Pacific Gas and Electric Company

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March 15, 2005

Mr. Norman Shopay
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Geology and Corrective Action Branch
700 Heinz Avenue
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Subject: Final Extraction Well Installation Work Plan
Pacific Gas and Electric Company, Topock Project

Dear Mr. Shopay:

This letter transmits the final *Extraction Well Installation Work Plan* for the siting and installation of an extraction well in the floodplain at the Pacific Gas and Electric Company (PG&E) Topock site. The work plan has been revised to address your February 25, 2005 comments on the draft work plan. Per your condition approval, the drilling and well installation activities described herein were initiated on February 26, 2005. PG&E is planning on submitting a fieldwork summary report in April that addresses the information you requested in further detail.

Per your February 16, 2004 letter, a request to install piping, well vaults, and power supply for the new extraction well was submitted to the DTSC and BLM on March 4, 2005. The design plan for the extraction well piping and power supply will be submitted to the DTSC and BLM by March 21, 2005.

If you have any questions, please do not hesitate to contact me. I can be reached at (805) 546-5243.

Sincerely,

Terre Herson
for Yvonne Meeks

cc: CWG Members

Final

Extraction Well Installation Work Plan PG&E Topock Compressor Station Needles, California

March 15, 2005

Prepared for

California Department of Toxic Substances Control and

United States Bureau of Land Management

on behalf of

Pacific Gas and Electric Company

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155 Grand Avenue, Suite 1000
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Extraction Well Installation Work Plan
PG&E Topock Compressor Station
Needles, California

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March 15, 2005

This work plan was prepared under supervision of a

California Certified Engineering Geologist,

Paul Bertucci

Paul Bertucci, C.E.G.
Project Hydrogeologist

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Acronyms and Abbreviations

µg/L	micrograms per liter
bgs	below ground surface
BLM	United States Bureau of Land Management
CWG	Topock Consultative Workgroup
CRBRWQCB	Colorado River Basin Regional Water Quality Control Board
Cr(T)	total chromium
Cr(VI)	hexavalent chromium
DTSC	California Department of Toxic Substances Control
IDW	investigation-derived waste
IM	Interim Measure
MWD	Metropolitan Water District of Southern California
PG&E	Pacific Gas and Electric Company

1.0 Introduction

Pacific Gas and Electric Company (PG&E) is addressing chromium in groundwater at the Topock Compressor Station in Needles, California under the oversight of the California Department of Toxic Substances Control (DTSC). In a letter dated February 16, 2005, DTSC directed PG&E to install and test a new groundwater extraction well in the vicinity of recent groundwater investigations conducted in the Topock site (DTSC 2005). The directive was issued in light of the detection of hexavalent chromium [Cr(VI)] at monitoring well MW-34-100 at a concentration of 357 micrograms per liter (µg/L) during groundwater sampling in February 2005. Well MW-34-100 is located on the Colorado River floodplain, approximately 600 feet east of the location of the existing groundwater extraction well TW-2D and the treatment facilities operated as part of Interim Measures (IM) No. 2. Well MW-34-100 monitors the deep portion of the Alluvial Aquifer near other locations in the floodplain where Cr(VI) has been detected previously.

This work plan provides a scope of work and schedule to site, install, and test one new groundwater extraction well that will be incorporated into the IM program. A request to install piping, well vaults, and a power supply for this new well will be submitted to the DTSC and federal agencies by March 4, 2005. A design plan for the extraction well piping and power supply will by submitted to the DTSC and federal agencies by March 21, 2005.

1.1 Project Background

The Topock Compressor Station is located in San Bernardino County, approximately 15 miles to the southeast of Needles, California (Figure 1). In February 1996, PG&E and DTSC entered into a Corrective Action Consent Agreement pursuant to Section 25187 of the California Health and Safety Code. Under the terms of that agreement, PG&E was directed to conduct a Resource Conservation and Recovery Act Facility Investigation and to implement corrective measures to address constituents of concern released in the Bat Cave Wash Area near the PG&E Topock Compressor Station. The primary constituents of concern at Topock are Cr(VI) and total chromium [Cr(T)]. The source of these constituents was Cr(VI) salts historically used as a corrosion inhibitor in the station's cooling towers. DTSC is the lead administering agency for the project. Assisting DTSC and PG&E with the planning and review of interim remedial measures are the members of the Topock Consultative Workgroup (CWG), constituted under California's site designation process, and consisting of representatives of DTSC, Colorado River Basin Regional Water Quality Control Board (CRBRWQCB), Metropolitan Water District of Southern California (MWD), the various federal agencies who own or manage adjacent property, and other project stakeholders.

As directed by the DTSC under IM No. 2, PG&E is currently pumping groundwater from one deep extraction well (TW-2D) located on the MW-20 bench along the station access road and above the Colorado River floodplain. PG&E is also constructing an expanded treatment plant under IM No. 3, which is currently scheduled to be commissioned in late April of 2005. TW-2D and the new extraction well are both located on United States Bureau of

Reclamation lands that are managed by United States Bureau of Land Management (BLM). The new extraction well is scheduled to be installed by March 15, 2005.

1.2 Project Objectives

The primary objective of the new extraction well is to extract groundwater from an additional location to maintain a landward gradient and hydraulic control of the lower portion of the Alluvial Aquifer in the vicinity of MW-34-100 and MW-27-85. To best achieve this objective, it is desirable that the extraction well pump from the deep sand and gravel zone where recent groundwater investigations have confirmed Cr(VI) concentrations. The lateral extent of this zone has not been fully mapped. The final location of the extraction well will be selected based on the results of exploratory borings drilled to confirm the presence of the deep gravel zone. Three potential locations for the extraction well (PE-1, PE-1A, and PE-1B) have been identified and are shown on Figure 2. Potential extraction well locations PE-2 and PE-3 are also shown on Figure 2, but are not being considered or installed as part of this work plan.

1.3 Authorizations

This extraction well will be installed on BLM-managed property. BLM has authorized this activity under an Action Memorandum, dated March 3, 2004 (BLM 2004a). Section V of this Action Memorandum authorizes PG&E to site, install, and test new extraction wells as part of the time critical removal actions (BLM 2004a). At the direction of DTSC, PG&E submitted a work plan on December 22, 2004 to summarize the proposed Phase 2 Interim Measure groundwater investigation activities on BLM land. The *Field Activity Summary for Supplemental Interim Measures No. 2 Well Installation* (CH2M HILL 2004a) identified the potential installation of monitoring wells and up to two additional extraction wells in the middle portion of the floodplain. In a letter dated December 29, 2004, BLM approved the drilling at seven well locations including PE-1 (BLM 2004b).

Once approved by BLM and DTSC, this work plan will authorize PG&E to site and install an extraction well in the vicinity of location PE-1. Approval of other activities, such as pipeline and power supply installation on BLM-managed property, will be the subject of a separate authorization.

At the direction of DTSC, the alignment and construction of a pipeline and power supply from the new extraction well to the MW-20 bench will be detailed in a subsequent design plan that will be submitted to the DTSC and BLM on March 21, 2005. The alignment of the piping and power supply will be decided in consultation with DTSC and BLM. It is anticipated that the pipeline and power supply will be constructed within an approximate 24-inch-wide trench and will be similar to the construction other underground pipelines for IM No. 3.

2.0 Extraction Well Siting

The requirement for installing an additional extraction well in the floodplain (DTSC 2005) was prompted by a the detection of Cr(VI) at a concentration of 357 micrograms per liter (µg/L) in the initial sampling (February 14, 2005) of new monitoring well MW-34-100. Well MW-34-100 was installed adjacent to existing wells MW-34-55 and MW-34-80 and was screened from 90 to 100 feet below ground surface (bgs) to monitor the water quality in the lower portion of the Alluvial Aquifer in the floodplain.

During recent drilling, Cr(VI) was also detected at a concentration of 400 µg/L (field laboratory screening result) in a grab sample collected at a depth of 85 feet in nearby boring MW-27D. However, the initial samples from the installed monitoring well at this location (MW-27-85) in February 2005 were non-detect for Cr(VI). The grab sample from the MW-27D boring was obtained from a sandy gravel fluvial deposit overlying the bedrock Miocene conglomerate. These coarse-grained sediments are similar to the coarse-grained deposits observed at the same stratigraphic zone in the nearby floodplain borings. Groundwater grab samples and samples from well screens in shallower portions of the aquifer at all three of the locations (MW-27, MW-34, MW-36) have been non-detect for Cr(VI). In this area of the floodplain, it appears that the presence of Cr(VI) may be coincident with the coarser-grained fluvial deposits in the lower portion of the Alluvial Aquifer.

Recent drilling shows that the coarse-grained fluvial sediments occur as lenses and channel deposits interbedded with other fluvial deposits in the lower portion of the aquifer and locally overlying the Miocene bedrock formation. Figure 3 is an east-west cross section showing the geologic borings, monitoring wells, and general hydrostratigraphy in the floodplain area. As observed in borings MW-39, MW-36, MW-34, and MW-27, the bedrock is a dry, consolidated and cemented conglomerate. Based on drilling information from these and other borings, the depth to bedrock in the southern area of the floodplain ranges from approximately 30 feet to 100 feet bgs. The proposed extraction well will be screened in the lower portion of the Alluvial Aquifer where coarse-grained fluvial sediments are expected to be present (Figure 3).

Based on these findings as well as considerations for biological resources and access, three potential locations (PE-1, PE-1A, and PE-1B) for the extraction well have been identified and are shown on Figure 2. To meet the short timeframe outlined in DTSC's February 16, 2005 letter, it was necessary to use locations that have been previously approved or discussed with DTSC and BLM (PE-1 and PE-1B), or identify others immediately within the vicinity of those locations (PE-1A).

On February 24, 2005, DTSC, PG&E, and federal agency representatives performed a site walk, and concluded that PE-1 is the only location for which both an extraction well and associated piping/power can be constructed in the coming months. Although an extraction well could be installed at PE-1A or PE-1B, installation of piping and power would need to be delayed until October 2005 to accommodate the nesting season of the willow flycatcher, and endangered bird species. Out of the three locations, PE-1 is also best located to provide hydraulic control of the chromium plume observed at well MW-34-100. Therefore, the

extraction well will be installed at the PE-1 location, and exploratory borings will be completed at PE-1A and PE-1B to evaluate chromium concentrations and the characteristics of the fluvial deposits at these locations.

3.0 Extraction Well Installation

3.1 Site Preparation

A monitoring well drilling program is currently underway on the floodplain area as part of the IM site investigation. The new extraction well will be drilled using the same equipment and crew currently drilling the monitoring wells. The exploratory borings and extraction well will be located in open areas where no clearing of vegetation is required. The same biological mitigation measures approved for the IM Phase 2 activities that are underway on the BLM floodplain area will be implemented for this extraction well installation. All activities associated with the extraction well drilling activities will be coordinated with BLM to ensure the protection of cultural and biological resources.

Site preparation will take place prior to execution of drilling and well installation tasks. Site preparation will include identifying and avoiding biologically- and/or culturally-sensitive areas and site hazards. The drill rig shall be cleaned before mobilization to each site. After the drill rig has mobilized into place, drilling equipment and supplies will be temporarily staged in a gravel-surfaced access area on BLM land, adjacent to Park Moabi Road and monitoring well cluster MW-35. Existing work areas on PG&E Parcel No. 650-151-06 also will be used for longer-term equipment staging for the drilling program. Plastic sheeting will be laid on the ground surface under the drilling rig to keep the drilling materials and equipment clean and to minimize impacts to the ground surface from the drilling materials and equipment. Materials to be stored at the well site include drilling equipment and well construction materials (e.g., casing, sand, bentonite, and grout).

3.2 General Drilling Requirements

Exploratory drilling and well installation shall conform to state and local regulations. CH2M HILL will obtain all permits and other approvals required by state and local authorities. Utility clearances will also be obtained prior to commencement of drilling. Boreholes for exploratory borings will be 7 inches in diameter. The borehole for extraction well will be expanded to approximately 10 inches in diameter and will be straight enough to allow the constructed extraction well to accommodate the installation of a pump.

Potable water may be added during drilling to assist with lifting cuttings from the well when advancing casing. The driller will keep the amount of water added to a minimum. The field geologist will record the volume of water added and will ensure that this water volume, at a minimum, is removed from the well during development.

3.2.1 Drilling Method

Drilling will be accomplished using the rotosonic drilling technique that involves advancing a rotating and vibrating drill head or core barrel through the subsurface. This method produces a continuous core from the land surface to the target drilling depth (approximately 100 feet below ground surface [bgs]); generates minimal drilling wastes; and

typically can drill through gravel, cobble, and competent bedrock formations. The continuous core obtained from sonic drilling will facilitate the core logging, sampling, and core preservation requirements for the IM drilling program (CH2M HILL 2005a).

The location of the proposed extraction well on the floodplain will require use of track-mounted or balloon-tire all-terrain drilling equipment. A track-mounted sonic drilling rig of the same type that was used to construct the previous floodplain monitoring wells is already on site for another activity; this rig will be used to drill the new extraction well, as feasible.

To support the all-terrain drilling rig, a tracked or balloon-tired forklift and one or more all-terrain vehicles will be used to transport crew, equipment, and materials from staging areas near the roadways to the drill site on the floodplain. The forklift will also be used to transport cuttings and excess core generated from drilling the soil borings to lined, steel roll-off soil bins that will be temporarily staged on the MW-20 bench, on PG&E property or, with permission of the property owners, in other suitable locations (such as the MW-35 area) on BLM property. Disposal procedures for the investigation-derived waste (IDW) are discussed in Section 4.0.

3.2.2 Core Logging and Preservation Procedures

Lithologic descriptions will be logged under the supervision of a California-registered geologist at each soil boring based on visual inspection of the retrieved core. The field log will document at each soil boring:

- Unique soil boring or well identification.
- Purpose of the soil boring (e.g., monitoring well).
- Location in relation to an easily identifiable landmark.
- Names of the drilling subcontractor and logger.
- Start and finish dates and times.
- Drilling method.
- If applicable, types of drilling fluids and depths at which the fluids were used.
- Diameters of surface casing, casing type, and methods of installation.
- Depth at which saturated conditions were first encountered.
- Lithologic descriptions (based on the Unified Soil Classification System).
- Other geologic information including clast rounding and lithology.
- Sampling-interval depths.
- Zones of caving or heaving.
- Depth at which drilling fluid was lost and the volume lost.
- Changes in drilling fluid properties.
- Drilling rate.
- Drilling rig reactions, such as chatter, rod drops, and bouncing.

As recommended by the Topock CWG technical committee, a subset of core material from the saturated Alluvial Aquifer and Miocene conglomerate unit will be preserved in the field. Selected core samples will be collected during drilling at approximately 10-foot intervals within the saturated zone, sealed in aluminized Mylar sleeves, and archived for potential future testing or analysis. Core samples for preservation will be selected based on lithology, with zones that are different from the norm being targeted. Any obvious gray- or black-

colored potential reducing zones will be sampled along with any obviously aerobic zones. This might result in additional samples to those collected on 10-foot intervals. One core sample will also be preserved from the unsaturated zone. These samples might be useful in understanding the geochemistry of the vegetation root zone.

During exploratory boring, samples of wood, if encountered, will be collected and provided to the United States Geological Survey for their carbon-14 age dating studies. The collection of wood samples will follow the provisions and procedures described in the approved work plan for the IM Phase 2 groundwater monitoring well installation (CH2M HILL 2005a).

3.2.3 Groundwater Grab Sampling

Groundwater grab samples will be collected during drilling to help determine the optimum screening interval for the well and as directed by the DTSC for the recent IM phase 2 groundwater monitoring well installation. The sampling interval for these grab samples will be approximately every 20 feet through the saturated zone. A sample will be collected from the zone just above the bedrock. Grab samples will be obtained from an open section of borehole below the drive casing either by bailing or by pumping using the Isoflow® vertical aquifer profiling system, a special sampling system designed by the drilling contractor, ProSonic. The sampling pump incorporates a packer that is inflated in the bottom of the temporary casing to isolate the open hole below the casing. Attached below the packer is a submersible pump enclosed in a short section of well screen. By using a packer to hydraulically isolate the sampling interval from the water standing in the temporary casing above, the purge volumes can be minimized and representative samples can be obtained from a discrete section of the borehole.

Purging will involve pumping one to three casing volumes from the open borehole interval being sampled and monitoring the field parameters (temperature, pH, electrical conductivity, and oxidation-reduction potential). After the field parameters have stabilized and at least one casing volume has been removed, groundwater samples will be collected for Cr(VI) analysis. Because these samples are considered screening-level data, the Cr(VI) analyses will be conducted at the field laboratory currently set up at the batch treatment plant. A sufficient quantity of sample will be collected and filtered in the field so that confirmation samples can be sent to a certified laboratory if Cr(VI) is detected in any of the grab samples. Because the time of field sample collection and screening precludes laboratory analysis of these samples within the hexavalent chromium 24-hour holding time, the confirmation samples will be run for Cr(T) only. All groundwater grab samples will be filtered in the field prior to preservation and analysis.

3.2.4 Borehole Abandonment

Boreholes not completed as wells will be abandoned with bentonite-cement grout such as Wyo-Ben Grout-Well® or equivalent. The grout will be checked for settling after at least 24 hours and topped off to the ground surface.

3.3 Extraction Well Construction

The extraction well will be installed and constructed to an approximate depth of 100 feet bgs, the estimated lowest depth of permeable deposits in the Alluvial Aquifer. It is

anticipated that the extraction well will be selectively screened in the deep portion of the aquifer with no more than 20 feet of screen. The final depth and quantities of material will be determined by the on-site CH2M HILL representative following drilling of a pilot hole(s) and consultation with DTSC. A drawing of a typical extraction well and associated details is presented on Figure 4.

3.3.1 Casing Requirements

The extraction well will be completed with 6-inch-diameter, louvered, stainless-steel screen coupled to 6-inch-diameter Schedule-40 PVC blank casing. Casing requirements are as follows:

- All casing will be new, unused, and decontaminated.
- Glue will not be used to join casing, and casings will be joined only with compatible threads that will not interfere with the planned use of the well.
- All PVC will conform to ASTM Standard F 480-88A or the National Sanitation Foundation Standard 14 (Plastic Pipe System).
- The casing will be straight and plumb.

3.3.2 Well Screen Requirements

Well screen requirements are as follows:

- All requirements that apply to casing will also apply to well screen, except for strength requirements.
- Screens will be 6-inch-diameter, Type 304, stainless-steel, louvered screen, 0.060-inch slot.
- The bottom of the screen will be capped with a blank casing sump (sediment trap).

3.3.3 Annular Space Requirements

The annular space will be filled with a filter pack, a bentonite seal, or casing grout between the well casing and the borehole wall. Because centralizers interfere with electric geophysics logging, no centralizers will be used in the well.

3.3.4 Filter Pack Requirements

The filter pack will consist of Lonestar 6-12 sand (or equivalent) and will extend from the bottom of the hole to approximately 2 feet above the top of the well screen. The top of the sand pack will be sounded to verify its depth during placement. A tight-fitting swab will be used to surge the well during placement of the filter pack. Additional filter pack will be placed as required during swabbing to return the level of the pack to 2 feet above the screen. A minimum 1-foot-thick layer of fine sand will be placed above the Lonestar 6-12 filter pack to minimize the potential for the bentonite slurry (seal) material to invade the filter pack adjacent to the top of the well screen during well construction.

The contractor will record the volume of the filter pack emplaced in the well. With the approval of the field geologist, potable water may be used to emplace the filter pack, as long as no contaminants are introduced to the subsurface.

3.3.5 Bentonite Seal Requirements

The bentonite seal requirements are as follows:

- The bentonite seal will consist of at least 2 feet of bentonite between the filter pack and the casing grout.
- Only 100-percent sodium bentonite will be used.
- Bentonite chips or pellets will be hydrated with potable water if the transition seal is not below the water table; otherwise a bentonite slurry (1 gallon water for 2 pounds bentonite) will be used.

3.3.6 Casing Grout Requirements

The casing grout requirements are as follows:

- The casing grout will extend from the top of the bentonite seal to ground surface.
- The grout will be either Wyo-Ben Grout-Well®, or a cement mixture in the following proportions:
  - 94 pounds of neat Type I or II Portland or American Petroleum Institute Class A cement.
  - Not more than 4 pounds of 100-percent sodium bentonite powder.
  - Not more than 6.5 gallons of potable water.
- All grout will be pumped into place using a tremmie pipe.
- The expected volume of each ingredient in the grout mixture will be pre-calculated and documented.
- No curing/hydration enhancing (accelerator) compounds will be used in the grout mixture.

San Bernardino County will be notified at least 2 hours prior to grouting to provide them the opportunity to have a representative on site during grouting.

3.3.7 Surface Completion Requirements

Surface completions will consist of a steel, locking wellhead monument. A watertight expanding rubber seal type locking cap will be provided for each well. The wellhead monument (steel stovepipe) completion will be placed over the casing and cap and seated in a 3-foot by 3-foot by 4-inch-thick concrete pad. The ground surface will be cleared of grass and scoured to a depth of 2 inches before setting the concrete pad. The diameter of the sleeve or stovepipe will be at least 4 inches greater than the diameter of the casing. The

concrete pad will be sloped away from the well sleeve. The identity of the well will be permanently marked on the casing cap and the protective sleeve.

All wells will be secured as soon as possible after drilling by using corrosion-resistant locks. The locks will be keyed for opening with one master key.

3.3.8 Well Development

Following well construction and annular seal placement, the extraction well will be developed using a combination of surge block, bailer, and pumping. Development will not begin until at least 48 hours after placement of the grout. During development, temperature, pH, specific conductance, oxidation-reduction potential, and turbidity will be measured using field instruments. Well development will continue until field parameters (temperature, pH, specific conductance, and oxidation-reduction potential) stabilize and turbidity is reduced to less than 50 nephelometric turbidity units. The purge water produced during well development will be collected in portable tanks or drums at the drill site and transferred to cuttings bins or storage tanks in the staging area. Disposal procedures for the IDW are discussed in Section 5.0.

3.3.9 Well Completion Diagrams

A completion diagram will be prepared for the extraction well. It will include:

- Well identification.
- Drilling method.
- Installation date(s).
- Elevations of ground surface and the measuring point.
- Total boring depth.
- Lengths and descriptions of the screen and casing.
- Lengths and descriptions of the filter pack, bentonite seal, casing grout, and any back-filled material.
- Elevation of groundwater surface.
- Summary of the material penetrated by the soil boring.

3.4 Extraction Well Initial Sampling

At least 48 hours after well development, the new extraction well will be purged and sampled for initial water quality characterization. The sampling activity will follow the procedures, analytical methods, reporting limits, and quality control plan used for the Topock groundwater monitoring program as described in the *Sampling, Analysis, and Field Procedures Manual* (CH2M HILL 2005b).

Samples from the new extraction well will be analyzed for Cr(VI), Cr(T), total dissolved solids, specific conductance, and cations/anions (chloride, sulfate, alkalinity,

carbonate/bicarbonate, nitrate, and general minerals). Field water quality parameters (temperature, pH, specific conductance, oxidation-reduction potential, and turbidity) will also be measured.

4.0 Extraction Well Hydraulic Testing

To conduct a constant rate aquifer pumping test on the extraction well, it would be necessary to pipe water to a tank located at the existing TW-2D extraction and treatment facilities or along Park Moabi Road. To avoid the risk associated with using temporary piping to a temporary storage tank, the constant rate testing of the extraction well will be conducted after the permanent piping is installed. The schedule for the pipeline installation is pending biological assessments.

Initial estimates of the hydraulic properties and degree of influence of the extraction well will be obtained by pumping the well in stages during development and monitoring water levels in nearby deep monitoring wells. The pumping will be conducted in 200-gallon increments, which is the size of the portable tank used to transfer water from the well site to the storage bin. Transducers will be installed in the nearby wells and will be set for 5-minute recording intervals. This is expected to provide a semi-quantitative estimate of the potential influence of the new extraction well on nearby monitoring wells in the floodplain completed at equivalent depths.

5.0 Waste Management and Equipment Decontamination

5.1 Waste Management

Several types of waste materials will be generated during the well drilling, development, and sampling activities. IDW materials that will be generated include groundwater, drill cuttings, and incidental trash.

Water generated during well drilling and development will be collected in drums or portable storage tanks temporarily located at each drilling site and transferred by forklift to storage tanks in a staging area for characterization, treatment, or disposal at a permitted waste disposal facility. Based on available data, it is anticipated that chromium concentrations in groundwater samples collected from the extraction well boring(s) will be low to non-detectable, well below threshold limits that define a hazardous waste. Therefore, it is not considered necessary to provide secondary containment berms for water storage tanks.

Drill cuttings include the fragments of rock and soil that are removed to create the borehole. The cuttings will be contained in lined roll-off bins at the staging area during the drilling and sampling activities. After sampling and characterization, all cuttings bins will be removed from the staging area for ultimate disposal by PG&E. The cuttings will be screened for chromium. If the cuttings are characterized as a hazardous waste, they will be transported off site for disposal at a permitted hazardous waste disposal facility. It is estimated that the soil IDW bins temporarily staged at the drill site will not remain in excess of 45 days.

Incidental trash will be collected at the end of each drilling shift and hauled off the drill site to an appropriate disposal facility.

5.2 Equipment Decontamination

The back of the drilling rig and all downhole drilling tools will be decontaminated prior to starting each new borehole. Decontamination will be accomplished by steam cleaning the core barrel, drill stem, drive casing, and back of the drilling rig. Steam cleaning will be conducted on a decontamination pad so that all rinsate can be contained and collected. Rinsate from the decontamination operation will be transferred to the cuttings bin or purge water tank that contains materials from the borehole last drilled by the rig. The decontamination rinsate will be managed along with the cuttings or purge water.

6.0 Schedule and Reporting

The schedule for the installation of the extraction well is provided in Table 1. The drill rig and crew will be available to begin exploratory borings as early as Saturday, February 26, 2005, depending on progress of current floodplain drilling activities. This work will be conducted during daylight hours.

Following completion of the field work, a summary report will be prepared to document the well installation and the results of sampling and testing of the extraction well. The report will include the drilling, well completion, well development, and post-construction groundwater sampling records and results, as well as the results of hydraulic testing. The investigation report will be submitted approximately 5 weeks after the completion of the field work.

TABLE 1
Extraction Well Installation Field Schedule
PG&E Topock Compressor Station, Needles, California

Activity	Duration	Start	Finish
Work plan submittal to DTSC and BLM	1 days	2/23/05	2/23/05
DTSC and BLM review and approval	2 days	2/24/05	2/25/05
Extraction Well Drilling and Installation	2 weeks	2/26/05	3/14/05
Fieldwork Summary Report	5 weeks	3/15/05	4/19/05

The well is near sensitive habitat and must be installed by March 15, which is the start of the nesting season for one of the endangered species that may be present, the willow flycatcher. The breeding season for the willow flycatcher extends through the summer and possibly into early fall, subject to evaluation by federal representatives (biological resource experts).

7.0 Required Permits and Approvals Required

Table 2 provides a listing of permits and approvals that have been identified as applicable to the installation of the extraction well on the BLM-managed land adjacent to the Colorado River, near the PG&E Topock Compressor Station. All applicable and necessary permits and approvals will be documented prior to moving drilling equipment to the drilling site.

TABLE 2
Permits, Approvals, and Certifications for Extraction Well
PG&E Topock Compressor Station, Needles, California

Agency	Permits, Approvals, Certifications, etc.
BLM	Action memorandum authorizing IM activities on BLM land
DTSC	CEQA Notice of Exemption (emergency project)
State Water Resources Control Board/ Colorado River Basin Regional Water Quality Control Board	Notice of Intent and Storm Water Pollution Prevention Plan for construction activities; coverage under statewide general permit
United States Fish and Wildlife Service	Informal Consultation
California Department of Fish and Game	CDFG 1600 (emergency exemption)
State Historic Preservation Office	Section 106 Consultation
San Bernardino County	Well permit

8.0 References

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_____. 2005b. *Sampling, Analysis, and Field Procedures Manual, Revision 0, PG&E Topock Compressor Station, Needles, California.* February 11.

Department of Toxic Substances Control (DTSC). 2005. Letter to Yvonne Meeks, PG&E, from Norman Shopay, DTSC. February 16.

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_____.2004b. Letter to Yvonne Meeks/PG&E from Patricia Taylor/BLM. December 29.

Figures

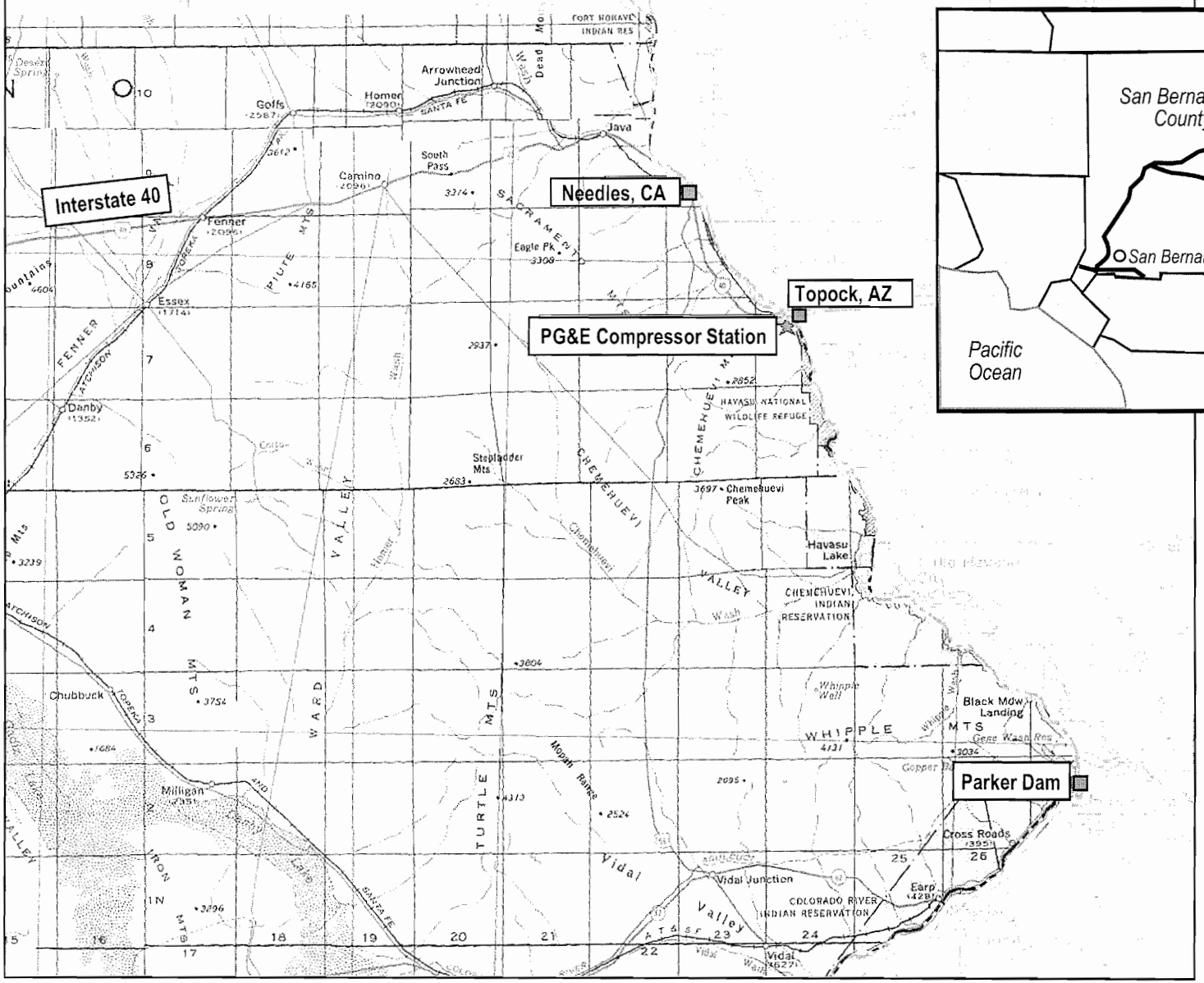

FIGURE 1
SITE LOCATION MAP
PG&E TOPOCK COMPRESSOR STATION,
NEEDLES, CALIFORNIA

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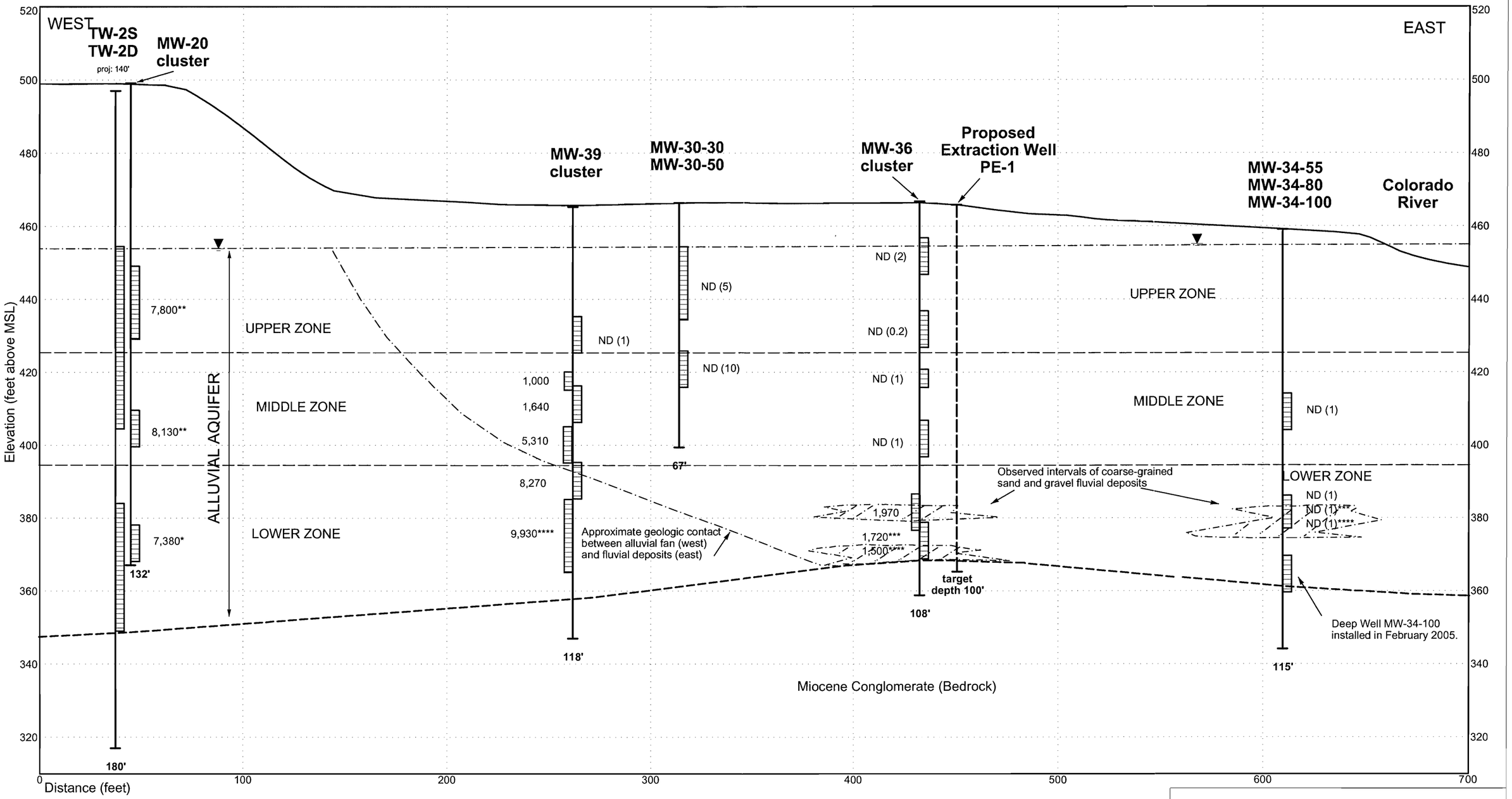
315994.PS.07.IW_Figure 1 SiteLocMap-Final_12/29/04_ccc

Figure 2
Potental Locations for Extraction Well, February 2005

WELL INSTALLATION WORK PLAN
INTERIM MEASURES FIELD PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

SFO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MXD\2005\IM_EX_WELL_LOCS_FEB05.MXD IM_EX_WELL_LOCS_FEB05.PDF 3/14/2005 11:59:37



water level

well screen

boring depth (feet) 103

3,420 Hexavalent Chromium concentration in micrograms per liter (ug/L) / parts per billion (ppb)

Notes:
Results marked * are from September 20-24 2004 sampling.
Results marked ** are from December 13-16 2004 sampling.
Results marked *** are from December 29 biweekly sampling.
Results marked **** are from January 27 2005 biweekly sampling.
All other results are from January 10-12 2005 sampling.

Figure 3
Floodplain Hydrogeologic Section

WELL INSTALLATION WORK PLAN
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Revision 2/22/05

Proposed Groundwater Extraction Well

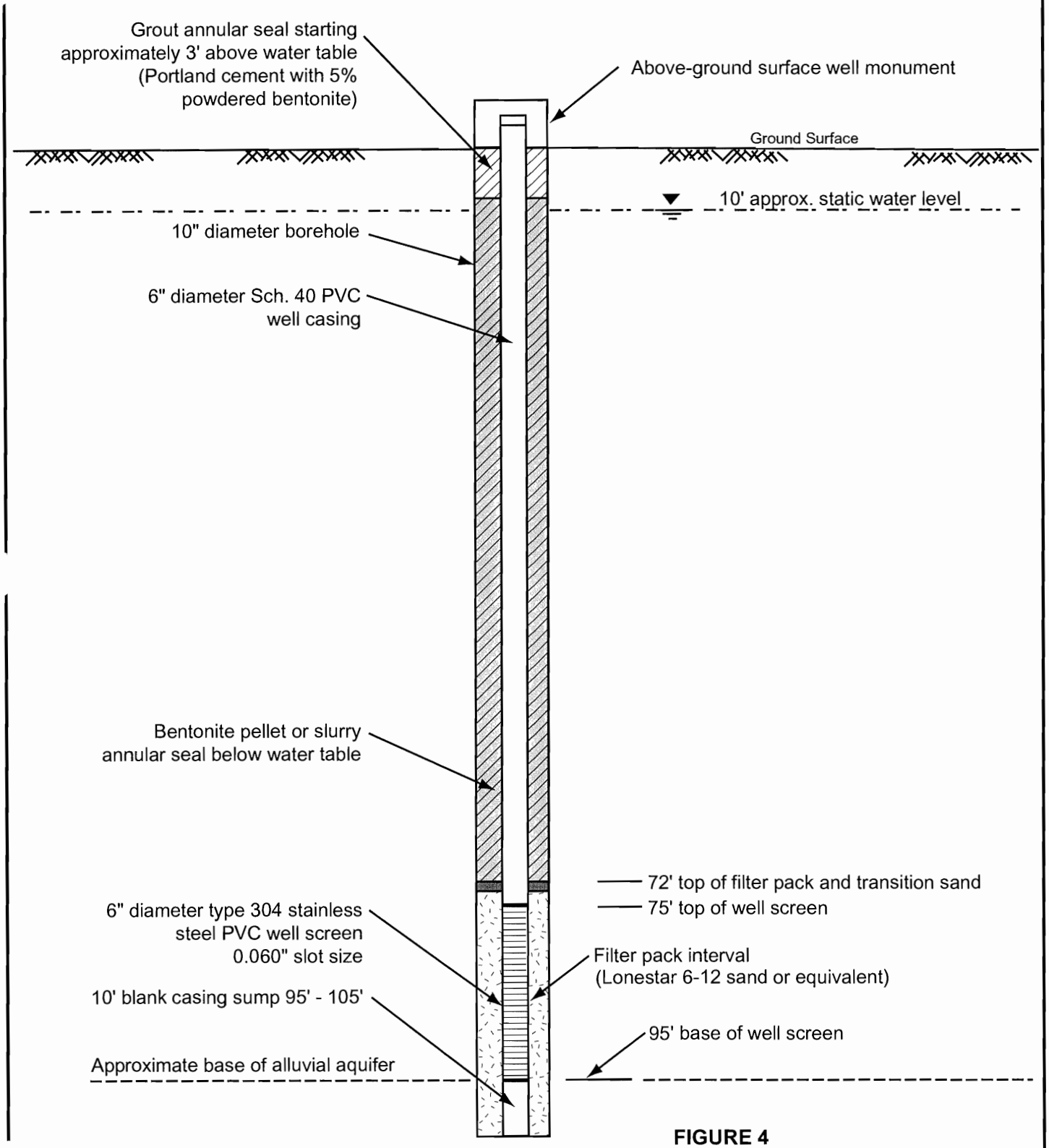

DIAGRAM NOT TO SCALE
All depths are approximate.
Actual depths for each well will be determined based on field conditions in consultation with DTSC.

FIGURE 4
SCHEMATIC DIAGRAM OF PROPOSED EXTRACTION WELL
PG&E TOPOCK COMPRESSOR STATION
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

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