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July 8, 2004

Norman Shopay  
Project Manager  
California Department of Toxic Substances Control  
Geology and Corrective Action Branch  
700 Heinz Avenue  
Berkeley, California 94710

Subject: Project Description, Interim Measure No. 3 – Revision 1  
PG&E Topock Compressor Station, Needles, California

Dear Mr. Shopay:

Enclosed is the revised summary of the proposed project, Interim Measures No. 3, at the Topock site. This project description was prepared in response to the Department of Toxic Substances Control's *Approval with Conditions* letter dated June 30, 2004. Please contact me at (805) 546-5243 if you have any questions or if you need additional information.

Sincerely,

*Teri Herson  
for Yvonne Meeks*

Enclosure

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**Summary of Proposed Project for  
Interim Measures No. 3**

**Pacific Gas and Electric Company,  
Topock Project**

**Revision 1**

Prepared for  
**Department of Toxic Substances Control**

On behalf of  
**Pacific Gas and Electric Company**

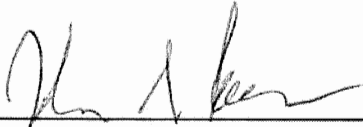
July 8, 2004

**Summary of Proposed Project for  
Expanded Groundwater Extraction and Treatment**  
Revision 1

Prepared for  
Department of Toxic Substances Control

On behalf of  
Pacific Gas and Electric Company

This work plan was prepared under supervision of a  
California Professional Engineer,



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John Porcella, P.E.,  
No. CH 4658



## 1.0 Introduction

Pacific Gas and Electric Company (PG&E) requests approval by the California Department of Toxic Substances Control (DTSC) on the installation of facilities at the Topock project required to manage increased volumes of extracted groundwater, in compliance with DTSC directives under Interim Measures No. 2. Given the nature of seasonal variations in Colorado River flows and the results of recent groundwater monitoring, the facilities installation activities proposed and described below, termed Interim Measures No. 3, are necessary to prevent an emergency.

The daily fluctuations in river stage cause the surface water-groundwater interaction at this site to be dynamic. Hydraulic control will be maintained by pumping groundwater to mitigate potential impacts to the Colorado River. The primary Interim Measures No. 3 components include additional groundwater extraction from well TW-2 or additional wells, piping and conveyance of extracted groundwater to a treatment system, treatment of extracted groundwater using reduction-precipitation-filtration and reverse osmosis, and onsite management of treated groundwater. A description of each of the IM No. 3 project components follows.

## 2.0 Background

In February 2004, DTSC directed PG&E to initiate immediate pumping, transport, and disposal of groundwater at the Topock site to ensure that groundwater containing chromium does not reach the Colorado River. Recognizing the time-critical nature of its directive, DTSC prepared a CEQA Notice of Exemption (NOE) pursuant to §21080(b)(4) of the Public Resources Code. As noted in the NOE signed by DTSC on February 10, 2004, "...immediate action is required in order to prevent and/or mitigate any possible future impacts to the beneficial water resource, the Colorado River." The NOE further notes "...the goal of the immediate action is to reduce or reverse the flow of contaminated water toward the river."

Subsequent to the issuance of the NOE, PG&E began extracting groundwater at the MW-20 bench location, on property owned by the U.S. Bureau of Reclamation and managed by the U.S. Bureau of Land Management. These measures have contributed to the prevention of groundwater containing chromium from reaching the Colorado River. However, certain anticipated conditions will mandate the taking of additional emergency measures to continue to prevent chromium (VI) from reaching the river. Specifically, due to the influence of the Colorado River stage on groundwater levels (as described below), extracting groundwater at higher rates will be necessary to maintain the stated goal of hydraulic control.

Space and treatment capacity limitations at the MW-20 bench will make necessary the installation of additional facilities to extract, treat and manage the significantly higher groundwater flows required to continue to maintain hydraulic control of the plume near the Colorado River. Because the February 2004 NOE excludes conveyance pipelines and other "longer term" activities, an additional CEQA determination is required for the proposed facilities. PG&E believes that the issuance of a CEQA statutory exemption pursuant to

§21080(b)(4) of the Public Resources Code is warranted for such facilities, on the basis that their installation is a specific action "... necessary to *prevent* or mitigate an emergency" (emphasis added). In this case, the installation of additional extraction, treatment, and discharge facilities will allow the extraction of groundwater at increased flow rates, thus preventing the emergency that could otherwise arise (*i.e.*, potential damage to the beneficial uses of the Colorado River resulting from loss of hydraulic control of the chromium plume).

The emergency exemption does not apply to "... long-term projects undertaken for the purpose of preventing or mitigating a situation that has a low probability of occurrence in the short-term." Cal. Code Regs. §15269(c). The proposed additional remedial facilities meet the criteria for issuance of an emergency exemption under CEQA because there is more than a low probability of damage in the short-term if the measures are not implemented.

### **3.0 Influence of Colorado River Stage on Groundwater Levels**

The stage in the Colorado River at the Topock site fluctuates both daily and seasonally in response to variations in the amount of water released by Davis Dam, located approximately 30 miles upstream. The daily fluctuations are typically on the order of 2 to 3 feet. Over the course of a year, river levels can fluctuate by as much as seven feet.

Groundwater levels in wells near the river fluctuate in response to the river levels. The wells closest to the river generally show the largest fluctuations, with the magnitude of the fluctuations decreasing with distance away from the river. The river provides recharge to the groundwater during times of rising river levels. During times of declining river levels, groundwater discharges to the river. During the late winter and early spring, when river levels are rising, the direction of groundwater flow in the area near the river is away from the river. During the summer and fall, when river levels are declining, the groundwater gradient in the floodplain is toward the river.

Based on the Davis Dam projected release schedule for 2004-2006, the river levels will reach the highest stage during the months of March, April and May. For the current year (2004), the river levels will begin to decline in June and will continue to decline steadily through October. The lowest river levels will occur in the period from October 2004 through January 2005. During the period of declining and low river levels, groundwater within the aquifer will tend to flow toward the river.

The goal of the interim measure pumping system at the Topock site is to create a net gradient away from the river, thereby preventing the migration of chromium-containing water toward the river. The pumping at the MW-20 bench began in March 2004, coincident with the period of rising river levels. During the spring, a pumping rate of approximately 20 gallons per minute was sufficient to maintain gradients away from the river. As the river levels begin to decline, the pumping rate must increase to overcome the natural tendency of the groundwater to flow toward the river.

## 4.0 Estimates of Increased Pumping Rates Needed in Fall and Winter

A computer model of the groundwater system at the Topock site has been developed to evaluate pumping rates needed to maintain an inward (*i.e.*, away from the river) gradient. The model was calibrated to match the results of aquifer testing conducted in conjunction with the installation of the new TW-2 extraction wells in April and May, 2004. The model then was used to project both the monthly rate of groundwater that would discharge to the river or recharge from the river if no pumping was to occur. This model is still under development and results are considered preliminary at this time; however it is the best tool available to provide an estimate of the required future pumping rates.

Based on the groundwater model projection, extraction at approximately 130 gallons per minute (gpm) from the TW-2 extraction wells will be needed to provide an inward gradient during month of highest groundwater discharge rates (October 2004). The actual pumping rate to achieve control is assumed to be from 130 to 150 gpm, when accounting for inherent inefficiencies in capture and uncertainty in the model projections. Projected pumping rates for 2004-2006 are shown on Table 1.

## 5.0 Current Operations on MW-20 Bench

As directed by the DTSC, PG&E is currently pumping groundwater from one deep extraction well (TW-2D) located on a bench along Park Moabi Road (former U.S. Highway 66) and above the Colorado River floodplain. The bench, referred to as the monitoring well MW-20 bench, is owned by the U. S. Bureau of Reclamation and is managed by the U. S. Bureau of Land Management (BLM). PG&E began pumping from this location in March 2004 and is currently pumping at a rate of approximately 20 gallons per minute.

PG&E currently is modifying the pumping and storage facility on the MW-20 bench to provide the capacity to treat extracted groundwater, thus reducing the volume of hazardous waste generated by over 99 percent and reducing risks during transport. The modified facility will include an additional storage tank, and the resulting facility will be capable of processing 30 gallons per minute. After initial process testing and operation, we anticipate being able to increase the throughput to 40 gallons per minute. At these pumping rates, 9 to 12 truckloads daily will be necessary to remove the water for reuse or disposal.

To accommodate the required increase in pumping rates based on the river stage in October, additional storage or treatment capacity is required. However, the limited space on the MW-20 bench provides for a maximum of six additional storage tanks. Increasing the footprint of the extraction system with these additional tanks, which requires BLM authorization, would allow PG&E to batch treat an additional 30 to 40 gpm of extracted groundwater. Further system expansion on the MW-20 bench beyond this increase in capacity is not physically possible. Thus, even with expansion of operations to the maximum that can be accommodated, the MW-20 bench does not allow for sufficient capacity to handle and treat the substantially larger volumes of pumped water necessary to prevent an emergency.

## 6.0 The Proposed Project

The proposed project will be located on property now owned by the Metropolitan Water District of Southern California (San Bernardino County assessor's parcel number 650-151-06). The project consists of several elements including extraction wells, piping and conveyance, treatment facilities and management of the treated water. The most critical elements are the piping, conveyance and treatment facilities. Immediate planning and permitting followed by construction of these elements will provide the means to handle the increased extraction flows necessary. Each project element is described in the paragraphs below.

### 6.1 Extraction wells

The two existing extraction wells (TW-2S and TW-2D) are capable of accommodating the peak extraction rate. The installation and use of additional extraction wells also has been discussed during Topock Consultative Workgroup (CWG) technical committee meetings. The technical committee has recommended drilling additional extraction wells at strategic locations to ensure effective capture of the plume. Two possible extraction well locations include the floodplain between monitoring well clusters MW-36 and MW-34 (near the leading edge of the plume), and adjacent to well MW-26 to capture the central and upgradient portions of the plume. Each well would be installed in a manner similar to that used for wells TW-2S and TW-2D, and would be screened in appropriate sections of the aquifer.

The proposed well installations would result in negligible impacts to the environment. Submersible pumps would be placed down-hole, and subsurface concrete vaults equipped with instrumentation, valves and other pipe appurtenances would complete the well head construction. Underground piping and electrical conduit would be connected to the well heads to convey water and provide power and control for the pump and instrumentation. Piping inside the vault and connecting to the main influent line would be secondarily contained to comply with hazardous waste regulations.

### 6.2 Piping and conveyance

Piping would be installed from the MW-20 bench to the treatment facility on parcel 650-151-06. The proposed main piping and conveyance alignment for the project follows existing access roads and avoids impact to the Topock Maze and other cultural resources. Buried piping would be placed in trenches except where aboveground crossings are necessary. Trenching along the roadway will minimize the disturbance to the hill slopes around the MW-20 bench. Aboveground piping, directional drilling or other similar techniques (*e.g.*, boring and jacking) will be used to avoid impacts to cultural and natural resources.

It is anticipated that influent lines will be double-contained high density polyethylene (HDPE) and effluent lines will be single-contained polyvinyl chloride (PVC) or HDPE. Both influent and effluent piping would be contained in the main line trench running from the MW-20 bench to the treatment facilities. The two effluent lines to be contained in this main line trench would convey treated water and reverse osmosis concentrate (brine stream) from the treatment facility back to the MW-20 bench. In addition, piping would be installed to

deliver treated water from the treatment facility to the proposed injection wells on parcel 650-151-06.

PG&E will offset the piping from existing utilities in accordance with applicable requirements and will work with the appropriate resource agencies to avoid impacts to cultural and natural resources.

### **6.3 Treatment Facilities**

Treatment facilities would include process equipment such as storage tanks (influent, effluent, and chemical), pumps, piping, reactors, and instrumentation installed on a concrete slab foundation. Other features would include electrical power supply, security fencing, operator facilities, and equipment storage. The treatment process would be a continuous process involving chromium (VI) reduction with ferrous chloride, precipitation with sodium hydroxide, and solids removal in a clarifier and microfilter.

If required under the selected treated water reuse option, reverse osmosis equipment could be installed to reduce the amount of salt (measured as total dissolved solids) occurring naturally in the extracted groundwater. Reverse osmosis produces two streams: the RO permeate (low salt stream) and the RO concentrate or brine stream (high salt). The RO permeate stream can be re-used for industrial process supply, reclaimed for other uses, injected back into the ground.

### **6.4 Treated Water Management and Reuse**

PG&E proposes to inject treated groundwater at locations on parcel 650-151-06 in a manner that will minimize permanent surface disturbance of the parcel. The proposed injection well field is located near the southwest corner of parcel 650-151-06. Alternatively, and at the direction of DTSC and the Consultative Workgroup, PG&E will evaluate the feasibility of discharge of the treated water to the Colorado River pursuant to a National Pollutant Discharge Elimination System (NPDES) permit. PG&E will also evaluate re-use in the cooling towers at PG&E's Compressor Station.

To accommodate the schedule with higher flows expected as early as June and peak flows beginning in October, trucking of treated water (non-hazardous) to an off-site facility and/or to PG&E's Compressor Station is proposed as an interim step, continuing only until the regulatory approvals for the use of the selected treated water management options have been obtained and construction of the required facilities is complete. During this interim period, the facilities at the MW-20 bench would be utilized both to manage groundwater extraction operations as well as to stage transportation of the treated water (RO permeate) and RO concentrate. The RO permeate generated at the treatment facility and conveyed to the MW-20 bench could be suitable for reuse in the cooling towers at the PG&E Compressor Station. However, the capacity of the PG&E Compressor station to accept such water is limited to a maximum flow of 60-70 gpm, and thus this reuse option will not accommodate the necessary extraction flows during the highest flow months. Additional water management options are therefore proposed to accommodate extraction and treatment of groundwater at higher rates, necessary to maintain hydraulic control.



## **6.5 Additional Technical Work Plans**

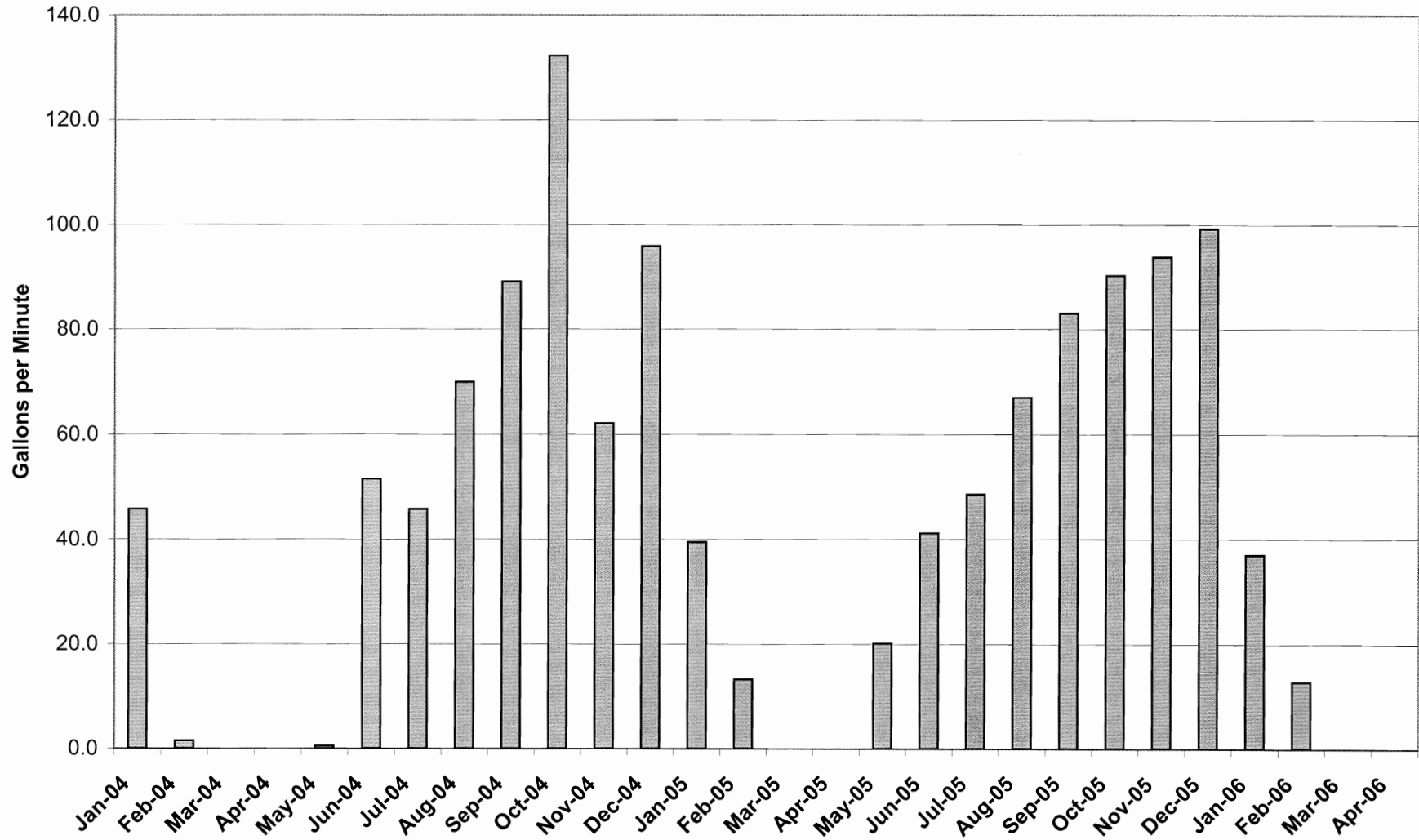
Further information necessary to implement the activities summarized herein will be submitted to the DTSC as work plans and/or reports. The results of the initial screening and evaluation of treated water management options will be incorporated in a report to be submitted to the DTSC in mid- July for approval.

The groundwater extraction, treatment and discharge system is currently in the design phase. A design package including engineering drawings will be submitted to DTSC by July 30, 2004. PG&E also will submit a design basis report to provide the agency with a written description of the design. Prior to these submittals, we anticipate that DTSC will participate in the design process and will provide comments through an "on-board" review with engineers and planners.

## **6.6 Project Schedule and Phasing**

The critical period for the project, associated with the lowest river levels, is October 2004 through January 2005. It is essential that PG&E immediately begin preparations to expand the interim measure treatment and water management/reuse activities to meet the increasing pumping rates this summer and the peak flow season of October. The attached schedule illustrates the project timeline that will enable PG&E to pump and handle these higher flows, and to focus permitting, design, and construction efforts to meet the deadline.

**Table 1**  
**Projected Pumping Rates, PG&E Topock Site**



**PG&E Topock Compressor Station  
Interim Measures No. 3**

ID	Task Name	Duration	Est. Start	Est. Finish	Qtr 2, 2004			Qtr 3, 2004			Qtr 4, 2004			Qtr 1, 2005			Qtr 2, 2005			Qtr 3, 2005		
					Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
1	<b>Interim Measures</b>	145 days	Tue 02/24/04	Mon 09/13/04	Major Assumptions Interim Measures Schedule																	
82	<b>Acquisition of MWD land</b>	81 days	Tue 04/27/04	Tue 08/17/04	(Date: 07/02/04)																	
83	Confirmation of MWD intent to convey	2 wks	Tue 04/27/04	Mon 05/10/04	- Actual dates will vary depending on field conditions.																	
84	Deed conveyance of MWD property	99 edays	Mon 05/10/04	Tue 08/17/04	- Site access permits or approvals are estimated based on recent experience.																	
85	<b>Conveyance &amp; treatment system</b>	116 days	Mon 05/03/04	Mon 10/11/04	- Design drawings go to 30 percent level consisting of process & instrumentation diagrams, site plan, facility general arrangement, grading plans and piping plans. These drawings are sufficient for obtaining all permits and regulatory approval. Specifications prepared in specific cases only.																	
86	<b>Permitting/approvals for conveyance &amp; treatment system</b>	69 days	Wed 06/23/04	Tue 09/28/04	- All vendors and contractors are pre-qualified and may be sole-sourced if appropriate.																	
87	Prepare workplan to BLM	24 edays	Fri 06/25/04	Mon 07/19/04	- Equipment assembly completed from engineering drawings (e.g., isometrics, equipment schematics, equipment elevations and plans, standard civil and mechanical details).																	
88	NEPA: BLM Action Memo.	14 edays	Mon 07/19/04	Mon 08/02/04	- Regulatory review for 30 percent drawing set as shown by DTSC only. Project description site plan adequate for all other regulatory interactions.																	
89	DTSC review project description	12 edays	Fri 06/25/04	Wed 07/07/04	- Major activities to occur simultaneously include structural, grading/earthwork, conveyance piping, and power supply.																	
90	DTSC issues CEQA Emergency Exemption	0 days	Wed 06/30/04	Wed 06/30/04	- Resource related permits except for SHPO relate to Bat Cave Wash crossing. Sequence construction to delay these activities until permits received or approved.																	
91	<b>Construction Stormwater Permit</b>	27 days	Fri 07/02/04	Tue 08/10/04	- Major equipment delivery dates include: microfilter = 6 weeks; clarifiers = 10 weeks; reverse osmosis=22 weeks based on vendor quotations.																	
95	<b>CUPA Permits/Notifications</b>	52 days	Fri 07/16/04	Tue 09/28/04	- Ten injection wells are required to accommodate the treated water. The exact number will be verified during a field investigation.																	
96	<b>Haz Mat Bus Plan Permit</b>	50 days	Fri 07/16/04	Fri 09/24/04																		
100	<b>Cond Auth Notif</b>	52 days	Fri 07/16/04	Tue 09/28/04																		
104	<b>MDAQMD PTO</b>	57 days	Thu 06/24/04	Sun 09/12/04																		
110	<b>EPA Identification Number</b>	30 days	Wed 06/23/04	Wed 08/04/04																		
114	<b>Resource related</b>	39 days	Fri 06/25/04	Thu 08/19/04																		
115	<b>USACE 404</b>	27 days	Mon 06/28/04	Tue 08/03/04																		
119	<b>RWQCB 401</b>	35 days	Mon 06/28/04	Fri 08/13/04																		
123	<b>Section 7 USFWS</b>	39 days	Mon 06/28/04	Thu 08/19/04																		
129	<b>CDFG 1600</b>	27 days	Mon 06/28/04	Tue 08/03/04																		

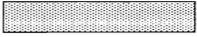









Project: Expanded Groundwater Extraction and Treatment    Notes: Date: Thu 07/08/04    edays = calendar days; days = work days

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
Milestone		Rolled Up Milestone		External Tasks			

**PG&E Topock Compressor Station  
Interim Measures No. 3**

ID	Task Name	Duration	Est. Start	Est. Finish	Qtr 2, 2004			Qtr 3, 2004			Qtr 4, 2004			Qtr 1, 2005			Qtr 2, 2005			Qtr 3, 2005		
					Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
133	<b>Section 106 SHPO</b>	<b>38 days</b>	<b>Fri 06/25/04</b>	<b>Wed 08/18/04</b>																		
138	<b>Treatment &amp; conveyance system on former MWD land</b>	<b>116 days</b>	<b>Mon 05/03/04</b>	<b>Mon 10/11/04</b>																		
139	<b>Design/construct</b>	<b>116 days</b>	<b>Mon 05/03/04</b>	<b>Mon 10/11/04</b>																		
140	Conceptual design	7 wks	Mon 05/03/04	Fri 06/18/04																		
141	<b>Treatment Plant/Piping Design</b>	<b>45 days</b>	<b>Mon 06/21/04</b>	<b>Fri 08/20/04</b>																		
142	Submit 30% design drawings to DTSC	6 wks	Mon 06/21/04	Fri 07/30/04																		
143	Submit design basis report to DTSC	6 wks	Mon 06/21/04	Fri 07/30/04																		
148	<b>Treatment Plant Construction &amp; Startup</b>	<b>66 days</b>	<b>Mon 07/12/04</b>	<b>Mon 10/11/04</b>																		
177	<b>Discharge System</b>	<b>71 days</b>	<b>Mon 06/21/04</b>	<b>Mon 09/27/04</b>																		
179	<b>Design/construct injection well field/piping</b>	<b>71 days</b>	<b>Mon 06/21/04</b>	<b>Mon 09/27/04</b>																		
186	Submit 30% design drawings (combined w/ #142 & 143)	6 wks	Mon 06/21/04	Fri 07/30/04																		
187	Submit design basis report (combined w/ #142 & 143)	6 wks	Mon 06/21/04	Fri 07/30/04																		
188	<b>Discharge/Reuse System Permitting</b>	<b>56 days</b>	<b>Wed 06/30/04</b>	<b>Wed 09/15/04</b>																		

Project: Expanded Groundwater Extraction and Treatment    Notes:  
Date: Thu 07/08/04    edays = calendar days; days = work days

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
Milestone		Rolled Up Milestone		External Tasks	