tribal comments were accepted through July 19, 2010. Responses to the tribal comments are also included within the Responsiveness Summary of this ROD.

In November of 2010, the BLM, USFWS, ACHP, the SHPOs, and PG&E executed a PA. In developing the PA, the signatories, in consultation with the tribes, determined that the Selected Remedy has the potential to adversely affect historic properties that have been listed in or determined eligible for the National Register of Historic Places, including, but not limited, to the Topock Maze (Locus A), portions of US Route 66, the Atlantic and Pacific Railroad Right-of-Way, certain archaeological sites, as well as certain geoglyphs. The signatories also determined that historic and cultural properties on public lands administered by BLM and the Havasu National Wildlife Refuge managed by USFWS are subject to the requirements of the NHPA, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, and applicable Executive Orders concerning consultation regarding the protection of sensitive cultural and historic resources.

The PA recognizes that adverse effects to cultural and historic properties resulting from implementation of the Selected Remedy should be avoided, minimized, or mitigated to the extent practicable, provided that the Selected Remedy protects human health and the environment, attains applicable or relevant and appropriate requirements ("ARARs"), and complies fully with all CERCLA and NCP requirements. In the CMS/FS Report, DOI determined that substantive mitigation measures identified through consultation and adopted by DOI were ARARs that would need to be attained by any remedy selected for the site.

While certain measures contained in the PA to protect cultural and historic properties are unrelated to the CERCLA cleanup or otherwise exceed what is required of the Selected Remedy to satisfy ARARs, the PA does identify certain mitigation measures to mitigate adverse effects resulting from the Selected Remedy that are ARARs. For example, the PA provides that existing monitoring wells and related facilities will be used in

implementing the Selected Remedy to the extent practicable, and that new facilities will be placed in areas already disturbed, to the extent practicable and consistent with protecting human health and the environment and achieving cleanup objectives in a timely manner. The PA also provides that if the Selected Remedy affects a previously unidentified cultural or historic resource, including human remains or associated funerary objects or graves, work in the immediate vicinity of the discovery will cease until a resolution is determined of how to treat the discovery. The PA requires BLM to notify the tribes and parties to the PA of the nature and location of the discovery and to implement appropriate measures to protect the discovery from further disturbance until treatment of the discovery is resolved.

In addition, the PA requires, to the extent practicable, that areas, excluding the Topock Compressor Station and related facilities, affected by implementation of the Selected Remedy be restored to conditions that existed prior to implementation of CERCLA response actions at the site once site remedial action objectives are attained. Specifically, the PA provides that facilities related to the Selected Remedy be removed as soon as practicable upon a determination by DOI that removal of such facilities is protective of human health and the environment. The PA specifies that the removal of such facilities take place along existing graded roads to the extent practicable, in consultation with the tribes and the parties to the PA.

Finally, the PA recognizes that, because the final design of the Selected Remedy will differ from, or include greater detail than, its conceptual design, ongoing consultation with the tribes, PG&E, the SHPOs, and the ACHP will be necessary. Toward that end, the PA establishes a consultation protocol that will be utilized to implement consultation with the tribes and other parties as the Selected Remedy is designed and implemented to identify additional potential adverse effects on cultural and historic properties and evaluate means to avoid, minimize, or mitigate such effects.

D. Scope and Role of Response Action

DTSC is the state lead agency overseeing cleanup at the Compressor Station pursuant to the State's authority to regulate the treatment, storage, and disposal of, and require corrective action to clean up, contaminants classified as hazardous waste pursuant to the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §§ 6901 et seq. DOI is the lead federal agency overseeing response actions addressing the release of hazardous substances on or from land under its jurisdiction, custody, or control near the Compressor Station pursuant to CERCLA.

Investigative and remedial activities at the Compressor Station date back to the 1980s with the identification of Solid Waste Management Units ("SWMUs") through a RCRA facility assessment. Closure activities of former hazardous waste management facilities at the Compressor Station were performed from 1988 to 1993. The RFI began in 1996 when DTSC and PG&E executed a CACA, and numerous phases of data collection and evaluation have been performed as of the date of this ROD. Since 2005, investigative

and remedial activities have been performed in accordance with the requirements of both RCRA and CERCLA.

PG&E completed the *Revised Final RCRA Facility Investigation and Remedial Investigation Report, ("RFI/RI") Volume 1 – Site Background and History* ("RFI/RI Volume 1 Report") in August 2007 and DTSC and DOI approved it later in 2007. The RFI/RI Volume 1 Report contains information on Compressor Station operations; history; and descriptions of SWMUs, Areas of Concern ("AOCs"), and other undesignated areas.

The *Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 2 - Hydrogeological Characterization and Results of Groundwater and Surface Water Investigations* ("RFI/RI Volume II Report") was completed in February 2009 and was approved by DTSC and DOI in 2009. The RFI/RI Volume 2 Report contains information on the hydrogeologic characterization and results of groundwater, surface water, pore water, and river sediment investigations to evaluate and characterize the nature and extent of groundwater contamination resulting from the past discharge of wastewater from the Compressor Station.

In November 2009, PG&E completed the *Final Human Health and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2, Topock Compressor Station, Needles, California* ("GWRA"). The GWRA evaluated potential risks to human health and ecological receptors associated with groundwater affected by past discharges to supplement the RFI/RI Volume 2 Report. The GWRA provides information to assist risk management decision making about the constituents of concern ("COCs") in groundwater and risk-based concentrations of those constituents. DTSC and DOI approved the GWRA in December 2009.

In December 2009, PG&E completed the *Final Groundwater Corrective Measures Study/Feasibility Study Report for SWMU 1/AOC 1 and AOC 10 at the Pacific Gas and Electric Company* (PG&E), Topock Compressor Station ("CMS/FS Report"). The purpose of the CMS/FS Report was to identify and evaluate groundwater remedial alternatives and to provide the basis for the identification of a preferred alternative to address the defined objectives for the remedial action.

Subsequent to the RFI/RI Volume 2 and Volume 2 Addendum, PG&E completed additional hydrogeologic and groundwater characterization activities in the East Ravine. The additional hydrogeologic and groundwater characterization in the East Ravine has been incorporated into the conceptual site model for the Selected Remedy and was included as an addendum to the CMS/FS Report.

Following completion of additional soil investigations at the site, PG&E will prepare RFI/RI Volume 3. RFI/RI Volume 3 will include final soil and sediment characterization data to complete the RFI/RI requirements to fully characterize the nature and extent of contamination resulting from Compressor Station operations, including the results of investigations of the other SWMUs, AOCs, and undesignated areas. To supplement

RFI/RI Volume 3, PG&E will also prepare a risk assessment that evaluates potential risks to human and ecological receptors that could be exposed to contaminants in soils and other media at the other AOCs and undesignated areas at the Compressor Station. A separate CMS/FS and/or an addendum to this CMS/FS Report will be prepared for additional media and SWMUs/AOCs at the Compressor Station, if appropriate, based on the conclusions and recommendations in RFI/RI Volume 3 and the associated risk assessment.

E. Site Characteristics

Conceptual Site Model

To determine whether constituents are present in groundwater at levels that may potentially pose an unacceptable risk to human health or the environment, a conceptual site model was developed to identify the populations that potentially may be exposed to those constituents in groundwater and determine the pathways by which the exposures may occur. *Figure 3*, published in the GWRA, presents the conceptual site model for the Topock groundwater.

Regional Aquifer Characteristics

The Topock site is situated at the southern (downstream) end of the Mohave Valley groundwater basin, which is in the basin-and-range geologic province. While alluvial groundwater in the northern and central area of the valley is recharged primarily by the Colorado River, most of this groundwater discharges back to the river in the southern area, above where the Alluvial Aquifer thins near the entrance to Topock Gorge.

Site Aquifer Characteristics

The hydrogeologic conditions of the site described below are summarized from the RFI/RI Volume 2 Report, Volume 2 Addendum, and the Final Groundwater CMS/FS Report. The site is located at the southern downstream end of the Mohave Valley groundwater basin. Groundwater in the Mohave Basin occurs in the Tertiary and younger alluvial fan and fluvial deposits. The unconsolidated alluvial and fluvial deposits are underlain by the Miocene Conglomerate and pre-Tertiary metamorphic and igneous bedrock. The bedrock typically has lower permeability; therefore groundwater movement occurs primarily in the overlying unconsolidated deposits. In the Mohave groundwater basin, water-bearing zones may occur locally where bedrock formations are weathered or fractured, although no areas have been identified where saturated bedrock formations are capable of yielding significant quantities of groundwater.

Groundwater occurs under unconfined to semi-confined conditions within the alluvial fan and fluvial sediments beneath most of the site. The alluvial sediments consist primarily of clayey/silty sand and clayey gravel deposits inter-fingered with more permeable sand and gravel deposits. The alluvial deposits exhibit considerable variability in hydraulic

conductivity between fine- and coarse-grained sequences. The fluvial sediments similarly consist of interbedded sand, sandy gravel, and silt/clay. The fluvial deposits at the site include the older Pleistocene deposits as well as more recent fluvial deposits associated with the Colorado River. The saturated portion of the alluvial fan and fluvial sediments are collectively referred to as the Alluvial Aquifer. *Figure 4* presents a schematic cross-section to illustrate the hydrogeologic setting between the Compressor Station and the Colorado River. In the floodplain area adjacent to the Colorado River, the fluvial deposits interfinger with and are hydraulically connected to the alluvial fan deposits. The interface between alluvial and fluvial units occurs near the western edge of the floodplain. The Topock Compressor Station is located on an upland alluvial terrace near the southern edge of the Alluvial Aquifer where the aquifer pinches out against the underlying, sloping bedrock.

As shown in *Figure 4*, the water table in the Alluvial Aquifer is flat and typically equilibrates to an elevation within 2 to 3 feet of the river level. On the basis of the variable topography, the depth to groundwater ranges from as shallow as 5 feet below ground surface ("bgs") in the floodplain to approximately 170 feet bgs at the upland alluvial terrace areas. The saturated thickness of the Alluvial Aquifer is about 100 feet in the floodplain and thins to the south, pinching out along the Miocene Conglomerate and bedrock outcrops. In the western portions of the site, where the depth to bedrock increases, the saturated Alluvial Aquifer is over 200 feet thick.

Under natural conditions, groundwater in the Alluvial Aquifer flows from west-southwest to east-northeast across the site. Localized areas of northward flow likely occur along the mountain front to the south of the compressor station. Gradients are very small due to the limited recharge, with a typical value of 0.0005 foot/foot in the alluvial area. Under average conditions, groundwater velocity ranges from about 25 to 46 feet/year, according to numerical model estimates. Gradients are upward between bedrock and the overlying Alluvial Aquifer and typically, but not universally, upward within the Alluvial Aquifer.

Additional hydrogeologic data collected from February through July 2009 for the East Ravine groundwater investigation refined the site hydrogeologic conceptual model presented in the RFI/RI Volume 2, specifically mapping bedrock structure and the bedrock/Alluvial Aquifer contact, and characterizing hydraulic properties, groundwater gradient and flow, and groundwater quality in bedrock. Groundwater occurs in the bedrock formations underlying and south of the East Ravine. The water table in the bedrock units equilibrates to an approximate elevation similar to the water table present in the Alluvial Aquifer. Testing and monitoring shows that groundwater in fractured bedrock is in hydraulic communication with the Alluvial Aquifer. Compared to the Alluvial Aquifer, the fractured rock permeabilities are overall very low. Additional characterization of bedrock groundwater in the East Ravine is ongoing.

The groundwater in the alluvium and shallow bedrock directly beneath the Topock site is derived mostly from the relatively small recharge from the nearby mountains. Mineral content of site groundwater is variable but is mostly brackish water with total dissolved solids ("TDS") between 1,000 and 15,000 milligram per liter (mg/l). In general, TDS

content increases with depth, with the highest TDS concentrations found in the deepest alluvial and bedrock wells. The TDS concentration in fluvial groundwater increases with distance away from the river and with depth, becoming similar to alluvial groundwater quality in deeper fluvial wells west of the floodplain.

As alluvial groundwater approaches the river, its elevation and hydraulic gradient become increasingly influenced by fluctuations in river level. Dam operations on the Colorado River cause the river level to fluctuate on daily and seasonal cycles. Groundwater levels in monitoring wells completed in the floodplain follow the same cycles. Alluvial groundwater naturally discharges to the river during lower river stages in fall and winter, whereas the river recharges the alluvial groundwater system during the spring and summer months. Since 2004, the IM No. 3 groundwater extraction and treatment system has maintained a consistent year-round landward gradient in the area in the floodplain.

Under non-pumping conditions, as alluvial groundwater flows through the organic-rich fluvial floodplain sediments bordering and underlying the river, the groundwater chemistry becomes more reducing, with reduced oxygen content, Cr (VI) converted to Cr (III), nitrate converted to ammonia and detectable manganese and iron observed. Decay of organic material in the river deposits created the reducing conditions, which in turn supports microbial communities that maintain the reduced conditions. Based on sampling and analysis of fluvial deposits and river sediments, reducing conditions were observed at all tested floodplain locations near the river and in all tested river sediments. In some of the older and deeper fluvial sediments, oxidizing (i.e., non-reducing) conditions prevail, owing to a relative shortage of organic carbon at depth; however, those non-reduced zones appear to be separated from the river by zones of fluvial sediments with reducing conditions.

The presence of reducing conditions in the floodplain area serves as a natural barrier to Cr (VI) migration to the river and will be discussed later. Cr (VI) in alluvial groundwater is chemically reduced (i.e., transformed) into Cr (III) in the presence of reducing conditions. Cr (III) is much less mobile and poses much less risk than does Cr (VI). The presence of this natural barrier is an important component of the selected groundwater remedy described in this ROD.

Cultural Resources

The Topock site lies within a larger area of traditional cultural importance and spiritual significance to some tribes in the area. Thousands of years of human history are evident in the area surrounding the Compressor Station. Among the larger and better-known cultural resources on the site is an expansive desert geoglyph or intaglio known as the Topock Maze. Although the Maze is viewed as one contiguous element of a larger area having unique value to some tribes, archaeological documents refer to three geographically-distinct parts, two of which overlie the groundwater plume. Prominent historic-era features, several of which intrude upon the Maze and also overlie the groundwater plume, include segments of historic U. S. Route 66, the National Trails Highway, and the right-of-way of the Atlantic and Pacific/Atchison, Topeka and Santa Fe

Railroad. A broad spectrum of archaeological resources is also present within the project site and on adjacent lands. Properties on and near the project site that are listed in the National Register of Historic Places include Native American cultural resources and elements of the historic "built environment."

Biological Resources

The Topock site is located adjacent to and partially on the Refuge managed by USFWS. The Refuge was established in 1941 to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

The dominant plant communities at the site consist of creosote bush scrub (generally west of National Trails Highway) and salt cedar (generally between National Trails Highway and the Colorado River and at the mouth of Bat Cave Wash). These plant communities support a variety of common wildlife species and have provided habitat for several species that are currently designated as threatened or endangered by state and federal endangered species acts.

Federally listed species that occur on the Refuge include the southwestern willow flycatcher (*Empidonax traillii extimus*), the desert tortoise (Mohave population) (*Gopherus agassizii*), the Yuma clapper rail (*Rallus longirostris yumanensis*), the Colorado pikeminnow (*Ptychocheilus lucius*), the razorback sucker (*Xyrauchen texanus*), and the bonytail chub (*Gila elegans*). Some of the state-listed species that occur on the Refuge include western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), the Gila woodpecker (*Melanerpes uropygialis*), the elf owl (*Micrathene whitneyi*), and Arizona Bell's vireo (*Vireo bellii arizonae*).

The contamination pathway from AOC 1 leads from upland terrestrial/wash habitat to the confluence of Bat Cave Wash with the Colorado River. At this point, there is a salt cedar (Tamarix spp.) thicket that is saturated with water year-round. This salt cedar thicket provides some southwestern willow flycatcher habitat on the Refuge on the west bank of the Colorado River. This habitat has likely functioned as a sink for sediment deposition over time. In addition, the Refuge is charged with protecting wildlife and wildlife habitat for species other than threatened and endangered species. The habitat in and around the Topock site is suitable for bighorn sheep, bobcats, chuckwallas, red-tailed hawks and other mammals, reptiles, and birds. Observations of mountain lion activity have been reported in this area as well.

Groundwater Characterization

The current information regarding groundwater characterization at the Topock site is based on an extensive investigation, sampling, and monitoring program with data collected from July 1997 to the present. Multiple phases of drilling and hydrogeologic investigations have been conducted to characterize site hydrogeology, groundwater conditions, and the nature and extent of Contaminants of Potential Concern ("COPCs") in groundwater. These investigations included the installation and sampling of 112

groundwater monitoring wells at 53 locations (including 27 individual well clusters) to support the RFI/RI groundwater characterization. As part of IM implementation during November 2003 through April 2006, seven groundwater test and extraction wells and two injection wells were installed. *Figure 2* shows the location of monitoring wells used in the characterization of groundwater at the site.

The RFI/RI groundwater data include analytical results for a wide variety of chemicals constituents and parameters including Cr (VI), Cr (T), specific conductance, pH, copper, nickel, zinc, lead, total petroleum hydrocarbons ("TPH"), and general chemistry parameters (including total dissolved solids TDS, chloride, fluoride, sulfate, nitrate, and other parameters), Title 22 trace metals, volatile organic compounds ("VOCs"), semivolatile organic compounds ("SVOCs"), polychlorinated biphenyls ("PCBs"), perchlorate, and radionuclides. Field water quality parameter data (specific conductance, temperature, pH, oxidation-reduction potential, and dissolved oxygen) were also collected during the routine groundwater sampling and are stored in the project analytical database.

Background concentrations for trace metals in groundwater, including Cr (T), have been calculated for the Topock site, and are reported in PG&E's *Revised Groundwater Background Study, Steps 3 and 4: Report of Results*. The groundwater background study was completed to assess the range of naturally occurring background concentrations of Cr (VI), Cr (T), and 17 other trace metals in groundwater near the PG&E Topock site and surrounding region. Six rounds of groundwater samples were collected from 25 wells near the PG&E Topock Site over a one-year period. The calculated Upper Tolerance Limits ("UTLs") are deemed tentative background concentrations. This means that if concentrations above this value are found in the future, a closer examination of the local geochemical environment would be necessary to determine whether the sample is natural or anthropogenic in nature.

Based on the characterization data presented in the RFI/RI report, the COPCs in groundwater related to SWMU 1/AOC 1 are Cr (T), Cr (VI), molybdenum, selenium, and nitrate. Only Cr (T) and Cr (VI) exhibit defined groundwater plumes. Molybdenum, selenium, and nitrate occur at concentrations exceeding background levels in localized areas. The Cr (VI) groundwater plume extends from the former percolation beds in Bat Cave Wash to the floodplain area north of the railroad tracks (*See Figure 2*). The existing dimensions of the plume exceeding natural background levels underlie an area that is approximately 175 acres. The volume of contaminated groundwater in the Alluvial Aquifer is currently estimated to be approximately 1.50 billion gallons (approximately 4,600 acre-feet). Nearly all of the Cr (VI) releases to alluvial groundwater at the site are believed to have occurred during the 1951 to 1964 period when untreated wastewater from the compressor station was discharged to Bat Cave Wash. Within the plume, Cr (VI) is typically present at all depth intervals of the alluvial portion of the aquifer, but is generally limited to deep wells in the fluvial portion of the aquifer near the river. As discussed earlier, reducing conditions have been documented in most shallow to mid-depth fluvial wells and sediments near and underlying the river. South of the railroad tracks, these reducing conditions are also encountered in deep wells

near and beneath the river. Under non-pumping conditions, as Cr (VI) migrates in groundwater from non-reducing conditions in the alluvial and deep fluvial sediments to reducing conditions near and beneath the river, it undergoes chemical reduction and transforms to Cr (III), which is immobilized in the sediments, as evidenced by its absence in groundwater samples collected from fluvial wells screened in reducing material.

The results of five rounds of groundwater sampling (April-September 2008) in monitoring wells installed in Arizona on the opposite side of the Colorado River have shown that Cr (VI) and Cr (T) are not present at concentrations above background levels in all eight monitoring locations east of the river.

Cr (VI) is also present within the Miocene conglomerate and pre-tertiary metadiorite bedrock formations east and southeast of the Topock Compressor Station. Cr (VI) concentrations in bedrock groundwater appear to be limited in extent to shallow and to a much lesser extent, mid-depth intervals. Currently, investigation data suggest Cr (VI) greater than or equal to 32 µg/L in the shallow and mid-depth wells extends approximately 1,500 feet east southeast of the compressor station, however, investigations of the extent of contamination in the East Ravine are ongoing. The mass of Cr (VI) in bedrock likely represents less than one percent of the total plume mass due to the low porosity of these bedrock formations.

Cr (VI) is relatively stable under the non-reducing conditions of the Alluvial Aquifer beneath the uplands portions of the Topock site. Once Cr (VI) encounters a sufficiently reducing geochemical environment, as found in portions of fluvial materials in the floodplain, it quickly reverts to Cr (III). CR (III) is essentially immobile except under specific pH or other conditions not present at the Topock site. Strongly-reducing geochemical conditions are observed in groundwater in most of the fluvial deposits along the Colorado River floodplain. Reducing conditions in floodplain areas of the site are derived from organic carbon in the younger fluvial deposits. Groundwater in the shallow bedrock of the East Ravine area is notably less reducing, presumably due to the stronger hydraulic communication with alluvial groundwater and/or surface runoff. Wherever the natural reducing capacity of the fluvial material is present, chromium is converted to its stable form of Cr (III) and is essentially immobile. The reducing conditions in the fluvial sediments provide a natural geochemical barrier that would, at the very least, greatly limit the movement of Cr (VI) in groundwater through the fluvial sediments adjacent to and beneath the Colorado River. Calculations suggest that there is sufficient capacity within the floodplain and beneath the river in the Alluvial Aquifer to reduce at least a significant portion of the Cr (VI) plume were the plume to come in contact with these sediments.

Surface Water Characterization

Since July 1997, surface water samples were collected from up to 43 surface water sampling locations. Water quality sampling was conducted at up to 18 surface water monitoring locations along the Colorado River during the RFI/RI. The current surface water monitoring program in place since 2005, includes routine surface water sample collection from nine shoreline locations and nine in-channel stations at specific depths in

the Colorado River (*Figure 5*). Since 2005, River Monitoring Program ("RMP") events have been conducted quarterly during most of the year and monthly during low river stages (typically November through January). Prior to 2005, RMP events typically were performed quarterly. Surface water samples have also been collected during one-time events, such as during the pore water study in January 2006. Samples have been analyzed for chromium, trace metals, general chemistry parameters, stable isotopes, and perchlorate. The chemical-specific ARARs for surface water are the Federal Water Pollution Control Act, California Toxics Rule, and the drinking water MCLs as defined in the California and federal Safe Drinking Water Acts.

None of the average PCOC concentrations for the samples from the shoreline, in-channel, and pore water study surface water locations exceed the most conservative chemical-specific surface water ARAR. Parameters were detected upstream and downstream of the site at similar frequencies and similar concentrations. There was no discernable difference between COPC results in samples collected upstream or downstream of Bat Cave Wash in the Colorado River. Based on data collected during the monitoring period of the RFI/RI, no site-related contamination of surface water was observed.

Pore Water Sampling

Pore water samples have been collected from up to 70 pore water locations underneath the Colorado River. These samples were collected from two one-time events in February 2003 and January 2006 at depths of 2 and 6 feet below the bottom of the Colorado River. The analytical suite included chromium and general chemistry parameters. Objectives for the pore water and sediment sampling included assessing chromium concentrations in pore water and determining whether geochemical conditions in shallow sediments below the Colorado River favored chromium reduction. Cr (VI) was not detected in any of the pore water samples. Cr (T) was detected in the 2003 sampling event in pore water samples from three locations at trace concentrations around 1 µg/L, well below the California surface water quality criteria of 50 µg/L. Cr (T) was not detected in pore water in the 2006 sampling event.

River Sediment Sampling

Colorado River sediment samples were collected from up to 18 locations. These samples were collected from two one-time events in February 2003 and December 2005, at depths ranging from the surface to 2 or 3 feet below the bottom of the Colorado River. The analytical suite included chromium and general chemistry parameters. Along with the pore water samples from the pore water study, the sediment sampling results were used in a multiple lines of evidence approach to determine whether geochemical conditions in shallow sediments below the Colorado River favored chromium reduction. Cr (T) concentrations did not exceed sediment quality guidelines and Cr (VI) was not detected in sediment samples.

F. Current and Potential Future Land and Water Uses

Land Uses

The Compressor Station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. The surrounding area includes land owned and/or managed by a number of government agencies and private entities including the BLM, Reclamation, USFWS, San Bernardino County, California Department of Transportation, Burlington Northern Santa Fe Railroad, Metropolitan Water District of Southern California, and the Fort Mohave Indian Tribe.

The Compressor Station property is immediately surrounded by the Refuge. Recreational activities at the Refuge include sightseeing, bird watching, fishing, hunting, and canoeing. All areas within the Refuge and outside the Compressor Station are currently accessible for some or all of these activities and are expected to remain accessible in the future.

Other land uses in the area are predominantly open space, interspersed with industrial facilities, recreational uses, and transportation infrastructure. Open space near the Compressor Station is characterized primarily by sparse desert vegetation on steep, rocky slopes. The area is bisected by several steep-sided ephemeral streams, including Bat Cave Wash and several unnamed washes that flow north to the confluence of the Colorado River. Open space along the Colorado River floodplain is characterized by shifting sand dunes and associated riparian vegetation, primarily non-native tamarisk (salt cedar).

The nearest communities are mobile home parks at Topock, Arizona and Moabi Regional Park, California. Topock is located on the Arizona (or eastern) side of the Colorado River, about 0.5 mile east-northeast of the Compressor Station. Moabi Regional Park is located on the California (or western) side of the Colorado River about 1 mile northwest of the Compressor Station. The community of Golden Shores, Arizona, the largest nearby community, is located approximately 5 miles north of the Compressor Station on the east side of the Colorado River.

A major gas utility and transportation corridor is located within the project site. This corridor includes six natural gas transmission pipelines, the Burlington Northern Santa Fe Railway, and the Interstate 40 freeway. Other developed land uses within the project site include National Trails Highway, former Route 66, and various unnamed access roads. A former gravel quarry is located approximately 1,500 feet southwest of the Compressor Station. Evaporation ponds associated with the Compressor Station operations are located approximately 3,000 feet west of the Compressor Station. In addition, an interim remedial measures groundwater treatment plant and numerous groundwater well clusters are located near the Compressor Station.

Current land uses at the site are likely to remain the same for the foreseeable future. PG&E plans to continue owning and operating the Compressor Station and associated

property as an industrial operation for the foreseeable future. The railroad and highway will also continue in their current use for the foreseeable future. The primary conservation mission of USFWS, as it applies to the Refuge, limits human use of the Refuge property. In the future, human use of the Refuge property will likely continue to be restricted to recreational uses. Although current uses of the BLM-managed land in the area are predominantly recreational, BLM has determined that residential use of some of this property cannot be precluded.

Groundwater and Surface Water Uses

Groundwater affected by or in the vicinity of the Cr (VI) groundwater plume currently is not used as a drinking water supply. The nearest groundwater supply wells in California are located approximately 1.3 miles west-northwest of the plume at the Park Moabi Marina. Groundwater supply wells are also located at private residences south of the Topock Marina on the eastern side of the Colorado River approximately 0.3 mile east-southeast of the eastern extent of the plume.

Given that the BLM has determined that the possibility of residential use of property overlying or adjacent to the plume area cannot be precluded, the possibility of future development of the groundwater aquifer as a drinking water supply was considered in the risk assessment and feasibility study and as a part of this decision document.

The Colorado River, located adjacent to and east of the Cr (VI) plume, is a major source of water for irrigation, drinking, and other uses by humans and wildlife. The closest downstream supply intake is located approximately 21 river miles downstream of the railroad bridge over the Colorado River. The Colorado River also supports recreational uses of swimming, boating, and fishing. In addition, the Colorado River provides essential habitat and supports various plant and wildlife species, including threatened or endangered species. It is expected that use of the Colorado River as a major source of water for irrigation, drinking, and other uses by humans and wildlife will remain the same for the foreseeable future.

G. Summary of Site Risks

CERCLA requires that remedial action selected by the CERCLA lead agency must protect human health and the environment from current and potential threats posed by releases of hazardous substances into the environment. The GWRA was completed to assist risk management decision-making by quantitatively evaluating COPCs in groundwater and determining whether the COPCs are potential threats to human health or the environment. The GWRA was conducted in accordance with governing USEPA and DTSC guidance and was reviewed and approved by DOI and DTSC. The COPCs that are related to the facility and are identified as potential risks to human or ecological receptors are identified as COCs that then become the focus of the remedial action objectives and remedial alternatives. The GWRA developed the conceptual site model, including identified sources of groundwater contamination, potential transport

mechanisms, potential exposed receptors and exposure pathways, and potential exposure point concentrations for impacts by activities at SWMU 1/AOC 1 and SWMU 2. The key conclusions of the GWRA, for purposes of defining objectives for this remedial action, are:

- The potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway; floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria.

- There are no current direct or indirect complete exposure pathways for human contact with impacted site groundwater; thus, there are no human populations currently at risk of adverse health effects due to groundwater at the Topock site.

- There is no significant ecological exposure pathway for contact with impacted site groundwater; thus, there are no ecological receptors currently at risk of adverse effects due to the presence of COPCs in groundwater.

- Due to the possibility of future development of the groundwater as a drinking water supply, the GWRA included a quantitative risk characterization of future hypothetical human groundwater users that may be exposed to site groundwater in a residential setting. Both child and adult future hypothetical residential groundwater users were considered. Potential exposure through ingestion and dermal contact while bathing and showering was evaluated. Potential cumulative cancer risks and non-cancer hazard indices were estimated for all COPCs, including the constituents that were not related to SWMU 1/AOC 1. The risk characterization concluded that:

  - Cr (VI) is present in site groundwater at concentrations that could pose a potential hazard to the future hypothetical human groundwater user, if the groundwater were to be developed as a potable source of water in the future (*Table 1*). Based on the results of the risk estimates and the fact that the presence of Cr (VI) is related to historical releases from SWMU 1/AOC 1, Cr (VI) is a COC for this remedial action.

  - The calculated noncarcinogenic risk-based remediation goal for Cr (VI) is 46 µg/L based on the hypothetical child receptor.

The GWRA determined that other COPCs either were not associated with SWMU 1/AOC 1 and/or are not present in site groundwater at levels of potential concern to human health or the environment. DTSC and DOI, however, concluded that although the non-cancer hazards associated with molybdenum, selenium and nitrate are much lower than those associated with Cr (VI), these constituents do have risks above a hazard index of 1 and they do contribute to a hazard quotient greater than 1 at localized areas within the plume. For example, Cr (VI) contributed 95% to the combined Cr (VI),

molybdenum, selenium, and nitrate hazard index. DTSC directed PG&E to continue monitoring molybdenum, selenium, and nitrate and to consider their associated impacts in future soil and soil to groundwater risk evaluations.

H. Remedial Action Objectives

The objectives of this remedial action are defined based on the conclusions of the GWRA and ARARs identification. The Remedial Action Objectives ("RAOs") are intended to provide a general description of the cleanup objectives and to provide the basis for the development of site-specific remediation goals.

The RAOs for groundwater in this remedial action are to:

1. Prevent ingestion of groundwater as a potable water source having Cr (VI) in excess of the regional background concentration of 32 µg/L Cr (VI).
2. 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)).
3. Reduce the mass of Cr (T) and Cr (VI) in groundwater at the site to achieve compliance with ARARs in groundwater. This RAO will be achieved through the cleanup goal of the regional background concentration of 32 µg/L of Cr (VI).
4. Ensure that the geographic location of the target remediation area does not permanently expand following completion of the remedial action.

I. Description of Alternatives

The remedial alternatives to address contaminated groundwater at the Site were evaluated in the CMS/FS Report and are presented below. The alternatives are identified with letters to correspond with the description of the alternatives within the CMS/FS Report.

Generally, Alternatives A and B would not include any active treatment or other measures to remove Cr (VI) from groundwater. Alternatives C, D, and E would rely primarily on treating the Cr (VI) underground (also known as "in-situ" treatment) by injecting a carbon food source into the aquifer to "feed" the naturally-occurring bacteria thereby accelerating the change of Cr (VI) to Cr (III) by enhancing the naturally occurring biological conditions that transform contaminants. Alternative F would extract contaminated groundwater and treat it above-ground using an industrial treatment plant. Alternatives G and H would combine in-situ treatment with above-ground treatment. Alternative I would continue the existing Interim Measure currently in place by which limited volumes of water are extracted and treated using an existing above-ground treatment facility.

Provided below is a more specific description of each alternative. In the section that follows ("Comparative Analysis of Alternatives"), the alternatives are compared using

the nine remedy selection criteria required by CERCLA. As explained in that section, Alternative E was the Preferred Alternative presented in the Proposed Plan and is the alternative chosen as the Selected Remedy in this ROD.

Alternative A: No Action

Regulations governing CERCLA response action generally require that the "no action" alternative be evaluated to establish a baseline for comparison. Under the No Action alternative, no active construction, operational, or monitoring activities would occur. There would be no active treatment to reduce chromium concentrations in groundwater. While natural processes converting Cr (VI) to Cr (III) would continue to occur within the river sediments near the Colorado River, there would be no government restrictions on the use of groundwater in locations where concentrations exceed cleanup levels for the foreseeable future. No additional groundwater monitoring facilities would be constructed under this alternative, nor would any ongoing sampling or well maintenance activities be conducted to monitor concentrations of contaminants in groundwater or in the Colorado River.

Estimated Capital Cost: $0
Estimated Time to Achieve RAOs: 220-2,200 years

Alternative B – Monitored Natural Attenuation ("MNA")

No active treatment to reduce Cr (VI) concentrations in groundwater would occur under this alternative. This alternative would rely only on the naturally occurring organic conditions in the shallow groundwater areas of the Site near the river to convert and remove Cr (VI) from groundwater. Restrictions on the use of groundwater in the area of the plume would be maintained during the remediation period. The existing groundwater monitoring network would potentially be enhanced with additional monitoring wells, and the monitoring program of routine sampling, analysis, and reporting would occur until the cleanup goals are attained.

Estimated Net Present Value: $25,000,000 - $54,000,000
Estimated Time to Achieve RAOs: 220-2,200 years

Alternative C – High volume In-situ Treatment

Alternative C would involve active in-situ groundwater treatment through distribution of an organic carbon food source (such as whey) through high volume injection through a minimum number of wells installed primarily in previously disturbed areas. The organic carbon would be injected to enhance natural biological conditions that convert Cr (VI) to immobile Cr (III) thereby removing it from groundwater. This alternative would be implemented in two phases: the first phase would treat the plume edge nearest the river, and the second phase would treat the interior of the plume through installation of a limited number of wells.

Estimated Net Present Value: $119,000,000 - $255,000,000
Estimated Time to Achieve RAOs: 10 to 60 years

Alternative D – Sequential In-situ Treatment

Under this alternative, treatment of the plume would be accomplished through injection of carbon using wells within the interior of the plume to convert Cr (VI) to insoluble Cr (III), which would remove chromium from groundwater. Treatment would be implemented in several sequential phases involving construction of approximately 12 lines of injection and extraction wells to distribute the carbon food source over the entire plume.

Estimated Net Present Value: $118,000,000 - $254,000,000
Estimated Time to Achieve RAOs: 10 to 20 years

Alternative E – In-situ Treatment with Fresh Water Flushing

Alternative E would involve flushing to push the plume through an In-Situ Reactive Zone ("IRZ") located along National Trails Highway. Flushing would be accomplished through a combination of fresh water injection and injection of carbon-amended water in wells to the west of the plume. This alternative would also include using extraction wells in the area near the Colorado River to capture and control the plume, accelerate cleanup of the floodplain, and flush the groundwater with elevated Cr (VI) through the treatment zone. Additional extraction wells would be located in an area northeast of the Compressor Station where the flushing efficiency from injection wells alone is relatively poor. Water extracted from the near-river wells and wells northeast of the Compressor Station would be treated with the carbon food source and the water would be reinjected west of and within the Cr (VI) plume.

Estimated Net Present Value: $92,000,000 - $198,000,000
Estimated Time to Achieve RAOs: 10 to 110 years

Alternative F – Pump and Treat

This alternative would involve pumping groundwater, construction and operation of an above-ground treatment system to remove chromium from the extracted groundwater, and reinjection of the treated water back to the aquifer.

Estimated Net Present Value: $187,000,000 - $401,000,000
Estimated Time to Achieve RAOs: 15 to 150 years

Alternative G – Combined Floodplain In-situ / Pump and Treat

This alternative would combine floodplain cleanup by in-situ treatment, with treatment of the uplands portion of the plume by pumping groundwater, construction and operation of

an above-ground treatment plant to remove chromium from the extracted groundwater, and reinjection of the treated water back into the aquifer. The floodplain cleanup would involve construction of in-situ treatment zones at National Trails Highway and between National Trails Highway and the Colorado River.

Estimated Net Present Value: $177,000,000 - $380,000,000
Estimated Time to Achieve RAOs: 10 to 90 years

Alternative H – Combined Upland In-situ / Pump and Treat

This alternative would combine in-situ treatment in the upland portions of the plume, with pump-and-treat technology in the floodplain (consisting of pumping groundwater, above-ground treatment to remove chromium from the extracted groundwater, and reinjection of the treated water back into the aquifer). This alternative differs from Alternative G by relying on an in-situ treatment zone as the dominant feature of the cleanup rather than pump and treat.

Estimated Net Present Value: $127,000,000 - $273,000,000
Estimated Time to Achieve RAOs: 10 to 70 years

Alternative I – Continued Operation of Interim Measure Groundwater Treatment

This alternative would involve continued operation of the current Interim Measure Groundwater Treatment Plant as the final remedial action at the site. The plant includes a pump and treat system that extracts groundwater and utilizes chemical reduction, precipitation, and filtration to remove Cr (VI). The Interim Measure system would operate with the existing equipment with existing procedures using the existing process at the existing flow rate until RAOs are attained.

Estimated Net Present Value: $186,000,000 - $398,000,000
Estimated Time to Achieve RAOs: 100 to 960 years

Addressing Chromium in Bedrock in East Ravine

The development of a hydraulic containment and treatment system for groundwater in the bedrock was evaluated in conjunction with alternatives C, D, E, F, G, and H instead of developing and evaluating a separate range of remedial alternatives to attain RAOs in the East Ravine bedrock. East Ravine bedrock groundwater would be addressed through natural attenuation in alternatives A and B.

For alternatives C through H, hydraulic containment would involve pumping from a group of wells near the eastern end of the East Ravine. The assumed location for these wells from a hydraulic and infrastructure perspective would be along the former National Trails Highway. For alternative I, hydraulic containment would be through the existing Interim Measure pump and treat system. The approach for management and treatment of groundwater extracted from the bedrock would vary depending on the alternative. The

quantity of extracted bedrock groundwater would be minor relative to alluvial groundwater. For Alternatives C, D, and E, bedrock groundwater would be amended with a carbon food source and reinjected in the alluvial aquifer along with amended alluvial groundwater. For alternatives F, G, H, and I, extracted bedrock groundwater would undergo above ground treatment with extracted alluvial groundwater. For alternative B, bedrock groundwater would be monitored to assure that the Cr (VI) is changed by natural conditions and that there is no adverse effect to the Colorado River.

If it is determined that additional measures are needed to achieve RAOs in the East Ravine bedrock, other technologies will be evaluated and adopted as necessary through a ROD Amendment or Explanation of Significant Differences ("ESD"), to supplement the pumping wells. In addition to pumping for hydraulic control, technologies that may be applicable to East Ravine bedrock groundwater may include, but are not limited to, freshwater injection for flushing and injection of carbon amendments for in-situ treatment of Cr (VI).

Common Elements and Distinguishing Features of Each Alternative

Alternative C (High Volume In-situ Treatment) and Alternative D (Sequential In-situ Treatment) and Alternative E (In-situ Treatment with Freshwater Flushing) all rely on in-situ treatment technology. In contrast to Alternative E, however, the in-situ treatment concept for Alternatives C and D involves distributing carbon throughout the plume, while Alternative E involves flushing the plume toward an established in-situ reductive zone. Both concepts have technical challenges that can be overcome. Alternative E provides in-situ treatment with fewer wells but more pipelines than Alternatives C and D. Generation of in-situ treatment byproducts would be considerably less with Alternative E than with Alternatives C and D because the in-situ component of Alternative E would only be applied along National Trails Highway and in a limited area around each of the upland injection wells. Overall, a much smaller fraction of the aquifer would become reduced with Alternative E than with Alternatives C and D. In comparison to Alternative D, Alternative E would involve construction primarily in previously disturbed areas, thereby resulting in less grading and construction of fewer access roads.

In comparison to Alternatives F, G, H, and I that include ex-situ treatment, Alternative E is substantially more cost-effective and would result in substantially fewer effects to the community, workers, and environment. Alternatives F, G, and H require the construction of a large aboveground treatment plant with a high level of energy requirements that would generate waste byproducts to be transported offsite with associated energy use and traffic hazards. Alternatives F, G, H, and I would generate waste byproducts from an ex-situ treatment plant that would require long-term monitoring and containment after the RAOs at the site are attained.

J. Comparative Analysis of Alternatives

This section summarizes the comparative analysis of the alternatives considered for remediating contaminated groundwater at the site performed in the CMS/FS Report. The alternatives were evaluated against nine criteria, as set forth in the NCP (§300.430(f)), comprising two "threshold" criteria, five "balancing" criteria, and two "modifying" criteria. These criteria include: (1) Overall Protection of Human Health and the Environment, (2) Compliance with ARARs, (3) Long-term Effectiveness and Permanence, (4) Reduction of Toxicity, Mobility, or Volume through Treatment, (5) Short-term Effectiveness, (6) Implementability, (7) Cost, (8) State Acceptance, and (9) Community Acceptance.

Overall Protection of Human Health and the Environment

Alternative A would not satisfy the threshold criterion for protecting human health and the environment because there would be no institutional controls imposed to restrict use of groundwater in locations where Cr (VI) concentrations exceed the cleanup goals, and there would be no monitoring to evaluate changes in geochemical conditions near the river over the long time period required to reach the cleanup goals. Alternatives B through I were found to satisfy the threshold criterion of protecting human health and the environment. Alternatives C, D, E, F, G, and H were ranked high for this criterion; these alternatives 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. These alternatives would also provide additional certainty for river protection as a result of floodplain cleanup (mass removal in the floodplain and establishment of a geochemical barrier) as the initial step in implementation and/or through hydraulic control. Alternatives B and I ranked medium for this criterion primarily because of the long time required to attain cleanup goals, which would require long-term use of institutional controls, as well as the uncertainty about the robustness of the natural geochemical conditions near the river over this relatively long time for Alternative B, and the high level of operation and maintenance for Alternative I.

The historic practice of wastewater discharge to Bat Cave Wash and the use of Cr (VI) at the site have been eliminated. Therefore, sources of wastewater discharge and Cr (VI) have been controlled. However, the historical source of contaminated groundwater in bedrock at East Ravine has not yet been determined, and the evaluation of whether leaching of Cr (VI) from contaminated soils represents a significant transport pathway to groundwater has not yet been completed. There is no distinction between the alternatives with respect to this criterion.

Compliance with Applicable or Relevant and Appropriate Requirements

Applicable or Relevant and Appropriate Requirements ("ARARs") identified by DOI for the Topock site in the CMS/FS Report are provided in Table 2.

Alternatives A, B, and I were determined not to satisfy all identified ARARs. Specifically, these alternatives did not satisfy the "reasonable time frame" requirement established by the California State Water Resources Control Board Resolution 92-49. This Resolution requires that the remedial action have "a substantial likelihood to achieve compliance, within a reasonable time frame, with the cleanup goals and objectives" established for a site. The CMS/FS Report determined that Alternatives C, D, E, F, G and H would comply with this ARAR.

The CMS/FS Report identified a number of statutes established to protect cultural, historic, or religious values as sources of ARARs for the Topock Site. Broadly speaking, these statutes require that a federal agency identify and consider the effects of an undertaking on cultural and historic properties and evaluate measures, through consultation, to avoid, minimize, or mitigate any adverse effects that otherwise would result from the undertaking. Some of these statutes have more specific or prescriptive requirements that must be satisfied when specific circumstances are present. As a threshold matter, the CMS/FS Report found that none of the alternatives would be unable to satisfy the ARARs derived from these statutes. As the Selected Remedy is designed and implemented, DOI will continue to consult with the tribes and other parties to ensure that these ARARs are satisfied.

As described previously in the Tribal Consultation section of this ROD, the PA executed by the BLM, USFWS, ACHP, SHPOs, and PG&E establishes certain mitigation measures that the Selected Remedy will be required to attain. As the Selected Remedy is designed and implemented, the Federal Agencies will continue to engage in consultation with the tribes, ACHP, SHPOs, and others to identify potential effects on cultural and historic properties and to evaluate measures to avoid, minimize, or mitigate any adverse effects, thereby ensuring that the Selected Remedy satisfies these ARARs.

With respect to any remedial action to be undertaken within the Refuge, the National Wildlife System Administration Act has been identified as an ARAR. This statute governs the use and management of National Wildlife Refuges, requiring that ongoing and proposed activities and uses on a Refuge are appropriate and compatible with both the mission of the National Wildlife Refuge System, as well as the specific purposes for which a Refuge was established. Any remedial action proposed on the Refuge is subject to the formal appropriate use/compatibility determination process. Accordingly, prior to the selection of a remedial action by DOI/USFWS, the Refuge Manager must find the remedial action to be both an appropriate use of the Refuge and compatible with the mission of the Refuge and the Refuge System as a whole. In addition, the Endangered Species Act ("ESA") has been identified as an ARAR for this site. As the Selected Remedy is designed and implemented, DOI will continue to consult with USFWS to ensure that proposed activities remain appropriate and compatible with the Refuge mission and that the requirements of the ESA are satisfied.

Long-Term Protectiveness and Permanence

Alternative A (No Action) ranked the lowest of all alternatives because this alternative does not include institutional controls to preclude future groundwater use nor would it provide for monitoring to verify the effectiveness of natural attenuation processes and to determine when the RAOs have been achieved. Any future changes in site conditions that may cause undesirable impacts to the Colorado River or unacceptable exposures to other receptors would not be detected under Alternative A. Alternative B ranked medium because, in contrast to Alternative A, Alternative B would include monitoring and institutional controls; however, this alternative would rely on natural attenuation to convert Cr (VI) to Cr (III), and while the reducing conditions have been shown to be robust, there is no way to prove that these conditions exist everywhere. Over the centuries that would be required for MNA to reach cleanup goals, it is possible that the geochemistry or groundwater flow directions, or even the location of the Colorado River channel, could change significantly.

Alternatives F, G, H, and I all ranked medium for long-term effectiveness, permanence, and reliability. These alternatives included ex-situ treatment that would generate waste requiring land disposal of treatment residuals at an offsite, permitted landfill. Such off-site disposal would require long-term containment, management, and monitoring that would not be required by in-situ treatment alternatives.

Alternatives C, D, and E ranked medium-high for this criterion. While there is uncertainty regarding the ability to distribute substrates across the targeted area, and Alternative E relies on flushing to remove contaminants from the upland portion of the aquifer, comparatively few long-term controls would be required for these alternatives following attainment of cleanup goals.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives F, G, and I ranked high for this criterion because the toxicity, mobility, and volume of Cr (VI) would be reduced throughout the plume. Byproducts from in-situ treatment would be expected to be localized to the reducing zone formed by the IRZ and within the range of naturally occurring concentrations found at the site but could remain temporarily elevated above baseline and background concentrations in some portions of the aquifer. For these reasons, Alternatives C, D, E, and H ranked medium high. Byproducts from ex-situ treatment would be managed through disposal at an offsite, permitted disposal facility. Alternatives A and B ranked medium because the amount of plume destroyed or treated would be less certain due to the passive nature of treatment and the extent and average capacity of the floodplain area to naturally reduce Cr (VI) over time.

Short-Term Effectiveness

Timeliness of the remedy and protection of the community, workers, and environment during remedy implementation were the factors considered in evaluating short term

effectiveness. Taking these factors into consideration, Alternative B ranked medium because of the minimal footprint but relatively long time to cleanup. Alternatives C and E ranked medium-low because of the comparatively shorter remediation period and relatively limited construction and operational activities that would occur primarily in previously disturbed areas. Alternatives A, D, F, G, H, and I received a low ranking for short-term effectiveness. Alternative A ranked low primarily because of the extensive time to cleanup with no controls during the remedial period. Alternatives F, G, H, and I ranked low as a result of construction and operation of an aboveground treatment plant and the greater amount of construction, aboveground visual impact, worker/operator presence onsite, electrical power requirements, and trucking requirements for chemical delivery and waste transportation and disposal. Alternative D ranked low primarily because the location of remedial facilities would not be limited to previously disturbed areas and because of the need for subsequent additional disturbance from grading, road construction, facility construction, and operation and maintenance.

Implementability

Alternatives A and B ranked high for implementability because Alternative A involved no remedial action, and the only remedial activities associated with Alternative B were monitoring well construction and maintenance and administration of institutional controls. Alternative I also ranked high because the system has been shown to be technically implementable over the years it has operated. Alternatives D, E, F, G, and H ranked medium because while these alternatives are administratively implementable, there would be technical challenges associated with the active treatment processes. Alternative E requires additional approvals from landowners and associated water agencies for the water supply well and pipeline. Alternative C ranked low for this criterion because of the relatively more complex technical challenges associated with balancing reductant delivery and hydraulic containment of the plume, as well as construction within Bat Cave Wash.

Cost

The costs of each alternative are estimated to a level of accuracy of +50 to -30 percent, consistent with the preliminary nature of the design development (approximately 2 to 5 percent design development). The table below summarizes the estimated present value and nominal (total lifetime alternative) costs for the remedial alternatives. The costs for Alternatives A and B were the lowest; therefore, these alternatives ranked high in cost-effectiveness. Alternatives C, D, E, and H were the next most costly; therefore, these alternatives ranked medium in cost-effectiveness. Alternatives F, G, and I were the most expensive of the alternatives and therefore ranked low in cost effectiveness.

Alternative Cost Summary

Description	Net Present Value	Nominal Costs
Alternative A—No Action	$0	$0
Alternative B—Monitored Natural Attenuation	$25,000,000 - $54,000,000	$513,000,000
Alternative C—High Volume In-situ Treatment	$119,000,000 - $255,000,000	$206,000,000
Alternative D—Sequential In-situ Treatment	$118,000,000 - $254,000,000	$191,000,000
Alternative E—In-situ Treatment with Freshwater Flushing	$92,000,000 - $198,000,000	$184,000,000
Alternative F—Pump and Treat	$187,000,000 - $401,000,000	$443,000,000
Alternative G—Combined Floodplain In-situ/Pump and Treat	$177,000,000 - $380,000,000	$329,000,000
Alternative H—Combined Upland In-situ/Pump and Treat	$127,000,000 - $273,000,000	$225,000,000
Alternative I—Continued Operation of Interim Measure	$186,000,000 - $398,000,000	$2,030,000,000

State Acceptance

This criterion considers the degree to which the State of California agrees with DOI's analyses and recommendations as described in the Proposed Plan and supporting documentation. DTSC reviewed all site-related documents and identified its preferred alternative in DTSC's draft Statement of Basis. DOI and DTSC have coordinated fully in the selection of a final remedial action, and the State concurs with the Selected Remedy.

Community Acceptance

The RFI/RI Report, CMS/FS Report, and Proposed Plan were made available to the public in July 2010 and all are available in the Administrative Record file located at the BLM Lake Havasu Field Office and the information repositories found at the Chemehuevi Indian Reservation Environmental Protection Office, the Colorado River Indian Tribes Library, the Golden Shores/Topock Station Library, and the Lake Havasu City Library. A public comment period was held June 4, 2010 to July 19, 2010. DOI's response to all comments received during this period is included in the Responsiveness Summary.

K. Principal Threat

The GWRA concluded that Cr (VI) is the principal threat present in groundwater at concentrations that could pose a potential hazard to the future hypothetical groundwater user, if the groundwater were to be used as a source of drinking water. All of the alternatives would eventually address the principal threat by reducing Cr (VI) concentrations in groundwater to acceptable levels, but they vary substantially in the amount of time and disturbance required. All of the alternatives, except Alternative A, would rely on the use of institutional controls until RAOs were achieved to ensure that exposure pathways were not created during the remedial process. Alternative A did not include institutional controls and therefore presented the possibility of future exposure to human populations in residential setting prior to attainment of cleanup goals. Alternatives B through I included institutional controls; however Alternatives B and I were considered less protective than Alternatives C, D, E, F, G, and H because they would require a considerably longer time period to achieve RAOs, and therefore required a longer period over which institutional controls would be maintained. Alternatives C through G were all considered equally protective in this regard.

With regard to verifiable river protection, Alternatives C, D, E, F, G and H were considered equally protective. Alternative I ranked lower than Alternatives C through H because of the considerably longer time until cleanup goals were achieved. Existing data show that concentrations in surface water collected from the Colorado River, both upgradient and downgradient of the site, both before and after implementation of the interim measure, are below water quality standards that support the designated uses of the Colorado River (CH2M HILL, 2009a), and the groundwater risk assessment concluded that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway (ARCADIS, 2009). The two alternatives that relied on natural processes to convert Cr (VI) to Cr (III) (Alternatives A and B) presented some uncertainty about protection of the river in the long term because there was no way to prove that the reducing conditions exist everywhere, and over the centuries that would be required for natural processes to reach cleanup goals, it is possible that the geochemistry or groundwater flow directions, or even the location of the Colorado River channel, could change significantly. Further studies to assess the effectiveness of long-term natural attenuation in the East Ravine will continue during remedial design.

Alternatives C, D, E, and G included floodplain cleanup (mass removal and establishment of geochemical barriers in the floodplain) as the initial step in the implementation. Alternatives E, F, G, H, and I included extraction and, thereby, hydraulic control, providing additional certainty of river protection. Alternatives C through H also included extraction within the East Ravine bedrock to provide hydraulic control of East Ravine groundwater. For Alternative I, uncertainty existed regarding the flow direction of groundwater in bedrock at East Ravine.

These two approaches (mass removal/establishment of geochemical barrier in floodplain and hydraulic containment) both would require a high level of management to ensure that

the natural reducing conditions in the floodplain were not damaged or otherwise altered in a manner that diminishes the natural reductive capacity of the floodplain. Management of reducing conditions will involve regular sampling of groundwater to monitor reduction/oxidation conditions and possibly dosing with organic carbon to restore floodplain reducing capacity if it becomes depleted.

L. Selected Remedy

The Selected Remedy to remediate groundwater contamination at the Topock Site is Alternative E - In-situ Treatment with Fresh Water Flushing. Alternative E is selected because it will achieve the RAOs while substantially reducing, through treatment, the amount of Cr (VI) in the groundwater [which is the principal threat at the site], and will do so in a reasonable time frame with fewer adverse effects to cultural resources and biological resources than other alternatives considered. Alternative E also includes bedrock extraction wells in the eastern (downgradient) end of the East Ravine, with the water from the bedrock extraction wells managed within the active treatment system for the alluvial aquifer.

If it is determined that additional measures are needed to achieve RAOs in the East Ravine bedrock, other technologies will be evaluated and applied to supplement the pumping wells. In addition to pumping for hydraulic control, technologies that may be applicable to East Ravine bedrock may include, but are not limited to, freshwater injection for flushing and injection of carbon amendments for in place treatment of Cr (VI).

Because the variable nature of the geologic materials beneath the site may result in some localized areas being resistant to in-situ treatment and flushing, the Selected Remedy also includes monitored natural attenuation as a long term component to address residual Cr (VI) that may remain in portions of the aquifer formation after a majority has been treated by In-situ Treatment with Fresh Water Flushing. Monitored natural attenuation relies on the naturally occurring chemical transformation and dilution properties of the groundwater system to change Cr (VI) to Cr (III) in groundwater.

<u>Summary of the Rationale for the Selected Remedy</u>

The key factors upon which the remedy decision is based are presented below along with a description of how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria.

The Selected Remedy meets both of 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 ARARs. The Selected Remedy also provides a sufficient degree of long-term effectiveness, permanence, and reliability; is implementable; is

relatively cost-effective; and provides a sufficient degree of protectiveness to the community, workers, and environment during implementation.

Detailed Description of the Selected Remedy

The Selected Remedy involves flushing to accelerate plume movement through an IRZ barrier located along National Trails Highway. Flushing will be accomplished through a combination of fresh water injection and injection of carbon amended water in wells to the west of the plume. The Selected Remedy also includes extraction wells near the Colorado River to provide hydraulic capture of the plume, accelerate cleanup of the floodplain, and flush the groundwater with elevated Cr (VI) through the IRZ line. Additional extraction wells will be located in an area northeast of the Compressor Station where the flushing efficiency from injection wells alone is relatively poor. The Selected Remedy was designed to meet the RAOs by active groundwater treatment until cleanup goals are attained. Figure 6 illustrates the conceptual remedial approach for the Selected Remedy.

The Selected Remedy consists of three main elements: an IRZ line along the length of National Trails Highway, extraction wells near the Colorado River pumping carbon-amended water to the western area of the plume, and freshwater injected west of the plume to accelerate groundwater flow.

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of a cleanup action or result in unacceptable human exposure to hazardous substances remaining at a site. Such measures are adopted to assure the continued protection of human health. The institutional controls adopted by the Selected Remedy for the Site are specified in the *BLM Lake Havasu Field Office Resource Management Plan* issued in May 2007 and in the *1994 Lower Colorado River National Wildlife Refuges Comprehensive Management Plan.* These plans restrict surface uses and use of the groundwater. Institutional controls will remain in place for the duration of the remedy until RAOs are achieved.

The IRZ along National Trails Highway will be constructed using a line of wells that may be used either as injection or extraction wells to circulate groundwater and distribute the organic carbon source.

The extraction wells near the river will provide hydraulic control to prevent contaminated groundwater from reaching the river. Extraction near the river will also help to draw carbon-amended water across the floodplain to treat the existing Cr (VI) beneath the floodplain east of National Trails Highway. The extracted water will be amended with carbon substrate and reinjected in the western portion of the plume where it will help induce an increased hydraulic gradient to accelerate the movement of the contaminated groundwater through the IRZ, where it will be treated. The assumed flow rate of groundwater extracted from the extraction wells, amended with carbon substrate, and reinjected is approximately 640 gpm. The primary purpose of adding carbon to the

reinjected water is to create treatment zones in the vicinity of each injection well where any Cr (VI) in the injected water would be reduced.

To further accelerate the movement of groundwater toward reducing zones, and to enhance distribution of the organic carbon, additional injection wells will be constructed in areas further to the west and north of the plume, and within the southern portion of the plume for freshwater injection. Freshwater injection will involve piping freshwater to the site from an offsite source. The injection of freshwater at an assumed rate of approximately 500 gpm will induce a hydraulic gradient to accelerate the movement of the site groundwater through the IRZ, where it will be treated. This fresh water injection also serves to constrain westward movement of the carbon amended water and flush much of this water eastward toward the extraction wells.

Cost Estimate for the Selected Remedy

The Total Present Worth Cost of the Selected Remedy is approximately $184,000,000 based on a present worth discount rate of 3.17% and 29-year O&M. These costs are summarized in *Table 3*.

The costs developed for the CMS/FS Report do not represent bid- or construction-level engineering costs. It is fully expected that the quantities, layouts, and configuration of the Selected Remedy will vary from that described herein. Costs were estimated using unit rates appropriate for the size and scope of the alternatives. Costs were based on 2008 costs or for past costs escalated to 2008. Future costs were not escalated.

The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an ESD, or a ROD amendment. This is an order-of-magnitude engineering cost estimated that is expected to be within +50 to -30 percent of the actual cost.

Expected Outcomes of Selected Remedy

The estimated time to achieve RAOs with the Selected Remedy is approximately 29 years based on the simulated time to remove 98 percent of the Cr (VI) mass within the plume. The amount of Cr (VI) mass within the East Ravine bedrock is estimated to be less than one percent of the total plume mass, and therefore does not significantly affect the simulated time to cleanup. The actual cleanup time will be dependent on the rate at which organic carbon can be distributed to all areas of contaminated groundwater in the floodplain and/or contaminated groundwater in recalcitrant zones in the upland areas can be flushed to the IRZ treatment line where it will be treated by injected organic carbon. The range of time to achieve RAOs is estimated to be between 10 and 110 years. By attaining the RAOs, the Selected Remedy will reduce the potential human health risk from exposure to Cr (VI) and Cr (T) in a hypothetical future use of groundwater as a

potable water supply/drinking water source and support the designated beneficial uses of the Colorado River (after cleanup goals have been attained). Further restrictions on groundwater use to address Cr (VI) in groundwater would not be necessary.

Socioeconomic effects from implementation of the Selected Remedy were evaluated by addressing how impacts to the physical environment may affect the socioeconomics of the area, as well as addressing how socioeconomic effects associated with the Selected Remedy may affect the physical environment. For this particular project, changes associated with increased economic output and employment were assessed for the surrounding region of influence for the construction, operation and maintenance, and decommissioning phases of the proposed project and project alternatives. The Selected Remedy will provide a modest economic benefit to the surrounding region, which may attract new residents resulting in some indirect growth. The vast majority of economic benefit is expected to occur during the construction phase, but these impacts are expected to be short-term. Long-term economic effects associated with operation and maintenance of the Selected Remedy are anticipated to be relatively modest compared with the economic output of the surrounding region. Employment associated the operation and maintenance of the Selected Remedy would also be modest, resulting little change to population and housing, and well below projected growth for the region.

M. Statutory Determinations

Based on the information currently available, DOI expects that the Selected Remedy, In-situ Treatment with Fresh Water Flushing, will satisfy the following requirements of CERCLA § 121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and treatment technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principle element of the remedy.

Protection of Human Health and the Environment

The Selected Remedy will protect human health and the environment in the long term through reduction of Cr (VI) concentrations in groundwater by in-situ treatment. Monitoring will provide data to evaluate the effectiveness of in-situ treatment. The Selected Remedy protects human health in the short term by limiting exposure through restriction of groundwater use as potable water source until cleanup goals are met.

Compliance with ARARs

The Selected Remedy will attain chemical-specific ARARs, including, for example, the following. By achieving cleanup goals less than MCLs, the remedy will comply with federal (40 CFR Part 141-Subpart G) and California (22 CCR Division 4, Chapter 15) Safe Drinking Water Act requirements for Cr (T) in groundwater delivered by a public water supply system. The Selected Remedy will comply with the Federal Water Pollution Control Act because surface water samples collected within the river near the

site, both before and after implementation of the IMs, show concentrations less than federal water quality criteria (40 CFR 131.38) for Cr (VI), naturally occurring reducing conditions in sediments near the Colorado River, and dilution provided by the river are expected to continue to prevent contaminated groundwater from causing exceedances of these standards in the river prior to remedy completion. By achieving cleanup goals in groundwater, the Selected Remedy will provide additional certainty that contaminated groundwater will not cause exceedances of Federal water quality criteria established under the Federal Water Pollution Control Act (40 CFR 131.38) for Cr (VI) in the Colorado River in the future.

The Selected Remedy will satisfy location-specific ARARs, including, for example, the following. Because surface water bodies are not being modified, USFWS coordination requirements (40 CFR 6.201) will not be triggered. Because RCRA-regulated treatment systems will not be constructed in a floodplain or seismic zone, RCRA seismic and floodplain requirements (40 CFR 264.18) will not be triggered. Construction of wells and piping in floodplain or wetland areas will be performed in a manner that complies with federal floodplain and wetlands protection requirements (40 CFR 6.201). Steps will be taken during design and implementation to ensure compatibility with the National Wildlife Refuge System Administration Act. The requirements of the National Historic Preservation Act ("NHPA") (16 U.S.C. § 470, et seq.) will be satisfied through the implementation of the Programmatic Agreement, discussed previously, or through additional consultation in compliance with Section 106 of the NHPA. Other cultural or historic resource protection ARARs, including, for example, those established by the National Archaeological and Historic Preservation Act (16 U.S.C. § 469, et seq.), the Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001, et seq.), and the Archaeological Resources Protection Act (16 U.S.C. § 470aa-ii, et seq.), will be attained through the design and implementation of the Selected Remedy as circumstances require. If a well for potable water is located in the future on land owned or controlled by the State of Arizona, the requirements of A.R.S. § 41-841 through 847 require that there will be no excavation of a historic site. If a well for potable water is located on land other than Arizona state land, A.R.S. § 41-861 through 866 require that no human remains or specified cultural objects will be disturbed intentionally, and unintentional disturbances will be reported.

The Selected Remedy will be designed and implemented to attain action-specific ARARs, including, for example, the following. Injection of reductant material and recirculation of groundwater will be performed in a manner that meets Federal Underground Injection Control requirements (40 CFR Parts 144-148). There will be no discharge of fill to wetlands or waterways (40 CFR 230.10), point source discharge of pollutants to waters of the United States (40 CFR Parts 122, 125), or other activities that alter the course, condition, or capacity of navigable waters (33 USC § 401 and 403). Remedial activities will comply with applicable NPDES construction stormwater requirements (40 CFR 122.26). Remedial activities will not emit regulated hazardous air pollutants (40 CFR Parts 61, 63). Installation of wells, piping, and reagent storage equipment will be performed in a manner that does not result in a "take" of threatened or endangered species, damage their critical habitat (50 CFR part 402), or impact migratory

birds (15 USC § 703-712). Waste generated during remedial activities will be handled in compliance with hazardous waste generator requirements (22 CCR Division 4.5, Chapters 11, 12, 18). Regulated waste piles, tank systems, landfills, and miscellaneous units will not be constructed. Monitoring will be performed in accordance with RCRA (22 CCR Division 4.5, Ch. 14, Article 6) and California Water Code (23 CCR Div. 3, Chapter 15; 27 CCR Div. 2, Subdivision 1; Calif. Water Code Section 13801(c)) monitoring requirements. Because RAOs will achieve background levels for chromium, the Selected Remedy will comply with the substantive provisions of State Water resource Control Board ("SWRCB") Resolution 68-16 that requires maintenance of the highest water quality consistent with maximum benefit to the people of the State, and with the substantive provisions of SWRCB Resolution 92-49 that require restoration of background water quality. The Selected Remedy will also result in achieving Basin Plan water quality objectives for chromium in groundwater. Appropriate land use covenants will be implemented (22 CCR 67391.1). Arizona well standards (A.A.C. R-12-15-850; A.R.S. Title 5, Chapter 2, Article 10) will be met for potable water supply wells constructed in Arizona.

A complete list of all ARARs identified by DOI for the Topock Site is provided in *Table 2*.

Cost Effectiveness

The Selected Remedy will be cost-effective. As defined by the NCP, a remedy is "cost-effective if its costs are proportional to its overall effectiveness." (40 CFR §300.430(f)(1)(ii)(D)). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of the Selected Remedy was determined to be proportional to its costs.

The estimated present worth cost of the Selected Remedy is $184,000,000.

Utilize Permanent Solutions and Treatment Technologies

The Selected Remedy includes in-situ treatment by distributing an organic carbon substrate within the floodplain to create geochemically-reduced conditions to convert Cr (VI) in groundwater to insoluble Cr (III) and thereby reducing the toxicity and mobility of the site contaminants.

Five-year Reviews

Section 121(c) of CERCLA and NCP §300.430(f)(5)(iii)(C) provide the statutory and regulatory requirements for conducting five-year reviews. Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be

conducted within five years after initiation of remedial action and every five years after until attainment of the RAOs to ensure that the remedy is, or will be, protective of human health and the environment.

Figures and Tables

Figure 1. Topock Location Map with Nearby Communities and Tribal Reservations

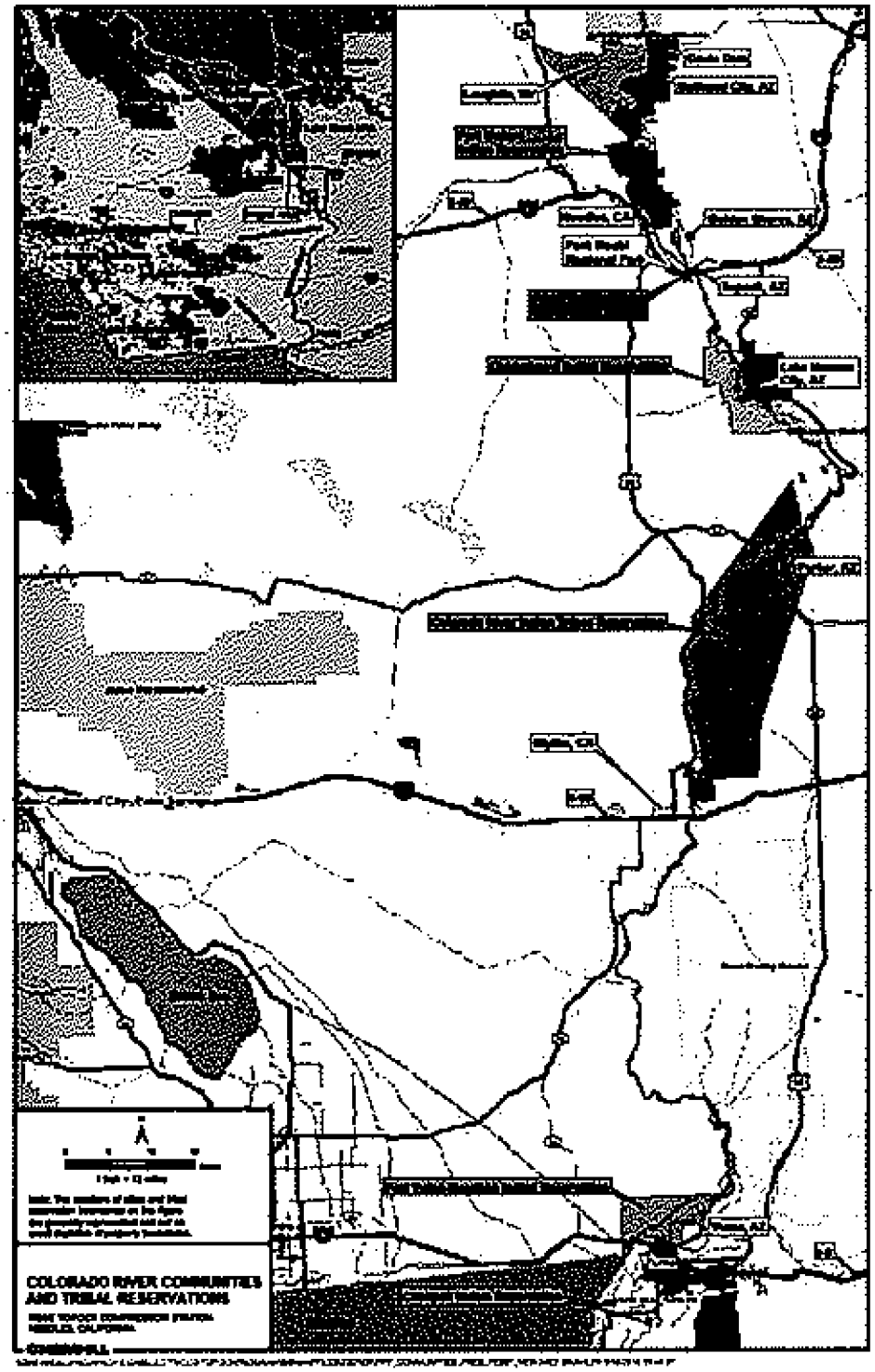


Figure 2. Topock Federal, State, and Private Property Boundaries, Cr (VI) Plume Boundary and Groundwater Monitoring Well Locations

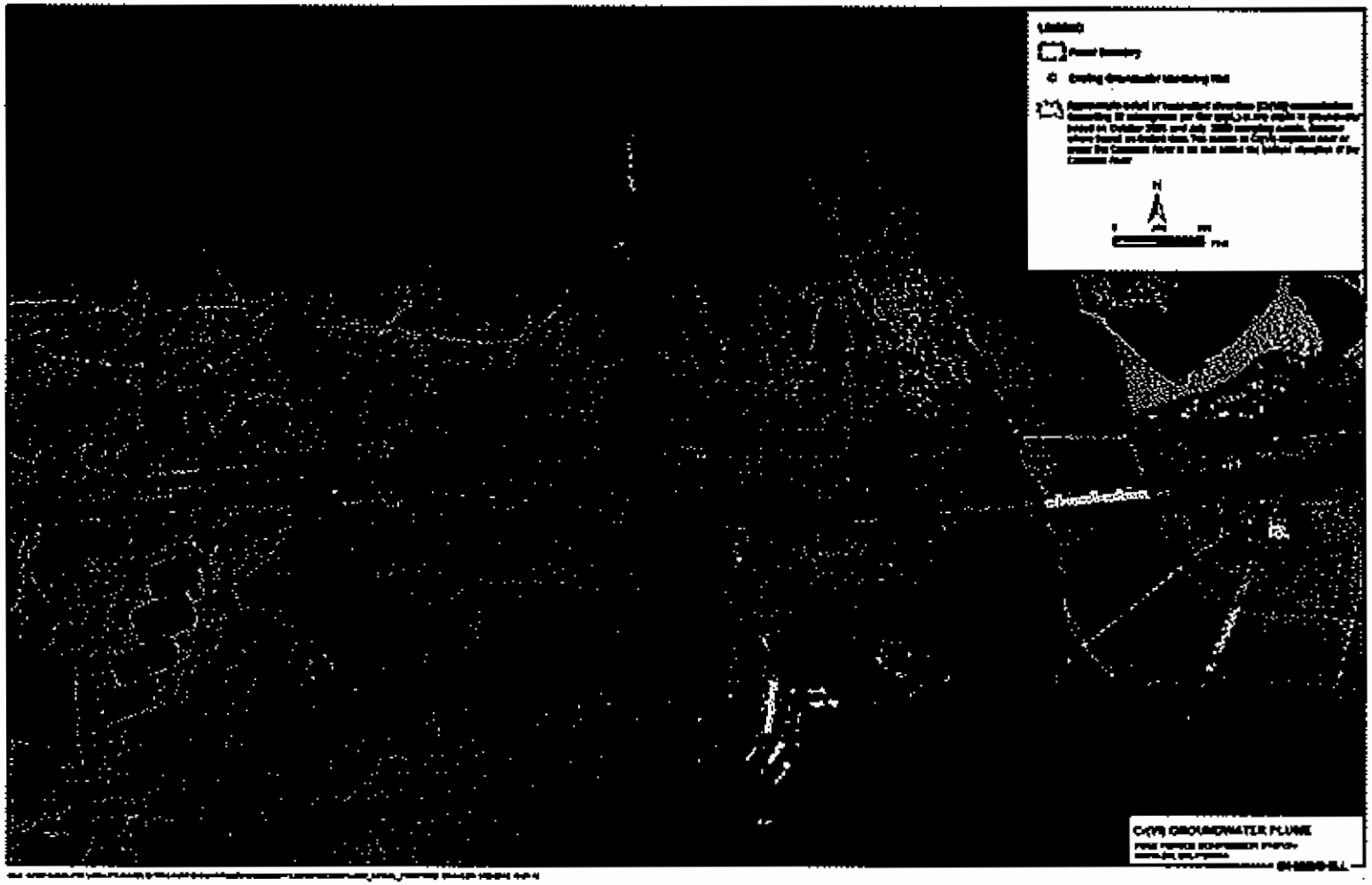


Figure 3. Topock Groundwater Conceptual Site Model

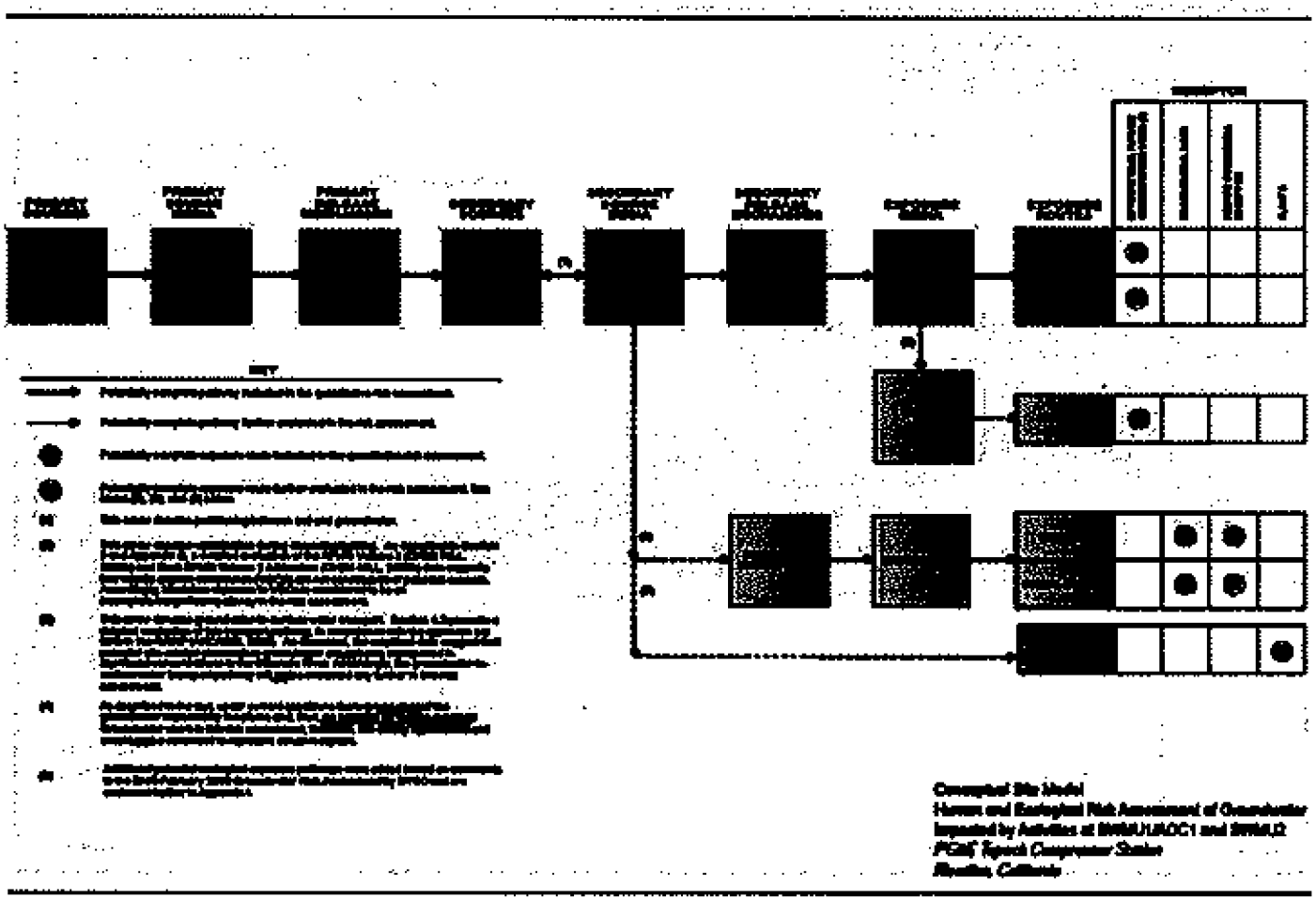


Figure 4. Topock Hydrogeologic Cross-Section

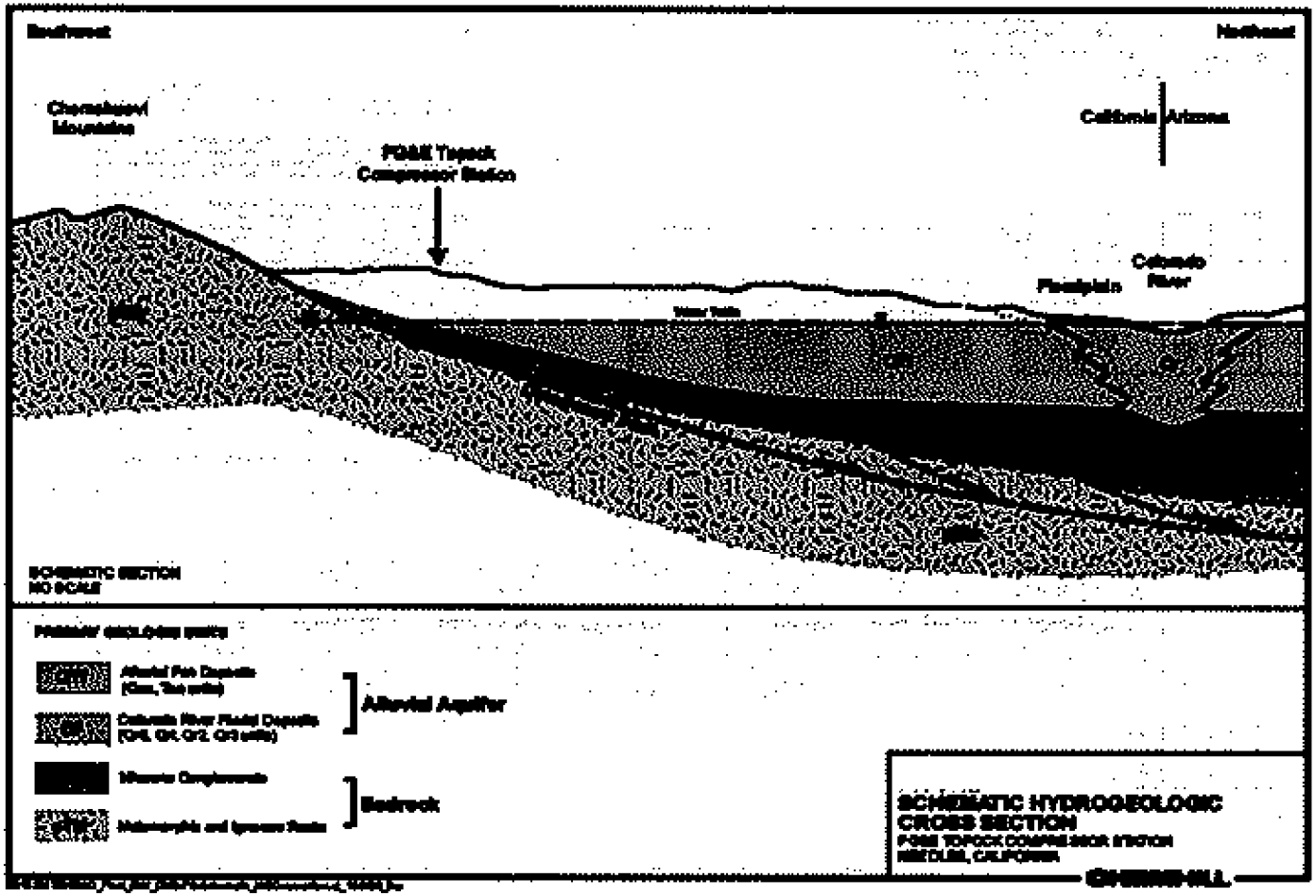


Figure 5. Surface Water Monitoring Locations.

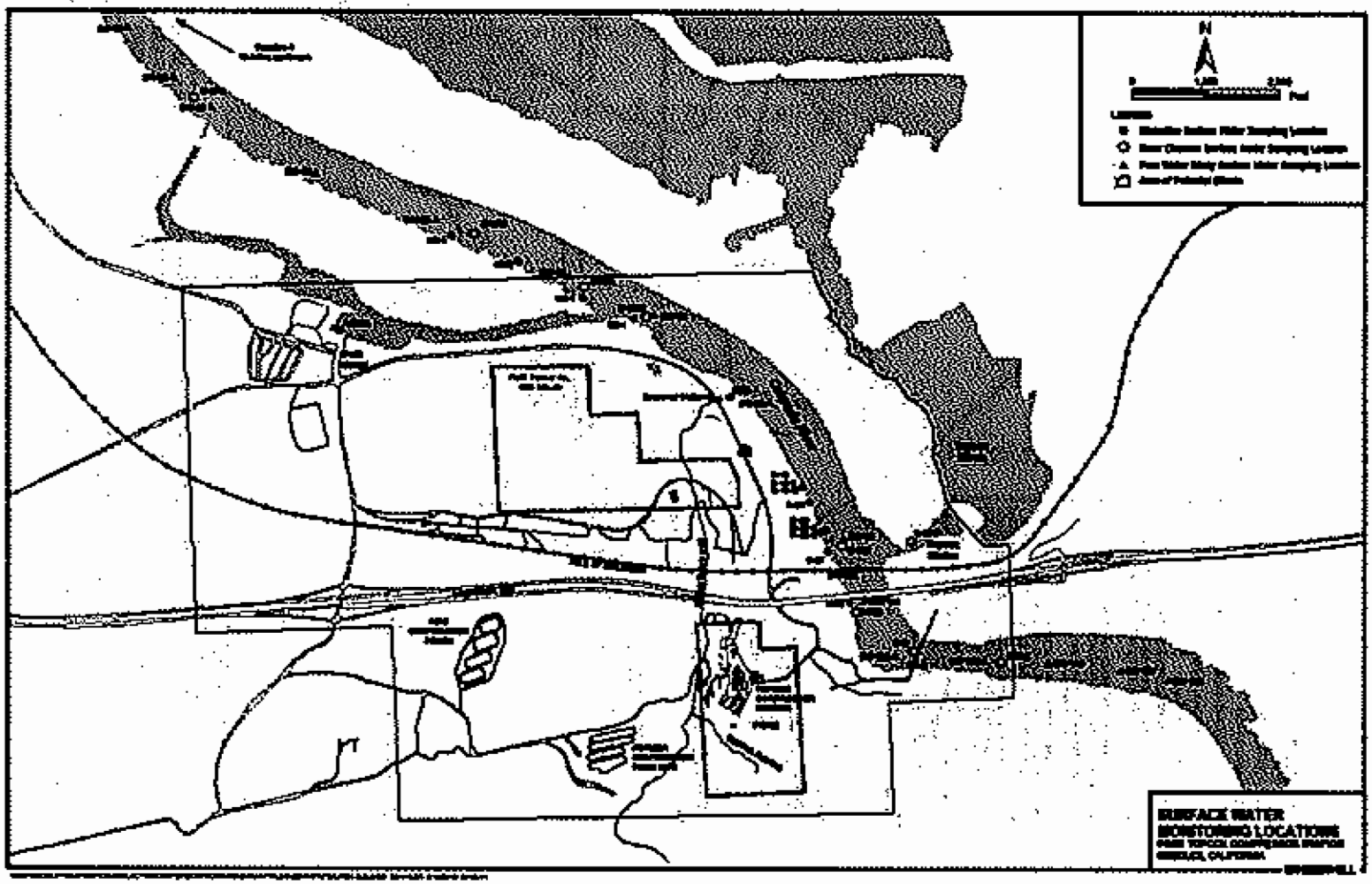


Figure 6. Alternative E – In-Situ Treatment with Fresh Water Flushing – Conceptual Drawing

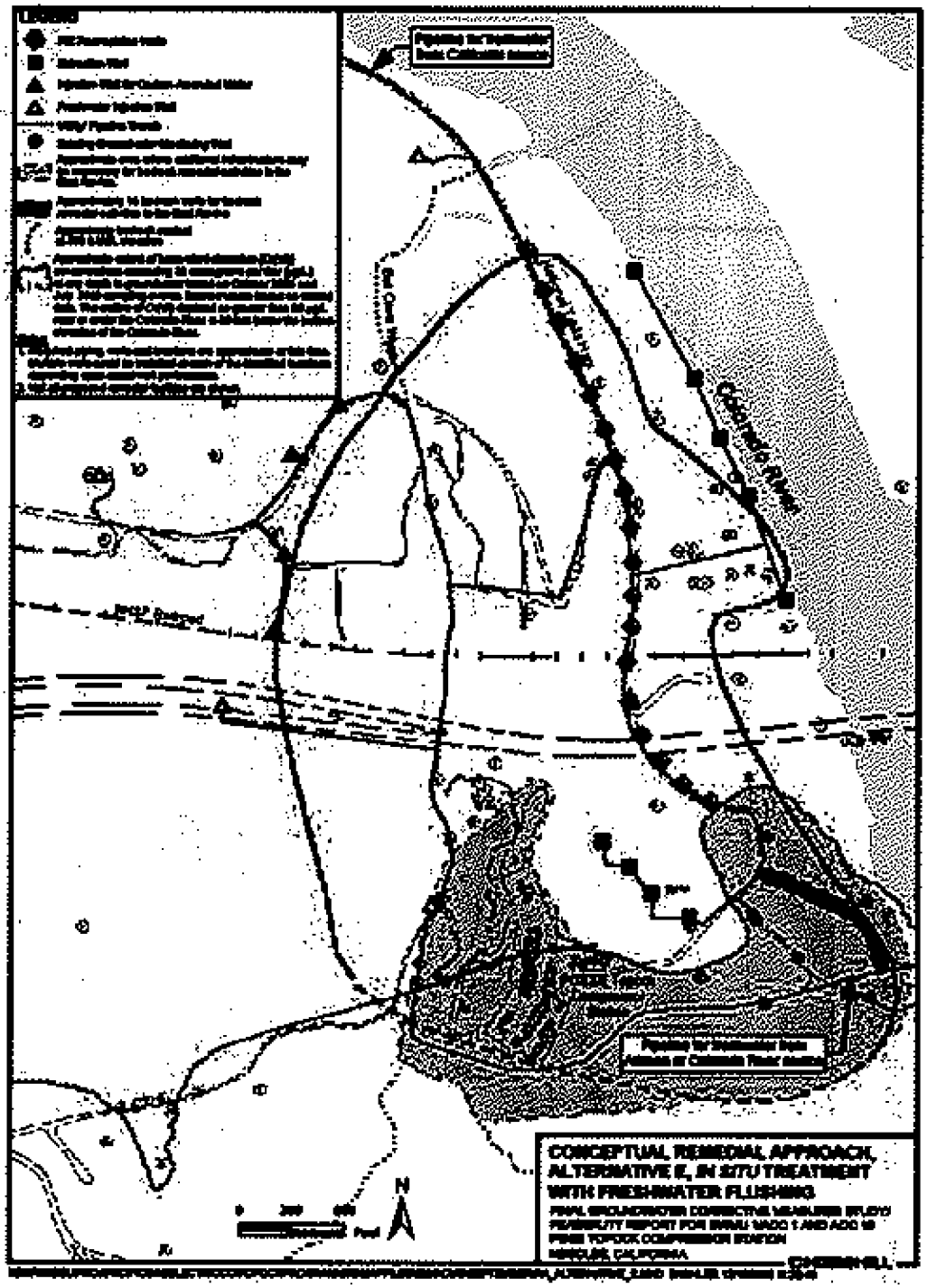


Table 1. Human Health Risk Assessment Results: Hypothetical Groundwater User

[illegible]
PG&E Topock Compressor Station, Needles, California

Summary of Estimated Potential Human Health Risk Assessment Results: Hypothetical Future Groundwater User

Chemical of Potential Concern	Number of Wells Sampled	Number of Wells Exceeding Cumulative Hazard Threshold	Frequency	Average Hazard Index at Wells where Chemical is Driving Risk	Number of Wells Exceeding Cumulative Hazard Threshold + Sensitivity Analysis	Frequency	Average Hazard Index at Wells where Chemical is Driving Risk + Sensitivity Analysis	Total Number of Samples	Number of Detections	Number of Wells Exceeding Background Levels	Frequency
Aluminum	[illegible]	0	0.0%	NA	0	0.0%	NA	[illegible]	21	[illegible]	[illegible]
Antimony	[illegible]	7	10.3%	[illegible]	3	4.4%	[illegible]	[illegible]	[illegible]	[illegible]	11.8%
Arsenic	110	3	2.7%	1.2E+01	3	2.7%	1.0E+01	[illegible]	[illegible]	3	2.7%
Barium	[illegible]	2	1.9%	1.7E+00	1	0.9%	1.7E+00	[illegible]	[illegible]	[illegible]	[illegible]
Beryllium	[illegible]	0	0.0%	NA	0	0.0%	NA	374	30	14	[illegible]
Cadmium	[illegible]	1	1.5%	1.4E+00	0	0.0%	NA	374	1	1	1.5%
Chromium, hexavalent	[illegible]	[illegible]	[illegible]	[illegible]	44	[illegible]	[illegible]	2,7[illegible]	[illegible]	[illegible]	41.[illegible]%
Cobalt	[illegible]	2	2.9%	1.0E+00	2	2.9%	6.2E-01	374	13	8	11.8%
Copper	[illegible]	0	0.0%	NA	0	0.0%	NA	[illegible]	[illegible]	40	[illegible]
Fluoride	104	4	4.8%	1.3E+01	4	4.8%	[illegible]	[illegible]	[illegible]	[illegible]	4.8%
Lead	[illegible]	7	8.4%	2.7E+00	2	2.4%	1.0E+00	[illegible]	[illegible]	[illegible]	43.4%
Mercury	[illegible]	0	0.0%	NA	0	0.0%	NA	[illegible]	1	1	1.2%
Molybdenum	[illegible]	17	20.0%	[illegible]	14	[illegible]	1.0E+00	[illegible]	[illegible]	[illegible]	[illegible]
Nickel	[illegible]	2	2.3%	[illegible]	2	2.3%	[illegible]	[illegible]	[illegible]	[illegible]	44.2%
Nitrate as nitrogen	[illegible]	8	4.8%	8.4E-01	3	1.8%	7.7E-01	[illegible]	[illegible]	[illegible]	[illegible]
Selenium	[illegible]	7	[illegible]	1.3E+00	1	1.3%	1.4E+00	[illegible]	[illegible]	17	[illegible]
Silver	[illegible]	3	4.4%	[illegible]	0	0.0%	NA	374	8	7	10.3%
Thallium	[illegible]	2	2.9%	1.1E+00	2	2.9%	[illegible]	374	2	2	2.9%
Vanadium	[illegible]	17	[illegible]	1.1E+00	[illegible]	[illegible]	6.7E-01	[illegible]	[illegible]	[illegible]	[illegible]
Zinc	[illegible]	0	0.0%	NA	0	0.0%	NA	[illegible]	[illegible]	37	[illegible]

Notes:

(1) See Appendix F for an explanation of methodologies used in determining relative contribution to elevated hazard.

(2) [illegible]

(3) Estimated potential noncancer hazard indices are presented in Table 7-2.

(4) [illegible]

EPC = exposure point concentration
NA = not applicable
OTM = of the mean
UCL = upper confidence limit

Table 2. Applicable or Relevant and Appropriate Requirements (ARARs) and other factors To Be Considered (TBCs)

Appendix A - Corrective Measures Study/Feasibility Study Report for Chromium in Groundwater, PG&E Topock Compressor Station, Needles, California

Note: Only substantive requirements of the statutes and regulations listed here must be attained for on-site remedial actions. Compliance with administrative, procedural, and permitting requirements of those statutes and regulations is not required for on-site actions.

	ARAR or TBC and Citation	Determination	Description and Applicability
CHEMICAL-SPECIFIC			
1.	Federal Safe Drinking Water Act • 42 USC § 300f, *et seq.* • 40 CFR 141 – Subpart F– Maximum Contaminant Level Goals (MCLGs)	ARAR Relevant and Appropriate	MCLGs are not federally enforceable drinking water standards, but CERCLA § 121(d) identifies MCLGs as relevant and appropriate requirements.
2.	Federal Safe Drinking Water Act • 42 USC § 300g-1 • 40 CFR 141 – Subpart G – National Primary Drinking Water Regulations (MCLs)	ARAR Relevant and Appropriate	These MCLs are relevant and appropriate standards, which establish the maximum permissible level of contaminants (eg. Chromium) in sources (or potential sources) of drinking water. MCLs may be applicable where water at a CERCLA site is delivered through a public water supply system.

3.	Federal Water Pollution Control Act (CWA) • 33 USC §§ 1251-1387 • 40 CFR 131.38	ARAR Applicable	These are federally promulgated Water Quality Standards for surface waters. Such water quality standards include specific criteria for water bodies in California, including standards for Hexavalent Chromium.
4.	Occupational Safety and Health Act • 29 USC § 651, *et seq.* • 29 CFR 1910.1026	TBC	This Act provides standards for workers engaged in field activities associated with remedial actions under the NCP, including occupational exposure to Hexavalent Chromium. Pursuant to the NCP preamble, OSHA standards are not ARARs but may be included as TBCs.
LOCATION-SPECIFIC			
5.	Federal Land Policy and Management Act (FLPMA) • 43 USC § 1701, *et seq.* • 43 CFR 2800	ARAR Applicable	In managing public lands, BLM is directed to take any action necessary to prevent unnecessary or undue degradation of the lands. Actions taken on the public land (i.e. BLM-managed land) portions of the Topock site should provide the "optimal balance between authorized resource use and the protection and long-term sustainability of sensitive resources."
6.	U.S. Department of Interior, Bureau of Land Management, *Approved Resource Management Plan and Final Environmental Impact Statement*, May 2007	TBC	The Resource Management Plan provides further direction on how FLPMA requirements will be satisfied.
7.	National Wildlife Refuge System Administration Act, as amended • 16 USC §§ 668dd-ee • 50 CFR Part 27	ARAR Applicable	This Act governs the use and management of National Wildlife Refuges. The Act requires that FWS evaluate ongoing and proposed activities and uses to ensure that such activities are appropriate and compatible with both the mission of the overall National Wildlife Refuge System, as well as the specific purposes for which the Havasu National Wildlife Refuge was established. The Topock site includes portions of the Havasu National Wildlife Refuge. Prior to selection of a remedial action by DOI/FWS, that remedial action must be found by the Refuge Manager to be both an appropriate use of the Refuge and compatible with the mission of the Refuge and the Refuge System as a whole. Any remedial action proposed

			to be implemented on the Refuge that was not selected by DOI/FWS would be subject to the formal appropriate use/compatibility determination process.
8.	Executive Order 8647; 6 FR 593	TBC	This Executive Order establishes the Havasu National Wildlife Refuge and describes the purposes for which it was created.
9.	Appropriate Use Policy • 603 FW 1	TBC	This policy elaborates on the appropriate uses of a National Wildlife Refuge, ensuring that such uses contribute to fulfilling the specific refuge's purposes and the National Refuge System's mission.
10.	Compatibility Policy • 603 FW 2	TBC	This policy specifies the guidelines for determining the compatibility of proposed uses of a National Wildlife Refuge. This determination is done once a proposed use is deemed appropriate (see number 9 above).
11.	Lower Colorado River National Wildlife Refuges, Comprehensive Management Plan (1994-2014)	TBC	The Comprehensive Management Plan provides further direction on how compliance with the National Wildlife Refuge System Administration Act, as amended, shall be achieved.
12.	Fish and Wildlife Conservation Act • 16 USC §§ 2901-2911	TBC	Federal departments and agencies are encouraged to utilize their authority to conserve nongame fish and wildlife and their habitats and assist States in the development of their conservation plans.
13.	Fish and Wildlife Coordination Act • 16 USC §§ 661-667e • 40 CFR 6.302(g)	ARAR Applicable	This Act requires that any federally-funded or authorized modification of a stream or other water body must provide adequate provisions for conservation, maintenance, and management of wildlife resources and their habitat. Necessary measures should be taken to mitigate, prevent, and compensate for project-related losses of wildlife resources. Any remedial action selected for the Topock site that includes any modification of a water body will be subject to these requirements.

14.	National Historic Preservation Act • 16 USC § 470, *et seq.* • 40 CFR 6.301(b) • 36 CFR 800.1, *et seq.*	ARAR Applicable	This statute and the implementing regulations direct federal agencies to consider the effects of their undertakings on historic properties included in or eligible for inclusion in the National Register of Historic Places and to consult with certain parties before moving forward with the undertaking. The agency must determine, based on consultation, if an undertaking's effects would be adverse and consider feasible and prudent alternatives that could avoid, mitigate, or minimize such adverse effects on a National Register or eligible property. The agency must then specify how adverse effects will be avoided or mitigated or acknowledge that such effects cannot be avoided or mitigated. The Topock site includes historic properties in or eligible for inclusion in the National Register and remedial action selected for the Topock site qualifies as an undertaking pursuant to the NHPA. Measures to avoid or mitigate adverse effects of any selected remedial action that are adopted by the agency through consultation must be implemented by the remedial action to comply with the NHPA.
15.	National Register Bulletin 38	TBC	Guidelines for evaluating and documenting traditional cultural properties.
16.	Preservation Brief 36	TBC	Guidelines for planning, treating, and managing historic landscapes.
17.	National Archaeological and Historic Preservation Act • 16 USC § 469, *et seq.* • 36 CFR 65 • 40 CFR 6.301(c)	ARAR Applicable	This statute requires the evaluation and preservation of historical and archaeological data which might otherwise be irreparably lost or destroyed through any alteration of terrain as a result of federal construction projects or a federally-licensed activity. The Topock site includes historical and archaeological data. Any remedial action selected for the Topock site must include measures for the evaluation and preservation of historical and archaeological data that might be lost or destroyed as a result of the remedial action.
18.	Archaeological Resources Protection Act • 16 USC § 470aa-ll, *et seq.* • 43 CFR 7.1, *et seq.*	ARAR Applicable	This statute provides for the protection of archaeological resources located on public and tribal lands. The Act establishes criteria which must be met for the land manager's approval of any excavation or removal of archaeological resources if a proposed activity involves soil disturbances. The Topock site includes archaeological resources on public land. Any remedial action selected for the Topock site must satisfy the criteria applicable to excavation or removal of archaeological resources that might be affected as a result of the remedial action.

19.	Historic Sites Act • 16 USC §§ 461-467 • 40 CFR 6.301(a)	ARAR Applicable	Pursuant to this Act, federal agencies are to consider the existence and location of historic sites, buildings, and objects of national significance using information provided by the National Park Service to avoid undesirable impacts upon such landmarks. The Topock site includes areas which are considered historic sites. Undesirable impacts on these sites that might result from any remedial action selected for the Topock site will be evaluated and mitigated to the maximum extent practicable.
20.	Executive Order No. 11593	TBC	This Order directs the Federal Agencies to initiate measures for the protection and enhancement of the cultural environment. These measures include assuring that steps are taken to make records, drawings, and/or maps and have such items deposited in the Library of Congress when, as the result of a Federal action, a property listed on the National Register of Historic Places is to be substantially altered.
21.	Native American Graves Protection and Repatriation Act (NAGPRA) • 25 USC § 3001, *et seq.* • 43 CFR 10.1, *et seq.*	ARAR Applicable	NAGPRA establishes requirements regulating the removal and trafficking of human remains and cultural items, including funerary and sacred objects. The Topock site may contain human remains. If remediation activities result in the discovery of Indian human remains or related objects, NAGPRA requirements must be met.
22.	American Indian Religious Freedom Act • 42 USC § 1996, *et seq.*	ARAR Relevant and Appropriate	The United States must "protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise (their) traditional religions..." Any remedial action selected for the Topock site must satisfy this requirement.
23.	Executive Order No. 13007	TBC	In managing federal lands, the United States "shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and (2) avoid adversely affecting the physical integrity of such sacred sites."
24.	Executive Order No. 13175	TBC	Federal Agencies are to conduct regular and meaningful consultation and collaboration with tribal officials in the development and implementation of Federal policies that have tribal implications.

25.	Executive Order No. 12898	TBC	Federal agencies shall conduct "activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities, because of their race, color, or national origin."
26.	Executive Order No. 13352	TBC	The Department of Interior shall, to the extent permitted by law, "implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation."
27.	Resource Conservation and Recovery Act • 42 USC § 6901, *et seq.* • 40 CFR 264.18	ARAR Applicable	These regulations promulgated under RCRA establish Seismic and Floodplain considerations which must be followed for treatment, storage, or disposal facilities constructed, operated, or maintained within certain distances of fault lines and floodplains. Portions of the Topock site are located on or near a 100-year floodplain.
28.	Floodplain Management and Wetlands Protection • 40 CFR § 6.302(a) & (b) • 40 CFR 6, Appendix A	ARAR Applicable	Before undertaking an action, agencies are required to perform certain measures in order to avoid the long and short term impacts associated with the destruction of wetlands and the occupancy and modification of floodplains and wetlands. The regulation sets forth requirements as means of carrying out the provisions of Executive Orders 11988 and 11990.
29.	Executive Order 11988 -- Floodplain Management	TBC	Executive Order 11988 requires evaluation of the potential effects of actions that take place in a floodplain to avoid, to the extent possible, adverse impacts.
30.	Executive Order 11990 -- Responsibilities of Federal Agencies to Protect Wetlands	TBC	Executive Order 11990 requires that potential impacts to wetlands be considered, and as practical, destruction, loss, or degradation of wetlands be avoided.

ACTION-SPECIFIC			
31.	Federal Safe Drinking Water Act • 42 USC §300f, *et seq.* Part C – Protection of Underground Sources of Drinking Water • 40 CFR 144 -148	ARAR Applicable	These Underground Injection Control Regulations assure that any underground injection performed on-site will not endanger drinking water sources. Substantive requirements include, but are not limited to, regulation of well construction and well operation. These requirements will be applicable if underground injection is proposed as a part of a site remedy.
32.	Federal Water Pollution Control Act (Clean Water Act) • 33 USC § 1344 • 40 CFR 230.10	ARAR Applicable	This section of the Clean Water Act prohibits certain activities with respect to on-site wetlands and waterways. No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed activity which would have less adverse impact to the aquatic ecosystem.
33.	Federal Water Pollution Control Act (Clean Water Act) • 33 U.S.C. § 1342 • 40 CFR 122 • 40 CFR 125	ARAR Applicable	These National Pollutant Discharge Elimination System (NPDES) requirements regulate discharges of pollutants from any point source into waters of the United States.
34.	Federal Water Pollution Control Act (Clean Water Act) • 40 CFR 122.26	ARAR Applicable	These regulations define the necessary requirements with respect to the discharge of storm water under the NPDES program. These regulations will apply if proposed remedial actions result in storm water runoff which comes in contact with any construction activity from the site remediation.
35.	River and Harbor Act of 1899 • 33 USC §§ 401 and 403	ARAR Applicable	This Act prohibits the creation of any obstruction in navigable waters, in addition to banning activities such as depositing refuse, excavating, filling, or in any manner altering the course, condition, or capacity of navigable waters. These requirements will apply if proposed activities at the Topock site have the potential of affecting any navigable waters on the site.

36.	Colorado River Front Work and Levee System Act • 44 Stat. 1010 (1927)	TBC	Any proposed remediation activities shall not interfere with the water operations or related water management activities and responsibilities of the Bureau of Reclamation.
37.	Clean Air Act • 42 USC §§ 7401, *et seq.* National Ambient Air Quality Standards (NAAQS) • 40 CFR 50	TBC	These ambient air quality standards define levels of air quality to protect the public health. NAAQSs are not enforceable in and of themselves, but they may be used as guidance if remediation activities create potential air quality impacts.
38.	Clean Air Act • 42 USC §§ 7401, *et seq.* National Emission Standards for Hazardous Air Pollutants (NESHAP) • 40 CFR 61 • 40 CFR 63	ARAR Applicable	NESHAPs are regulations which establish emissions standards for certain hazardous air pollutants (HAPs) identified in the regulations. NESHAPs will apply if remediation activities on the site produce identified HAP emissions.
39.	Religious Freedom Restoration Act • 42 USC § 2000bb	ARAR Applicable	Pursuant to this Act, the government shall not substantially burden a person's exercise of religion, unless the application of the burden is in furtherance of a compelling government interest, and it is the least restrictive means of furthering that interest. To constitute a "substantial burden" on the exercise of religion, a government action must (1) force individuals to choose between following the tenets of their religion and receiving a governmental benefit or (2) coerce individuals to act contrary to their religious beliefs by the threat of civil or criminal sanctions. If any remedial action selected imposes a substantial burden on a person's exercise of religion, it must be in furtherance of a compelling government interest and be the least restrictive means of achieving that interest.
40.	Endangered Species Act of 1973 • 16 USC §§ 1531-1544	ARAR	The ESA makes it unlawful to remove or "take" threatened and endangered plants and animals and protects their habitats by prohibiting certain activities. Examples of such species in or around the Topock site may include, but are not limited to, southwestern

	• 50 CFR 402	Applicable	willow flycatcher, Mojave Desert tortoise, Yuma clapper rail, Colorado pike minnow, razorback sucker, and bonytail chub. Any remedial action selected for the Topock site will not result in the take of, or adverse impacts to, threatened and endangered species or their habitats, as determined based on consultation with the Fish and Wildlife Service under section 7 of the ESA.
41.	Migratory Bird Treaty Act • 16 USC §§ 703-712	ARAR Applicable	This Act makes it unlawful to "take, capture, kill," or otherwise impact a migratory bird or any nest or egg of a migratory bird. The Havasu National Wildlife Refuge, which is part of the Topock site, was created as a refuge and breeding ground for migratory birds and other wildlife, therefore, there is potential for contact with migratory birds during proposed remediation activities. Any remedial action selected for the Topock site will be designed and implemented so as to not take, capture, kill, or otherwise impact a migratory bird, nest, or egg.
42.	Executive Order 13186: Responsibilities of Federal Agencies To Protect Migratory Birds	TBC	This Order directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act, including supporting the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
	ARAR or TBC and Citation	**Determination**	**Description and Applicability**
LOCATION-SPECIFIC			

43.	Archeological Discoveries • A.R.S. § 41-841 through 847	ARAR	This Act prohibits any person from knowingly excavating on Arizona State or State agency owned land which is a historic or prehistoric ruin, burial ground, archaeological or paleontological site. These requirements will apply if the selected remedy involves excavation in Arizona.
44.	Historic Preservation • A.R.S. § 41-865	ARAR	This Act restricts any person from disturbing human remains or funerary objects on land owned or controlled by the State. These requirements will apply if the selected remedy involves excavation in Arizona.
ACTION-SPECIFIC			
45.	Arizona Well Standards • A.A.C. R-12-15-850	ARAR	These requirements on the placement of wells will apply if the selected remedy includes placement of wells in Arizona.
46.	Design criteria for treatment units • A.A.C. R18-5-(501-502)	ARAR	These minimum design criteria will apply if the selected remedy includes construction of a groundwater treatment plant.
47.	Requirements for wells, groundwater withdrawal, treatment, and reinjection • A.R.S. §45-454.01	ARAR	This statute exempts new well construction, withdrawal, treatment, and reinjection into a groundwater aquifer as a part of a CERCLA Remedial Action from the requirements of the Arizona Groundwater Code, except that they must comply with the substantive requirements of A.R.S. 45-594, 45-595, 45-596, and 45-600. If groundwater that is withdrawn is not reinjected into the aquifer, the groundwater shall be put to reasonable and beneficial use.

48.	Well construction standards • A.R.S. §45-594 and 595	ARAR	These provisions identify the well construction standards and requirements for new well construction in the State of Arizona. These requirements will apply if the selected remedy involves the construction of wells in Arizona.
49.	Notice of intention to drill • A.R.S. §45-596	ARAR	Substantive requirements will apply if the selected remedy involves the construction of wells in Arizona.
50.	Report by driller • A.R.S. §45-600	ARAR	Substantive requirements will apply if the selected remedy involves the construction of wells in Arizona.
51.	Arizona Remedial Action Requirements • A.R.S. §49-282.06(A)(2)	ARAR	Any treatment of groundwater must be conducted in a manner to provide for the maximum beneficial use of the waters of the state.

	ARAR or TBC and Citation	Determination	Description and Applicability
CHEMICAL-SPECIFIC			
52.	California Safe Drinking Water Act • Title 22, CCR, Div 4, Ch 15, §64431, §64444	ARAR Applicable	Maximum Contaminant Levels (MCLs) which shall not be exceeded in the water supplied to the public. California state MCLs for drinking water standards are more stringent than primary federal standards.
53.	Secondary MCLs list for drinking water • Title 22, CCR, Div 4, Ch 15, §64449	ARAR Relevant and Appropriate	State secondary MCLs for drinking water standards are more stringent than federal standards. These secondary MCLs are relevant and appropriate standards, which establish the maximum permissible level of contaminants in sources (or potential sources) of drinking water. These secondary MCLs would be applicable if water at the site was used as drinking water and delivered through a community water supply system.
54.	Characteristics of Hazardous Waste • Title 22, CCR, Div 4.5, Ch 11, Article 3, §66261.20- §66261.24	TBC	These criteria do not establish substantive requirements, but instead describe the analysis by which waste is determined to be hazardous. These regulations outline Toxicity Characteristic Leaching Procedure (TCLP) regulatory levels, persistent and bioaccumulative toxic substances total threshold limit concentrations (TTLC), and soluble threshold limit concentration (STLC).
55.	Groundwater and vadose zone protection standards • Title 22, CCR, Div 4.5, Ch 15, Article 6,	ARAR Applicable	RCRA hazardous waste Interim Status TSD facilities shall comply and ensure that hazardous constituents entering the groundwater, surface water, and soil from a regulated unit do not exceed the concentration limit from contaminants of concern in the uppermost aquifer underlying the waste management area beyond the point of

	§66265.94		compliance.
56.	State Water Quality Control Policy Porter-Cologne Water Quality Control Act (California Water Code Sections 13140, *et seq.*)	TBC	
57.	Regional Water Quality Control Plan Objectives Porter-Cologne Water Quality Control Act (California Water Code Sections 13240, 13241)	TBC	
58.	Regional Water Quality Control Plan Implementation Porter-Cologne Water Quality Control Act (California Water Code Sections 13242)	TBC	
59.	*Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities* DTSC Human and Ecological Risk Division July 1996	TBC	
60.	*Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities* DTSC Human and Ecological Risk Division July 1992	TBC	
61.	*Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual – Interim Final (EPA/540/1-89/002)* United States Environmental Protection Agency December 1989	TBC	

82.	*Selecting Inorganic Constituents As Chemicals Of Potential Concern At Risk Assessments At Hazardous Waste Sites And Permitted Facilities* DTSC Final Policy, February 1997	TBC	

LOCATION-SPECIFIC			
63.	Seismic and Floodplain standards • Title 22, CCR, Div 4.5, Ch 14, Article 2, §66264.18	ARAR Relevant and Appropriate	These standards are relevant and appropriate for TSD facilities constructed, operated, or maintained within certain distances of fault lines, floodplains, or the maximum high tide.
64.	*Drilling, Coring, Sampling and Logging at Hazardous Substance Release sites* Guidance Manual for Ground Water Investigations, Cal/EPA, July 1995	TBC	
65.	*Reporting Hydrogeologic Characterization Data at Hazardous Substance Release sites* Guidance Manual for Ground Water Investigations, Cal/EPA, July 1995	TBC	
66.	*Guidelines for Hydrogeologic Characterization of Hazardous Substance Release Sites, Volume 1 & 2*, Cal/EPA, July 1995	TBC	
67.	*Aquifer Testing for Hydrogeologic Characterization* Guidance Manual for Ground Water Investigations, Cal/EPA, July 1995	TBC	
68.	*Application of Borehole Geophysics at Hazardous Substance Release Sites* Guidance Manual for Ground Water Investigations, Cal/EPA, July 1995	TBC	

69.	*Ground Water Modeling for Hydrogeologic Characterization* Guidance Manual for Ground Water Investigations Cal/EPA, July 1995	TBC	
70.	*Monitoring Well Design and Construction for Hydrogeologic Characterization* Guidance Manual for Ground Water Investigations. Cal/EPA, July 1995	TBC	
71.	*Advisory – Active Soil Gas Investigation* DTSC/CRWQCB-Los Angeles Region, January 2003	TBC	
72.	*Representative Sampling of Ground Water for Hazardous Substances*, Cal/EPA, July 1995	TBC	
73.	*Accumulating Hazardous Waste at Generator Sites*, Cal/EPA, July 1995	TBC	
ACTION-SPECIFIC			
74.	Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste ▪ Title 22, CCR, Div 4.5, Ch 12, Article 1, §66262.11	ARAR Applicable	Owners or operators who generate waste shall determine whether waste is a hazardous waste. Applicable for any operation where waste is generated. The determination of whether wastes generated during remedial activities are hazardous shall be made when the wastes are generated.
75.	Hazardous Waste Control Act (HWCA) • Title 22, CCR, Div 4.5, Ch 12, Article 1, §66262.12	ARAR Applicable	A generator shall not treat, store, dispose of, transport or offer for transportation, hazardous waste without having received an identification number. Substantive requirements will be applicable for any operation where waste is generated. The determination of whether wastes generated during remedial activities

			are hazardous shall be made when the wastes are generated.
76.	Hazardous Waste Control Act (HWCA) Standards for owners and operators of hazardous waste transfer and TSD facilities ▪ Title 22, CCR, Div 4.5, Ch 14, Article 2	ARAR Applicable	Establish requirements for a hazardous waste treatment facility to have a plan for waste analysis, develop a security system, conduct regular inspections, provide training to facility personnel, and use a quality assurance program during construction. The requirements may be applicable if CERCLA response action includes treatment, storage, or disposal as defined under RCRA, or may be relevant and appropriate if the requirements address problems or situations sufficiently similar to the specific circumstances at the site that their usage will be well suited.
77.	Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste • Title 22, CCR, Div 4.5, Ch 12, Article 2, §66262.20, §66262.22	ARAR Applicable	A generator of hazardous waste who transports or offers hazardous waste for transportation shall prepare a manifest. Substantive requirements will be applicable for any operation where waste is generated. The determination of whether wastes generated during remedial activities are hazardous shall be made when the wastes are generated.
78.	Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste • Title 22, CCR, Div 4.5, Ch 12, Article 3, §66262.30, §66262.31, §66262.32, §66262.33	ARAR Applicable	Before transporting hazardous waste or offering hazardous waste for transportation off-site, the generator must do the following in accordance with DOT regulations: package the waste, label and mark each package of hazardous waste, and ensure that the transport vehicle is correctly placarded.
79.	Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste • Title 22, CCR, Div 4.5, Ch 12, Article 3, §66262.34	ARAR Applicable	Requirements with respect to accumulation of waste on-site.

80.	Hazardous Waste Control Act (HWCA) Standards applicable to generators of hazardous waste ▪ Title 22, CCR, Div 4.5, Ch 12, Article 4, §66262.40, §66262.41	ARAR Applicable	Establishes requirements for record keeping of manifests, test results, waste analyses, and Biennial Reports. Any substantive requirements shall be attained.
81.	Corrective Action ▪ Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.100 (a) through (d), (f), (g)(1), and (h)	ARAR Relevant and Appropriate	The owner or operator is required to take corrective action under Title 22, CCR, §66264.91 to remediate releases from the regulated unit and to ensure that the regulated unit achieves compliance with the water quality protection standard. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.
82.	Corrective action for Waste Management Units ▪ Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.101	ARAR Relevant and Appropriate	The owner or operator is required to take corrective action to remediate releases from any solid or hazardous waste management unit at the facility to protect public health and the environment. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.
83.	Closure and post-closure care ▪ Title 22, CCR, Div 4.5, Ch 14, Article 7, §66264.111, §66264.112, §66264.115 through 120	ARAR	Owners and operators shall close a facility and perform post-closure care when contaminated subsurface soil cannot be practically removed or decontaminated. Contaminated soil, residues, or groundwater from remedial action at a site will achieve clean closure; otherwise, post-closure care requirements will be relevant and appropriate.

84.	Use and management of containers • Title 22, CCR, Div 4.5, Ch 14, Article 9	ARAR Applicable	Containers used for the transfer or storage of hazardous waste must be in good condition, compatible with the waste, kept closed except to add or remove materials and be inspected weekly. The area used to store the containers must provide adequate secondary containment and be designed with runoff controls. Also, appropriate closure of the containers must take place.
85.	Tank systems • Title 22, CCR, Div 4.5, Ch 14, Article 10	ARAR Applicable	The remedial activities may involve storage and/or treatment in tanks. These tanks are required to have secondary containment, be monitored and inspected, be provided with overfill and spill protection controls, and operated with adequate freeboard. Also, appropriate closure must take place.
86.	Waste piles • Title 22, CCR, Div 4.5, Ch 14, Article 12	ARAR Applicable	The waste piles should be placed upon a lined foundation or base with a leachate system, protected from precipitation and wind dispersal, designed to prevent run on and run off. Also, closure and post-closure care requirements. Remedial action may involve soil excavation and the compiling of soil in a temporary waste pile. This requirement is applicable if the excavated waste meets RCRA hazardous waste criteria.
87.	Landfills • Title 22, CCR, Div 4.5, Ch 14, Article 14	ARAR Relevant and Appropriate	The requirements for landfills include the design and operation, action leakage rate, monitoring and inspection, response actions, surveying and recordkeeping and closure and post-closure care.
88.	Miscellaneous Units • Title 22, CCR, Div 4.5, Ch 14, Article 16	ARAR Applicable	Applies to waste management unit not otherwise regulated under RCRA. It may include pumps, auxiliary equipment, air strippers, etc. The substantive requirements include design, construction, operation, maintenance and closure of the unit that will ensure protection of human health and the environment. The actions include general inspections for safety and operation efficiency, testing and maintenance of the equipment (including testing of warning systems). Applicable if pumps are used for extraction and treatment of leachate that meets RCRA hazardous waste criteria.

89.	Land Disposal Restrictions (LDR) for RCRA wastes and non-RCRA wastes • Title 22, CCR, Div 4.5, Ch 18, Articles 1, 3, 4, 10, 11	ARAR Applicable	Movement of hazardous waste to new locations and placed in or on land will trigger LDR. General applicability, dilution prohibited, waste analysis and record keeping, and special rules apply for wastes that exhibit a characteristic waste. Best Demonstrated Available Technology (BDA) standards for each hazardous constituent in each listed waste, if residual is to be disposed. Utilize treatment standards table when necessary. Where applicable, hazardous waste generated from remedial activities must comply with LDR and meet the treatment standards or notify the disposal facility of the treatment standards before disposal at an appropriate offsite disposal facility.
90.	Hazardous Waste Control Act (HWCA) Standards for owners and operators of hazardous waste transfer and TSD facilities • Title 22, CCR, Div 4.5, Ch 14, Articles 3 and 4	ARAR Applicable	Establish requirements for a facility to plan for emergency conditions. In addition, the design and operation of the facility must be done to prevent releases. Other requirements include testing and maintenance of equipment and incorporation of communication and alarm systems and contingency plan. The requirements may be applicable if CERCLA response action includes treatment, storage, or disposal as defined under RCRA, or may be relevant and appropriate if the requirements address problems or situations sufficiently similar to the specific circumstances at the site that their usage will be well suited.
91.	Hazardous Waste Control Act (HWCA) Groundwater monitoring and response • Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.91 (a) and (c)	ARAR Relevant and Appropriate	Owners or operators of a RCRA surface impoundment, waste pile, land treatment unit, or landfill shall conduct a monitoring and response program for each regulated unit. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.
92.	Hazardous Waste Control Act (HWCA) Monitoring • Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.97 (b), (c), (d) and (e)(1) through (e)(5)	ARAR Relevant and Appropriate	Requirements for monitoring groundwater, surface water, and vadose zone. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.

93.	Hazardous Waste Control Act (HWCA) Detection Monitoring • Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.98	ARAR Relevant and Appropriate	Requires the owner or operator of a regulated unit to develop a detection monitoring program that will provide reliable indication of a release. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.
94.	Hazardous Waste Control Act (HWCA) Evaluation Monitoring • Title 22, CCR, Div 4.5, Ch 14, Article 6, §66264.99	ARAR Relevant and Appropriate	Requires the owner or operator of a regulated unit to develop an evaluation monitoring program that can be used to assess the nature and extent of a release from the unit. Substantive technical requirements are potentially relevant and appropriate for remedial action including groundwater monitoring.
95.	Discharges of Waste to Land • Title 23 CCR, Div 3, Ch 15	ARAR Relevant and Appropriate	The regulations in this chapter pertain to water quality aspects of hazardous waste discharge to land, establishing waste and site classifications and waste management requirements for waste treatment, storage, or disposal in landfills, surface impoundments, waste piles, and land treatment facilities. Requirements in this chapter are minimum standards for proper management of each waste category. Pursuant to Section 2511 (Exemptions), because this remediation constitutes actions taken by public agencies to cleanup unauthorized releases of waste, these regulations will only apply if the proposed remedial activities include (1) removal of waste from the immediate place of release, or (2) keeping some contamination in place.
96.	Consolidated Regulations for Storage, Treatment, Processing, or Disposal of Solid Waste • Title 27 CCR, Div 2, Subdivision 1	ARAR Relevant and Appropriate	The regulations in this subdivision (promulgated by the State Water Resources Control Board (SWRCB)) pertain to water quality aspects of discharges of solid waste to land for treatment, storage, or disposal. Pursuant to Section 20090 (Exemptions), because this remediation constitutes actions taken by public agencies to cleanup unauthorized releases of waste, these regulations will only apply if the proposed remedial activities include (1) removal of waste from the immediate place of release, or (2) keeping some contamination in place.

97.	Requirements for land-use covenants • Cal. Code Regs. Title 22, § 67391.1	ARAR Applicable	This regulation requires appropriate restrictions on use of property in the event that a proposed remedial alternative results in hazardous materials remaining at the property at levels which are not suitable for unrestricted use of the land. This is an ARAR with respect to PG&E-owned land at the Topock site.
98.	California Water Code Section 13801(c) • California Well Standards, Bulletin 74-90 (Supplement to Bulletin 74-81)	ARAR Applicable	These standards for water, cathodic, and monitoring wells will be applicable if the remediation requires use of such wells.
99.	State Water Resources Control Board Resolution No. 88-63 Adoption of Policy Entitled "Sources of Drinking Water"	ARAR Applicable	With certain exceptions, all surface and ground waters of the State of California are to be considered suitable, or potentially suitable, for municipal or domestic water supply. The Regional Water Quality Control Board and State Water Resources Board have designated the beneficial use of the ground and surface waters in the Topock Site area as "municipal and domestic water supply." This designation is set forth in the Basin Plan.
100.	Water Quality Control Plan; Colorado River Basin-Region 7, June 2005 (Basin Plan)	ARAR Applicable	This Basin Plan designates the Colorado River and the Colorado Hydrologic unit as having the beneficial use of "MUN" (or, municipal or domestic water supply). The Basin Plan also prescribes General Surface Water Objectives and Ground Water Objectives, in addition to Specific Surface Water Objectives for the Colorado River, which include a flow-weighted average annual numeric criterion for salinity for the portion of the Colorado River on the Topock Site of 723 mg/L. This TDS value must not be exceeded in any remedial alternative being considered.
101.	State Water Resources Control Board Resolution No. 68-16 ("Antidegradation Policy") Statement of Policy with respect to Maintaining High Quality of Waters in California	ARAR Applicable	Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

102	State Water Resources Control Board Resolution No. 92-49 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304	ARAR Relevant and Appropriate	Section III.A of this Resolution states that the Regional Water Board shall" "concur with any investigative and abatement proposal which the discharger demonstrates and the Regional Water Board finds to have a substantial likelihood to achieve compliance within a reasonable time frame..."
103	State Water Resources Control Board Resolution No. 77-1 Policy with Respect to Water Reclamation in California	TBC	
104	*Transportation Plan* Preparation Guidance for Site Remediation DTSC, May 1994	TBC	

TABLE 3

Alternative E

Remedial Alternative Cost Summary - In-Situ Treatment with Freshwater Flushing

Site: Topock

Date: [illegible]

CAPITAL COSTS

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL		NOTES
Wells						
Injection & Extraction Wells	1	[illegible]	[illegible]	[illegible]		See Table [illegible] [illegible]
Monitoring	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
SUBTOTAL				[illegible]		
In Situ Systems						
IRZ	1	LS	[illegible]	[illegible]		See Table [illegible]
SUBTOTAL				[illegible]		
Ex Situ Treatment						
Treatment plant	[illegible]			[illegible]		
SUBTOTAL				[illegible]		
Infrastructure						
Conveyance & Control (Pipe & Trench)	1	[illegible]	[illegible]	[illegible]		See Table [illegible]
Access Roads	[illegible]	[illegible]	[illegible]	[illegible]		
Fresh water						
Wells	1	LS	[illegible]	[illegible]		[illegible]
Pipeline	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
SUBTOTAL				[illegible]		
[illegible] Treatment Plant						
[illegible]	1	LS	[illegible]	[illegible]		See Table [illegible]
SUBTOTAL				[illegible]		
SUBTOTAL				[illegible]		
Prime Contractor Cost Factors						
General Conditions [illegible]	[illegible]			[illegible]		
Field Construction Management and Engineer [illegible]	[illegible]			[illegible]		USEPA [illegible]
Pre-construction [illegible]	[illegible]			[illegible]		
Project Management	[illegible]			[illegible]		
Contractor Markup [illegible]	[illegible]			[illegible]		
SUBTOTAL			[illegible]	[illegible]		
Miscellaneous						
Institutional Controls and other Administrative Approvals	1	[illegible]	[illegible]	[illegible]		Allowance
Biological Monitoring	1	[illegible]	[illegible]	[illegible]		Allowance
Cultural Monitoring	1	[illegible]	[illegible]	[illegible]		Allowance
Regulatory Oversight	1	[illegible]	[illegible]	[illegible]		Allowance
[illegible]	1	[illegible]	[illegible]	[illegible]		Allowance - [illegible]
SUBTOTAL				[illegible]		
Contingency	[illegible]			[illegible]		
TOTAL CAPITAL COST				[illegible]		
			Low Range		High Range	
			[illegible]		[illegible]	

Table 3 Continued

OPERATIONS AND MAINTENANCE COST						
DESCRIPTION	UNITS	UNIT COST Baseline		COST [illegible]	Long-Term Mon. [illegible]	NOTES
[illegible] Treatment Plant O&M	[illegible]					
[illegible]	[illegible]	[illegible]		$ [illegible]	$ -	[illegible]
[illegible]	[illegible]	See Note		$ [illegible]	$ -	[illegible]
[illegible]	[illegible]	Capital Cost of Wells		$ [illegible]	$ -	[illegible]
Maintenance of Wells [illegible]	See Note			$ [illegible]	$ [illegible]	[illegible]
Groundwater/Surface Water Monitoring	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
Reporting - Site-wide Groundwater Monitoring	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
Reporting - Performance	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]		$ [illegible]	$ -	
Other O&M Costs						
[illegible]	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	$ [illegible]		$ [illegible]	$ [illegible]	[illegible]
Biological Surveys	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
Cultural Surveys	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	See Note		$ [illegible]	$ [illegible]	[illegible]
Water rights	[illegible]	$ [illegible]		$ [illegible]	$ -	[illegible]
[illegible]	[illegible]	$ [illegible]		$ [illegible]	$ [illegible]	[illegible]
SUBTOTAL				$ [illegible]	$ [illegible]	
Contingency	[illegible]			[illegible]	[illegible]	
SUBTOTAL				[illegible]	[illegible]	
TOTAL O&M COST				[illegible]	[illegible]	
POST-REMEDIATION DECONSTRUCTION COSTS						
DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL		NOTES
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]				
SUBTOTAL				[illegible]		
Contingency	[illegible]			[illegible]		
TOTAL [illegible] COST				[illegible]		
PRESENT VALUE ANALYSIS						
COST TYPE	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR[2]	PRESENT VALUE	NOMINAL VALUE	NOTES
CAPITAL COST, YEAR 0	[illegible]	-	[illegible]	[illegible]	[illegible]	See Section [illegible] for more information on Present Value calculations
[illegible] O&M COST, YEAR [illegible]		[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	-	[illegible]	[illegible]	[illegible]	
TOTAL PRESENT VALUE OF ALTERNATIVE				[illegible]		
			Low Range [illegible]		High Range [illegible]	
Total Nominal Cost				[illegible]		

Notes:

[illegible] are defined in Table [illegible]. Total costs rounded to [illegible] significant figures.

[illegible]

1\. [illegible] United States Environmental Protection Agency. July 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA [illegible].

2\. Discount factor of [illegible] per year is used.

Groundwater Record of Decision
SWMU 1/AOC 1 and AOC 10
PG&E Topock Compressor Station
Needles, California

Part 3: Responsiveness Summary

United States Department of the Interior

RESPONSIVENESS SUMMARY
GROUNDWATER RECORD OF DECISION
PG&E TOPOCK COMPRESSOR STATION

December 2010

U.S. Department of the Interior
Office of Environmental Policy and Compliance

TABLE OF CONTENTS

Table of Contents

LIST OF ACRONYMS and ABBREVIATIONS

µg/L	micrograms per liter
AOC	Area of Concern
APE	Area of Potential Effect
ARAR	applicable or relevant and appropriate requirement
AZ	Arizona
bgs	below ground surface
BLM	United States Bureau of Land Management
BOR	United States Bureau of Reclamation
CA	California
CACA	Corrective Action Consent Agreement
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CIP	community involvement plan
CMS/FS	corrective measures study/feasibility study
COC	constituent of concern
COPC	constituent of potential concern
COPEC	constituent of potential environmental concern
Cr (III)	trivalent chromium
Cr (T)	total chromium
Cr (VI)	hexavalent chromium
CWG	Consultative Working Group
DOI	United States Department of the Interior or "the Department"
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EIR	environmental impact report
EPC	exposure point concentration
ESA	Endangered Species Act
gpm	gallons per minute
GWRA	groundwater human health and ecological risk assessment
HI	health index
HNWR	Havasu National Wildlife Refuge
IM	interim measure
IRZ	in-situ reactive zone
MCL	maximum contaminant level
mg/L	milligrams per liter
Mn	manganese
Mn (II)	manganese (II) oxide
Mn (IV)	manganese (IV) oxide
MNA	monitored natural attenuation
MnO_2	manganese dioxide

MWD	Metropolitan Water District
NCP	National Contingency Plan
O&M	operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
PG&E	Pacific Gas and Electric Company
PRBs	permeable reactive barriers
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFI/RI	Resource Conservation and Recovery Act facility investigation/ remedial investigation
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
SWFL	southwestern willow flycatcher
SWMU	Solid Waste Management Unit
TBC	to be considered
TDS	total dissolved solids
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UTL	upper tolerance limit
VOC	volatile organic compound

EXECUTIVE SUMMARY

This Responsiveness Summary Section of the Record of Decision ("ROD") summarizes public comments on the Proposed Plan and the supporting analysis and information, including the Remedial Investigation and Feasibility Study ("RI/FS"), received during the tribal consultation and public comment period on the proposed groundwater remedy for the Topock Compressor Station Remediation Site (the "Site") and provides the Department of the Interior's (the "Department's" or "DOI's") responses to those comments. This Responsiveness Summary was prepared in accordance with the requirements of Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), as amended, and 40 CFR Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). Comments submitted during the tribal consultation and public comment period addressing issues other than the proposed groundwater remedy, while not addressed in this Responsiveness Summary, are included in the Administrative Record for this remedy selection decision.

The *Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 2 - Hydrogeological Characterization and Results of Groundwater and Surface Water Investigations Report* ("RFI/RI") (CH2M Hill 2009a) was made available to the public in February 2009. The *Final Groundwater Corrective Measures Study/Feasibility Study Report for SWMU 1/AOC 1 and AOC 10 Report* ("CMS/FS") (CH2M Hill 2009b) was made available to the public in December 2009. These reports, along with the DOI Proposed Plan and other supporting documents, can be found in the Administrative Record file located at the Bureau of Land Management ("BLM") Lake Havasu Field Office in Lake Havasu City, AZ. These documents may be found in the information repositories maintained at the Needles Public Library, Lake Havasu City Library, Parker Public Library, Chemehuevi Indian Reservation, Colorado River Indian Tribes Public Library, and the Golden Shores/Topock Library Station.

Comments received during the tribal consultation and public comment period indicate a wide range of sentiment regarding the remedial process and the proposed remedy. Several commenters expressed strong and deeply held beliefs that the Selected Remedy would result in significant, adverse effects on an area they consider to be sacred to their culture and religion. These commenters generally preferred Alternatives A or B (no action or monitored natural attenuation) over the Selected Remedy. On the other end of the spectrum, several commenters expressed strong concerns that the Selected Remedy would not remediate Site contamination quickly or comprehensively enough and that this was due to the Department's giving too much weight to concerns about impacts on cultural resources. These commenters generally favored a more aggressive pump and treat approach (e.g., Alternative F). In the Department's view, the Selected Remedy strikes the appropriate balance between these competing concerns. It will provide hydraulic control to prevent contaminants from reaching the river while drawing carbon-amended water across the floodplain to accelerate treatment, protecting human health and the environment and attaining ARARs, but with fewer adverse effects to cultural resources and biological resources than other alternatives considered.

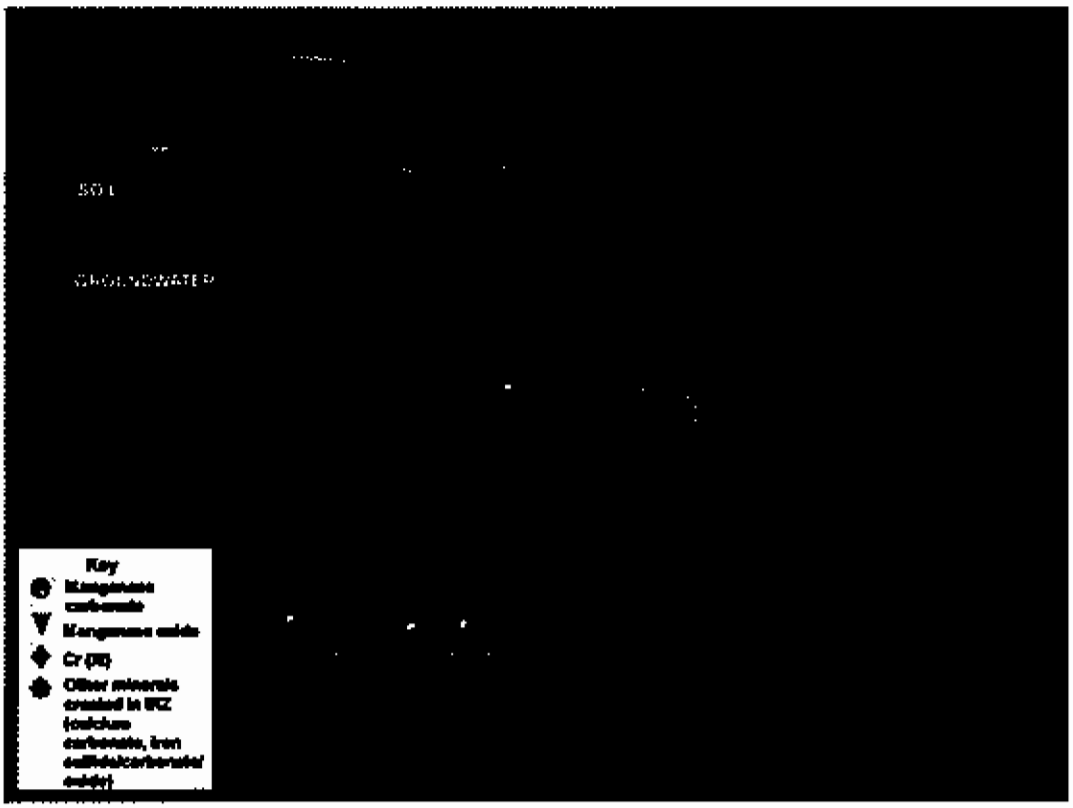
Several commenters expressed concerns about institutional controls imposed as part of the remedy and how such controls may affect access to the area. Access to the Topock area is currently addressed in the BLM Lake Havasu Field Office Resource Management Plan and the United States Fish and Wildlife Service ("USFWS") Lower Colorado River National Wildlife

Refuges Comprehensive Management Plan. Recreational activities at the Havasu National Wildlife Refuge ("HWNR") include sightseeing, bird watching, fishing, hunting, and canoeing. All areas within the HNWR and outside the Compressor Station are considered publicly accessible for such activities and are likely to remain publicly accessible in the future. The Department recognizes that important riparian habitat and cultural resources are located in the area. The Federal Agencies will continue to manage the area to protect and prevent irreparable damage to these valuable resources.

Several commenters were concerned that the hexavalent chromium ("Cr (VI)") contamination had already reached the Colorado River. Based on data collected during the RFI/RI monitoring period, no Site-related contamination of the Colorado River was observed. Over 700 surface water samples were collected from 43 locations in the Colorado River to determine the occurrence and extent of constituents of potential concern ("COPCs") in surface water for the RFI/RI. None of the average concentrations for the samples from the shoreline, in-channel, and pore water study surface water locations exceeds the most stringent surface water contaminant limits. Moreover, there was no discernable difference between results in samples collected upstream or downstream of Bat Cave Wash in the Colorado River. None of the Cr (VI) and total chromium ("Cr (T)") concentrations from the RFI/RI samples collected from the Colorado River exceeded the chemical-specific surface water criteria of 11 and 50 micrograms per liter ("µg/L"), respectively.

Several comments questioned the validity of the cost information provided in the CMS/FS and Proposed Plan. It should be recognized that costs of each alternative are estimated to a level of accuracy of +50 to -30 percent, consistent with the preliminary nature of the design development (approximately 2 to 5 percent design development). The costs are included in the CMS/FS for comparison purposes. Present-value analysis is the method used to evaluate expenditures, either capital or operation and maintenance, that occur over different time periods. This standard methodology allows for cost comparisons of different remedial alternatives on the basis of a single cost figure for each alternative. The NCP (40 CFR 300.430) requires estimation of the net present value of capital and operation and maintenance costs for remedial alternatives.

Several commenters had questions and concerns about the potential for trivalent chromium ("Cr (III)"), generated from the conversion of Cr (VI) to Cr (III) during the in-situ treatment process, to reconvert back to Cr (VI). The US Geological Survey, in support of the Topock Remediation Project, examined this issue in depth and concluded that the most likely scenario after in-situ remediation is complete is that mineral coatings on aquifer sediments will consist of a complex mixture of mostly iron oxides with some Cr and manganese oxides ("MnO_2"). For oxidation to occur, Cr (III) would have to come into contact with MnO_2. Since both are solid phases with low solubility, this is unlikely under natural conditions (see illustration provided below). USGS concluded that it is doubtful that enough MnO_2 will be in direct contact with chromium hydroxides ("$Cr(OH)_3$") to cause oxidation and mobilization of Cr (VI) above background levels.



Permanence of Chromium Treatment: Limited availability of reactive Mn, Figure G3 CMS/FS Report for Chromium In Groundwater Appendix G: In-situ Reactive Zone Treatment Design Elements

Several commenters were concerned that the preferred alternative would create byproducts and that the contamination from these byproducts and the Cr (VI) could potentially reach the river. The introduction of the in-situ treatment zone can affect the stability of naturally-occurring minerals found in the aquifer solids and can temporarily mobilize certain naturally-occurring metals within the treatment zone (primarily iron, manganese, and arsenic). River water contains oxygen. When river water interacts with groundwater in the aquifer these metals are precipitated, thus removing them from the groundwater. These reactions are well characterized and the mechanisms of iron, arsenic, and manganese removal are effective. Additionally, extraction wells near the river will provide hydraulic control to prevent water originating in the plume from reaching the river.

Several commenters voiced concerns about the potential impacts to groundwater supply wells in the surrounding communities due to extraction of water for the fresh water flushing portion of the proposed remedy. Freshwater injection involves piping fresh water to the site from an offsite source. The injection of fresh water at an assumed rate of approximately 500 gallons per minute ("gpm"), combined with the floodplain groundwater extraction, amendment, and reinjection, is sufficient to induce a hydraulic gradient to accelerate the movement of the site groundwater through the in-situ reactive zone ("IRZ"). No consumptive use would be associated with the in-situ treatment and freshwater flushing elements of the Selected Remedy because all extracted water would come from the Colorado River Basin and would be returned to the Colorado River

Basin via reinjection wells within the Colorado River accounting surface. The extraction well location and/or extraction rates will be adjusted during remedy design, based on a hydrologic analysis, to ensure that groundwater extraction does not have substantial adverse affects on the production rates of existing nearby wells. Very small, localized effects on the groundwater table near the freshwater extraction wells are, however, possible.

The offsite source of fresh water for this alternative could be the same as the water source for the Topock Compressor Station. The Topock Compressor Station is currently purchasing its water from wells in Arizona owned by Southwest Water Inc. Future water supply may be from the Colorado River or from wells on the California side of the river. This will be further evaluated as part of the remedy design.

This public involvement process and the Department's incorporation of these comments in the remedy selection process are evident in the ROD, which is being released at this time.

INTRODUCTION

This Responsiveness Summary Section of the ROD summarizes and responds to public comments on the Proposed Plan which identified the Department's preferred alternative among the remedial alternatives evaluated to address chromium contamination in groundwater from the Pacific Gas and Electric ("PG&E") Topock Compressor Station. On March 11, 2010, BLM initiated consultation with nine tribes concerning DOI's Proposed Plan. The Proposed Plan was provided to all Topock Project Tribal Executives, Tribal Cultural Resource Management Staff, and California and Arizona State Historic Preservations Officers ("SHPOs") in advance of that public review and comment period as part of the ongoing tribal government consultation regarding CERCLA remedy selection. Tribal comments were accepted through July 19, 2010.

The Proposed Plan was issued for public review on June 4, 2010. The public comment period was held from June 4, 2010 to July 19, 2010. Public meetings were held on June 22 at the Parker Community/Senior Center in Parker, CA, on June 23 at the Lake Havasu Aquatic Center in Lake Havasu City, AZ, on June 29 at the Needles High School in Needles, CA, and on June 30 at the Topock Elementary in Topock, AZ, to present the Proposed Plan and to accept oral and written public comments. The transcripts for the public meetings have been placed in the Administrative Record.

The Responsiveness Summary serves two functions:

1. It provides the CERCLA lead agency with information about the views of the community on the Proposed Plan and the supporting analysis and information, including the RI/FS, located in the Site information repository; and
2. It documents how public comments were considered during the decision-making process, and responds to significant comments regarding remedy selection.

Public involvement in the review of Proposed Plans is required by Section 117(a) of CERCLA, as amended, and Sections 300.430(f)(3)(i)(F) and 300.430(f)(5)(iii)(B) of the NCP. Significant comments on the Proposed Plan are addressed in this Responsiveness Summary, which was prepared in accordance with the Community Involvement Plan ("CIP") for the PG&E Topock Compressor Station, and applicable Environmental Protection Agency ("EPA") guidance. Comments regarding the State of California's implementation of State requirements and decision-making process, and other comments on topics beyond the scope of characterizing Site contamination and the evaluation and selection of CERCLA remedial action, are not addressed in this Responsiveness Summary. The comments presented in this Responsive Summary have been considered by the Department in its final selection of a remedy to address groundwater contamination at the Site.

Commenters on the Proposed Plan included the San Diego County Water Authority, Metropolitan Water District of Southern California, Colorado River Indian Tribe, Hualapai Tribe, Chemehuevi Tribe, Fort Mohave Indian Tribe, Fort Mohave tribal members, and private citizens. Responses to significant comments received at both public meetings and in writing during both the tribal and public comment periods are included. Comments have been organized into the following categories:

- Legal Issues (Policy Issues, CERCLA Requirements and Issues, Public Participation Process)

- RFI/RI
- Risk Assessment
- CMS/FS (Remedial Action Objectives, Technology Evaluation and Alternative Development, Implementability, Cost, Short and Long-term Effectiveness)
- Preferred Remedy
- Tribal Concerns/Impacts
- Community Concerns/Impacts

The information provided in the tables below includes comments specific to the groundwater investigation, alternative evaluation, and the alternative selection, summarized or paraphrased from written comments or transcripts of verbal comments made at public meetings. The actual transcripts from the public meetings and the complete set of comment letters are available in the Administrative Record for the Topock Site at the following location:
Bureau of Land Management – Lake Havasu Field Office
2610 Sweetwater Avenue
Lake Havasu City, AZ
(928) 505-1200
Hours: Monday – Friday
8:00 a.m. to 4:30 p.m.

COMMENTS & RESPONSES

A. LEGAL AND POLICY ISSUES

	Comment	DOI Response
1.	Several commenters asked how institutional controls will affect access to the area.	Institutional controls are mechanisms used to limit human exposure to hazardous substances at or near a contaminated site, or to ensure the effectiveness of the remedial action over time, when contaminants remain at a site at levels that preclude unrestricted use of the property. Land use management plans established by BLM and USFWS HNWR provide for restrictions on the drilling of new groundwater wells in the plume or its path until Remedial Action Objectives are attained. No other access restrictions are established by the Selected Remedy.
2.	Shoreline in the Project area invites recreational usage. While the Tribes recognize this as a natural human impulse, that impulse may be monitored, and where appropriate, its adverse effects reasonably mitigated to balance the multiplicity of interests interacting along the River at the site of the Topock Remediation Project. Just as Tribal peoples would not be welcome to throw a party at Stonehenge or in the Sistine Chapel, we ask that the same respect be shown for our sacred sites. The Tribes therefore recommend that a process of monitoring shoreline usage be incorporated into the overall Proposed Plan for the Project. The purpose of the shoreline monitoring process shall be to minimize the incidence of and mitigate adverse impacts to religious and spiritual access and, or, usage by area Tribal peoples.	The shoreline of the Colorado River periodically attracts recreational usage of the beaches near the remediation site. Depending on the water level in the river, one to four small sand beaches and one gravel beach under the I-40 Bridge are available to boaters and anglers. The primary access to these beaches is via watercraft. No work that would increase access to the beaches is planned as part of the remediation. Because of the heavy vegetation along the river, it is expected that the new extraction well infrastructure to be installed near the river will be screened from the beaches. Given this, the project will not provide additional public access to the site, and the well installation will not encourage or attract increased public access or visitors.
3.	The Fort Mojave Indian Tribe has	DOI solicited applicable or relevant and

	ARARs as well and piecemeal selection of ARARs to rule out alternatives could work both ways.	appropriate requirements ("ARARs") from State agencies, tribal governments, and stakeholders on several occasions, including by letter from the office of the Solicitor dated April 28, 2006. Counsel representing the Fort Mojave Indian Tribe ("FMIT") responded in writing to this and other requests for the identification of ARARs on June 15, 2006, May 8, 2007, September 28, 2007, and August 28, 2009. DOI wrote written responses to these letters on December 4, 2007 and October 29, 2009, and counsel for DOI and FMIT met in person on this topic on July 15, 2009. All ARARs proposed by FMIT were given full consideration by DOI and most of these proposed ARARs were, in fact, adopted by DOI.
4.	How long will institutional controls identified in the BLM Resource Management Plan and HNWR Comprehensive Management Plan remain in place?	Institutional Controls will remain in place concerning groundwater use until remedial action objectives have been achieved. The management plans for BLM and the HNWR will remain in effect after the remedy is complete.
5.	Will development at Topock Marina, Park Moabi or other areas be limited or reduced as a result of institutional controls?	Development at the Topock Marina, Moabi Regional Park, and other nearby areas will not be restricted based on institutional controls imposed to prohibit use of groundwater in the Topock plume area until remedial action objectives are achieved.
6.	Can you please explain the detailed process for DTSC and DOI responding to stakeholder comments on the Statement of Basis and the EIR that will be provided? Does DTSC/DOI staff actually review and prepare responses to comments received? Or does DTSC/DOI provide the comments to PG&E who then prepares the desired PG&E response to comments in order to frame the response that best meets PG&E desire and needs? Will DTSC/DOI ensure that each and every comment is provided a detailed and complete response?	The Responsiveness Summary provides an overview of significant community concerns regarding the alternatives evaluated in the Feasibility Study, the preferred alternative identified in the Proposed Plan, the underlying information and analysis supporting the selection of a remedy, and how community input was incorporated into the ROD. DOI has developed specific responses to comments related to the groundwater remedy for the Topock site. Comments that go beyond the scope of the Proposed Plan, such as comments on documents and decisions generated by the State of California and comments unrelated to the CERCLA remedy selection decision

	Does DTSC/DOI have an obligation to ensure that each and every comment is provided a detailed and thorough response?	are not included in this Responsiveness Summary. Responses presented in this Responsiveness Summary have been prepared by DOI and have not been shared outside of the Department prior to the final issuance of this ROD.
7.	One of the issues that we see is that there's a lack of institutional memory; that many of the issues handled with this project are related to individual tenure within the different agencies; and if those employees no longer are there or something changes – there's a restaffing, there's a reorganization – those memories get pushed to the side.	Under CERCLA, an administrative record for a site is kept and is the complete body of documents that were considered or relied upon when selecting a response action. The Administrative Record for the Topock Site has been established in the BLM Lake Havasu Field Office and provides federal agency representatives and the public a thorough compilation of the information considered selecting remedial action.
8.	One commenter suggested, in going through the public repositories, that some information seemed to be missing. This commenter requested that DOI re-notice the public comment period at such a time that all the documents are determined to be readily available in the repository. This commenter suggested that when asked where these documents were, the librarian had no idea.	DOI personnel completed a review of the repositories at all locations and found them complete with respect to the documents that provide the supporting information for the evaluation of alternatives and remedy selection decision made by DOI. Representatives also spoke with library personnel who were immediately able to provide directions to their respective repository locations and provide information regarding the number of inquiries regarding the documents.

B. RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION

	Comment	DOI Response
1.	One commenter suggested that while there currently is not a contaminant transport pathway from groundwater to surface water, the risk to the Colorado River if such a pathway occurred should be recognized. The commenter also pointed out that the remedial action objectives identify prevention of migration of the plume to the	The Groundwater Risk Assessment contains an evaluation of whether there could be significant transport of site-related constituents to surface water (i.e., the Colorado River). This evaluation was based on a series of screening-level evaluations for those constituents determined to be floodplain Contaminants of Potential Concern ("COPCs). The sequential screening process was based first on a

	Colorado River, which substantiates the need to identify the risk to the river in this document.	comparison of floodplain groundwater exposure point concentrations ("EPCs") to surface water criteria, secondly on a comparison of downstream surface water results to surface water criteria, and lastly on a comparison of downstream to upstream surface water concentrations. These comparisons concluded that the groundwater-to-surface water transport evaluation indicates that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: in other words, floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. The flow of the Colorado River at Topock is regulated by BOR, primarily by the controlled release of water from Davis Dam on Lake Mohave approximately 33 miles upstream. Given this, it is not likely that the conditions evaluated in the GWRA will change in the foreseeable future.
2.	Is the salt [previously] dumped on the ground at the Site considered a contaminant or contamination? Has the salt impacted groundwater or does it have the potential to impact groundwater? What is the background level for salt in soil, groundwater and surface water?	The salt content in soils is not addressed by the proposed groundwater remedy. Constituents in soils will be addressed in the selection of a separate remedy for soils. Salts have not been identified as a chemical of potential concern in groundwater at the Site. A background level for salt in soil has not been calculated, but might range significantly considering the desert environment within the Topock area. Soils or wastes that could contain elevated salts that might impact groundwater in the future will be addressed during the soil investigation and remedy selection process.
3.	What were the chromium concentrations in the cooling tower blowdown? Was it greater than the 32 micrograms per liter that was identified as the upland groundwater background levels? What was the total amount of treated water that	As described in the RFI/RI Volume 1, samples of the effluent from the single-step treatment system (from 1964 through 1969) contained Cr (T) at concentrations of 13.81 and 14.41 parts per million ("ppm") (1 mg/L = 1 ppm, thus 32 µg/L = .032 ppm). In late 1969, the single-step treatment process was

	was injected?	replaced by a two-step system. Laboratory reports of wastewater samples collected in the mid-1970s generally show chromium concentrations at 1 ppm or less. The RFI/RI Volume 1 cites records indicating that, during the injection period (June 1970 through December 1973), an estimated 29.4 million gallons of treated wastewater were injected into well PGE-8. In addition, handwritten notes by an unknown author (circa 1984) indicated that 42 million gallons of wastewater had been injected into the well.
4.	One commenter noted that they did not understand what "clean closed" actually means. Was PG&E allowed by DTSC to leave any residual contamination in the soil above residential standards of background levels? If so what were these levels that DTSC allowed to be left in the soil? Were these concentrations above regional soil background levels? Do any of these contaminants have the potential to migrate and impact groundwater? Have any of these contaminants migrated to groundwater?	Closure is the term used to describe taking a RCRA regulated disposal unit out of service. *Clean closure* means that all hazardous wastes have been removed from a given RCRA regulated unit and any releases at or from the unit have been remediated so that further cleanup under RCRA is not necessary to protect human health and the environment.
5.	How many solid waste management units were identified at the Site that may potentially be sources of contamination? How many areas of concern were identified? Are any of these solid waste management units or areas of concern a potential threat to groundwater? Is it possible that contamination from these units may have impacted groundwater?	SWMUs and AOCs are construed to be facilities where a release or threatened release of a hazardous substance has occurred, as defined under CERCLA. The RFI/RI Volume (CH2MHILL, 2007a.) identifies fourteen SWMUs and twenty AOCs at the Topock Compressor Station. In response to DTSC's comment on the 2007 Soil Part B Work Plan, one additional SWMU and five additional AOCs were added to the Part B investigation program, resulting in current totals of fifteen SWMUs and twenty-five AOCs identified to date. The groundwater remedy addresses the cleanup of constituents found throughout the contamination plume, including contaminants that may be continuing to enter groundwater. The nature and extent of soil

		COPCs and constituents of potential environmental concern ("COPECs") associated with former compressor station practices at or affecting the AOCs and SWMUs will be evaluated as part of the ongoing soil investigation to determine whether unacceptable risks or impacts to groundwater occur currently or could occur in the future, and whether soil remediation is required and should be implemented.
6.	Please explain what is the current and immediate threat to the water resource and the Colorado River at the site? Is there a current real and direct threat to the Colorado River? Is the Colorado River being impacted right now? Is the Interim Measures No. 3 keeping the contamination from the Colorado River?	The Cr (VI) groundwater plume extends from the former percolation bed in Bat Cave Wash to the floodplain area north of the railroad tracks and, under natural conditions, flows from west/southwest to east/northeast. Within the plume, Cr (VI) is typically present at all depth intervals of the alluvial portion of the aquifer but is generally limited to deep wells in the fluvial portion of the aquifer near the river and as such is not reaching the river. The Interim Measures (IM) groundwater extraction system has maintained a consistent landward gradient in the plume floodplain area year round, preventing the plume from discharging to the river. Based on data collected during the monitoring period of the RFI/RI, no Site-related contamination of the Colorado River has been observed.
7.	What happened from 1973 when PG&E stopped injecting blowdown to the bedrock until 1985 when PG&E reportedly stopped using hexavalent chromium? Is this the same chemical that was the serious problem at the PG&E Hinkley facility that contaminated the drinking water wells in the Hinkely community? Is this the same chemical that the Hollywood movie was based on about PG&E?	Beginning in May 1970, treated wastewater was discharged to an injection well (PGE-08) located on PG&E property, and discharges to Bat Cave Wash generally ceased. The well facilitated the injection of wastewater into the subsurface at depths in excess of 405 below ground surface (bgs). By 1971, PG&E had constructed the first of four single-lined evaporation ponds, and used this pond as a discharge location when operational problems were encountered with the injection well. In 1973, PG&E discontinued use of injection well PGE-08, and wastewater was discharged exclusively to the four, single-lined evaporation ponds, located about 1,600 feet west of the

		compressor station. PG&E replaced the Cr (VI)-based cooling water treatment products with phosphate-based products in 1985. Use of the four, single-lined evaporation ponds continued until 1989. In 1989, the single-lined ponds were replaced with four new, Class II (double-lined) ponds, located approximately 1.2 miles to the northwest. Hexavalent chromium was a common chemical additive for cooling water in various industries prior to the 1980s and was used at both the Topock and Hinkley compressor stations. The Hinkley site was the subject of a motion picture.
8.	What was the basis for the decision to accelerate the groundwater cleanup? Who made it? Was this a decision by only DTSC? Did DOI also approve and agree to this approach?	The idea of separating the soil and groundwater investigations was discussed with stakeholders in the Consultative Working Group ("CWG") as early as May 2004 when concerns about groundwater contamination were elevated due to the detection of Cr (VI) in a new well near the Colorado River. In the interest of expediting the groundwater cleanup, DTSC and the DOI decided to separate the soil and groundwater investigations.
9.	If the pending soil investigation will evaluate the potential for soil contamination to leach into groundwater, then how can DTSC/DOI proceed with any groundwater remedy at this time? Until DTSC/DOI knows the complete and full potential for contamination to leach from the soil into the groundwater, DTSC/DOI will not know what the appropriate and complete groundwater remedy or project will be. What is the complete list of contaminants that were found in soil so that I can know what possible contaminants may potentially leach from soil into the groundwater in the future?	The groundwater remedy addresses the cleanup of constituents found throughout the contamination plume, including contaminants in soil that may be continuing to enter groundwater. The nature and extent of soil COPCs and COPECs associated with former compressor station practices will be evaluated as part of the ongoing soil investigation to determine whether unacceptable risks or impacts to groundwater occur currently or could occur in the future, and whether soil remediation is required and should be implemented to address those or other risks found to be present.
10.	Is it possible that hexavalent chromium is actually discharging to	There was no discernable difference between results in samples collected

	the Colorado River but is not being detected due to laboratory detection limits and the fact that sampling techniques in the Colorado River allow for a mixing zone and potential dilution with the fast moving Colorado River water before a sample is collected? Is DOI able to state that the existing bedrock groundwater contamination in East Ravine is NOT in direct contact with the Colorado River? Is this contamination discharging into the Colorado River? Has the full and complete extent of the groundwater contamination been defined? Is there a greater potential direct threat to the Colorado River from the groundwater contamination at East Ravine since the bedrock is in direct contact with the Colorado River and no continuous reducing conditions exist in this area?	upstream or downstream of Bat Cave Wash in the Colorado River. None of the Cr (VI) and Cr (T) concentrations from the RFI/RI samples collected from the Colorado River exceeded the chemical-specific ARARs criteria of 11 and 50 µg/L, respectively. Two new surface water sampling locations were added to the surface water monitoring program in response to Cr (VI) results for samples in East Ravine wells. Samples have been collected from these locations since April 2009. Consistent with surface water samples collected from other monitoring locations adjacent to the Colorado River, sample results at these two new locations and previously established surface water sampling locations were less than analytical reporting limits during April 2009 and July 2010 monitoring. Additionally, no detections of chromium were found in samples of undiluted pore water entering the Colorado River at 64 sample locations. Elevated chromium in groundwater in the East Ravine appears to be primarily in the uppermost 20 to 50 feet of the saturated bedrock. Due to the low porosity and limited fracturing present within the bedrock formations, mass of chromium in bedrock likely represents less than one percent of the total plume mass for the Topock Site. Additional investigation to determine the source and confirm the full extent of Cr (VI) in East Ravine bedrock will be conducted as the remedial action is designed to ensure that the remedy is protective and complies with ARARs.
11.	If the extent of groundwater contamination is not known, an appropriate groundwater remedy cannot be determined.	The hydrogeologic and groundwater characterization in the East Ravine has been incorporated into the conceptual site model for this remedial action. Uncertainties that exist regarding the extent of East Ravine contamination do not preclude DOI from determining that the Selected Remedy will be protective. Hydraulic containment is included in the Selected Remedy as the primary component for the East Ravine

		bedrock and includes containment involving pumping from a group of wells near the eastern (downstream) end of the East Ravine. In addition to pumping for hydraulic control, technologies that may be applicable to East Ravine bedrock include freshwater injection for flushing and injection of carbon amendments for *in-situ* reduction of Cr (VI). Additional investigations to determine the source and confirm the full extent of Cr (VI) in East Ravine bedrock will be utilized to complete the design of the portion of the remedy for East Ravine.
12.	Do organic rich conditions exist at all locations under the river? Are they continuous? Will these organic rich conditions remain stable over 100 years? Do organic rich conditions exist downstream in the area of bedrock contamination where the bedrock is in direct contact with the Colorado River?	The fluvial sediments in the floodplain are relatively recent in origin and contain abundant organic material from several sources. Following the construction of Parker Dam in 1938, the river channel near Topock began to accumulate silt. The river level rose approximately 27 feet, and the channel near Topock became a braided stream. Organic material, probably from vegetation in the Topock marsh area, was incorporated into the fluvial sediments. Some of these organic-rich sediments were deposited directly on the floodplain. In addition, dredging operations resulted in placement of additional organic-rich river bottom materials on the floodplain. The reducing conditions observed in the floodplain sediments are likely caused by microbial breakdown of the organic carbon present (regardless of the source) in these shallow fluvial deposits. Field measurements of redox potential and other chemical data and field observations of collected core indicate that organic-rich sediments in the fluvial deposits result in naturally-reducing conditions. The reducing zone has been found to be continuous and robust in each of the many areas studied. Uncertainties remain in the distribution and extent of reducing zones, particularly south of the bridge where fluvial unconsolidated materials appear to thin and

		may be absent in some areas. Concerns also exist with respect to bridge piers that may have disrupted natural reducing zones. Moreover, the extent to which current reducing conditions provide a permanent barrier to Cr (VI) contaminant migration is uncertain. It is impossible to prove that such conditions will be able to persist hundreds or thousands of years into the future. The Selected Remedy addresses this concern. Enhancement of the floodplain reducing zone through in situ injection of carbon-amended water will augment the naturally occurring reducing conditions, and the treatment zone barrier along the National Trails Highway prevents the upland plume from migrating into the floodplain in the future.
13.	How did contamination of groundwater in the East Ravine get there? What was the source of this contamination? Are there any other areas that have not been investigated that may have potential groundwater contamination?	See response to Comments B-11.
14.	The desire to downplay this contamination by PG&E when the full extent is not know in addition to the location of this contamination related to immediate direct and substantial potential endangerment to impacting the Colorado River is serious cause for concern. Additional interim measures should have been taken by DTSC to protect the Colorado River. Why is DTSC/DOI using PG&E's estimate? What is DTSC/DOI estimate? With the BP oil spill in the Gulf of Mexico we can see how Corporate management will downplay the extent of contamination. Further as evidenced by PG&E's previous activities at Hinkley, we should be very cautious when evaluating any statements or information provided	See response to Comment B-11. Based on data collected during the monitoring period of the RFI/RI, no site-related contamination of the Colorado River has been observed. Over 700 surface water samples were collected from 43 locations in the Colorado River to determine the occurrence and extent of COPCs in surface water for the RFI/RI. None of the average concentrations for the samples from the shoreline, in-channel, and pore water study surface water locations exceeds the most stringent chemical-specific ARAR. There was no discernable difference between results in samples collected upstream or downstream of Bat Cave Wash in the Colorado River. None of the Cr (VI) and Cr (T) concentrations from the RFI/RI samples collected from the Colorado River exceeded the chemical-specific ARARs

	by PG&E.	criteria of 11 and 50 µg/L, respectively. At DOI's direction, PG&E is continuing to investigate the nature and extent of East Ravine groundwater contamination and will design and implement the remedial action to reflect the results of this additional investigation.
15.	You indicated that the extent of groundwater contamination has not been completely defined. Therefore, how can you do this?	See Response to Comment B-11 and 14.
16.	Three additional chemical contaminants exist in the groundwater (in addition to Cr (VI)). However, you are now saying that you are not going to deal with these contaminants and you will further evaluate them during the soil investigation. Why? So in fact you are saying that the proposed groundwater remedy is only for one chemical (hexavalent chromium) that will be converted to another contaminant (chromium) and left in the ground? This is completely misleading to the public since it is presented as a "groundwater remedy" when in fact it is not a complete groundwater remedy. There is not a valid reason to be proceeding in this manner. A complete groundwater remedy should be considered. Not a piecemeal approach. In addition, since a complete groundwater remedy is not known, the IM3 facility should be expanded and more pumping and treating of contaminated groundwater should occur if there is a concern that contamination is entering the Colorado River. Also as stated in this section if DTSC/DOI needs to evaluate the presence of additional chemicals during the soil investigation then the potential	The RFI/RI Volume 2 Report and Volume 2 Addendum concluded that, in addition to Cr (VI), three constituents in groundwater—namely molybdenum, selenium, and nitrate—may be associated with SWMU 1/AOC 1; however, the groundwater risk assessment concluded that these three constituents were not present in groundwater at levels of potential concern to future human health or the environment. Also see response to comment B-9.

	impacts to groundwater from this soil contamination is NOT known and therefore, a complete groundwater remedy can not be determined at this time.	
17.	One commenter asked for clarification on the extent to which Cr (III) was presently beneath the river.	A hydrogeologic investigation was performed near the shore of the Colorado River in Arizona in March and April 2008. The purpose of the investigation was to supplement the site conceptual model, to complete the groundwater characterization of the potential eastern extent of the groundwater plume, and further characterize the hydrogeologic conditions beneath the river channel downstream of the chromium plume observed in the California floodplain. The results of the investigation are documented in the *Installation Report for Wells on the Arizona Shore of the Colorado River at Topock Arizona*, dated August 12, 2008 (CH2M HILL, 2008). Reducing conditions are present in the vast majority of shallow and mid-depth fluvial wells, along with pore water and slant well samples beneath the river bottom. Under the reducing conditions prevalent beneath the river, chromium will be present in the reduced [Cr (III)] state.
18.	Don't you think the Cr (VI) might have actually reached the river, but it was diluted by the large river volumes? If Cr (VI) gets into the Colorado River, and the concentrations are below the 11 ppb standard, is that acceptable to DOI? Is it acceptable to the Tribes? Is it a desecration to the river? Is it acceptable to the public?	Cr (VI) was not detected in any shoreline surface water samples collected during the July 1997 through October 2007 monitoring period, except for one sampling event. During June 2002 surface water sampling, Cr (VI) was reported at concentrations ranging from 15.9 to 25.7 µg/L in six samples collected from the Colorado River at locations both upstream and downstream of Bat Cave Wash. According to the data quality review for the June 2002 monitoring, there was indication of false-positive results caused by unidentified interference for these samples. DTSC concurred that no action should be taken or project decisions should be made based on the results. All RFI/RI shoreline surface water samples collected from the Colorado River, other than the June

		2002 event, have been "non-detects" for Cr(VI), at the analytical reporting limit. No detections of chromium were found in samples of undiluted pore water entering the Colorado River at 64 sample locations. The Cr (VI) groundwater plume extends from Bat Cave Wash to the floodplain area north of the railroad tracks. Reducing conditions [conditions that change Cr (VI) to Cr (III)] have been documented in most shallow to mid-depth fluvial wells and sediments near and underlying the river and Cr (VI) is generally limited to deep wells in the fluvial portion of the aquifer near the river. Cr (VI) concentrations in the floodplain have been below analytical detection limits. Stable isotope data from floodplain monitoring wells indicate that the decrease in Cr (VI) concentration does not occur by dilution, and laboratory testing of fluvial anaerobic core samples provides direct evidence of the reduction reaction. The Federal Water Pollution Control Act (33 USC §§ 1251-1387, 40 CFR 131.38) specifies the allowable concentration of discharge to surface water of 11 µg/L. Cr (VI) concentrations water passing through the in-situ reduction zone and the floodplain are not expected to exceed the current conditions (less than detection limits).
19.	Our economy here on the reservation – our way of life on the reservation – is wholly dependent on water; and the surface water of the Colorado River is the primary resource that we have here. One of our sources of wealth, but also, an enormous component of our culture deals with this resource of water. It always has been. We have been assured for many years that there's no contamination in the river; and yet we see acceptable levels at 11 – at 11. So I guess the question is: When was that changed; and if there's a known detection in the	Cr (VI) and dissolved Cr (T) have not been detected in any in-channel surface water samples at analytical reporting limits during the RFI/RI period, except for one occurrence. The reference to 11 µg/L comes from the Federal Water Pollution Control Act (33 USC §§ 1251-1387, 40 CFR 131.38) and is a promulgated criteria for Cr (VI) as a priority toxic pollutant in the State of California for inland surface waters and enclosed bays and estuaries.

	river, why is it at 11? Why isn't it at zero, if there's no 11 detection in the water? The same with the groundwater as well.	

C. RISK ASSESSMENT

	Comment	DOI Response
1.	The Hualapai Tribe believe that the plants are sacred. Willows are still used as materials for basket making by members of the Hualapai Tribe, where willow shoots are split with the teeth. In the DOI Proposed Plan (p. 6): "…there are no ecological receptors currently at risk of adverse effects." Have plants been sampled and analyzed for chromium-6? Has the DOI considered plants as a potential contaminant pathway? Do the willows at Topock contain chromium-6?	A comprehensive groundwater risk assessment ("GWRA") was conducted to understand potential health threats and ecological risks posed by groundwater impacted by hazardous substance releases from the Compressor Station. The GWRA was conducted in accordance with the agency approved Risk Assessment Work Plan, and was accepted by DTSC and DOI in December 2009. The following related human health scenarios and pathways were included in the GWRA: • Indirect Human Exposure to Chemicals in Groundwater Through Ingestion of Plants and Animals: An evaluation of the potential secondary exposure pathways, specifically human exposure through the ingestion of plants and animals that have been exposed to the groundwater (through irrigation and direct ingestion), was also conducted and presented as Appendix K in the GWRA. • Plant and Animal Exposure to Chemicals in Groundwater through Root Uptake and Subsequent Ingestion of the Plants by Animals: Potential exposure of shallow-rooted wetland plants and deep-rooted plants (phreatophytes) to chemicals of potential concern (COPCs) in groundwater was evaluated. In addition, potential exposure of herbivorous mammals to COPCs

		(originating in groundwater) via ingestion of plant tissue was evaluated. These scenarios are presented in Appendix I in the GWRA. The related key conclusions of the GWRA are summarized as follows: • Indirect Human Exposure to Chemicals in Groundwater through Ingestion of Plants and Animals: The quantification of human exposure to impacted groundwater through ingestion of plants and animals exposed to the groundwater indicates that secondary exposure pathways are not significant to overall health risks. Instead, potential risks to human health from exposure to contaminated groundwater are dominated by the direct exposure routes: ingestion and dermal contact with groundwater. Accordingly, the analyses presented in the GWRA support the determination that there would be no adverse human health effects associated with the ingestion of homegrown produce that has been irrigated with groundwater containing the hexavalent chromium. Potential incidental exposures that could occur through the use of plants for non-consumptive purposes (e.g., splitting willow stems with one's teeth) would be insignificant compared to exposures that could result from daily ingestion of homegrown produce that has been irrigated with the groundwater, and thus would also be well below any health-based level of concern. • Plant and Animal Exposure to Chemicals in Groundwater through Root Uptake

		and Subsequent Ingestion of the Plants by Animals: The exposure pathway from chemically-affected groundwater to shallow or deep-rooted plants is insignificant; that is, surface water, not groundwater, is expected to be the primary source of moisture for shallow-rooted wetland plants, and concentrations in groundwater at the site are lower than concentrations that are toxic to deeply-rooted plants. Further, toxicity to herbivorous mammals resulting from potential exposure to COPCs is not predicted given the low concentrations in groundwater and the low concentrations predicted in plant tissue. Additionally, the ecological risk assessment included three exposure pathways in addition to the groundwater-to-surface water pathway. The potential pathways evaluated included (1) shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake; (2) deep-rooted plant (i.e., phreatophyte) exposure to chemicals in groundwater via root uptake; and (3) transfer of hexavalent chromium, molybdenum, nitrate, and selenium in groundwater to plant foliage via root uptake and translocation, then potential ingestion of these COPCs in plant tissue by herbivorous mammals. The GWRA concluded that there is no significant ecological exposure pathway for contact with impacted site groundwater and there are no ecological receptors currently at risk of adverse effects due to the presence of COPCs in the groundwater. These additional pathways and receptors were evaluated and were found to be potentially complete but insignificant.
2.	Is the East Ravine groundwater contamination in direct contact with ecological receptors? Has this been	See response to Comment B-11 and C-1. The groundwater sampling results indicate that Cr (VI) is not reaching the Colorado

	evaluated? How can the human and ecological risk assessments make these evaluations if the extent of groundwater contamination has not been defined or the potential discharge to the surface waters or uptake from plants?	River; therefore, there is not a complete pathway for ecological receptors.
3.	One commenter asked if there would be a risk assessment performed for the East Ravine.	Data collection efforts as part of the East Ravine investigation will assist in determining whether there are other sources (i.e., sources other than the historical releases to Bat Cave Wash) that have impacted groundwater at the site and whether additional supplemental risk evaluations need to be conducted.

D. CORRECTIVE MEASURES STUDY/FEASIBILITY STUDY

	Comment	DOI Response
1.	One commenter objected to the in-situ treatment of Cr (VI) by which it is reduced to Cr (III) arguing that this is the conversion of one type of contamination to another type of contamination and does not actually remove the contamination. The commenter argued that this gives the appearance and/or illusion of actually doing something that we are to trust may take place somehow below the ground surface that we are not able to see in the hopes that subsurface conditions are continuous, homogenous, without variation and as expected in the laboratory.	Reduction of Cr (VI) to Cr (III) is a core technology behind in-situ and ex-situ groundwater treatment with the key difference being that the former uses in-place biological processes instead of above-ground chemical treatment in a water treatment plant. In the Selected Remedy, the in-situ barrier is installed across the flow path of the Cr (VI) plume, thereby allowing groundwater to move through the barrier below grade, reducing the Cr(VI) to a lower soluble and less toxic Cr(III). Reduction of Cr (VI) to Cr (III) results in the formation of Cr (III) oxides that have a low solubility under the neutral and alkaline pH encountered in site groundwater. The feasibility of in-situ treatment at the PG&E Topock Site has been studied through the conduct of two separate pilot studies, the results of which are contained in the Floodplain Reductive Zone In-Situ Pilot Test Final Completion Report, dated March 5, 2008, and the Upland Reductive Zone In-Situ Pilot Test Final Completion Report, dated May 3, 2009. The pilot testing has shown that in-situ treatment is technically implementable at this site. Operation of the Selected Remedy will require a high level of oversight during

		implementation to ensure that the system is optimized and modified as remediation progresses.
2.	A RAO of 32 micrograms per liter for hexavalent chromium only? What about all the rest of the contamination?	The primary contaminant of groundwater is Cr (VI). The calculated non-carcinogenic risk-based remediation goal for Cr(VI) is 46 µg/L based on the hypothetical child receptor. The RAO of 32 µg/l was established because it is the natural background concentration for Cr (VI) in groundwater. The chromium plume is defined as that part of the alluvial where Cr (VI) concentrations exceed natural background levels. Selenium, molybdenum, and nitrate were found to exceed a hazard index of 1 and contribute to a hazard quotient greater than 1 at localized areas within the plume. Due to comparatively lower risk contributions at the site, these constituents will be monitored throughout the remediation process. In addition, the Selected Remedy includes institutional controls that prohibit use of the groundwater until cleanup objectives are achieved.
3.	What is the background level of hexavalent chromium currently in the Colorado River? Does this mean that DOI will allow PG&E to discharge hexavalent chromium contamination in and allow it to enter the Colorado River as long as the level in the Colorado River is less than 32 micrograms per liter? Does this mean that if I have a groundwater well that currently has non-detectable levels of hexavalent chromium in it, that PG&E will be allowed to increase the level of hexavalent chromium in my groundwater well to 32 micrograms per liter? What about the other chemicals that DTSC will be allowing PG&E to dump into the Colorado River? Has any Dioxin compounds been reported in soil samples onsite? What is the current background groundwater level of chromium in the floodplain adjacent to the Colorado River?	Background concentrations in surface water were not calculated; instead concentrations in upgradient samples and downgradient samples were compared in the RFI/RI. Cr (VI) was not detected in any shoreline surface water samples collected, except for one sampling event. During June 2002 surface water sampling, Cr (VI) was reported at concentrations ranging from 15.9 to 25.7 µg/L in six samples collected from the Colorado River at locations both upstream and downstream of Bat Cave Wash. See response to Comment B-18 for further information. The RAO of 32 µg/l was established because it is the natural background concentration for Cr (VI) in groundwater. The chromium plume is defined as that part of the alluvial aquifer where Cr (VI) concentrations exceed natural background levels. The Cr (VI) plume extends from Bat Cave Wash to the floodplain. Reducing conditions have been documented in most shallow to mid-depth fluvial (floodplain) wells and sediments near and underlying the river. In this area, Cr (VI) is naturally converted to Cr (III). Dioxins were found in samples taken at the

		Debris Ravine (AOC 4) and have been addressed in a Time-Critical Removal Action. See response to Comment D-4.
4.	What is the current background level of chromium and hexavalent chromium in the Colorado River? And how does that compare to what you will be allowing PG&E to dump into the river? What about a non-degradation protection policy? Does one exist? What is the 11 micrograms per liter you reference related to? Chromium? Or hexavalent Chromium? If it only relates to one of them, then what is the amount that PG&E will be allowed to discharge for the other? Does a limit exist? What will be the level that PG&E will be allowed to increase the amount of Chromium or Hexavalent Chromium in the Colorado River?	See response to Comment D-3. The Federal Water Pollution Control Act (33 USC §§ 1251-1387, 40 CFR 131.38) specifies the allowable concentration of discharge to surface water of 11 µg/L for Cr (VI). The Selected Remedy does not allow for any discharge of chromium to the Colorado River.
5.	The estimated time of up to 110 years to achieve RAOs is much too long. The length of time can be significantly reduced by adding pump and treat to the alternative. What would the time period be to complete the remediation if upland in-situ, flood-plain in-situ and pump and treat was used? If this alternative was used would the groundwater gradient and movement of groundwater contamination be away from the Colorado River?	It is estimated that the Selected Remedy will take 10 to 110 years to achieve the RAOs, with 110 years being the high end of the estimate based on the simulated time to remove 98 percent of the Cr (VI) mass within the plume. For the pump and treat option, Alternative F, it is estimated that 15 to 150 years would be required to achieve the RAOs.
6.	How is this ranking of "high level of operation and maintenance" related to the specific remedy selection criteria of protect human health and the environment, attain media cleanup goals and control sources of releases. This is evidence of incorrect analysis of screening criteria.	Overall protection of human health and the environment considers all assessments conducted under the other evaluation criteria including short-term impacts. Operation and maintenance of a treatment system is considered a short-term impact. A "high level of operation and maintenance" poses a potential increased risk to site workers and increased ongoing impacts to the surrounding environment throughout the operational period of the system.
7.	If Alternative "B" Monitored Natural Attenuation" does not satisfy the requirements established by the California State Water Resources	The Regional Water Quality Control Board has determined that Resolution 92-49 provides that monitored natural attenuation is "unacceptable as a stand-alone cleanup alternative." The

	Control Board Resolution 92-49, then it is not appropriate to include monitored natural attenuation as part of the Selected Remedy. T If pump and treat is included as a component of the remediation, monitored natural attenuation would not be needed and the time to complete the remediation would be significantly quicker.	Resolution does not prohibit monitored natural attenuation as a component of a broader remedy. The variable nature of the geologic materials beneath the site may result in recalcitrant zones that are resistant to *in situ* treatment and flushing. These zones would likely be resistant to pump and treat as well since the geologic formation in these areas is less permeable, inhibiting groundwater flow. Under either scenario, monitored natural attenuation is necessary to address any residual chromium that may remain in these recalcitrant zones.
8.	What is the definition of "high" and "Medium" [in the evaluation of remedial alternatives]?	Alternatives were evaluated on the basis of engineering judgment as high, medium, or low relative to the other process options. This is a common practice in the evaluation of remedial alternatives as these terms are easy to understand where medium is the average, normal or middle position relative to the other two.
9.	Pump and treat is ranked high for implementability since it has been proven to work. Therefore, pump and treat should be a continued component of any proposed remedial activity.	Implementability is not the only factor considered when selecting a remedy. DOI evaluated the alternatives against the nine CERCLA criteria and determined that Alternative E achieved the RAOs while substantially reducing, through treatment, the principal threat at the site, will do so in a reasonable time frame, and will do so with fewer adverse effects to cultural resources and biological resources than other alternatives considered.
10.	One commenter asked for an explanation about the disparity in the cost for the clean up under the Selected Remedy versus other alternatives.	The costs developed for the CMS/FS were for alternative comparison and do not represent bid- or construction-level engineering cost evaluations. The costs for Alternatives A and B were the lowest and Alternatives C, D, E, and H were the next most costly. Alternatives F, G, and I were the most expensive of the alternatives considered in the CMS/FS. The costs of each alternative are estimated to a level of accuracy of +50 to -30 percent, consistent with the preliminary nature of the design development.
11.	One commenter asked the cost for 30 years to clean the ground water plume with pump and treat method.	The net present value of the pump and treat alternative is between $187,000,000 and $401,000,000.
12.	Another commenter asked about the timeframes for the alternatives.	Estimated Time to Achieve Remedial Action Objectives: *Alternative A*: No Action – 220 to 2,200 years

		Alternative B – Monitored Natural Attenuation – 220-2,200 years *Alternative C* – High volume In-situ Treatment – 10 to 60 years *Alternative D* – Sequential In situ Treatment – 10 to 20 years *Alternative E* – In-situ Treatment with Fresh Water Flushing – 10 to 110 years *Alternative F* – Pump and Treat – 15 to 150 years *Alternative G* – Combined Floodplain In-situ / Pump and Treat – 10 to 90 years *Alternative H* – Combined Upland In-situ / Pump and Treat – 10 to 70 years *Alternative I* – Continued Operation of Interim Measure Groundwater Treatment – 100 to 960 years
13.	A commenter expressed concern about making the contamination problems worse by damaging bedrock.	Bedrock contamination appears to be limited to the East Ravine, which comprises approximately 1% of the total Cr (VI) plume according to current estimates. The proposed wells for the investigation and cleanup of East Ravine will be designed and installed to monitor groundwater or capture Cr (VI) and are not expected to exacerbate the contamination. Continued monitoring of the groundwater will occur after remedy implementation.
14.	A commenter questioned whether the Alternative E treatment is different because of the plume's proximity to the river.	Alternative E includes extraction wells near the Colorado River to provide hydraulic capture of the plume, accelerate cleanup of the floodplain, and flush the groundwater with elevated Cr (VI) through the IRZ line.
15.	A commenter asked if there had been a study comparing Alternative E with a pump and treat remedy.	Section 5.5 of the CMS/FS provides a comparative analysis of alternatives identifying the advantages and disadvantages of each alternative relative to one another, including a comparison between Alternative E and a pump and treat remedy (Alternative F). The Proposed Plan provides an abbreviated version of this comparison.
16.	A commenter stated that it was not appropriate to exclude an alternative based on one agency's determination. He noted that DOI has the ability to waive an ARAR. He stated that a longer timeframe for cleanup might be prefereable if it involves less impact.	In order to be selected by the lead agency under CERCLA, a remedial alternative must be found to be protective of human health and the environment and comply with applicable or relevant and appropriate requirements (ARARs). In this instance, DOI solicited the Regional Water Quality Control Board's interpretation of its

		regulations that had previously been identified as ARARs and concurred with that interpretation. There is no basis in the administrative record for waiving these ARARs.
17.	A few commenters noted that the FS cost estimates do not include "soft costs" such as agency reimbursements and 5-year review costs. They expressed interest in getting a sense of the total costs for the remedy and asked if DOI could obtain these costs from PG&E or if the Tribe would need to make a FOIA request to get them.	The cost estimates developed for the CMS/FS were for alternative comparison and do not represent bid- or construction-level engineering cost evaluations. The conceptual cost estimates did include line items (under the O&M costs) for regulator/stakeholder oversight and 5-year reviews. Additional costs such as agency reimbursements would be considered similar for remedies having similar implementation periods.
18.	A commenter asked how DOI evaluates the relatively small portion of the plume represented by the East Ravine bedrock as balanced against the disturbance of installing wells to address the contamination. She asked if DOI would insist on cleanup if there is only a small impact to groundwater.	The Selected Remedy must protect human health and the environment and attain ARARs including water quality standards that support the designated beneficial uses of the Colorado River. DOI will minimize the disturbance from the remedy to the extent practicable while at the same time implementing the remedy in a manner that fulfills the requirements of CERCLA.
19.	A commenter asked if the East Ravine remedy, given its conceptual nature, is part of the soil or groundwater remedy.	The Selected Remedy includes hydraulic containment of groundwater contamination in the East Ravine that will involve pumping groundwater from a group of wells near the eastern end of the East Ravine. Groundwater will then be carbon amended and reinjected in the alluvial aquifer along with amended alluvial groundwater. The East Ravine remedy is part of the groundwater remedy for the Site.
20.	When Cr (VI) is converted to Cr (III), arsenic, iron, and manganese will take the place of Cr (VI). Do you know how much arsenic, iron, and manganese will be there? What about your hypothetical future groundwater users, won't they be exposed to arsenic, iron, and manganese?	The expected range of concentrations and longevity of by-products was presented in the CMS Appendix G. Concentrations of byproducts such as manganese and arsenic are likely to temporarily increase within portions of the treatment zone. Once groundwater flows back into the more oxidizing environment of the natural alluvial aquifer, dissolved iron, manganese, and arsenic are expected to return to their natural concentrations.

E. SELECTION OF THE PREFERRED REMEDY

	Comment	DOI Response
1.	Our concern continues to be the	DOI agrees that, among the alternatives

	potential risk to the Colorado River – a major water supply. We strongly support the recommendation to utilize Alternative E – In-Situ Treatment with Fresh Water Flushing for the Topock remediation due to its effectiveness in achieving the Remedial Action Objectives relative to costs, while substantially reducing the amount of hexavalent chromium in the groundwater in a reasonable timeframe with fewer adverse effects to cultural and biological resources than other alternatives analyzed. Selection of Alternative E for the Topock groundwater remediation meets the remedy selection criteria and will protect the Colorado River.	evaluated, the Selected Remedy is protective of human health and the environment and strikes the best balance in terms of cost effectiveness, time required to achieve Remedial Action Objectives, and minimizing impacts to cultural and biological resources.
2.	At this time our most significant concern has to do with the failure to protect our continued health and well being by your stated proposal to allow significant increased levels of hexavalent chromium in both the groundwater and release in to the surface waters of the Colorado River, where none or minimal levels had been detected before. The water in this region is our most precious resource and one that is both finite and irreplaceable. Any proposal to release increased levels of chromium contaminant or any contaminant for that matter in to any existing water resources is unacceptable. Further, conversion or other proposed strategies for essentially leaving the bulk of minimally treated and unconfirmed conversion below 100% is unacceptable as well. We believe it incredible that we as the tribal people from this area that are most directly affected by the chromium contamination have been available as a valuable project resource yet we were shut out of the process and not given an	The Selected remedy will not increase levels of Cr (VI) in the groundwater or allow it to be released into the Colorado River. The Selected Remedy includes extraction wells near the Colorado River which will provide hydraulic control to prevent contaminants from reaching the Colorado River. Extraction near the river will also help to draw carbon-amended water across the floodplain accelerating the treatment of existing Cr (VI) in the alluvial zone of the floodplain aquifer east of National Trails Highway. Conversion of hexavalent chromium to trivalent chromium does not leave contamination in place or untreated but instead converts a known carcinogen into a benign form of chromium without requiring the invasive and significant impacts to cultural and biological resources that other alternatives would have required. Through the Consultative Workgroup process that has been in place for several years, as well as regular and ongoing tribal consultation, tribal governments and individuals have been active participants in the remedy selection process at this site for many years.

	opportunity to participate or comment prior to this time. We are deeply concerned and believe your proposed remedy needs to be reworked and reconsidered in the light of our attached comments and expressed concerns. We expect a response to our questions and concerns and hope they will enlighten you with insights that you may not have previously considered in developing your proposed remedy.	
3.	The organic layer next to the river has been converting Cr (VI)) to Cr (III) in a natural manner. As part of the preferred Alternative E, many wells will be poked through this natural organic layer. What if these wells upset the natural balance of the organic layer? If the Cr (VI) needs to be pumped away from the Colorado River, the wells should be further away from the river so that the organic layer is not disrupted.	The line of wells along National Trails Highway would be used either as injection or extraction wells to circulate groundwater and distribute the organic carbon source, expanding the area where Cr (VI) is converted to Cr (III). The number of extraction wells near the river will be minimized but these wells are needed to provide hydraulic control to prevent contamination from reaching the river and to draw carbon-amended water across the floodplain to accelerate treatment of the existing Cr (VI) in the alluvial zone of the floodplain.
4.	The Proposed Plan says that "byproducts are expected from the in-situ treatment." What are these byproducts? Are the byproducts just as toxic and carcinogenic as Cr (VI)? Will the plants take up these byproducts? Will these by products discharge to the river?	Impacts to the stability of native minerals incorporated in the aquifer solids resulting from the in-situ treatment process are unavoidable. These impacts can temporarily mobilize certain naturally-occurring metals within the treatment zone (primarily iron, manganese, and arsenic). There is potential for these metals to exceed background concentrations during implementation of in-situ treatment. Under ideal geochemical and hydrologic conditions, arsenic and manganese byproducts should not be significant. However, because of uncertainty in the complexity of aquifer lithology and geochemistry, large-scale implementation of in-situ treatment could result in elevated concentrations of arsenic and manganese that persist for longer than expected periods of time in some portions of the aquifer. Careful monitoring during the initial phases of in-situ treatment will detect these conditions, if they occur, and specific contingencies will be in place to address any potential threat to the Colorado River or the aquifer.

5.	This groundwater remedy being proposed is limited and restricted and does not address all the groundwater contamination. This groundwater remedy only addresses one chemical in the groundwater plume of contamination in a very limited area since the entire extent of groundwater contamination is not known at this time. Further remedication of the other chemicals in groundwater in addition to any potential new chemicals are proposed to be addressed in an unspecified future unspecified time when PG&E may decide to do so DOI is allowing PG&E to minimize groundwater remedial actions by NOT requiring PG&E to completely remediate the entire groundwater plume of contamination that was caused by PG&E dumping hazardous materials and hazardous substances onto the ground surface. DOI should be requiring the highest possible protection for the Colorado River and PG&E should be required to remove all contamination that they caused as a direct result of their activities.	The comment is correct in that the Selected Remedy addresses Cr (VI) in groundwater. The human health risk assessment concluded that other contaminants detected in the groundwater were not present at levels of potential concern to future human health or the environment. Also see response to comment B-9.
6.	We disagree with the selection of this alternative. Alternative G and H combined would provide a higher safety factor for the protection of the Colorado River since it will maintain a landward groundwater gradient away from the Colorado River, and would actually reduce the mass of the contamination and not just convert one form of contamination to another. Remediation would be completed in a shorter period and would not allow any by-product contamination or other groundwater contamination to enter the Colorado River	The Selected Remedy was selected based on a careful evaluation of CERCLA's nine remedy selection criteria. The in-situ treatment zone along National Trails Highway will be constructed using a line of wells that can be used either as injection or extraction wells to circulate groundwater and distribute the organic carbon source, creating an in-situ "treatment barrier" for groundwater to flow through. The extraction wells near the river will provide hydraulic control to prevent contaminants from reaching the river while drawing carbon-amended water across the floodplain to accelerate treatment. The Selected Remedy will protect human health and the environment and attain ARARs with fewer adverse effects to cultural resources and biological resources than other alternatives considered.

7.	What alternative provides the greatest protection for the Colorado River in terms of drinking water, agricultural and recreational activities, and provides the greatest protection and safety for the current living people and the future generations?	As stated in the CMS/FS, with regard to verifiable river protection, Alternatives C, D, E, F, G and H were considered equally protective. See response to E-9 for further information
8.	What will happen to the current groundwater contamination that exists under the Colorado River that is beyond the proposed zone of in-situ treatment near the Colorado River? Will this contamination be treated? Or will it be ignored and allowed to potentially migrate and enter the Colorado River?	The Selected Remedy includes extraction wells near the Colorado River to provide hydraulic capture of the original plume, including the portion under the Colorado River, and to accelerate cleanup of the floodplain.
9.	For this alternative what is the direction of flow for the contamination? Is it toward the Colorado River? Or will it be away from the Colorado River?	Under natural conditions, groundwater flows from west/southwest to east/northeast across the site. The Selected Remedy includes extraction wells near the Colorado River and injection wells west of the plume to accelerate groundwater flow. The injection wells will induce a hydraulic gradient toward the east to accelerate the movement of the site groundwater through the IRZ, where it would be treated. Extraction wells near the river will provide hydraulic control to prevent water originating in the plume from reaching the river.
10.	What does substantially reducing mean? Are you saying that this alternative will not completely treat all the contamination?	The Selected Remedy is expected to reduce the mass of Cr (T) and Cr (VI) in groundwater at the site to achieve compliance with ARARs in groundwater. The Remedial Action Objective of 32 µg/L of Cr (VI) is based on the background level found in the region. Extraction wells in the floodplain will capture any potential byproducts. There will be on going groundwater monitoring to ensure protection of the Colorado River.
11.	What does controlling the movement of contaminated groundwater mean?	Controlling movement of contaminated groundwater refers to tracking the movement/flow of groundwater utilizing conventional groundwater monitoring methodologies and modifying flow through increased injection or extraction.
12.	The Proposed Plan states that residual contamination may remain above the	The variable nature of the geologic materials beneath the site may result in some localized

	RAO (32 micrograms per liter because complete information is not know about subsurface conditions. Why? This supports our previous comment that aggressive pump and treat needs to be a key component of any remedy selection. Protection of the Colorado River is primary.	areas being resistant to in-situ treatment and flushing. These areas would also prove resistant to pump and treat. The tighter portions of the formation have low-permeability and do not readily "give up" pore water and the associated constituents. DOI's preferred alternative includes monitored natural attenuation and institutional controls as long term components to address residual hexavalent chromium that may remain in portions of the aquifer formation after a majority has been treated by in-situ treatment.
13.	Where will this land use restriction extend to? Will restrictions be placed on wells in Arizona that may wish to pump at higher levels or rates directly adjacent to the Colorado River and deep in the aquifer? Will restrictions be placed on pumping rates? Will I be able to pump 1,000 gallons per minute at Topock Marina? Or at a house someone builds adjacent to the Colorado River? Will Park Moabi be limited the amount of water that they can pump?	Land use restrictions have been established in the land management plans adopted by the BLM Lake Havasu Field Office for BLM-managed land, and the Fish and Wildlife Service for the Havasu National Wildlife Refuge. The restrictions in each plan are applicable to the land managed by the respective agency.
14.	Will dredging of all portions of the Colorado River be allowed? Will fishing be restricted in the Colorado River adjacent to the site? Will recreational activities be limited in the Colorado River? Will native plants be allowed to be collected by Tribal members in the area of the contamination?	Implementation of the remedy, including institutional controls, will not include any restriction on use of the Colorado River for recreational activities including fishing. If required by BOR, dredging activities will be coordinated with the other Federal agencies and PG&E to ensure continued operation of the treatment system. See response to Comments A-1 and C-1.
15.	A commenter expressed concern that the application of the Selected Remedy may take 29 to 100 years to correct the toxic plume of Cr VI. She asked if this was the best alternative in terms of time for remediation.	Although some of the other remedies considered in the CMS/FS may have achieved RAOs in a shorter amount of time, the Selected Remedy balances the time required to achieve RAOs against the objective of minimizing adverse effects to cultural resources and biological resources. DOI believes that the Selected Remedy strikes the proper balance in this regard, will substantially reduce through treatment the amount of hexavalent chromium in the groundwater, and will do so in a reasonable time frame
16.	A commenter asked about the 30 year	The Selected Remedy includes extraction wells

	period for the remediation noting that there should be more concern for people of today and the immediate future. He expressed a preference for a more aggressive alternative that would take less than thirty years.	near the river that will provide hydraulic control to prevent contaminants from reaching the river. Estimates indicate that the floodplain will be cleaned up in approximately 2 years.
17.	A commenter asked if extraction of all contaminated groundwater would remove all Cr (VI) contamination.	Total Chromium [Cr (T)] and Cr (VI) are naturally occurring metals in groundwater at background concentrations for Cr (T) of 34.1 µg/L and Cr (VI) of 31.8 µg/L.
18.	A commenter asked where water extraction would occur.	The Selected Remedy includes a series of extraction and injection wells for the in-situ treatment along the length of National Trails Highway, as well as extraction wells near the Colorado River to maintain hydraulic control to prevent contaminants from reaching the River.
19.	A commenter asked about new structures and expressed concerns about the pipelines.	Pipelines will be constructed to convey fresh water from the source to the injection wells. Previously disturbed areas will be used for infrastructure to the extent practicable, subject to DOI's obligation to implement the remedy in a manner that fulfills the requirements of CERCLA.
20.	A commenter asked about the fallback position if the preferred remedy fails.	Components built into the Selected Remedy are designed to prevent a "failure" of the remedy from threatening human health or the environment. Ongoing monitoring of groundwater will enable the agencies to evaluate the effectiveness of in-situ treatment as well as the hydraulic control of the plume. If conditions indicate that the Selected Remedy needs to be augmented, or that a different remedy needs to be selected, DOI will initiate the appropriate steps to address those conditions.
21.	A commenter suggested that adding fresh water might only serve to contaminate more groundwater. He stated that this contamination is affecting lives.	Potential sources of injection water will be tested for contaminants prior to being considered for use in the injection component of the Selected Remedy.
22.	A commenter noted concerns about removing water from the River as part of the remediation effort mentioning preexisting tribal rights to the water and that water is a Trust Asset.	No consumptive use of water will be associated with the in-situ treatment and freshwater flushing elements of the Selected Remedy because all extracted water will be returned to the Colorado River Basin via reinjection wells within the Colorado River accounting surface. The extraction well location and/or extraction rates

		will be adjusted during remedy design, based on a hydrologic analysis, to ensure that groundwater extraction does not have substantial adverse affects on the production rates of existing nearby wells. Very small, localized effects on the groundwater table near the freshwater extraction wells are, however, possible. The use of water in implementing the Selected Remedy will be subject to existing water rights and the system by which such rights are established and exercised.
23.	A commenter asked who would sign the ROD for DOI and BLM.	Authority to sign CERCLA Records of Decision on land under the jurisdiction of DOI has been delegated by the Secretary of the Interior to the Assistant Secretary for Policy Management and Budget.
24.	What will happen when the wells become clogged with calcite? Will you drill more wells? How many more? 300, 400, 500 wells – when will it end? Why not use the wells you already have, why drill more? Will you inject acid into the wells when they clog?	Wells installed as part of the Selected Remedy may become clogged and required rehabilitation. Fouling of wells, particularly injection wells, through scaling, biological growth, corrosion or gas entrapment is likely over the lifetime of the proposed project. Routine maintenance and periodic replacement of wells will be required to maintain functioning wells. The lifetime of wells and replacement frequency in practice will depend on various site-specific factors, including well construction, lithology, groundwater chemistry, and how operations are conducted. Wells will be constructed and operated according to industry best practices to maximize well lifetime and limit the number of replacement wells required. Site experience with re-injection wells for treated effluent from IM-3 has shown deterioration in injection capacity over time, with projected lifetimes on the order of 10 years. Extraction and monitoring wells will be less susceptible to fouling, and it is anticipated that they will require less frequent replacement. Collectively, this site- and function-specific information will affect the number of wells to be replaced during the operation and maintenance period of the project. A plan for operation and maintenance of the wells will be developed to address this and input from the tribes will be solicited.
25.	A commenter asked if the river water criterion of 11 µg/L is acceptable to all	The Federal Water Pollution Control Act (33 USC §§ 1251-1387, 40 CFR 131.38) specifies the

	the agencies.	allowable concentration of discharge to surface water of 11 µg/L including the Colorado River. No Cr (VI) has been detected in the main channel of the river.
26.	A commenter asked if direct pathways might exist or could be formed during construction that could channel Cr (VI) to the river, considering global climate change and other unknown factors. She asked about the possibility of Cr (III) re-converting to Cr (VI) in the future.	During the CMF/FS, DOI conducted a detailed technical assessment of the possibility of reconversion of Cr (III) to Cr (VI). Two key factors are expected to limit such re-conversion after *in-situ* reduction: the limited solubility of Cr (III) and the lack of availability and reactivity of an adequate oxidizer (MnO2). Together, these factors are expected to limit any reoxidized Cr (VI) concentrations to levels similar to ambient background but not likely at levels of health risk concern.
27.	The Colorado River is a water supply for many, many people throughout the upper and lower basin. The Colorado River supply goes to a region of about 5,000 square miles and about 18 to 20 million people. Our concern is really protecting the water supply as far as the issues associated with the region; and the impacts to that culturally is always a concern, but it would be a greater concern not to support and move forward with the cleanup. It's critical that this takes place. We understand by all the history and the documentation that the threat is not imminent based upon what's already been explained. However, given the potential of seismic activity within the region and the area and the impact to the river and the life that it touches throughout its travels, the threat is there. As a result, we would support moving forward with the recommended cleanup; and that recommended cleanup seems to be the best of all of the alternatives for the reasons that's been stated.	Once the ROD is issued, DOI will direct PG&E to proceed with design. The design of the treatment system will take approximately one year and an initial start up period will take approximately one year as well. Once the system is fully functional, the groundwater models suggest that the plume in the floodplain area will take approximately two years to clean up. This will reduce the potential future threat of Cr (VI) contamination to the Colorado River.
28.	I wish there was some other means or another way of addressing it where you didn't have to put in a hundred and	The Selected Remedy was chosen, in part, because it balances the need to achieve compliance with RAOs in a reasonable amount of

	seventy more wells in addition to the hundred fifty that are already out there and the other maximum number of intrusions that will occur through pipelines, water lines, debris in the water from those areas that were mentioned earlier.	time with the objective of minimizing effects to cultural and biological resources to the maximum extent practicable. Monitored natural attenuation or the no-action alternative, alone, could not achieve RAOs in a reasonable amount of time.
29.	On your presentation, you said that water would be -- possibly be extracted from Park Moabi for infusion; and what is going to be the impact on Park Moabi, the recreation facilities that are there? Are you going to be building pumping stations there that are going to detract and interrupt the facilities at Park Moabi?	The source for fresh water will be further evaluated during the design. Park Moabi is one of the potential sources for fresh water. If it is determined that Park Moabi is the preferred source, the only impact to that area would be a well installation with the associated well head and piping from the well to the Topock Site. No pumping station will be installed.
30.	What is going to prevent injection of water into the plume from expanding the contaminated area rather than cleaning up or also cleaning up with the expansion of the contaminated area?	The Selected Remedy's injection of fresh water west of the plume will accelerate groundwater flow through the treatment zone along the IRZ line. Fresh water injection also serves to constrain westward movement of the carbon amended water and flush much of this water eastward toward the extraction wells. Injection of fresh water will not expand the contaminated area.
31.	Has this process that you're planning on using been used successfully someplace else? And if not, what kind of protection do you have for the groundwater and the river and the soil around if something does fail because accidents do occur? I guess that's something that I think needs to be looked at.	In-situ remediation is a well studied option for cleanup of contaminated groundwater. The goal of in-situ remediation schemes is to reduce the carcinogenic, soluble, and mobile Cr (VI) to the less toxic and less mobile Cr (III), which forms minimally soluble precipitates. The main advantage of in-situ treatment is that it allows ground water to be treated without being brought to the surface. Pilot testing has shown that in-situ treatment is technically implementable at the Topock site.
32.	I really want to say that I see that there's been a lot of hard work and a lot of consideration being put into these proposals. Technically, I see no problem with it. It's a simple chemical process of remediation. You're turning something that's really bad to something that is, relatively speaking, manageable. The chemistry of the process seems	DOI agrees with your observations.

	simple enough, and the implementation seems feasible; and I simply am here to applaud your efforts, and let's get it done.	
33.	What are the long-term management strategies to handle this project now and in the future? Especially if you're talking about the proposed remedies going on for years and they're supposed to be monitored. What will happen?	DOI will maintain federal oversight of the Selected Remedy until cleanup is complete. For the purposes of the groundwater cleanup, a long-term operation and maintenance plan will be developed by PG&E and subject to the approval and oversight by the agency. The obligations established by the Selected Remedy, including the long term operation and maintenance plan, will be adopted in a consent decree and enforceable in federal court.
34.	Potential 500 gallons of water per minute to recycle the plume should not come from the freshwater wells in Arizona. These private wells could go dry. Other wells even further away but on the same aquifer could have their water tables diminished. How will these private citizens be compensated for their loss of water and irrigation potential? Who will compensate them when they can no longer live on their land?	The offsite source of fresh water for this alternative could be the same as the water source for the Topock Compressor Station and is assumed to be available over the implementation period. The Topock Compressor Station is currently purchasing its water from wells in Arizona owned by Southwest Water Inc. Southwest Water would need to ensure that groundwater supplies were adequate for all users prior to approving further allotments to PG&E. Future water supply may be from the Colorado River or from wells on the California side of the river. The use of water to implement the Selected Remedy will be subject to existing water rights and the process by which such water rights are established and exercised.

F. TRIBAL CONCERNS/IMPACTS

	Comment	DOI Response
1.	While the Hualapai Tribe believes that the water should be kept clean, we also believe that there should be an emphasis on protection of cultural resources. The Department of the Interior (DOI) Proposed Plan seems to put a greater emphasis on cleaning up the groundwater. The Proposed Plan does not mention that the DOI owns almost all of the land surrounding the Topock Compressor Station, and the	DOI recognizes that the Site is located within an area of traditional cultural importance and spiritual significance to certain Native American tribes with ancestral ties to the region. Cultural resources are subject to the protections provided by numerous Federal statutes, regulations, and Executive Orders. Protection of historic properties and cultural resources, in particular those listed, or eligible for listing, in the National Register of Historic Places, requires that DOI, in consultation with State Historic

	plume is mostly under DOI land. You would think the DOI would be most concerned about protection of natural and cultural resources; however, there appears to be a tacit acceptance by the DOI that damage will be done to cultural resources.	Preservation Offices, the Advisory Council on Historic Preservation, the tribes, and other consulting parties, identify adverse effects on historic properties associated with remedial action at the Site and seek ways to avoid, minimize, or mitigate such effects. CERCLA also requires that DOI select a remedial action that satisfies two "threshold criteria;" protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). The Selected Remedy satisfies these threshold criteria while also balancing the need to avoid or mitigate adverse effects to cultural resources to the extent practicable.
2.	The Hualapai Tribe believes that the land should be returned to its original condition after the work has been completed. However, there is no mention of restoration or how they would properly abandon the huge number of wells at the site (up to 300 wells). All of the activities at the Topock site—wells, buried pipes, and roads—have taken place in an area that is sacred to us. What would you say if we drilled a bunch of wells next to your grandmother's grave? You would not be happy either. The least we can do is look into the future, and describe what the site will look like to our grandchildren.	The Programmatic Agreement and the Selected Remedy require restoration of impacts caused by the Selected Remedy to conditions existing prior to the implementation of the Selected Remedy, to the extent practicable.
3.	Groundwater contamination at Topock has created a negative public perception of Colorado River water quality and therefore places an undue economic burden upon the Tribes for actions that were, and largely still are not within our control. In order to alleviate these impacts, we strongly advocate incorporating quarterly sampling and analyses for hexavalent chromium of surface and groundwater at both the Chemehuevi and Colorado River Indian Tribes' Reservations into the Topock Remediation Project	With one isolated exception unrelated to the Topock Compressor Station, years of surface water monitoring at the Site have not detected hexavalent chromium in the Colorado River above background levels. The Department will work with the tribes and stakeholders to ensure the long-term monitoring of the Colorado River provides the assurance that the remedy continues to protect the water. See response to Comment B-19.

	("Project") monitoring schedule. This groundwater sampling should be conducted by independent laboratories, and funding should also be provided for the Tribes themselves to conduct parallel sampling to assure their membership, and the public at large, that the Colorado River remains uncontaminated downstream from the Topock Remediation Project site. Quarterly sampling of our waters that provides clear evidence to the public that our waters are not contaminated with hexavalent chromium will greatly lessen economic impacts as well as alleviate water quality concerns among Tribal members.	
4.	So that I can have an appreciation of the proximity of each Tribe to the contamination and the potential impacts, please indicate how far each Tribe is from the contamination? So that I understand the number of Tribal people this may impact what is the enrolled member population currently living on this land? What Tribes are upstream and not potentially impacted from the contamination and what tribes are downstream and potentially impacted. What are the concerns of the upstream non-impacted tribes related to the concerns of the downstream impacted tribes?	DOI and DTSC have engaged in regular communication and formal consultation with nine Native American Indian Tribes concerning the status of the Topock project and the process by which the Selected Remedy was evaluated and chosen. Although the membership enrollment of the tribes varies and not all tribes are along the Colorado River, these are all Yumen speaking tribes and share similar ancestral ties to the river. DOI understands from our discussions with various Tribes that different beliefs regarding the Topock area exist. All Tribes do agree, however, that the Colorado River must be protected. It is DOI's intent to ensure the protection of human health and the environment while respecting and taking into account, to the extent possible, the beliefs and concerns of all potentially affected people.
5.	When the work is completed, how will you reclaim the land? How will you reclaim 400 drill holes into the ground? This is important to the Hualapai Tribe, and has not been discussed at all.	The Programmatic Agreement and the Selected Remedy require restoration of impacts caused by the Selected Remedy to conditions existing prior to the implementation of the Selected Remedy, to the extent practicable. Through consultation with the tribes, DOI will continue to seek input from tribes and stakeholders on measures that can be taken to restore impacted areas to ensure the sustainability of the natural environment, such as use of native species or appropriate contouring of impacted land surfaces.

6.	One commenter asked about HAZWOPR training for tribal monitors.	PG&E has offered HAZWOPR training for tribal monitors in the past.
7.	We know the cleanup has to occur; but yet, on the other hand, we want it done in the most respectful manner. We want it done in a least harmful way that will at least give us a sense of, not total comfort, but that we would be able to at least be able to live with what is going to occur there. So we ask that if it's going to be done, that there be proper mitigations done to address the cultural concerns and issues that will affect our people, that continue to affect our people day in, day out.	DOI acknowledges and respects the tribal perspectives regarding the history of your ancestors in this area, the importance of the cultural and spiritual resources and values that you have in this area and the preference to minimize or mitigate impacts caused by ongoing activities related to the Topock cleanup including the implementation of the Selected Remedy. We appreciate the continued involvement and input from all tribal members and stakeholders on this project. Through implementation of the Programmatic Agreement signed by BLM, the Advisory Council on Historic Preservation, and the Arizona and California State Historic Preservation Officers, the Department will proceed with government-to-government and Section 106 consultation on the design and implementation of the remedy to continue to solicitor tribal views on ways to minimize or mitigate adverse effects from the remedy and will, to the extent practicable, require avoidance or mitigation of adverse effects.
8.	I think Alternative B should have been the chosen remedy, which we know is currently keeping it from entering the river because of the diagram you showed earlier. There is a natural occurring cleanup that's taking place by the earth itself and the land below it. And the only reason why this other alternative is being chosen is because the -- everybody else wants it cleaned up real quick and, you know, get it out of there. And that's why you're having the intrusion of having more wells. They have a hundred fifty out there now. They're going to be proposing So I think those mitigation impacts are important, that they need to be considered and negotiated and discussed with the affected Tribes, not only our tribe, but the other tribes that have been participating in this process.	DOI acknowledges that natural attenuation is occurring at the site and recognizes that this alternative would minimize impacts to both ecological and cultural resources. However, CERCLA requires the lead agency to select a remedy that is protective of human health and the environment and attains compliance with ARARs. Alternative B (monitored natural attenuation, standing alone), did not satisfy these threshold requirements. The Department has determined that the Selected Remedy satisfies the threshold criteria and balances the other factors and remedy selection criteria in the most appropriate manner. The Department will continue to work with all the tribes and stakeholders to minimize or mitigate the overall impacts to ecological and cultural resources during the implementation of this remedy.

	which there are eight other tribes, including the Fort Mojave, that have reverence for the area, the sacred area, where we go after we leave this earthly existence.	
9.	You know, water's sacred. Without water, there's no life. You don't live. You know, we need to clean the water. You know, the whole nation needs to have clean water. Not only us. But everyone. We need to think about cleaning all our waters. But we're not going to clean it by opening it up and recycling poison.	The Department recognizes the importance of the Colorado River and its life giving waters for all people. See response to Comment F-12 and F-14.
10.	We support PG&E correcting the damage caused by allowing pollutants to enter the groundwater of our ancestral land, but we want to be sure that correcting the damage is not itself doing more damage. We want to be sure that the gentlest means of remediation - the one that's most respectful of the earth and the river - is selected. That alternative unfortunately has not been selected by the regulators as the preferred alternative; so we have a situation where an engineered alternative, one that could introduce many more wells, more facilities, and people into this sacred area. Alternative E would put, in the worst case scenario, 170 new wells in addition to the 150 wells that are currently in the ground, to say nothing of the damage done by the remediation to date. On behalf of my people, we therefore ask that specific mitigation measures be negotiated with the Fort Mojave Indian Tribe as a means to ensure respect for our cultural landscape, the safe passage of our deceased to the next world, and to secure a future for the cultural practice of the Fort Mojave Indian Tribe. Fort Mojave Indian Community Tribal members will not accept anything less	DOI acknowledges and respects the tribal perspectives regarding the history of your ancestors in this area, the importance of the cultural and spiritual resources and values that you have in this area and the preference to minimize or mitigate impacts caused by ongoing activities related to the Topock cleanup including the implementation of the Selected Remedy. We appreciate the continued involvement and input from all tribal members and stakeholders on this project. Through implementation of the Programmatic Agreement signed by BLM, the Advisory Council on Historic Preservation, and the Arizona and California State Historic Preservation Officers, the Department will proceed with government-to-government and Section 106 consultation on the design and implementation of the remedy to continue to solicitor tribal views on ways to minimize or mitigate adverse effects from the remedy and will, to the extent practicable, require avoidance or mitigation of adverse effects.

	in exchange for having to live with this revised Alternative E.	
11.	I would like to see some definite period of time established in which the water will be cleaned up. How is this project going to be monitored for the period of time it takes to clean up the water? What requirements will be established to make sure PG&E completes the cleanup? What happens if PG&E files for bankruptcy again or refuses to perform the cleanup? Water is a very limited resource here and it needs 4to be cleaned up in a reasonable period of time.	The Department will ensure that the remedy is implemented and the continued operation of the remedy will occur until the RAOs are achieved. This is a requirement of the ROD and PG&E will be required to perform the cleanup until remedial action objectives (RAOs) are achieved. PG&E will be required to provide a bond or some other form of performance guarantee that ensures the money necessary to complete the required remediation work will be available now and in the future. While the estimated time necessary to attain RAOs throughout the entire plume of contamination is as long as 110 years, DOI expects that RAOs will be attained in the floodplain in approximately two years. Extraction wells in the floodplain will protect the River from contaminants and injection wells to the west of the plume will accelerate the pace at which contaminants move through the is-situ treatment zone.
12.	The Tribe here by resolution has passed its -- made known its wishes that health and human safety is primary in our concern. I know a major component of what has been discussed by some of the other tribes; notably, Fort Mojave is that they have cultural concerns. But their cultural concerns seem to be at the expense of our lives down here. And that's something that I hope that the agencies will consider is that our lives are more important.	DOI believes that Alternative E balances impacts to the ecological and cultural resources while protecting human health and the environment. We will ensure that the remedy is implemented and monitored in such a way as to ensure continued protection of the Colorado River.
13.	It is a fact that the cultural information you need is not anywhere being fully considered as it needs to be. I believe additional study, consultation, and more full community discussion are needed before any final remedy is put in place. I understand that much has changed in the process and none of it to the benefit of me or my tribe. Especially when the chromium contamination will not be removed and	The investigation of Site contamination, and the development and evaluation of alternatives have been the subjects of extensive discussion, consultation, and analysis for more than a decade. The Consultative Workgroup process established by DTSC, within which DOI has actively participated for the past six years, has enabled representatives of Tribes, local governments, and other stakeholders to participate actively in these discussions. In addition, DOI, through the BLM, has consulted actively with Tribal governments to

	instead a gradual release of the chromium will be allowed in the river and surrounding area.	identify, and avoid or mitigate to the extent practicable, potential effects on cultural and historic resources related to proposed remediation activities, including the Selected Remedy. The Selected Remedy does not allow for any discharge of Cr (VI) to the Colorado River. Instead, Cr (VI) will be treated to remove contamination from the groundwater in a manner that minimizes effects to cultural and biological resources to the extent practicable.
14.	Only one (1) sentence addresses the significance of the Colorado River as a critical water supply of major importance to millions of people of Arizona and Southern California. Why? In fact the Colorado River represents a greater significant feature to the Mohave culture than the Topock Maze. The name Mohave is composed of two Indian words "aha" which means water and "Muca" meaning alongside. The historic Mohave were known as Pipa Aha Macav, the people by the water. To suggest that other features such as the Topock Maze somehow has a greater or any significance in the Mohave Culture is incorrectly supporting and enabling the invention of Tribal Cultural Traditions. This is also allowing PG&E to limit their remedial efforts by supporting limited, unverified, undocumented facts and comments from a few Tribal individuals that do not represent the documented views of the Tribal Government and their tribal members. This is not a justification to limit complete and full removal and remediation of each and every chemical illegally dumped onto the soil and allowed to enter and contaminate the groundwater that now moves under the Colorado River.	The Colorado River is one of our greatest natural resources in the western United States. It provides drinking and agricultural waters and recreational opportunities to millions of people as well as habitat for many species of plants and animals. The Selected Remedy will protect the Colorado River, will attain compliance with applicable or relevant and appropriate requirements (ARARs), while also minimizing adverse effects to cultural and biological resources to the extent practicable.
15.	What procedures have been adopted if human remains or artifacts are	The Programmatic Agreement adopts protocols to ensure that requirements applicable to the

	encountered? What would happen if the entire area was found to contain artifacts or remains?	discovery of human remains or artifacts are fully satisfied, including provisions for stopping work when necessary. Recordation of artifacts would occur and artifacts will be removed if possible.

G. COMMUNITY CONCERNS/IMPACTS

	Comment	DOI Response
1.	Why is considerable text and discussion given to Tribal Cultural Resources and little to minimal discussion provided relative to the importance of the Colorado River as the single most important source of drinking, agricultural and recreational water supply to Arizona and Southern California? There appears to be a purposeful decision to downplay the importance of the Colorado River as a water supply in favor of discussions related to Tribal cultural resources. Why is this the case?	Protecting public health and welfare and the environment from risks posed by the release of hazardous substances is the central purpose of CERCLA response action. The Selected Remedy has been chosen by DOI to protect the Colorado River and remediate contaminated groundwater at the Site. In addition, the presence of important cultural resources at the Site requires that DOI consult with the Advisory Council on Historic Preservation, the SHPOs, and interested tribal governments to avoid or mitigate effects on such resources to the extent practicable.
2.	In relation to the protection of human health and the environment and preventing any possibility of contaminated groundwater entering the Colorado River and potentially impacting the lives of millions of people in Southern California, how has and will DOI rank the protection of human health and environment related to impacts on religious values and cultural resources when evaluating and selecting a remedy? What is more important? Will DOI weight the protection of cultural resources greater than the protection of the drinking water supply for millions of people in Arizona and Southern California?	Protection of human health and the environment is one of two threshold criteria that must be satisfied by any remedial action selected under CERCLA. The Selected Remedy satisfies this criterion while also acknowledging and respecting the important cultural resources that will be affected by the remedial action and seeking ways to avoid or mitigate, to the extent practicable, such effects.

References

ARCADIS, 2009. Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2, Topock Compressor Station, Needles California. November 13.

CH2M Hill, 2007a. Revised Final RCRA Facility Investigation and Remedial Investigation Report, Volume 1 - Site Background and History, PG&E Topock Compressor Station. August 2007.

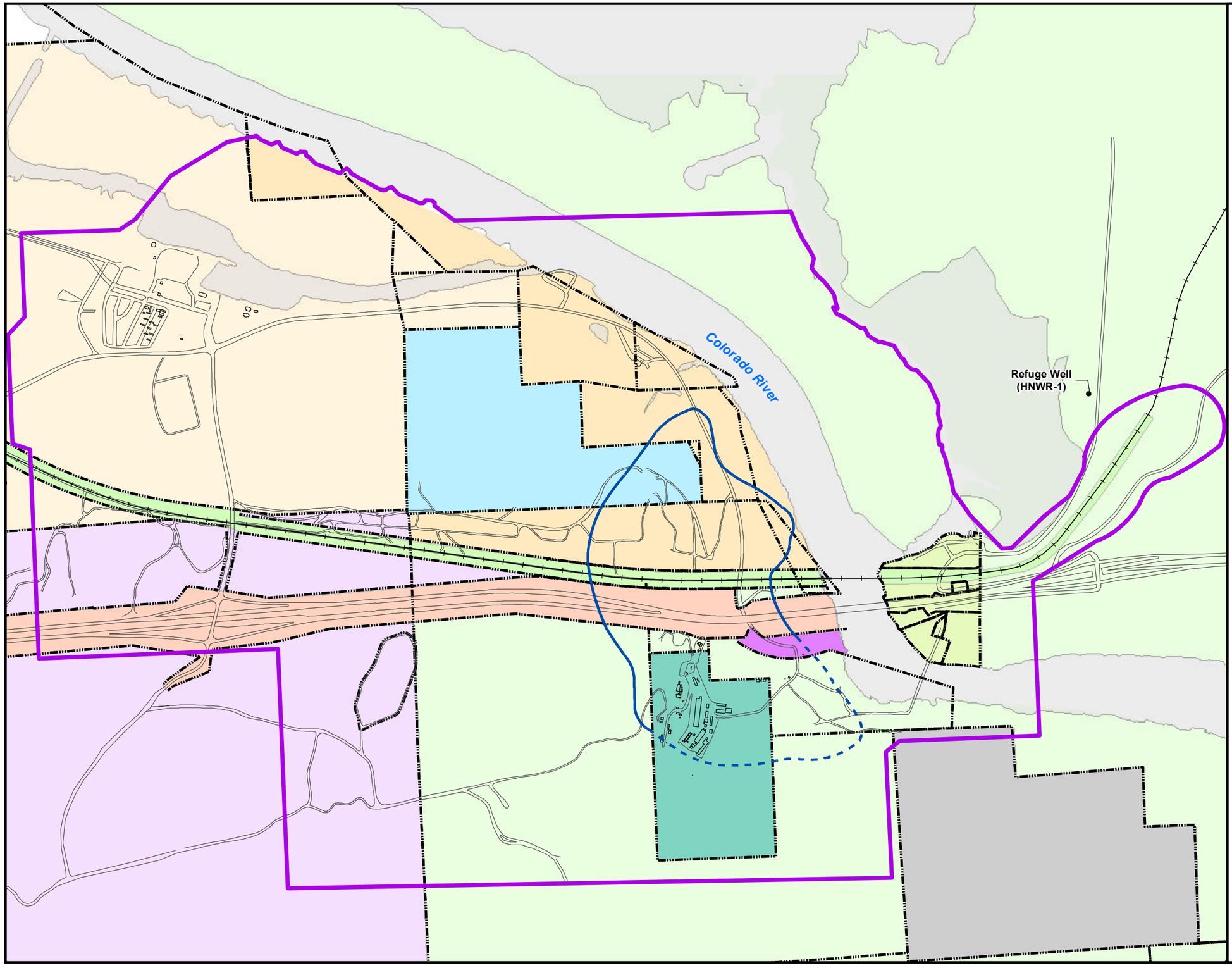
CH2M Hill, 2008. Installation Report for Wells on the Arizona Shore of the Colorado River at Topock, Arizona.

CH2M Hill, 2009a. Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 2—Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California. February 2009.

CH2M Hill 2009b. Final Groundwater Corrective Measures Study/Feasibility Study Report for SWMU 1/AOC 1 and AOC 10, PG&E Topock Compressor Station, Needles, California. December, 2009.

DTSC 2009. Letter from DTSC to DOI regarding *Clarification of Specific California Applicable or Relevant and Appropriate Requirements* dated October 6, 2009.

DTSC 2010. Memorandum from J. Michael Eichelberger, Ph.D to Aaron Yue, Senior Hazardous Substances Engineer dated September 28, 2010 regarding Draft EIR Response to Public Comments.



LEGEND

- Refuge Well
- Area of Potential Effect (APE)
- Approximate extent of hexavalent chromium [Cr(VI)] concentrations exceeding 32 micrograms per liter (µg/L) at any depth in groundwater based on second quarter 2011 sampling events. Dashed where based on limited data.

Property Owner

- BNSF Railroad
- Bureau of Land Management (owned and managed by BLM)
- Bureau of Reclamation (managed by BLM)
- Caltrans Leased From Underlying Federal Owner
- Fort Mojave Indian Tribe Owner in Fee, With PG&E Easement and Access for Remediation
- Havasu National Wildlife Refuge
- Metropolitan Water Dirstrict of Southern California
- PG&E
- Privately Owned
- San Bernadino County
- San Bernadino County Leased (managed by BLM)

Note:
1. * = PG&E has a possessory interest on these parcels (650-161-11,650-161-12) for the operation of a compressor station and associated pipelines.

0 350 700 1,400 Feet

N

SITE MAP

PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

CH2MHILL

Path: D:\Projects\Topock\MapFiles\2011\CMS\SurroundingPropV3.mxd
Date Saved: 12/20/2011 10:51:25 AM

Appendix C
Scope of Work

Introduction and Purpose

This Scope of Work ("SOW") specifies the response actions and obligations that the Pacific Gas & Electric Company ("PG&E") shall perform and satisfy to implement Remedial Design ("RD") and Remedial Action ("RA") activities addressing the release of hazardous substances into groundwater at or from the PG&E Topock Compressor Station ("Site"), as defined in the Remedial Design/Remedial Action Consent Decree ("Consent Decree") to which this SOW is attached. Pursuant to the Consent Decree, PG&E has agreed to perform RD/RA activities subject to the oversight and approval of the Department of the Interior ("DOI"). The SOW is intended to supplement the Consent Decree. Terms defined in the Consent Decree and used in the SOW shall have the meaning assigned to them in the Consent Decree. In the event of any actual or potential conflict between this SOW and the Consent Decree, the language of the Consent Decree shall control.

The Groundwater Record of Decision for the Site, dated January 20, 2011 ("ROD"), presents the Selected Remedy for groundwater contamination resulting from past disposal practices at the PG&E Topock Compressor Station near Needles in San Bernardino County, California ("Compressor Station"). The RD defines those activities to be undertaken by PG&E to develop the final plans and specifications for implementing the RA, in accordance with the Topock Remediation Detailed Project Schedule ("Rainbow Schedule"). The RA is the implementation phase of site remediation and shall be performed in accordance with the objectives and requirements of the RD to achieve the remediation goals specified in the ROD.

1. General Requirements

PG&E shall conduct the RA in accordance with this SOW, and the final plans and specifications developed during the RD, in order to achieve the Performance Standards and Remedial Action Objectives ("RAOs") identified in Part 2, Section H of the ROD.

As set forth in Section VI of the Consent Decree, and in the Memorandum of Understanding entered into between DOI and the Department of Toxic Substances Control ("DTSC"), concerning the coordination in overseeing the design and implementation of groundwater response actions at the Site, if modifications to the Work specified in the Consent Decree and this SOW, or in work plans developed pursuant to this SOW, are necessary to achieve and maintain the Performance Standards and/or comply with applicable or relevant and appropriate requirements ("ARARs") as set forth in the ROD, such modifications may be incorporated into the appropriate work plans developed pursuant to this SOW.

In the event the Performance Standards are modified pursuant to CERCLA § 121(d)(4), Settling Defendant shall continue to implement Remedial Action until such modified Performance Standards are achieved.

2. Remedial Design

RD activities shall include the preparation of clear and comprehensive design documents, construction plans and specifications, and other design activities needed to implement the Work in a manner consistent with the Consent Decree and satisfy all Performance Standards set forth in the ROD. All deliverables shall be developed in accordance with relevant portions of the *Remedial Design/Remedial Action Handbook* U.S. EPA, Office of Solid Waste and Emergency Response (OSWER), 9355.0-04B, EPA 540/R-95/059, June 1995.

2.1 Develop RD Work Plan

The RD Work Plan shall provide the framework and process by which the design of the Selected Remedy set forth in the ROD will be conducted to achieve the Performance Standards and other requirements set forth in the ROD and Consent Decree. The RD Work Plan must describe the tasks and deliverables PG&E will complete during the Remedial Design phase, a schedule for completing the tasks and deliverables, and the management of the design tasks. The major design tasks and deliverables described in the RD Work Plan shall include the following: (1) a preliminary design; (2) an intermediate design; (3) a pre-final design/final design; and (4) a Remedial Action work plan.

On May 2, 2011, PG&E submitted to DOI and DTSC a draft RD Work Plan. The Draft RD Work Plan was approved by DOI on November 3, 2011.

2.2 Remedial Design Submittals

The Preliminary Design (30%) provides plans and specifications for construction of the RA. The Intermediate Design (60%) provides a continuation and expansion of the preliminary design. The Pre-Final (90%) and Final Design (100%) provide the final plans and specifications for construction of the RA.

2.2.1 Preliminary Design

The preliminary design submittal shall include the following, at a minimum: (1) design criteria and design basis; (2) results of treatability studies, if applicable; (3) results of pre-design work, if applicable, (4) project delivery strategy; (5) preliminary plans, drawings, sketches, and schematics; (6) preliminary list and anticipated format of required specifications in outline form; and (7) preliminary construction schedule.

DOI may also determine that the following elements must be included in the preliminary design:

- Results of additional field sampling
- Results of value engineering screen
- Preliminary cost estimates.

2.2.2 Intermediate Design

The intermediate design submittal shall be a continuation and expansion of the preliminary design submittal and include the following: (1) revised design criteria and design basis reports; (2) intermediate drawings and specifications; (3) intermediate cost estimates; (4) a draft construction schedule; and (5) geotechnical analysis (appendix).

DOI may also determine that the following elements shall be included in the intermediate design:

- General site plans
- Process flow diagrams
- Mechanical/electrical/structural drawings
- Piping and instrumentation diagrams
- Excavation and earthwork drawings
- Equipment list
- Site preparation and field work standards
- Preliminary specifications for equipment and materials
- Response to preliminary design review comments.

2.2.3 Pre-Final/Final Design

The pre-final/final design submission shall include, at a minimum, the following: (1) pre-final/final Drawings and Specifications including complete specifications, complete drawings, and schematics; (2) Operation and Maintenance Plan and support appendices; (3) final design basis and design criteria report(s); (4) Construction Quality Assurance Project Plan (ACQAPP@); (5) Field Sampling Plan (directed at measuring progress towards meeting Performance Standards), including a Groundwater Monitoring Plan; (6) Contingency Plan; (7) IM-3 Decommissioning Plan; (8) pre-final/final remedial action cost estimate; and (9) pre-final construction schedule. The CQAPP, which shall detail the approach to quality assurance during construction activities at the Site, shall specify a quality assurance official, independent of the Supervising Contractor, to conduct a quality assurance program during the construction phase of the project.

DOI may also determine that the following elements shall be included in the final plans and specifications:

- General site plans
- Process flow diagrams
- Mechanical/electrical/structural drawings
- Piping and instrumentation diagrams

- Excavation and earthwork drawings
- Site preparation and field work standards
- Construction drawings
- Installation drawings
- Equipment Lists
- Detailed specifications for equipment and materials
- Response to intermediate design review comments
- Response to pre-final design review comments.

2.2.4 Operations and Maintenance (O&M) Plan

PG&E shall prepare an O&M Plan as part of the pre final/final design that includes the activities needed to operate the treatment system required by the Selected Remedy and to achieve Performance Standards. The O&M Plan shall describe the compliance monitoring that will be conducted to measure the performance of the treatment system in achieving and maintaining the Performance Standards. The O&M Plan shall include:

- Project management and organization
- Communication procedures and protocols
- System description
- Personnel training
- Start-up procedures
- O&M procedures - description of tasks for operation and maintenance, description of prescribed treatment or operation conditions, O&M schedule
- Equipment replacement schedule
- Waste management practices, including types of wastes to be generated and how each type of waste will be managed
- Sampling and Monitoring/Field Sampling Plan during system operation (including data quality objectives and Quality Assurance Project Plan). This sampling plan must be prepared in accordance with the EPA Region IX Sampling and Analysis Plan Guidance and Template (R9QA/002.1, April, 2000). The Sampling and Monitoring/Field Sampling Plan includes the Groundwater Monitoring Plan and shall describe the sampling objectives, analytical parameters, analytical methods, sampling locations and frequencies, analytical holding times, sampling procedures and equipment, sample preservation, sample packing, QA/QC samples, sample paperwork and chain-of-custody procedures, sample handling and shipping, and planned uses of the data, including a groundwater monitoring plan

- O&M Quality Assurance Project Plan ("QAPP"). The QAPP must be prepared in accordance with the *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (U.S. EPA, EPA/240/B-01/003, March 2001, Reissued May 2006), and the *Guidance for Quality Assurance Project Plans*, (U.S. EPA, EPA/240/R-02/009, December 2002)
- Remedial action completion criteria
- O&M contingency plans to address potential failure modes, per Section 2.2.6 herein
- Data management and documentation requirements, including a description of how analytical data and results will be evaluated, documented, and managed
- Details for the collection/maintenance of information.

2.2.5 Construction Quality Assurance Project Plan (CQAPP)

PG&E shall prepare a CQAPP as part of the pre final/final design that shall describe the approach to quality assurance during construction activities at the Site and shall include:

- Construction quality assurance objectives, specific quality control requirements and performance standards to be followed during implementation of remedial actions
- Identification of a quality assurance official (QA Official), independent of the construction contractor, to conduct a quality assurance program during the construction phase of the project
- Identification of responsibilities and authorities of all organizations and key personnel involved in the design and construction of the site remediation
- Description of the construction quality assurance personnel qualifications
- Description of inspection activities, observation and tests to be conducted, schedules, and scope.

2.2.6 Contingency Plans

The contingency plans shall include construction contingency plans as part of the RA Work Plan set forth in Section 3 herein, and O&M contingency plans as part of the O&M Plan set forth in Section 2.2.4 herein, to address potential failure modes.

The construction contingencies shall address potential failure modes related to: (1) changes to the design and/or specifications due to issues that may arise during construction; and (2) unforeseen events that prevent the construction of the groundwater remedy (e.g., acts of God like earthquakes, flooding, and fires).

The O&M contingencies shall address failure modes related to: (1) attainment of RAOs and ARARs compliance; (2) system breakdowns and operational problems causing the remedy to not perform to design specifications; (3) unforeseen events that prevent the operation of the groundwater remedy (e.g., acts of God like earthquakes, flooding, and fires).

2.2.7 Health and Safety Plan (HSP)

PG&E shall submit a HSP for field activities as part of the Sampling and Monitoring/Field Sampling Plan and the pre final/final design. A site-specific HSP must specify how workers will be protected during any site activities through the identification, evaluation, and control of health and safety hazards. The HSP shall be in conformance with U.S. Occupational Safety and Health Administration requirements in Title 29 of the Code of Federal Regulations ("CFR") (sections 1910 and 1926). DOI will review and comment on the HSP but will not approve this document.

2.2.8 IM-3 Decommissioning Plan

PG&E shall submit an IM-3 Decommission Plan as part of the pre final/final design that describes procedures for the removal and decommissioning of the IM-3 treatment plant and other infrastructure associated with the Interim Measures at Topock that are not incorporated into the groundwater remedy. This Plan will also describe the restoration of the site of the existing treatment plant and related facilities to the conditions existing prior to the construction of the investigation and remediation-related appurtenances and facilities, to the extent practicable and in conformance with the Programmatic Agreement ("PA") and the Settlement Agreement between PG&E and the Fort Mojave Indian Tribe dated November 9, 2006.

3. Remedial Action Work Plan

Concurrently with the submittal of the pre-final/final design package, PG&E shall submit to DOI the RA Work Plan, which shall include, at a minimum, the following: (1) schedule for completion of the RA; (2) method for selection of the RA Contractor; (3) schedule for developing and submitting other required RA plans; (4) sampling and monitoring during construction; (5) methodology for implementing the O&M Plan; (6) methodology for implementing the Contingency Plan; (7) Final Construction Quality Assurance Project Plan; (8) Site Management Plan; (9) IM-3 Decommissioning Plan; (10) Protocol for documenting ARARs Compliance; (11) Project Management Plan; (12) Habitat Restoration Plan; and (13) procedures and plans for the documentation of equipment and the disposal of contaminated materials.

The RA Work Plan shall also include:

- A schedule for implementing all RA tasks identified in the final design submission
- The methodology for overseeing and implementing the CQAPP
- Identification of PG&E's Remedial Action project team
- Project management and organization

- Communication procedures and protocols
- Project schedule, including timing of key elements for bidding purposes, timing of the initiation and completion of all major tasks, and when the construction completion report will be submitted
- Sampling and monitoring plan during construction
- Construction contingency plans to address potential failure modes, per Section 2.2.6 herein
- Data management and documentation requirements, including a description of how analytical data and results will be evaluated, documented, and managed
- Details for the collection/maintenance of information.

At the same time as it submits the Remedial Action Work Plan, PG&E shall submit a revised HSP to include the field activities required by the Remedial Action Work Plan. The HSP shall be in conformance with U.S. Occupational Safety and Health Administration requirements in Title 29 of the Code of Federal Regulations ("CFR") (sections 1910 and 1926).

3.1 Construction Quality Assurance Project Plan

The Construction Quality Assurance Project Plan (CQAPP) is the same CQAPP presented in Section 2.2.5 above (pre-final/final design). The CQAPP describes the approach to quality assurance during construction activities at the Site and is intended to ensure that the Selected Remedy will meet all design criteria, plans, and specifications. The CQAPP shall include:

- Construction quality assurance objectives, specific quality control requirements and performance standards to be followed during implementation of remedial actions
- Identification of a quality assurance official (QA Official), independent of the construction contractor, to conduct a quality assurance program during the construction phase of the project
- Identification of responsibilities and authorities of all organizations and key personnel involved in the design and construction of the site remediation
- Description of the construction quality assurance personnel qualifications
- Description of inspection activities, observation and tests to be conducted, schedules, and scope.

3.2 Site Management Plan

The Site Management Plan describes protocols and procedures to manage the Site during implementation of the Remedial Action including at a minimum the following:

- Site access

- Site security
- Waste management procedures addressing how wastes generated during construction will be managed
- Protocols for site workers, visitors, and monitors.

3.3 IM-3 Decommissioning Plan

The IM-3 Decommissioning Plan described here is the same as the IM-3 Decommissioning Plan described in Section 2.2.8 (as part of the pre-final/final design) above. The IM-3 Decommissioning Plan describes procedures for the removal and decommissioning of the existing IM-3 treatment plant and other infrastructure associated with the Interim Measure at Topock that are not incorporated into the groundwater remedy. This Plan will also describe the restoration of the site of the existing treatment plant and related facilities to the conditions existing prior to the construction of the investigation and remediation related appurtenances and facilities, to the extent practicable and in conformance with the PA and the Settlement Agreement between PG&E and the Fort Mojave Indian Tribe dated November 9, 2006.

3.4 Protocol for Documenting ARARs Compliance

In implementing the Selected Remedy, PG&E must attain ARARs adopted by DOI in the course of or upon completion of the RA. PG&E shall develop a protocol for documenting the attainment of site-specific ARARs specified in the ROD, and further developed during RD and implementation of the RA.

3.5 Project Management Plan

The Project Management Plan describes the management approach to be utilized by PG&E. The Project Management Plan will include levels of authority and responsibility, an organization chart, and lines of communication and the qualifications of key personnel who will be responsible for PG&E for the implementation of the Selected Remedy described in the ROD.

3.6 Habitat Restoration Plan

If during the design, complete avoidance of sensitive habitats under the jurisdiction of the United States Fish and Wildlife Service ("FWS"), United States Army Corps of Engineers ("USACE"), or the California Department of Fish and Game cannot be achieved, PG&E will be responsible for preparing a Habitat Restoration Plan that includes measures for restoration, rehabilitation, and/or replacement of the habitats. The Plan will be developed in coordination with the FWS Havasu National Wildlife Refuge Manager.

3.7 Decontamination Plan

PG&E shall submit a decontamination plan that identifies general guidance procedures to be followed during construction of the Selected Remedy. This plan will be used for all construction and support equipment, either contaminated or suspected of being contaminated.

4. RA Construction Completion Report

4.1 RA Construction Completion Report

After construction and operational tests are complete, PG&E shall submit a RA Construction Completion Report written by a registered professional engineer stating that the Work has been completed in full satisfaction of the requirements of the Consent Decree. The RA Construction Completion Report will document how the completed project is consistent with the Final Design Plans and Specifications and shall include:

- Purpose
- Synopsis of the final remedial action, design criteria, and certification that the remedial action was constructed in accordance with the final design plans and specifications
- Explanation and description of any modifications to the final design plans and specifications and why the modifications were necessary
- Results of any operational testing and/or monitoring which may indicate how initial operation of the final groundwater remedy compares to the design criteria
- Summary of significant activities that occurred during construction
- Summary of any inspection findings
- Summary of any significant deviations (e.g., technical field changes, cost variances, revised assumptions) from the ROD or approved work plans made during construction
- As-built drawings
- A schedule indicating when treatment systems will begin full scale operations
- The following statement, signed by a responsible corporate official of PG&E or PG&E's project manager:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

4.2 DOI Notification

If DOI concludes, based on the initial or any subsequent request for Certification of Completion of the Work by PG&E, and after a reasonable opportunity for review and comment by the State, that the Work has been performed in accordance with the ROD, the RD, and the Consent Decree, DOI will so notify PG&E in writing as provided in the Consent Decree.

5. Remedy Progress Reports

PG&E shall submit to DOI electronic progress reports on a monthly basis during RA construction and on a quarterly basis after the Selected Remedy has been implemented and demonstrated to be operating as intended. Such progress reports shall describe, among other things, the actions that have been taken toward attaining RAOs. Adjustment to the reporting frequency can be made if agreed upon by DOI and PG&E. Hard copies will be provided to DOI upon request. If requested by DOI, PG&E shall provide briefings for DOI to discuss the progress of the Work.

Progress reports shall (a) describe the actions which have been taken to implement RA activities in accordance with the Consent Decree during the previous reporting period; (b) include a summary of available results of sampling and tests and all other data received or generated by PG&E or its contractors or agents in the previous reporting period; (c) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next reporting period and provide other information relating to the progress towards attaining RAOs, including, but not limited to, critical path diagrams, and Gantt charts; (d) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (e) include any modifications to the work plans or other schedules that PG&E has proposed to DOI or that have been approved by DOI; (f) if requested by DOI to assist in community involvement activities (as provided in Section XXIX (Community Relations) of the Consent Decree), describe all activities undertaken in support of the Community Involvement Plan during the previous reporting period and those to be undertaken in the next reporting period; (g) include a discussion of any changes in personnel that occurred during the reporting period; and (h) include a summary of contacts with representatives of the press, local community or public interest groups during the reporting period.

PG&E shall notify DOI of any change in the schedule described in the monthly progress report during RA construction for the performance of any activity, including, but not limited to, data collection and implementation of work plans, no later than seven days prior to the performance of the activity, or as otherwise agreed to by PG&E and DOI.

6. Five-Year Review Process

PG&E shall conduct any studies and investigations that DOI requests in order to permit DOI to conduct reviews of whether the Remedial Action is protective of human health and the

environment at least every five years as required by Section 121(c) of CERCLA, 42 U.S.C. ' 9621(c), and any applicable regulations. The Five-Year Review process evaluates the long-term effectiveness and reliability of the remedy and involves the following:

- Administrative components
- Outline of components and schedule for the five-year review
- Community involvement
- Document review
- Data review
- Site inspections
- Interviews
- Technical assessment:
  - Question A: Is the remedy functioning as intended by the decision documents?
  - Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?
  - Question C: Has any other information come to light that could call into question the protectiveness of the remedy?
  - Technical assessment summary
- Issues
- Recommendations and follow-up actions
- Protectiveness statement
- Next review

In support of the Five-Year review, PG&E will provide supporting documentation to DOI including data evaluations, plume maps, progress reports, etc. Included within this documentation, PG&E will provide an evaluation of changes since remedy implementation or the previous review such as assumptions regarding remedy byproducts, costs, land use, and plume characteristics.

7. RA Completion Report

Once cleanup goals and RAOs are achieved and/or the agency issues a decision that monitored natural attenuation is appropriate to address residual Cr(VI) in portions of the plume, a RA Completion Report will be prepared. The RA Completion Report shall describe how the criteria for the completion of the final groundwater remedy have been fully satisfied and justify why the final groundwater remedy and/or monitoring may cease. The RA Completion Report shall include:

- Purpose
- Synopsis of the remedial action
- Remedial action completion criteria, including a description of the process and criteria for determining when remedial actions, maintenance, and monitoring may cease
- Demonstration that the RAOs have been met, including results of testing and monitoring
- Summary of remedy accomplishments
- Summary of significant activities that occurred during operations
- Summary of inspection findings
- Summary of total O&M costs

8. Certification of Completion of RA

This is a request for certification from DOI that the RA has been fully performed and the Performance Standards have been achieved. The request shall include: (1) documentation of pre-certification inspection and completion of all work; and (2) statement that the remedial action has been completed in full satisfaction of the requirements of the Consent Decree.

9. Remedy Decommissioning Plan

The Remedy Decommissioning Plan describes procedures for the removal and decommissioning of the groundwater remedy treatment system and associated infrastructure. The Plan will also describe the post-remedy restoration of the site to the conditions existing prior to the implementation of the remedial investigation and remedy construction, including related appurtenances and facilities, to the extent practicable. This Plan will be submitted by PG&E to DOI within 120 days of DOI's certification of completion of the RA and a determination by DOI that removal of such facilities is protective of human health and the environment. Removal of remediation facilities will be consistent with the PA.

References

The following guidance documents are referred to in this SOW:
Remedial Design/Remedial Action (RD/RA) Handbook, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER), 9355.0-04B, EPA 540/R-95/059, June 1995.

EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, U.S. EPA, EPA/240/B-01/003, March 2001, Reissued May 2006.

Guidance for Quality Assurance Project Plans, U.S. EPA, EPA/240/R-02/009, December 2002.

Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.

Standards for General Industry, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.

EPA Region IX Sampling and Analysis Plan Guidance and Template (R9QA/002.1, April, 2000).

Department of Toxic Substances Control

Linda S. Adams
Acting Secretary for
Environmental Protection

Leonard E. Robinson
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

April 5, 2011

Mr. Rex Bell
Pacific Gas and Electric Company
P.O. Box 770000
San Francisco, California 94177

Certified Mail No.: 7009 2820 0001 3867 2957

FINANCIAL RESPONSIBILITY REVIEW FINDINGS – PACIFIC GAS AND ELECTRIC COMPANY, HIGHWAY I-40 AND PARK MOABI ROAD, NEEDLES, CALIFORNIA, 92363, ENVIRONMENTAL PROTECTION AGENCY IDENTIFICATION NUMBER CAT080011729

Dear Mr. Bell:

On April 4, 2011, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), conducted a financial responsibility review of Pacific Gas and Electric Company, Highway I-40 and Park Moabi Road, Needles, California. The enclosed review describes the findings of the review.

Because no violations were discovered during the review, no written response to this letter is required. DTSC appreciates your efforts to comply with the financial assurance regulations.

All pertinent information derived from the inspection, including financial assurance documents are included as attachments to the review.

This report will become a public document; you may request that any trade secret or facility security information be withheld from public disclosure. (See Health and Safety Code section 25173)

If you wish to assert the trade secret privilege after you have reviewed the report, please provide specific answers to each of the following questions for each item:

- To what extent is there knowledge of the information conveyed by the photograph/document outside of your business?

- To what extent is there knowledge of the information conveyed by the photograph/document, by employees and others in your business?

- To what extent have measures been taken to guard the secrecy of the information?
- Is the information valuable to competitors? If so, why?
- Has there been substantial monetary expenditure in the development of the information?
- Could the information be easily and properly acquired or duplicated by others?

DTSC will review your response to these questions to determine if the information should be treated as trade secret and will notify you of its decision.

If you have any questions regarding this letter, or if you wish to meet with DTSC to discuss any questions or concerns you have with the review, the violation, or the required corrective action, please contact Mr. Aaron Yue at (714) 484-5439 or Ms. Julie Mullins at (916) 255-3678.

Sincerely,

Keith Kihara
Supervising Hazardous Substances Scientist I
Enforcement and Emergency Response Program

Enclosures

cc: Mr. John Blodgett
Supervisor Project Controls
Pacific Gas and Electric Company
Environmental Remediation
3401 Crow Canyon Road
San Ramon, California 94583

cc: Ms. Karen Baker, CHG, CEG, Chief
Geological Services Branch
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630-4732

Mr. Aaron Yue
Senior Hazardous Substances Engineer
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630-4732

Ms. Julie Mullins
Associate Governmental Program Analyst
Financial Assurance Unit
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
8800 Cal Center Drive, 3rd Floor
Sacramento, California 95826-3200

FINANCIAL RESPONSIBILITY REVIEW FINDINGS

To: Aaron Yue	Branch: Cleanup Program	
From: Julie Mullins	Office: Cal Center	Phone No.: (916) 255-3678

FOR THE PURPOSE OF THE FINANCIAL RESPONSIBILITY REVIEW, THE RESULTS OF THE EVALUATION ARE GOOD FOR SIXTY (60) DAYS FROM THE DATE OF THIS REVIEW AND ARE AS FOLLOWS:

FACILITY REVIEWED:

Facility Name: Pacific Gas & Electric Company, Topock Compressor Station	EPA ID No.: CAT080011729

Facility Address:
Hwy I-40 and Park Moabi
Needles, CA 92363

FINANCIAL ASSURANCE FOR CLOSURE	FINANCIAL ASSURANCE FOR POSTCLOSURE	FINANCIAL ASSURANCE FOR CORRECTIVE ACTION
Results: ☐ *PASS* ☐ *FAIL* ☒ *N/A*	*Results:* ☐ *PASS* ☐ *FAIL* ☒ *N/A*	*Results:* ☒ *PASS* ☐ *FAIL* ☐ *N/A*
Document Type(s):	Document Type(s):	Document Type(s): Financial Test
Document Amount Closure: $	Document Amount Postclosure: $	Document Amount: $198,000,000.00
Closure Cost Estimate: $	Postclosure Cost Estimate: $	Corrective Action Cost Estimate: $198,000,000.00
Deficiency Closure: $	Deficiency Postclosure: $	Deficiency: $ 0
Violation(s): 0	Violation(s):	Violation(s): None

SUDDEN LIABILITY COVERAGE	NON-SUDDEN LIABILITY COVERAGE
Results: ☒ *PASS* ☐ *FAIL* ☐ *N/A*	*Results:* ☐ *PASS* ☐ *FAIL* ☒ *N/A*
Document Type(s): Financial Test	Document Type(s):
Document Amount Sudden: $1 million/$2 million	Document Amount Non-Sudden: $
Deficiency Sudden: $0	Deficiency Non-Sudden: $
Violation(s): 0	Violation(s):

COMMENTS:

No violations found during this review.

Julie Mullins 4/4/11
FR Analyst's Signature Date

Supervisor's Signature 4/4/11
Date

FR-2 (5/06)

ATTACH ANY ADDITIONAL INFORMATION TO THIS PAGE

State of California-California Environmental Protection Agency — Department of Toxic Substances Control

FINANCIAL RESPONSIBILITY REVIEW REQUEST

To: Financial Responsibility Analyst				Date: 3/21/2011
From: Aaron Yue				Phone No.: (714) 484-5439
Branch: Cleanup Program,				Office: Geology
PCA #: 22120	SITE #: 540015	WP #: 48	MPC #: 217	Date Received:

INFORMATION ON FACILITY TO BE REVIEWED:

Facility Name: Pacific Gas and Electric Company, Topock Compressor Station

EPA ID No.: CAT080011729 — Inspection Date:

Facility Address:
15 Miles East of Needles
Highway I-40 and Park Moabi
Needles, CA 92363

Mailing Address:
P.O. Box 770000
San Francisco, CA 94177

Facility Contact Name: Rex Bell — Phone No.: (415) 973-6904

PLEASE NOTE: DOCUMENTS IDENTIFYING THE CURRENT "DTSC APPROVED" CLOSURE AND/OR POSTCLOSURE COST ESTIMATE AND THE DATE OF THE ESTIMATE MUST BE ATTACHED. REQUEST WILL NOT BE PROCESSED WITHOUT THE PROPER DOCUMENTATION.

Closure Cost Estimate (CCE): $	Date of CCE:
Postclosure Cost Estimate (PCE): $	Date of PCE:
Corrective Action Cost Estimate (CACE): $	Date of CACE: $198,000,000.00

FACILITY TYPE *(Check all that apply)*

Full Permit: ☐RCRA ☐Non-RCRA	**Interim Status:** ☒RCRA ☐Non-RCRA	**Standardized Permit:** ☐Series A ☐Series B ☐Series C ☐Series Small Quantity C	
☐Permit-by-Rule	☐Conditionally Authorized	☐e-Waste	☐Other:

LIABILITY COVERAGE *(Check all that apply)*:

☐ Permit-by-Rule	
☐ Conditionally Authorized and Conditionally Exempt	
☐ Standardized Permit Series Small Quantity C	$ 100,000 Per Occurrence/$ 200,000 Annual Aggregate
☐ Standardized Permit Series C	$ 300,000 Per Occurrence/$ 600,000 Annual Aggregate
☐ Standardized Permit Series B	$ 500,000 Per Occurrence/$1,000,000 Annual Aggregate
☒ Full Permit or Standardized Permit Series A	$1,000,000 Per Occurrence/$2,000,000 Annual Aggregate
☐ e-Waste Recycling Facility	$1,000,000 Per Occurrence/$2,000,000 Annual Aggregate
☐ Land Disposal or Non-Sudden Liability Required	$3,000,000 Per Occurrence/$6,000,000 Annual Aggregate

PERMIT ACTIONS *(Check all that apply)*:

☐ New ☐ Renew ☐ Modify ☐ Deny ☐ Revoke ☐ Variance ☒ Corrective Action

COMPLIANCE ACTIONS *(Check all that apply)*:

☐ CEI ☐ Complaint ☐ Focused ☐ CME ☐ E-Waste ☐ O&M ☐ Variance

OTHER:

REVIEW DUE DATE: _____

3/21/2011
Requestor's Signature — Date

Karen Baker — 3/21/2011
Supervisor's Signature — Date

FR-1 (8/06)

ATTACH ANY ADDITIONAL INFORMATION TO THIS PAGE

From: Aaron Yue
To: Julie Mullins
CC: Karen Baker; Lori Hare
Date: 3/21/2011 11:07 AM
Subject: Fwd: RE: FW: Topock Financial Assurance
Attachments: PG&E FA CA 2011.pdf

Julie,

Attached is the completed FR review request for PG&E Topock. This site is a HWMP site, but currently only under Corrective Action for site clean-up. It use to be an Interim Status site. The FA is from a preliminary calculation of remedy concept. Facility will refine financial assurance cost estimate with each iterative design.

Aaron

>>> Julie Mullins 3/14/11 3:45 PM >>>
Hi Aaron,

If you would like the financial assurance unit to complete a financial responsibility review for PG&E, please complete the attached request and return to my attention. Just so you are aware, we are about 30-60 days out on completing reviews at this time, so the sooner you submit your request, the sooner we can respond.

Please let me know if you have any questions.

Thanks,

Julie Mullins
Lead Financial Assurance Analyst
Department of Toxic Substances Control
(916) 255-3678
Fax (916) 255-6445

>>> "Meeks, Yvonne J" <YJM1@pge.com> 3/11/2011 11:49 AM >>>
good. thanks for the update

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Friday, March 11, 2011 11:28 AM
To: Karen Baker; Meeks, Yvonne J
Cc: Julie Mullins
Subject: Re: FW: Topock Financial Assurance

Yvonne,

DTSC Cypress just received PG&E's FA package. I expect HQ to have received it at the same time. DTSC will review the package and notify you of our findings. Thank you.

Aaron

>>> "Meeks, Yvonne J" <YJM1@pge.com> 3/10/11 3:47 PM >>>

Karen and Aaron -- I wanted to flag for you the FA package should arrive in Cypress Friday 10:30 am. Let me know if it doesn't show up!

From: Bell, Rex
Sent: Thursday, March 10, 2011 3:38 PM
To: Meeks, Yvonne J; Jayo, Juan (Law); Gilbert, David; Doss, Robert; Blodgett, John; Martin, Hudson T; Wilson, Thomas C (Env Remediation)

Subject: Topock Financial Assurance

Folks -

The DTSC financial test package, which includes the $198,000,000 coverage for the Topock Compressor Station Groundwater Operable Unit, went out today with overnight delivery. Originals were sent to Julie Mullins at DTSC (Financial Assurance Section) in Sacramento with a complete copy to Karen Baker at the Cypress Regional Office. They're scheduled to be delivered by 10;30 a.m. tomorrow.

Included in each are:

*Financial Test letter from PG&E's CFO
*Agreed-Upon Procedures letter from Deloitte
*10K Report
*Annual Report
*Report of Independent CPA

Yvonne - Confirm with Karen tomorrow to verify she received it. John will confirm with Julie Mullins.

REX
223-6904

FINANCIAL ASSURANCE CHECKLIST FOR CLOSURE, POSTCLOSURE & LIABILITY FINANCIAL TEST/CORPORATE GUARANTEE

(Page 1 of 5)

Parent Company Name & Address: _____

Facility Name & Address: Pacific Gas & Electric Company
Hwy I-40 and Park Moabi Road
Needles, CA 92363

EPA ID No.: CAT080011729

Facility Contact/Title: Rex Bell /

Facility Contact Phone Number: (415) 973-6904

Instrument Covers:

___	Closure	___	Sudden Liability
___	Postclosure	___	Nonsudden Liability
X	Corrective Action	___	

Land Disposal Facility: ___ Yes X No

Year for which review is conducted: 2010 Fiscal Year Ends: 12/31

	Facility Submittal	Agency Approved
Closure Amount	$	$
Closure Source Document		
Closure Document Date		
Corr. Action Amount	$ 198,000,000.00	$ 198,000,000.00
Corr. Action Document Source	Financial Test	Cost Estimate
Corr. Action Document Date	3/10/11	3/21/11

	Facility Submittal	Agency Approved
Sudden Liability Amount Per Occurrence / Annual Aggregate	$ 1m/ $2m	$ 1m/ $2m
Nonsudden Liability Amount Per Occurrence / Annual Aggregate	$	$

FINANCIAL ASSURANCE CHECKLIST FOR CLOSURE, POSTCLOSURE & LIABILITY FINANCIAL TEST/CORPORATE GUARANTEE

(Page 2 of 5)

** If all boxes are checked "Yes" or "N/A" then facility is in compliance.*
** If any box is checked "No" then facility is in violation. See comments for clarification of violation.*

Corporate Guarantee Questions

Yes	No	N/A	
		X	If a Corporate Guarantee is employed, has a certified copy of the corporate guarantee that uses wording identical to that in title 22, section 66264.151(h) been submitted? 66264.143(f)(10); 66264.145(f)(11); 66264.147(g)(1); 66265.143(e)(9); 66265.145(e)(10); 66265.147(g)(1)
Yes	No	N/A	If a Corporate Guarantee is employed, is the guarantor one of the following? ____ The direct or higher-tier parent corporation of the owner or operator ____ A firm whose parent corporation is also the parent corporation of the owner or operator ____ A firm with a "substantial business relationship" with the owner or operator 66264.143(f)(10); 66264.145(f)(11); 66264.147(g)(1); 66265.143(e)(9); 66265.145(e)(10); 66265.147(g)(1)
		X	
Yes	No	N/A	If a Corporate Guarantee is employed, and if the guarantor's parent corporation is the parent corporation of the owner or operator, does the letter from the guarantor's CFO describe the value received in consideration of the guarantee? 66264.143(f)(10); 66264.145(f)(11); 66264.147(g)(1); 66265.143(e)(9); 66265.145(e)(10); 66265.147(g)(1)
		X	
Yes	No	N/A	If a Corporate Guarantee is employed, and if the guarantor is a firm with a "substantial business relationship" with the owner or operator, does the letter from the guarantor's CFO describe this relationship and the value received in consideration of the guarantee? 66264.143(f)(10); 66264.145(f)(11); 66264.147(g)(1); 66265.143(e)(9); 66265.145(e)(10); 66265.147(g)(1)
		X	
Yes	No	N/A	If a Corporate Guarantee has been submitted on behalf of a corporation incorporated in states other than California to satisfy requirements for "liability self-insurance" is the Attorney General or Insurance Commissioner of: 1. the State in which the guarantor is incorporated, and 2. each state in which a facility covered by the guarantee is located have submitted a written statement to the Department that a guarantee executed as described in this section is legally valid and enforceable obligation in that State? 66264.147(g)(2)(A); 66265.147(g)(2)(A)
		X	
Yes	No	N/A	If a Corporate Guarantee has been submitted on behalf of a corporation incorporated outside of the United States to satisfy requirements for "liability self-insurance" has: 1. the non-U.S. corporation identified a registered agent for service of process in the State in which a facility covered by the guarantee is located and in the State in which it has its principal place of business, and 2. the Attorney General or Insurance Commissioner of the State in which a facility covered by the guarantee is located and the State in which the guarantor corporation has its principal place of business, has submitted a written statement to the Department that a guarantee executed as described in title 22, section 66264.147(g) or section 66265.147(g) is a legally valid and enforceable obligation in that State? 66264.147(g)(2)(A); 66265.147(g)(2)(A)
		X	

FINANCIAL ASSURANCE CHECKLIST
FOR CLOSURE, POSTCLOSURE & LIABILITY
FINANCIAL TEST/CORPORATE GUARANTEE
(Page 3 of 5)

** If all boxes are checked "Yes" or "N/A" then facility is in compliance.*
** If any box is checked "No" then facility is in violation. See comments for clarification of violation.*

Financial Test Questions

Yes	No		
X			Does the owner, operator, or guarantor pass one of the financial tests (Alternative I or II) outlined in Attachment A? 66264.143(f)(1) or (10); 66264.145(f)(1) or (11); 66264.147(f)(1) or 66264.147(g)(1); 66265.143(e)(1) or (9); 66265.145(e)(1) or (10); 66265.147(f)(1) or 66265.147(g)(1)
X			Has a letter been submitted that is properly executed and signed by the owners or operators CFO and is worded as specified in title 22, section 66264.151(f) or (g)? 66264.143(f)(3)(A); 66264.145(f)(3)(A); 66264.147(f)(3)(A); 66265.143(e)(3)(A); 66265.145(e)(3)(A); 66265.147(f)(3)(A)
X			Has a copy of the independent CPA's report on examination of the owner or operator's financial statements for the latest completed fiscal year been submitted? 66264.143(f)(3)(B); 66264.145(f)(3)(B); 66264.147(f)(3)(B); 66265.143(e)(3)(B); 66265.145(e)(3)(B); 66265.147(f)(3)(B)
X			Has a special report from the owner or operator's independent CPA been submitted stating that: 1. the independent CPA has compared the data which the letter from the CFO specifies as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and 2. in connection with that procedure, no matters came to the independent CPA's attention which caused him or her to believe that the specified data should be adjusted? 66264.143(f)(3)(C); 66264.145(f)(3)(C); 66264.147(f)(3)(C); 66265.143(e)(3)(C); 66265.145(e)(3)(C); 66265.147(f)(3)(C)
X			Have updated versions of the three reports referenced above been submitted within 90 days after the close of each succeeding fiscal year? 66264.143(f)(5); 66264.145(f)(5); 66264.147(f)(5); 66265.143(e)(5); 66265.145(e)(5); 66265.147(f)(5)
		X	If a Corporate Guarantee is employed, is the facility in compliance with all corporate guarantee requirements set forth in Title 22, section 66264.143(f), 66264.145(f), 66264.147(g), 66265.143(e), 66265.145(e), and/or 66265.147(g)?
X			Is the facility in compliance with all financial-test requirements set forth in Title 22, sections 66264.143(f), 66264.145(f), 66264.147(f), 66265.143(e), 66265.145(e), and/or 66265.147(f)?

FINANCIAL ASSURANCE CHECKLIST FOR CLOSURE, POSTCLOSURE & LIABILITY FINANCIAL TEST/CORPORATE GUARANTEE

(Page 4 of 5)

ATTACHMENT A

Test Alternative I

Yes	No	N/A	
			Does the owner or operator meet at least two of the three following ratios? *(Ratios not required if financial test/corporate guarantee is submitted for liability only)* - total liabilities / net worth < 2.0 _____ = - net income+depreciation+depletion+amortization / total liabilities > 0.1 _____ = - current assets / current liabilities > 1.5 _____ =
Yes	No		Does the owner or operator have a net working capital and tangible net worth each at least six times the sum of the current (closure and post-closure cost estimates, and/or the amount of liability) coverage to be demonstrated by this test?
Yes	No		Does the owner or operator have tangible net worth of at least $10 million?
Yes	No		Do the owner or operator's U.S. assets equal to at least 90 percent of total assets or six times the sum of the current (closure and post-closure cost estimates, and/or the amount of liability) coverage to be demonstrated by this test?

Test Alternative II

Yes	No		
X			Is the current bond rating of the owner or operator adequate? Indicate the appropriate bond rating and the source: _____ Standard and Poor's: _____ AAA, _____ AA, _____ A, __X__ BBB+ _____ Moody's: _____ Aaa, _____ Aa, _____ A, _____ Baa
Yes X	No		Does the owner or operator have tangible net worth of at least $10 million?
Yes X	No		Does the owner or operator have tangible net worth at least six times the sum of the current (closure and post-closure cost estimates, and/or the amount of liability) coverage to be demonstrated by this test?
Yes X	No		Do the owner or operator's U.S. assets equal to at least 90 percent of total assets or six times the sum of the current (closure and post-closure cost estimate, and/or the amount of liability) coverage to be demonstrated by this test?

FINANCIAL ASSURANCE CHECKLIST
FOR CLOSURE, POSTCLOSURE & LIABILITY
FINANCIAL TEST/CORPORATE GUARANTEE

Comments

Reviewed by: Julie Mullins Date: 4/4/11

Pacific Gas and Electric Company®

March 10, 2011

Department of Toxic Substances Control
Financial Responsibility Section
8800 Cal Center Drive
Sacramento, California 95826

I am the Chief Financial Officer of Pacific Gas and Electric Company, 77 Beale Street, San Francisco, CA 94105. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and postclosure care as specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8.

The firm identified above is the owner or operator of the following facility(ies)/TTU(s) for which liability coverage for sudden accidental occurrences is being demonstrated through the financial test specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, sections 66264.147 and 66265.147:

EPA ID Number	Facility Name	Facility Address	Sudden	Non-Sudden
CAD077966349	Diablo Canyon Power Plant	P.O. Box 56, Avila Beach, CA 93424	$2,000,000 for all facilities	N/A for all facilities
CAD981290974	Martin Service Center	731 Schwerin Street, Daly City, CA 94014		
CAR000151118	Topock Groundwater Extraction Site	Highway I-40 and Park Moabi Road, Needles, CA 92363		
CAT080011729	Topock Compressor Station Groundwater Operable Unit at SWMU 1/AOC 1 and AOC 10	Highway I-40 and Park Moabi Road, Needles, CA 92363		
CAD980886873	Stockton Manufactured Gas Plant Site	535 South Center Street, Stockton, CA 95203		

EPA ID Number	Facility Name	Facility Address	Sudden	Non-Sudden
CAD981450190	Marysville Manufactured Gas Plant	4th & A Streets. Marysville, CA 95901	$2,000,000 for all facilities	N/A for all facilities
CAD981450737	Willows Manufactured Gas Plant	310 E. Wood Street, Willows, CA 95988		
CAD981370117	Oakland Manufactured Gas Plant	Gas Load Center at 50 Market St., Oakland, CA 94607		
CAC002619481	Chico Manufactured Gas Plant	825 West Second St., Chico, CA 95928		
CAR000016105	Sacramento #1 Manufactured Gas Plant	Front & T Streets, Sacramento, CA 95814		
CAL000268329	Redding Manufactured Gas Plant	1933 Waldon Street, Redding, CA 96001		
N/A	Monterey-1 Manufactured Gas Plant	498 Del Monte Ave, Monterey, CA 93940		
CAD981410087	Watsonville -2 Manufactured Gas Plant	11 Walker Street, Watsonville, CA 95076-4926		

The firm identified above guarantees, through the guarantee specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, sections 66264.147 and 66265.147, liability coverage for [insert "sudden" or "nonsudden" or both "sudden and nonsudden"] accidental occurrences at the following facility(ies)/TTU(s) owned or operated by the following:

None

The firm identified above is [insert one or more: (1) the direct or higher tier parent corporation of the owner or operator; (2) owned by the same parent corporation as the parent corporation of the owner or operator, and receiving the following value in

consideration of the guarantee [insert dollars]; or (3) engaged in the following substantial business relationship with the owner or operator [insert business relationship], and receiving the following value in consideration of the guarantee [insert dollars]]. [Attach a written description of the business relationship or a copy of the contract establishing such relationship to this letter.]

None

1. The firm identified above is the owner or operator of the following facilities/TTUs for which financial assurance for closure and/or postclosure or liability coverage is demonstrated through the financial test as specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e). The current closure and/or postclosure cost estimates covered by the test are shown for each facility/TTU:

EPA ID Number	Facility Name	Facility Address	Closure	Post-Closure
CAD077966349	Diablo Canyon Power Plant	P.O. Box 56, Avila Beach, CA 93424	$1,065,249	N/A
CAD981290974	Martin Service Center	731 Schwerin Street, Daly City, CA 94014	N/A	$2,092,963
CAR000151118	Topock Groundwater Extraction Site	Highway I-40 and Park Moabi Road, Needles, CA 92363	$606,905	N/A
CAT080011729	Topock Compressor Station Groundwater Operable Unit at SWMU 1/AOC 1 and AOC 10	Highway I-40 and Park Moabi Road, Needles, CA 92363	N/A	$198,000,000
CAD980886873	Stockton Manufactured Gas Plant Site	535 South Center Street, Stockton, CA 95203	N/A	$529,784
CAD981450190	Marysville Manufactured Gas Plant	4th & A Streets, Marysville, CA 95901	N/A	$546,163

EPA ID Number	Facility Name	Facility Address	Closure	Post-Closure
CAD981450737	Willows Manufactured Gas Plant	310 E. Wood Street, Willows, CA 95988	N/A	$196,025
CAD981370117	Oakland Manufactured Gas Plant	Gas Load Center at 50 Market St., Oakland, CA 94607	N/A	$579,340
CAC002619481	Chico Manufactured Gas Plant	825 West Second St., Chico, CA 95928	N/A	$607,744
CAR000016105	Sacramento #1 Manufactured Gas Plant	Front & T Streets, Sacramento, CA 95814	N/A	$1,649,765
*CAL000268329	Redding Manufactured Gas Plant	1933 Waldon Street, Redding, CA 96001	N/A	*$1,500,000
*N/A	Monterey-1 Manufactured Gas Plant	498 Del Monte Ave, Monterey, CA 93940	N/A	*$1,000,000
*CAD981410087	Watsonville-2 Manufactured Gas Plant	11 Walker Street, Watsonville, CA 95076-4926	N/A	*$555,000
Subtotal			$1,672,154	$207,256,784
Grand Total				**$208,928,938**

** Figures reflect cost estimates submitted to DTSC pending approval in 2011.*

2. The firm identified above guarantees, through the guarantee as specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e), the closure and/or postclosure care or liability coverage of the following facilities/TTUs owned or operated by the guaranteed party. The current cost estimates for the closure or postclosure care so guaranteed are shown for each facility/TTU:

None

3. In States where the U.S. Environmental Protection Agency is not administering the financial requirements of subpart H of 40 CFR parts 264 and 265, this firm as owner, operator or guarantor is demonstrating financial assurance for the closure or postclosure care of the following facilities/TTUs through the use of a financial test equivalent or substantially equivalent to the financial test specified in California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, section 66264.143, subsection (f), section 66264.145, subsection (f), section 66265.143, subsection (e), and section 66265.145, subsection (e). The current closure and/or postclosure cost estimates covered by such a test are shown for each facility/TTU:

None

4. The firm identified above is the owner or operator of the following facilities/TTUs for which financial assurance for closure or, if a disposal facility, postclosure care, is not demonstrated either to U.S. Environmental Protection Agency or a State through the financial test or any other financial assurance mechanism as specified in California Code of Regulations, Title 22, Division 4.5, Chapters 14 and 15, Article 8 or equivalent or substantially equivalent State mechanisms. The current closure and/or postclosure cost estimates not covered by such financial assurance are shown for each facility/TTU:

None

5. The firm is the owner or operator or guarantor of the following Underground Injection Control facilities for which financial assurance for plugging and abandonment is required under 40 CFR part 144 and is assured through a financial test. The current closure cost estimates as specified in 40 CFR144.62 are shown for each facility:

None

This firm **is required** to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on **December 31**. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended **December 31, 2010**.

This firm is using **Alternative II** for Part B.

Part B. Closure or Postclosure Care and Liability Coverage

ALTERNATIVE II

1. Sum of current closure and postclosure cost estimates (Total of all cost estimates shown in the paragraphs of the letter to the Director of the Department of Toxic Substances Control) $208,928,938

2. Amount of annual aggregate liability coverage to be demonstrated $2,000,000

3. Sum of lines 1 and 2 $210,928,938

4. Current bond rating of most recent issuance and name of rating service: [1] **BBB+ (S&P)**

5. Date of issuance of bond: [1] **November 18, 2010**

6. Date of maturity of bond: [1] **October 1, 2020 and January 15, 2040**

*7. Tangible net worth (if any portion of the closure and post closure cost estimates is included in "total liabilities" on your firm's financial statements, you may add the amount of that portion to this line.) **$11.6 billion**

*8. Total assets in the United States (required only if less than 90 percent of firm's assets are located in the United States) **Not Required**

9. Is line 7 at least $10 million? Yes

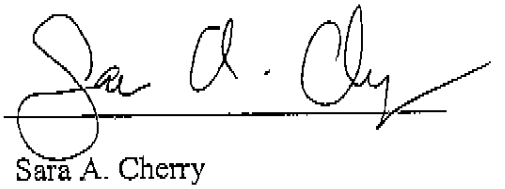
10. Is line 7 at least 6 times line 3? Yes ($210,928,938* 6 = **$1.2 billion**) < **$11.6 billion**

*11. Are at least 90 percent of the firm's assets located in the United States? If not, complete line 12. Yes

12. Is line 8 at least 6 times line 3? **Not Required**

[1] On November 18, 2010, Pacific Gas and Electric Company issued $250 million principal amount of 3.5% Senior Notes due October 1, 2020 and $250 million of 5.4% Senior Notes due January 15, 2040.

I hereby certify that the wording of this letter is identical to the wording as specified in California Code of Regulations, Title 22, section 66264.151, subsection (g) and is being executed in accordance with the requirements of California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8.

Signature: 

Name: Sara A. Cherry

Title: Vice President, Finance and Chief Financial Officer of Pacific Gas and Electric Company

Date: 3/10/11

Deloitte.

Deloitte & Touche LLP
50 Fremont Street
San Francisco, CA 94105-2230
USA

Tel: +1 415 783 4000
Fax: +1 415 783 4329
www.deloitte.com

INDEPENDENT ACCOUNTANTS' REPORT ON APPLYING AGREED-UPON PROCEDURES

To the Board of Directors of
Pacific Gas and Electric Company
San Francisco, California

We have performed the procedures included in the California Code of Regulations, Title 22, Division 4.5, Chapter 14 and 15, Article 8, which were agreed to by Pacific Gas and Electric Company (the "Company") and the Department of Toxic Substances Control, solely to assist you in evaluating the Company's compliance with the financial test option as of and for the year ended December 31, 2010, included in the accompanying letter dated March 10, 2011 from Sara A. Cherry, Vice President, Finance and Chief Financial Officer of Pacific Gas and Electric Company, to the Department of Toxic Substances Control. The Company's management is responsible for the Company's compliance with those requirements. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

The procedures that we performed and the related findings with respect to the letter referred to above are as follows:

1. Recomputed the tangible net worth balance under the caption Part B: Closure or Postclosure Care and Liability Coverage, Alternative II, in the letter referred to above from source documents prepared by the Company's management that agree to amounts included in the audited consolidated financial statements of Pacific Gas and Electric Company as of and for the year ended December 31, 2010, on which we have issued our report dated February 17, 2011, and noted no differences.

2. Recomputed from source documents prepared by the Company's management that agree to amounts included in the financial statements referred to in procedure 1 the information marked with an asterisk under the caption Part B. Closure or Postclosure Care and Liability Coverage, Alternative II, in the letter referred to above using, and noted no differences.

We were not engaged to, and did not, conduct an examination, the objective of which would be the expression of an opinion on the accompanying letter dated March 10, 2011. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of the specified parties listed in the first paragraph, and is not intended to be and should not be used by anyone other than these specified parties.

Deloitte & Touche LLP

March 10, 2011

EPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

o the Board of Directors and Shareholders of
G&E Corporation and Pacific Gas and Electric Company
an Francisco, California

Ve have audited the accompanying consolidated balance sheets of PG&E Corporation and subsidiaries (the "Company") and of Pacific Gas and lectric Company and subsidiaries (the "Utility") as of December 31, 2010 and 2009, and the Company's related consolidated statements of ıcome, equity, and cash flows and the Utility's related consolidated statements of income, shareholders' equity, and cash flows for each of the ıree years in the period ended December 31, 2010. We also have audited the Company's and the Utility's internal control over financial reporting s of December 31, 2010, based on criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring)rganizations of the Treadway Commission. The Company's and the Utility's management is responsible for these financial statements, for ıaintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting ıcluded in the accompanying *Management's Report on Internal Control Over Financial Reporting*. Our responsibility is to express an opinion on ıese financial statements and an opinion on the Company's and the Utility's internal control over financial reporting based on our audits.

Ve conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards equire that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement nd whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements ıcluded examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principle sed and significant estimates made by management, and evaluating the overall financial statement presentation. Our audits of internal control over inancial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness xists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included erforming such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our pinions.

A company's internal control over financial reporting is a process designed by, or under the supervision of, the company's principal executive and rincipal financial officers, or persons performing similar functions, and effected by the company's board of directors, management, and other ersonnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external urposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policie: ınd procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial tatements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in ıccordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely letection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of the inherent limitations of internal control over financial reporting, including the possibility of collusion or improper management verride of controls, material misstatements due to error or fraud may not be prevented or detected on a timely basis. Also, projections of any evaluation of the effectiveness of the internal control over financial reporting to future periods are subject to the risk that the controls may become ınadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of PG&E Corporation and subsidiaries and of Pacific Gas and Electric Company and subsidiaries as of December 31, 2010 and 2009, and the respective results of their operations and their cash flows for each of the three years in the period ended December 31, 2010, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company and the Utility maintained, in all material respects, effective internal control over financial reporting as of December 31, 2010, based on the criteria established in *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

DELOITTE & TOUCHE LLP

February 17, 2011
San Francisco, California

Key Analytic Initiatives For Financial Institutions
Analytical initiatives that our FI Ratings Team is developing to enhance our analysis of banks globally.

Senior Unsecured for Pacific Gas & Electric Co.

Description	Maturity Date	Ratings	Rating Date	Regulatory Identifiers	Last Credit Rating Action/
Shelf Sr Unsecd Debt Filed Under SEC Rule 415 Registered-02/22/2008 (Reg:333-149361): sr unsecd prelim **Rating Type :** Local Long Term		BBB+	27-Feb-2008	--	
US$1 bil 4.8% sr nts due 03/01/2014 **Rating Type :** Local Long Term		BBB+	31-May-2007	--	
US$200 mil 8.25% nts due 10/15/2018 **Rating Type :** Local Long Term		BBB+	18-Nov-2008	--	
US$250 mil fltg rate sr nts due 10/11/2011 **Rating Type :** Local Short Term		A-2	12-Oct-2010	--	
US$3 bil 6.05% sr nts due 03/01/2034 **Rating Type :** Local Long Term		BBB+	31-May-2007	--	
US$400 mil 6.25% nts due 12/01/2013 **Rating Type :** Local Long Term		BBB+	18-Nov-2008	--	
US$400 mil 6.35% nts due 02/15/2038 **Rating Type :** Local Long Term		BBB+	27-Feb-2008	--	
US$5 mil 6.05% nts ser 2004 due 03/01/2034 **Rating Type :** Local Long Term		BBB+	11-Mar-2008	--	
US$5 mil 6.05% nts ser 2004 due 03/01/2034 **Rating Type :** Local Long Term		BBB+	24-Jun-2009	--	
US$550 mil 6.25% sr nts due 03/01/2039 **Rating Type :** Local Long Term		BBB+	06-Mar-2009	--	
US$600 mil 8.25% nts due 10/15/2018 **Rating Type :** Local Long Term		BBB+	21-Oct-2008	--	
US$700 mil 5.625% sr nts due 11/30/2017 **Rating Type :** Local Long Term		BBB+	29-Nov-2007	--	
US$800 mil 3.5% sr nts due 10/01/2020 **Rating Type :** Local Long Term		BBB+	14-Sep-2010	--	
US$800 mil 5.4% sr nts due 01/15/2040 **Rating Type :** Local Long Term		BBB+	12-Nov-2009	--	
US$950 mil 5.8% sr nts due 03/01/2037 **Rating Type :** Local Long Term		BBB+	31-May-2007	--	

Pacific Gas and Electric Company®

ERM & Insurance Department
One Market, Spear Tower
Suite 2300
San Francisco, CA 94105

O: 415.267.7239
F: 415.267.7248

STATEMENT OF SELF-INSURANCE PROGRAM

Issued to:

Re: Insurance Requirements

This letter certifies PG&E is insured under a major risk management program with large self-insured retentions. The program provides coverage for the insurance types and limits reflected in the agreement which includes:

Commercial General Liability:
Business Automobile Liability:

Further, PG&E has qualified as a self-insurer under the laws of the State of California with respect to Workers' Compensation. Our identification number for this purpose is 2-0012-01-099.

This letter shall remain in effect until the termination of the insurance agreement between PG&E and the _____.

***Please note a **certificate of insurance** is not applicable when an entity is **self-insured**, such as PG&E, and note there is no expiration date.

MARTIN K. WYSPIANSKI
Director of ERM & Insurance
PG&E Company

Appendix F

Insurance Coverage and Claims Process Agreement

Pacific Gas & Electric Company ("PG&E") and the United States are entering into a Remedial Design/Remedial Action Consent Decree ("Consent Decree") to govern the groundwater remediation at the Topock Site. Paragraph 59 requires that "[n]o later than 15 days before commencing any on-Site Work, [PG&E] shall send to DOI a statement of self-insurance, following the form attached hereto as Appendix E, naming the United States as an additional insured with respect to all liability arising out of all activities performed by or on behalf of Settling Defendant pursuant to this Consent Decree and providing for commercial general liability insurance coverage with limits of $5,000,000, for any one occurrence, and automobile liability insurance coverage with limits of $1,000,000, combined single limit." This agreement sets forth the terms of PG&E's coverage of the United States pursuant to Paragraph 59 of the Consent Decree under PG&E's self-insurance program and the claim submission and dispute resolution process for such coverage.

PG&E agrees to pay on behalf of the United States with respect to all liability arising out of the activities performed by or on behalf of PG&E pursuant to the Consent Decree, as set forth in Paragraph 59 of the Consent Decree and as provided herein. PG&E's obligation to pay on behalf of the United States under Paragraph 59 of the Consent Decree is limited to commercial general liability insurance coverage with limits of $5,000,000, for any one occurrence, and automobile liability insurance coverage with limits of $1,000,000, combined single limit. PG&E will also have the right and duty to defend the United States against any claim or suit seeking damages for such liability as provided herein. PG&E will have no duty to defend the United States against any claim or suit to which this agreement does not apply. PG&E may, at its discretion, investigate any occurrence and settle any claim or suit that may result.

The United States must notify PG&E as soon as practicable of an occurrence or an offense which may result the United States seeking payment or defense. The notice should include: (1) How, when and where the occurrence or offense took place; (2) The names and addresses of any injured persons and witnesses; and (3) The nature and location of any injury or damage arising out of the occurrence or offense. If a claim is made or suit is brought against the United States, the United States must (1) As soon as practicable record the specifics of the claim or suit and the date received; and (2) Notify PG&E as soon as practicable. Finally, the United States must (1) As soon as practicable send PG&E copies of any demands, notices, summonses or legal papers received in connection with the claim or suit; (2) Authorize PG&E to obtain records and other information; (3) Cooperate with PG&E in the investigation or settlement of the claim or defense against the suit; and (4) Assist PG&E, upon its request, in the enforcement of any right against any person or organization which may be liable to the United States because of injury or damage to which this insurance coverage may also apply. Any such notices shall be directed to: PG&E Claims, 1850 Gateway Blvd., 6th Floor, Concord, California 94520. PG&E shall notify the United States in writing regarding any changes to the claim submission process set forth in this Agreement thirty (30) days prior to implementing such change.

PG&E shall contact the representatives of the Department of Justice and the Department

of Interior specified in Paragraph 100 of the Consent Decree in response to any notices from the United States received by PG&E under this agreement. PG&E shall determine if the United States' claim triggers PG&E's duty to defend and pay on behalf of the United States and shall notify the United States regarding the same. To the extent PG&E determines that its duty to pay on behalf of or its duty to defend are not triggered by the occurrence, offense, claim or suit for which the United States seeks indemnification or defense, and the United States wishes to contest PG&E's determination, the parties agree to mediate the dispute pursuant to one of the mediation procedures set forth in Paragraph 65(a) of the Consent Decree, specifically the International Institute for Conflict Prevention & Resolution Mediation Procedures, or the Mediation Process Agreement attached to the Consent Decree as Appendix G, as may be modified by agreement of the parties. To the extent mediation does not resolve the dispute, in whole or in part, the parties may, consistent with Section XXVII of the Consent Decree, apply to the Central District of California for such court order, direction, and relief as may be necessary or appropriate.

MODEL
MEDIATION PROCESS AGREEMENT (EO #185182)

1. The United States and Pacific Gas & Electric Company ("PG&E") (together, "the Parties") have entered into a Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") Remedial Design/Remedial Action Consent Decree (the "Consent Decree").

2. The Consent Decree provides for mediation upon agreement of the Parties, in the event the Parties cannot resolve a dispute by informal negotiations. *See* Consent Decree, ¶ 65(a).

3. This Mediation Process Agreement sets forth the terms and conditions under which the Parties will conduct the mediation process, thereby avoiding future disputes and disagreements. Subject to the terms and conditions of this Agreement, the Parties, along with the attorneys representing each, agree as follows:

4. The Parties agree to seek an efficient and mutually beneficial resolution of any dispute regarding the Consent Decree that cannot be resolved by informal negotiations, and as set forth in Paragraph 65(a) of the Consent Decree, through mediation with a third-party neutral mediator jointly selected by the Parties.

5. Participants in the Mediation Process

   (a) Parties. The "Parties" to the mediation process shall be the Department of Interior, the Department of Justice, as appropriate (the "Federal Government") and PG&E. The participants in the process, as necessary and appropriate during the course of mediation, include the following: for the United States, appropriate representatives of the Department of Justice and the Department of Interior and appropriate client representatives and counsel for PG&E. The Parties and their counsel are expected to be active participants in the mediation process. Each Party shall be represented during the course of the mediation process by at least one client representative and counsel, authorized to make recommendations concerning settlement or to bind that Party, as may be appropriate. Appropriate senior management for the Parties shall be reasonably accessible as necessary via telephone or in person during the mediation process.

   (b) Withdrawal from the Mediation Process**.** Any Party may withdraw from the mediation process by giving written notice to the other Parties and the Mediator, provided however, that prior to withdrawing that Party also shall contact the mediator to discuss the reasons for withdrawal. Withdrawal shall be effective on the date that all of the following have received appropriate notice of withdrawal: the other Party and the Mediator. Any Party who withdraws from the mediation process (1) shall remain bound by the confidentiality provisions of this Agreement; (2) shall within ten (10) days of notice of withdrawal return to the

other Parties or the Mediator, as appropriate, all documents (and all copies of such documents) received from the other Party(ies) or the Mediator during the mediation process; and (3) shall remain obligated to pay its share of the costs of the Mediator, up to the effective date of withdrawal, regardless of such withdrawal.

6. Selection of the Mediator and Payment of Fees

(a) Selection of the Mediator

(1) The Parties shall jointly select and retain a Mediator according to the following process, unless otherwise agreed by the Parties:

a. The Parties shall select the Mediator no later than 45 days after the conclusion of the informal negotiation period described in Paragraph 65 of the Consent Decree.

b. The Parties shall agree upon a pool of mediators consisting of three mediators proposed by each party. The Parties shall work together (using joint interviews, reference checks, conflicts checks, and other appropriate means) to narrow that pool of mediators to a pool of candidate mediators, not to exceed four in number, all of whom the Parties find acceptable mediators to perform the mediation. The Parties shall first make best efforts to select a Mediator from this final pool of mediators by unanimous consent. If the parties are unable to select a Mediator by unanimous consent, each Party shall rank the candidate mediators in descending order of preference, and the candidate mediator with the lowest combined score will be selected as the Mediator.

(2) The Parties agree that, after selection of the Mediator, the Federal Government shall have an opportunity to seek the necessary approval within the United States government to fund their share of the Mediator's fees and expenses. Such time shall be in addition to those time frames set forth for selection of the mediator and mediation in the Consent Decree. The United States will not unreasonably withhold its approval or funding of the Mediator.

(3) The selected Mediator must have appropriate training, experience, and expertise to conduct the mediation process, must not be biased, must be available for the duration of the mediation process, and must charge reasonable fees. As may be appropriate before and during the mediation process, the Mediator will make disclosures to the Parties of any potential or actual conflicts of interest.

(b) Payment of Mediator

(1) Except as otherwise provided in this Agreement, each Party to the mediation process will pay an equal share for the cost of the mediation process. The Parties and the Mediator shall make best efforts to keep the cost of mediation process fair and reasonable. To that end, mediation sessions shall be held in and/or in locations as may be appropriate to achieve that goal and accommodate the Parties.

(2) The Mediator shall be compensated by the Parties as follows:

a. The Mediator shall be paid a market hourly rate, as agreed upon between the Parties and the Mediator, for mediation and facilitation services.

b. Mediation fees do not include the time required to travel to individual meetings or joint sessions unless actual mediation and facilitation services are being performed during such travel.

c. The Mediator's necessary travel expense shall be reimbursed as follows:

i. Vehicle mileage costs, if required and necessary, shall be reimbursed at the then-current government rate of reimbursement, or actual rental car expenses if supported by a receipt.

ii. Lodging and Subsistence, if required and necessary, will be reimbursed at the then-current government rate if supported by actual receipts.

iii. Upon request, the Federal Government will furnish the Mediator with the current government per diem and subsistence reimbursement and mileage rates. If necessary, the Federal Government agrees to make best efforts, as are appropriate and legal, to assist the Mediator to obtain government rates for travel expenses. Government rates shall apply in subsections i. and ii. unless after the best efforts by the Mediator and the Federal Government such rates are unavailable. If government rates are not available the mediator shall attempt to obtain transportation and lodging at the lowest reasonably available cost.

(3) The Mediator shall provide to appropriate representatives of the Federal Government and PG&E monthly invoices, including a detailed description of all fees and expenses of the Mediator and the amount owed by each Party.

(4) Each party shall be independently responsible for its own expenses associated with the mediation process, including its respective share of the fees and expenses for the Mediator, its own attorneys fees, or any expert expenses that Party deems necessary for its participation in the mediation process.

(5) The above (or any) requirement for payment or obligation of funds by the Federal Government shall be subject to the availability of appropriated funds legally available for such purpose, and no provision of this Agreement shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §§ 1341, 1342, and 1511-1519. In the event the Federal Government fail to meet its financial obligation to the Mediator, PG&E shall not be responsible either to the Mediator or the Federal Government for such obligation.

7. Procedure for the Mediation Process

(a) Schedule. The Parties agree that the mediation process last no longer than 30 days from the selection of the Mediator, unless extended by written agreement of the Parties. The Parties shall work independently or with the Mediator, as necessary, to establish a schedule for the mediation process. The initial schedule may be amended, as necessary and in consultation with all Parties, to accommodate the needs of the Parties and the Mediator.

(b) Initial meeting. The Parties and their counsel expect to have an initial meeting with the Mediator within five calendar days of hiring the Mediator. The purpose of the initial joint session is for each Party to give a brief introductory oral presentation (no longer than 20 minutes), which may include discussion of the posture of the case, a brief summary of its position, and what that Party hopes to achieve in the mediation process.

(c) The Mediator

(1) The Parties, their counsel, and the Mediator understand that the Mediator has no authority to decide the case or any issues in the case and that the Mediator is not acting as an advocate or attorney for the Federal Government or PG&E.

(2) The Mediator will confer with the participants, review written information submitted by the Parties and counsel, and may request position papers from each Party outlining the legal and factual issues in the dispute or case as well as the range of options to settle the dispute. To the extent the Mediator requests position papers during the mediation process, a copy of each position paper shall be given to the Mediator and may be provided to each representative of the Parties. The Mediator shall conduct at least one face-to-face “joint session” where all Parties

and their counsel shall be present. In the initial "joint session," each Party will be expected to present a brief summary of its view of the dispute, and respond to the Mediator's questions. After the initial joint session, the Mediator may hold private sessions with one or more Parties (and counsel) and/or additional face-to-face joint sessions to assist the Parties in trying to find a mutually acceptable solution. The Mediator may hold subsequent sessions and discussions with counsel for the Parties on the phone or in person. Any Party or counsel may request that the Mediator excuse the other Party or Parties and respective counsel from a session to discuss or share confidential information with the Mediator. If at any time, the Mediator requests or any party elects to submit confidential information to the Mediator, such information shall be held in confidence by the Mediator.

(3) The Mediator shall ensure that each Party shall have a reasonable amount of time during the mediation process to present its position with respect to the issues in mediation. The Mediator shall ensure also that each Party has a reasonable amount of time to provide a response to other Party's position.

(4) The purpose of this mediation shall be to assist the Parties in reaching their own agreement, and the Mediator shall conduct the mediation in a fair and neutral manner to facilitate the resolution of this matter between the Parties. The Mediator shall work for the benefit of the Parties and be guided by the provisions of this Mediation Process Agreement.

(d) Role of the Mediator. In mediation, the Mediator shall act as a third-party neutral in a process in which the Parties, with the assistance of the Mediator, collaboratively and collectively seek to (l) identify issues; (2) develop potential alternatives and approaches to resolve those issues; (3) resolve those issues; and (4) achieve an appropriate resolution of matters in dispute. The Mediator shall assist the Parties to identify and communicate the interests underlying their dispute and help the Parties to develop their collaborative efforts into an overall settlement agreement.

8. Agreement of the Parties

(a) No Party or counsel for that Party shall be bound by anything said or done during the mediation process unless a written settlement is reached, executed, and approved by all the necessary Parties, counsel, and the appropriate government officials for the Federal Government. If an agreement is reached by the Parties through mediation that agreement shall be reduced to writing.

(b) The Parties make no admission of fact or law, responsibility, fault, or liability by entering into and participating in the mediation process, by entering into any Mediation Process Agreement, or by submitting any final agreement for approval to the Federal Government.

(c) The Parties acknowledge that the Department of Justice's participation in a mediation under this Agreement may depend on the nature of the dispute under the Consent Decree. If resolution of the dispute could result in a material modification of the Consent Decree, the Department of Justice will participate in the mediation. Where the Department of Justice is a party to a mediation, it is explicitly recognized that the trial attorneys for the United States Department of Justice (and its client agencies) do not have the authority to compromise the claims of the United States. Therefore those attorneys for the United States do not have the ultimate authority to agree to the terms of any proposed agreement or settlement. That authority is vested with the Assistant Attorney General of the Environment and Natural Resources Division and/or, as appropriate, the Deputy or Associate Attorney General of the United States. Where the Department of Interior is the sole federal party to a mediation under this Agreement, authority to resolve a dispute is vested in the Solicitor of the Department of Interior or her designated representative. If the mediation is successful and a final written agreement is reached by all the parties, the attorneys for the Federal Government will promptly make appropriate recommendations within the government concerning settlement of the dispute. Upon final approval by the appropriate officials within the Department of the Interior, and the Department of Justice, if necessary, the Department of the Interior shall provide a written statement of the joint resolution of the dispute to PG&E, consistent with Paragraph 65(a) of the Consent Decree.

(d) Failure to Reach Agreement Through Mediation. In the event that the Parties fail to reach agreement in the mediation process, the Parties may request that the Mediator provide the Parties with a brief written report detailing the positions of each of the Parties and the Mediator's perceived impediments to achieving agreement. When consensus cannot be reached, the Parties shall seek to agree upon a description of the remaining issues.

(e) Nothing contained in this Mediation Process Agreement shall be construed to limit the authority of the Federal Government to undertake any action pursuant to applicable law or regulation. This Mediation Process Agreement in no way affects or relieves any Party of its responsibility to comply with any federal, state, or local law or regulation. Nothing in this Mediation Process Agreement alters the rights and/or liabilities of the Parties with respect to the litigation.

9. Confidentiality

(a) The mediation process is a confidential process. That process, including any documents submitted to or prepared by the Mediator, and any statements made during that process are for settlement purposes only, are confidential, and shall be treated as compromise negotiations under Rule 408 of the Federal Rules of

Evidence. All information provided to the Mediator is confidential provided however, that information which is otherwise admissible or discoverable or known or available to the Federal Government or PG&E shall not be rendered confidential, inadmissible or non-discoverable because of its use in the mediation process.

(b) Except as otherwise provided for in this agreement, the Parties shall not disclose to any person not a Party to this Agreement, including but not limited to, the press, any information regarding the substance of the mediation, or the Parties' positions, negotiations, proposals, or settlement offers.

(c) The Federal Government reserves the right to utilize any information from the mediation process to fully inform decision makers within the government and to make recommendations within the Department of Justice and its client agencies concerning settlement of the dispute.

(d) No party may subpoena any documents prepared by or for the Mediator or subpoena the Mediator to testify as a witness regarding the mediation process. The Mediator shall not testify on behalf of any Party or participate as a consultant or expert in any federal or state judicial or administrative proceeding regarding the case or issues in or relevant to this case or the mediation process.

(e) The confidentiality provisions of this Mediation Process Agreement shall remain in full force and effect without regard to whether any disputes are settled or concluded through mediation or otherwise, and shall survive termination of this Mediation Process Agreement.

10. Miscellaneous

(a) This Mediation Process Agreement will become final and effective once the Federal Government and PG&E have approved it (signature by the appropriate representatives shall represent approval) and it is signed by the Mediator.

(b) The descriptive headings of this agreement are included for convenience only and shall not affect the interpretation of any provision herein.

(c) The provisions of this Agreement shall apply to and be binding upon each Party to the mediation process, its officers, agents, employees, successors and assigns, and any person acting on its behalf, and upon the United States on behalf of the Department of Interior.

(d) This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which shall constitute one instrument.

(e) Each of the undersigned representatives of each Party to the mediation process and representatives of the United States represents that representative is authorized to execute and bind that Party to this Mediation Process Agreement. By signature below, each representative acknowledges that representative has read, understands and agrees to this Mediation Process Agreement.

FOR THE UNITED STATES DEPARTMENT OF JUSTICE:

(Name)
Trial Attorney
U.S. Department of Justice
Environmental Enforcement Section
Environment and Natural Resources Division
P.O. Box Ben Franklin Station
Washington, D.C. 20044
Tel.:
Fax:
Date:

FOR THE U.S. DEPARTMENT OF INTERIOR

Signature:
Name:
Title:
Office:
Address:
Telephone:
Fax:
Date:

FOR PACIFIC GAS & ELECTRIC COMPANY

Signature:
Name:
Title:
Office:
Address:
Telephone:
Fax:
Date:

Counsel:
Signature:
Name:
Title:
Office:
Address:
Telephone:
Fax:
Date:

FOR THE MEDIATOR:

Signature:
Name:
Title/Firm:
Address:
Telephone:
Fax:
Date: