



California Regional Water Quality Control Board Lahontan Region



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Arnold Schwarzenegger
Governor

APR 19 2010

TO ALL CONCERNED PERSONS AND AGENCIES:

DRAFT NOTICE OF APPLICABILITY UNDER GENERAL WASTE DISCHARGE REQUIREMENTS FOR THE PACIFIC GAS AND ELECTRIC COMPANY (PG&E), HINKLEY, SAN BERNARDINO COUNTY

Enclosed is a draft Notice of Applicability (NOA) to PG&E for modifications to the groundwater monitoring program for hexavalent chromium in-situ remediation projects associated with the PG&E's Hinkley Compressor Station. These modifications would be in compliance with the PG&E's General Waste Discharge Requirements for the General Site-Wide Groundwater Remediation Project, Board Order No. R6V-2008-0014. The draft NOA describes in combining three on-going in-situ projects into one combined project. This consolidation designates one monitoring program, contingency plan, and quarterly report.

Water Board staff requests that you review the enclosed document and provide us with your written comments no later than **May 9, 2010**. Following consideration of comments on the draft NOA, the Water Board Executive Officer may issue the NOA, a revised NOA, or may decide the project does not fall under the requirements of the General Waste Discharge Requirements.

If you have any questions or wish to discuss the draft NOA, you may contact Lisa Dernbach at (530) 542-5424 or me at (530) 542-5460.

Chuck Curtis, Manager
Cleanup and Enforcement Division

cc: PG&E Hinkley, Public Mailing List

Enclosure: Draft Notice of Applicability

LSD/chT: PG&E Hinkley Draft NOA gw monitoring letter 310
[File Under: WDID 6B369107001]

California Environmental Protection Agency



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NOTICE OF APPLICABILITY OF GENERAL WASTE DISCHARGE REQUIREMENTS FOR THE GENERAL SITE-WIDE GROUNDWATER REMEDIATION PROJECT FOR THE IN-SITU REACTIVE ZONE AT THE PG&E COMPRESSOR STATION, HINKLEY, SAN BERNARDINO COUNTY (WDID NO. 6B369107001, BOARD ORDER NO. R6V-2008-0014)

We received information that completes the Notice of Intent (NOI) for the above-referenced project. The submitted documents include the Pacific Gas and Electric Company's (PG&E) December 10, 2009 NOI requesting that the three on-going in-situ remediation projects be combined into one project (Enclosure 1) and the February 11, 2010 response to Board staff questions (Enclosure 2)

Based on the information provided, it is our determination that this project meets the required conditions to be approved under our General Waste Discharge Requirements (WDRs) for the General Site-wide Groundwater Remediation Project (General Permit). All requirements contained in the General Permit will be applicable to your project.

PROJECT DESCRIPTION

The project proposes to combine the three existing in-situ remediation projects (Source Area, Central Area, South Central Re-injection Area) into one project for the purpose of groundwater monitoring, contingency plan implementation, and reporting. Currently, the Source Area is under WDRs R6V-2006-0054 and Monitoring and Reporting Program (MRP) R6V-2006-0054A1, the Central Area is under WDRs and MRP R6V-2007-0032, and the South Central Re-injection Area is under WDRs and MRP R6V-2008-0014.

The combined project will be referred to as the In-Situ Reactive Zone (IRZ) project. The benefit of combining the three projects includes eliminating unneeded groundwater sampling and combining discussion of all in-situ projects for remediation of hexavalent chromium in one report. The reporting frequency will remain quarterly (once every three months).

California Environmental Protection Agency

Current monitoring shows that reduction byproducts have been detected only in sporadic sampling events at various sentry and contingency wells. Downgradient migration of byproducts in groundwater is being controlled by mitigation measures, such as minimizing ethanol dosing and operating extraction wells.

The treatment effectiveness of the project will continue to be evaluated during and after the operational period in the monitoring and reporting program. The Discharger, PG&E, will be required to take all necessary actions to restore groundwater quality to pre-project conditions, with the exception of chromium, before monitoring is completed at the site.

PROJECT LOCATION

The PG&E Compressor Station is located at 35863 Fairview Road, Hinkley, in the Harper Valley Subunit of the Mojave Hydrologic Unit. The project combines the Source Area In-situ Remediation Project located on the Compressor Station property, as shown in Figure 1 (Enclosure 3), the South Central Re-injection Area, located on the north side of Community Boulevard, and the Central Area In-situ Remediation Project, located on the north side of Frontier Road. In general, the project is bounded by the following: the western boundary is defined by Fairview Road south of Community Boulevard and out to 1,900 feet west of Fairview Road north of Community Boulevard; the southern boundary is defined by Highcrest Road; the eastern boundary is defined by Summerset Road; and the northern boundary is defined by contingency wells (CA-MW-501 to CA-MW-511) located 1,600 feet north of Frontier Road.

RECEIVING WATER LIMITATIONS

Operation of in-situ remediation projects results in mineral scaling and biofouling of injection and extraction wells. This causes clogging of well screens and the aquifer formation adjacent to wells, resulting in reduced efficiency of remediation processes. Acidic compounds are commonly used to prevent such clogging and restore well use.

The following compounds are recognized for well rehabilitation under the California Waterworks Standards and may be discharged to groundwater if done according to manufacturer's directions and standard practice:

- Liquid Acid Descaler
- Aqua-Clear AE
- Aqua-Clear MGA
- BETZMPH500
- NuWell 120 Liquid Acid
- NuWell 310 Bioacid Dispersant
- NuWell 400 Non-Ionic Surfactant

MONITORING AND REPORTING

Compliance with the Monitoring and Reporting Program shall be as follows:

1. Monitoring shall be as described below:

**TABLE 1
Monitoring Wells and Sampling Frequency**

Performance Monitoring Wells (semiannual sampling)	First Row Sentry Wells (quarterly sampling)	Second Row Sentry Wells (quarterly sampling)	Contingency Wells (quarterly sampling)
SA-MW-01S/D	CA-MW-301	SC-MW-08S/D	CA-MW-501S/D
SA-MW-02S/D	CA-MW-302S/D	SC-MW-09S/D	CA-MW-502
SA-MW-03S/D	CA-MW-303S	SC-MW-10S/D	CA-MW-503S/D
SA-MW-04S/D	CA-MW-304		CA-MW-504
SA-MW-05S/D	CA-MW-305	CA-MW-401	CA-MW-505
SA-MW-06S/D	CA-MW-306S/D	CA-MW-402S/D	CA-MW-506S/D
SA-MW-10S/D	CA-MW-307S	CA-MW-403S	CA-MW-507
SA-MW-20S/D	CA-MW-308	CA-MW-404S	CA-MW-508S/D
SA-MW-21S/D	CA-MW-309	CA-MW-405S/D	CA-MW-509
SA-MW-22S/D	CA-MW-310S/D	CA-MW-406	CA-MW-510S/D
SA-SM-08S/D	CA-MW-311	CA-MW-407	CA-MW-511
SA-SM-11S/D	CA-MW-312D	CA-MW-408	Two sets of nested wells to be added west of CA-MW-501S/D
Two sets of nested wells to be added south of SA-MW-23S/D	CA-MW-313	CA-MW-409S/D	
	CA-MW-314	CA-MW-410	
	CA-MW-315S/D	CA-MW-411S/D	
	CA-MW-316	CA-MW-412S/D	
	CA-MW-317S/D	One set of nested wells to be added west of SC-MW-412S/D	
	SC-MW-02S/D		
	SC-MW-05S/D		
	SC-MW-06S/D		
	SC-MW-07S/D	SA-MW-16S/D	
	SC-MW-11S/D	SA-MW-17S/D	
	SC-MW-12S/D	SA-MW-18S/D	
	SC-MW-13S/D		
	SC-MW-14S/D		
	SC-MW-15S/D		
	SC-MW-16S/D		

Note: S/D = shallow and deep wells

2. The sampling frequency for performance monitoring wells shall be semiannually (once every six months) to evaluate in-situ remediation processes and to verify a reducing trend for chromium concentrations.
3. Sentry/contingency wells shall be sampled quarterly (every three months). Sentry wells and contingency wells, installed downgradient of the treatment zone, shall be used to monitor hexavalent chromium transformation in groundwater. Sentry and contingency wells shall also be used to verify the bioremediation effectiveness,

potential mobilized metals, and other constituents. Quarterly sampling must take place within 90 days of issuance of this NOA.

- During each monitoring event, all performance monitoring wells and sentry wells shall be sampled for the following constituents using the methods in Table 2:

**TABLE 2
Performance Monitoring Wells and Sentry Wells**

Constituents	Analytical Method
Total Chromium	EPA 6010
Hexavalent Chromium	EPA 7199
Total Organic Carbon	EPA 415.2
Nitrate (as N)	EPA 300
Sulfate	EPA 300
Chloride	EPA 300
Phosphate	EPA 300
Dissolved iron	EPA 6010
Manganese	EPA 6020A
Arsenic	EPA 6020A
pH	EPA 150.1
pH, temperature, dissolved oxygen, specific conductance, ORP	Field measurements

Note: Sulfate, chloride, and phosphate to be analyzed only when associated compounds are used for well rehabilitation.

- During each monitoring event, all contingency wells shall be sampled for the following constituents using the methods provided in Table 3:

**TABLE 3
Contingency Wells**

Constituents	Analytical Method
Total Chromium	EPA 6010
Hexavalent Chromium	EPA 7199
Total Organic Carbon	EPA 415.2
Nitrate (as N)	EPA 300
Sulfate	EPA 300
Chloride	EPA 300
Phosphate	EPA 300
Dissolved iron	EPA 6010
Manganese	EPA 6020A
Arsenic	EPA 6020A
pH	EPA 150.1
pH, temperature, dissolved oxygen, specific conductance, ORP	Field measurements

Note: Sulfate, chloride, and phosphate to be analyzed only when associated compounds are used for well rehabilitation and detected in the second row of sentry wells.

6. Contingency Monitoring: The injection of ethanol is intended to create a microbial anaerobic environment in the subsurface for stimulating reduction of hexavalent chromium to trivalent chromium. Reducing conditions may mobilize naturally-occurring metals in aquifer material. If any of the mobilized metals are found at elevated concentrations at or downgradient of sentry wells, the following contingency plan will be implemented as discussed below and summarized in Table 5.

Mobilized Constituents in Groundwater

1. First Row Sentry wells - In the event that any of the parameters are detected at or greater than threshold concentrations (refer to Table 4) in the first row of sentry wells, the Discharger must:
 - a. Re-sample the well(s) showing exceedances in the following quarter.
 - b. If the second sample contains a concentration of the parameter exceeding the threshold concentration, notify the Water Board within **ten days** of receipt of laboratory results confirming exceedances and scale back by at least half the original reagent amount or volume.
2. Second Row Sentry wells - In the event that any of the parameters are detected at or greater than threshold concentrations (refer to Table 4) in the second row of sentry wells, the Discharger must:
 - a. Re-sample the well(s) showing exceedances within **30 days**.
 - b. If the second sample contains the a concentration of the parameter exceeding the threshold concentration, notify the Water Board within **ten days** of receipt of laboratory results confirming exceedances, and either scale back by at least half the original reagent amount or volume or provide an evaluation of whether the parameter is expected to attenuate before groundwater travels to the contingency wells. If an evaluation is provided, it must contain an estimated travel time for the parameter to reach contingency wells.
3. Contingency wells - In the event that any of the parameters listed in Table 4 are detected at or greater than threshold concentrations in contingency monitoring wells, the Discharger must:
 - a. Re-sample the well(s) showing exceedances within **30 days**.
 - b. Notify the Water Board **within five working days** of receipt of laboratory results confirming exceedances.
 - c. **Within 14 days** of notification to the Water Board, the Discharger must submit a proposal to prevent further off-site migration. The proposal shall contain a remediation and monitoring plan to restore water quality and adequately monitor groundwater downgradient of the contingency wells where violations were observed.

- d. The remediation plan shall be placed into operation **within 90 days** of original notification to the Water Board of violations.

The above directive must be implemented whether or not contingency well violations were similarly observed in sentry wells. The Discharger shall maintain a field log noting when and how the Contingency Plan is implemented.

TABLE 4
Contingency Plan Threshold Concentrations

Monitoring Parameter	Regulatory Concentration	Basis for Limit	Maximum Baseline Concentration	Threshold Concentration ¹
Dissolved Arsenic	0.01 mg/L	Primary MCL	0.01 mg/L	0.013 mg/L
Dissolved Manganese	0.05 mg/L	Secondary MCL	0.312 mg/L	0.390 mg/L
Dissolved Iron	0.3 mg/L	Secondary MCL	0.377 mg/L	0.471 mg/L
Chloride	250 mg/L	Secondary MCL	231 mg/L	289 mg/L
Nitrate (as N)	10 mg/L	Primary MCL	18.2 mg/L	22.8 mg/L
Phosphate	none		To be determined	To be determined
Sulfate	250 mg/L	Secondary MCL	409 mg/L	511 mg/L
Eosine	100 µg/L	Color detection	<0.1 µg/L	100 µg/L
Fluorescein	100 µg/L	Color detection	<0.1 µg/L	100 µg/L

Notes:

¹ Threshold concentrations are based on the greater of the Regulatory Concentration and 125 percent of the Maximum Baseline Concentration in the Central Area, with the exception of Fluorescein and Eosine.

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

TABLE 5
Contingency Plan Schedule

Location	Task	Schedule
First Row Sentry wells	1. Re-sample well(s)	Within the following quarter
	2. Notify Water Board and scale back reagent injections	Within 10 days of lab results confirming exceedances
Second Row Sentry wells	1. Re-sample well(s)	Within 30 days
	2. Notify Water Board and either scale back by at least half the original reagent amount or volume or provide an evaluation of whether the parameter is expected to attenuate before groundwater travels to the contingency wells.	Within 10 days of lab results confirming exceedances
Contingency wells	1. Re-sample well(s)	Within 30 days of lab results showing violations at contingency wells
	2. Notify the Water Board	Within 5 days of confirmation lab results showing violations at contingency wells
	3. Submit proposal to prevent migration outside of project boundaries and to conduct additional monitoring	Within 14 days of notification to Water Board of violation(s)
	4. Begin operating the remediation proposal	Within 90 days of notification to Water Board of violation(s)

7. Any significant change of in-situ remediation operations that could be deemed as being less than full-scale must receive prior Board staff concurrence.
8. Quarterly monitoring reports are required within 45 days of when quarterly sampling was conducted. Reports must describe the monitoring conducted and the location of wells sampled. A discussion must be provided for any well required in the monitoring program that was not sampled. Reports must contain laboratory data sheets and a description of laboratory results. Reports must describe all discharges (reductants, tracers, well rehabilitation compounds) to groundwater and list volumes in a table. Reports must describe the effectiveness of in-situ remediation for converting hexavalent chromium to trivalent chromium in both the upper and deeper zones of the upper aquifer. Maps of the upper and deeper zones of the upper aquifer must show monitoring locations and sampling results in a readable font size. Reports must contain a statement as to whether the receiving water limitations or

criteria were exceeded for any constituent and, if so, what mitigation measure(s) to restore water quality, if any, were taken. Reports shall note all down periods of in-situ remediation and state the cause. Reports shall also state planned activities for the following quarter.

GENERAL REQUIREMENTS

1. The project shall be implemented in accordance with the requirements contained in the General Permit and in accordance with the information submitted in PG&E's December 10, 2009 letter and February 11, 2010 email requesting to combine the three in-situ remediation projects. Project activities must be completed within the project boundaries, as described in the Project Location, above, and shown on the map in Figure 1 (Enclosure 3).
2. The required annual fee (as specified in the annual billing you will receive from the State Water Resources Control Board) shall be submitted until this Notice of Applicability is officially revoked.
3. Failure to abide by the conditions of the General Permit and this Notice of Applicability may result in an enforcement action as authorized by provisions of the California Water Code.

You may contact Lisa Dernbach at (530) 542-5424 if you have any questions regarding the General Permit or this Notice of Applicability.

HAROLD J. SINGER
EXECUTIVE OFFICER

Enclosures:

1. December 10, 2009 letter from PG&E to combine the three in-situ remediation projects into one project
2. February 11, 2010 email from PG&E responding to Board staff's questions
3. Figure 1, Site Layout

LSD/clhT: PG&E Hinkley NOA gw monitoring 3-22-10 lsd
[File Under: VVL- WDID NO. 6B369107001]



**Pacific Gas and
Electric
Company**

Eric P. Johnson
Hinkley Remediation Project
Manager
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December 10, 2009

Mr. Chuck Curtis, PE
California Regional Water Quality Control Board, Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, California 96150

**Subject: Notice of Intent (NOI) for Request for Coverage under the General Permit for
Site-Wide Groundwater Remediation: In Situ Remediation Projects
Board Order No. R6V-2008-0014
PG&E Groundwater Remediation Project
Hinkley, San Bernardino County**

Dear Mr. Curtis:

As you are aware, Pacific Gas and Electric Company (PG&E) is currently operating in situ reduction zones (IRZs) for treatment of the hexavalent chromium (CrVI) groundwater plume in Hinkley, California. The IRZ remedial areas are shown on Figure 1. The remediation projects are covered by three separate Waste Discharge Requirements (WDRs) because the IRZs (Source, Central, and South Central) were initiated as separate projects. As shown on Figure 1, the three projects essentially cover one large area. This Notice of Intent (NOI) is being submitted to facilitate regulation of the remedial program as a single project, under the General WDRs that were issued by your Board for the Hinkley plume. This consolidation will provide the most effective and efficient means of continued monitoring for the remediation program, including contingency monitoring for secondary byproducts. A Notice of Applicability (NOA) from the California Regional Water Quality Control Board, Lahontan Region (LRWQCB) approving this NOI, would allow the separate WDRs for each area to be rescinded.

The primary permit modifications associated with the operation of the IRZ systems as one project under the General WDR are as follows and as outlined in Table 1:

- The individual project areas for the three in situ remediation projects (Central Area, South Central and Source Area) will be combined into one In Situ Reactive Zone (IRZ) Area - as shown in blue on Figure 2.
- There will be one compliance monitoring well network for the IRZ Area (compliance monitoring wells are listed in Table 2 and shown on Figure 2). Additional wells can be added as needed, in consultation with Board Staff.

- There will be one contingency plan that will be implemented based on data obtained from the proposed compliance monitoring well network, as described in Table 1
- One quarterly in situ remediation project report will be prepared for the IRZ Area. This report will be combined with the Site-wide Groundwater Remediation report.

Other operational and monitoring program modifications relative to the individual in situ remediation projects are presented in Table 1.

IRZ Operation

The combined project will utilize existing infrastructure including groundwater injection and extraction wells, conveyance piping, electrical systems, and dosing systems. As permitted by the General WDRs, additional remediation wells and associated conveyance piping, electrical systems, and dosing systems will be constructed within the IRZ Area to expand treatment to areas outside the current systems, but within areas already approved by the existing permits. As permitted by the General WDRs, reagent injections may also be conducted at additional locations within the IRZ Area using any of the injection technologies covered under the General WDRs, including use of a cone penetrometer testing (CPT) rig, a Geoprobe™ rig (or similar direct push technology), temporary well points, or a trailer-mounted reagent delivery system with temporary above ground piping.

Monitoring and Reporting

A key element of regulating the three projects as a single project is consolidation of the compliance monitoring and reporting programs. The proposed monitoring program is detailed on Table 1. This program primarily utilizes the Central IRZ compliance monitoring wells (i.e., wells located north of the Central IRZ) to monitor the northern portion of the IRZ area, and the South Central IRZ and several Source Area IRZ compliance monitoring wells to monitor the eastern and western flanks of the IRZ area. The intent of the proposed changes to the monitoring program is to eliminate compliance monitoring at several of the Source Area IRZ monitoring wells, as this area would essentially become part of the South Central IRZ. The proposed program is summarized as follows:

The **first row of sentry monitoring wells** includes the line of wells around the perimeter of the IRZ Area. These wells are listed in Table 2 and shown on Figure 2.

The **second row of sentry monitoring wells** is an east-west trending row of wells (the CA-MW-400 series wells listed in Table 2, and SC-MW-08S/D to SC-MW-10S/D) located north of the IRZ area, about 800 feet from the Central Area remediation wells (the CA-RW-series wells).

The **contingency monitoring wells** are located north of the second row of sentry monitoring wells in an east-west trending line (the CA-MW-500 series wells listed in Table 2) about 1,600 feet from the Central Area recirculation wells (the CA-RW series wells).

Additional compliance monitoring wells can be installed in a similar layout, as appropriate, to support future expansion of the IRZ recirculation systems within the IRZ area.

Compliance monitoring will be conducted on a quarterly basis. Groundwater samples will be collected for analyses of the following parameters:

- CrVI and total dissolved chromium (CrT)
- dissolved arsenic, dissolved manganese and dissolved iron
- total organic carbon
- tracers (bromide/eosine/fluorescein), if tracers are injected
- chloride, if hydrochloric acid is injected

Compliance monitoring reporting will be consolidated into a single quarterly report that presents the results of sampling from the monitoring wells shown on Table 2. The quarterly reports will also contain the operational information for the IRZ, as required in the existing WDRs for the three projects. This will include:

- listings of the type, volume, and concentrations of treatment reagent injections to groundwater during the prior quarter
- monitoring well maps and tabulated groundwater sampling results
- descriptions of any waste discharge requirement violations, equipment failures, and unexpected environmental impacts that occur
- explanations of any adverse impacts to groundwater that require implementation of the Contingency Plan
- descriptions of planned activities during the subsequent quarter

Additionally, semi-annual evaluations of total dissolved solids concentrations, and periodic evaluations of lateral chromium migration, will be performed and reported as required by the NOI/NOA for the General Site-wide Groundwater Remediation Project.

Use of Reductants, Tracers, and Well Rehabilitation Compounds in the IRZ Area

The General WDRs allow for injection of various biological reductants including emulsified vegetable oil, ethanol, sodium lactate, molasses, whey, corn syrup, acetate, glucose, and methanol. No new reductants are proposed in this NOI. Ethanol is currently being used in the Central, Source, and South Central Areas; other reductants that are already permitted under the General WDRs may be substituted in the future.

The General WDRs allow for injection of various tracers, e.g. bromide, eosine, and fluorescein. No new tracers are proposed in this NOI.

Injection wells periodically require rehabilitation to improve or maintain injection rates. The General WDRs allow for the injection of citric acid, acetic acid, hydrochloric acid, sodium

hydroxide, and hydrogen peroxide for well rehabilitation. In addition to the pure compounds covered under the General WDRs, the following commercial mixtures of well rehabilitation compounds that are certified under the specifications of NSF/ANSI 60-2005 (Drinking Water Treatment Chemicals –Health Effects) may be used to clean the remediation wells:

- Liquid Acid Descaler
- Aqua-Clear AE
- Aqua-Clear MGA
- BETZMPH500
- NuWell 120 Liquid Acid
- NuWell 310 Bioacid Dispersant
- NuWell 400 Non-Ionic Surfactant

The NSF/ANSI 60-2005 certified compounds listed above are routinely used for rehabilitation of drinking water wells in California under the California Waterworks Standard (California Code of Regulations Title 22, Section 64590: Direct Additives). The Material Safety Data Sheets and NSF certifications for the well rehabilitation compounds are included as an Attachment. Compounds will be used according to standard practice and within these specifications.

Contingency Monitoring Program

The contingency monitoring program will be consistent with the existing WDRs for the three IRZ projects. Groundwater samples will be collected from the sentry and contingency wells during routine sampling. If dissolved metals or parameters related to injected reagents are detected above the contingency plan threshold concentrations listed in Table 3, the contingency plan will be implemented to mitigate potential impacts and prevent adverse impacts outside the boundaries of the project area, as described in this section. The proposed contingency plan is presented below. A comparison of the proposed plan to the existing WDRs for the three in situ projects is provided in Table 1.

In the event that any of the parameters are detected in a first row sentry monitoring well at a concentration at or greater than the threshold concentration listed in Table 3, the well showing the exceedance will be sampled the following quarter and the data will be evaluated to assess whether changes in reagent dosing are appropriate. If the second sample contains the same or a higher concentration of the parameter exceeding the threshold concentration, then the LRWQCB will be notified and reagent injections will be scaled back to at least half in upgradient injection locations. If the concentration in the confirmation sample is higher than the threshold concentration, but lower than the concentration detected in the previous sample, an appropriate response will be proposed for LRWQCB concurrence.

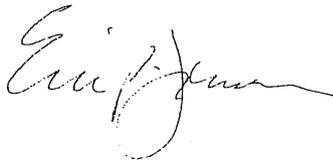
In the event that any of the parameters are detected at a concentration greater than the threshold concentration listed in Table 3 at a second row sentry monitoring well, the well showing the exceedance will be re-sampled during the following month. If the second sample confirms that

the concentration is above the threshold, then the LRWQCB will be notified and an evaluation of whether or not the parameter is expected to attenuate before groundwater travels to the contingency wells will be conducted. If it is not likely that the parameter will attenuate before reaching the contingency wells, a program to prevent migration downgradient of the contingency wells will be proposed.

In the event that any of the parameters are detected at a concentration greater than the threshold concentration listed in Table 3 at a contingency monitoring well, the well showing the exceedance will be re-sampled the following month. If the parameter concentration in the confirmation sample exceeds the threshold concentration, a remediation plan to prevent further migration and restore groundwater quality where the exceedances were observed will be proposed.

If you have any questions regarding this report, please call me at (530) 520-2959.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric Johnson". The signature is fluid and cursive, with a large loop at the end.

Eric Johnson
Hinkley Remediation Project Manager

Attachments:

- Table 1 Summary of the Existing and Proposed Operational, Monitoring and Contingency Plan Requirements for the In Situ Projects
- Table 2 Proposed Monitoring Well Network
- Table 3 Contingency Plan Threshold Concentrations

Figure 1 Site Plan and Current IRZ Systems

Figure 2 In Situ Reactive Zone and Proposed Monitoring Network

Material Safety Data Sheets and NSF Certifications

Table 1
Summary of the Existing and Proposed Operational, Monitoring, and Contingency Plan Requirements for the In Situ Projects
 Notice of Intent for Coverage Under General Permit for Site-wide Groundwater Remediation: In Situ Remediation Projects
 Pacific Gas and Electric Company, Hinkley Compressor Station
 Hinkley, California

OPERATIONS	Proposed under NOI for the IRZ Area under REV-2008-0014 (General WDRs)	Changes Relative to the General WDRs and/or each IRZ project	Source Area IRZ under REV-2006-0054 (original WDRs), REV-2006-0054A1 (MRP revision), and REV-2008-0014 (Source Area NOA under General WDRs)	Central Area IRZ under REV-2007-0032 (Central Area WDRs)	SCRIA under REV-2008-0014 (General Site-wide Project NOA under General WDRs)
Areas for Extraction and Re-injection	Extraction and re-injection anywhere within IRZ Area. Extraction from distal end of the plume up to 110 gpm and re-injection anywhere within the IRZ Area.	Adds approval to extract or re-inject anywhere within the IRZ Area, similar to SCRIA permit.	Extraction/Injection limited to Source Area Project.	Extraction/Injection limited to Central Area Project.	Extraction from distal end of the plume (north) up to 110 GPM, re-injection of carbon aerated groundwater limited within SCRIA Project Boundary.
Well Rehabilitation Compounds	Citric acid, acetic acid, hydrochloric acid, hydrogen peroxide, liquid acid descaler, Aqua Clear AE and MGA, BETZMPH500, NUWELL (120 liquid acid, 310 bleach dispersant), and 400 non-ionic surfactant)	Adds rehabilitation compounds commonly used for rehabilitation of drinking water wells (see Section 3.2.3 of the NOI).	None	Citric acid, acetic acid, hydrochloric acid, sodium hydroxide, and hydrogen peroxide	Citric acid, acetic acid, hydrochloric acid, sodium hydroxide, and hydrogen peroxide
Tracer Compounds	Bromide, eosine, and fluorescein	Allows injection of tracers into Source Area.	None	Bromide, eosine, and fluorescein	Eosine, fluorescein
MONITORING AND REPORTING					
Performance Monitoring Well Network	None proposed. PG&E will continue to monitor for performance, but proposes that performance monitoring not be required for compliance.	Removal of performance monitoring for compliance from Central Area (CA-MW-100 and -200 series wells).	None	CA-MW-100 and -200 series wells	None
Compliance Monitoring Well Network	Compliance Wells are listed in Table 2 and shown on Figure 2. - First Row of Sentry Wells: CA-MW-300 series wells listed in Table 2, SC-MW-01SD to SC-MW-06SD, and SC-MW-11SD to SC-MW-16SD. -Second Row of Sentry Wells: CA-MW-400 series wells listed in Table 2, SC-MW-08SD to SC-MW-10SD. -Contingency Wells: CA-MW-500 series wells listed in Table 2.	Creates one consolidated monitoring well network for all 3 IRZ Areas. Continues to use Central Area and SCRIA monitoring well network. Removes Source Area monitoring well network.	First Row of Sentry Wells: SA-MW-01SD through SA-MW-05SD Second Row of Sentry Wells: SA-MW-06SD through SA-MW-10SD Contingency Wells: SA-MW-11SD through SA-MW-16SD Additional Project Monitoring Wells: SA-MW-18SD through SA-MW-19SD and SA-MW-20SD through SA-MW-22SD	First Row of Sentry Wells: CA-MW-300 series wells listed in Table 2 -Second Row of Sentry Wells: CA-MW-400 series wells listed in Table 2 -Contingency Wells: CA-MW-500 series wells listed in Table 2	First Row of Sentry Wells: SC-MW-01SD through SC-MW-16SD -Second Row of Sentry Wells: none -Contingency Wells: none
Compliance Monitoring Program Wells listed in Table 2)	CVI, CT, TOC, dissolved arsenic, dissolved iron, dissolved manganese, tracers (if injected), and chloride (if hydrochloric acid used for well rehabilitation)	Removes several water quality analytes currently in the Central Area analytical suite: calcium, sodium, magnesium, ammonia, phosphorus, sulfate, sulfide, nitrate, nitrite, bicarbonate alkalinity, pH (lab) and methane. Analytical data from two years of Central Area operation indicates that these parameters are not negatively impacted by IRZ operation. Removes volatile fatty acids and ethanol from the analyte list. TOC results will be used instead.	Monitoring and Sentry Wells: CVI, CT, TOC, arsenic, manganese, iron, volatile fatty acids, pH (lab), bicarbonate alkalinity, nitrate, nitrite, sulfate Contingency Wells: CVI, CT, iron, manganese, arsenic	Monitoring, Sentry & Contingency Wells: CVI, CT, TOC, arsenic, manganese, iron, calcium, sodium, magnesium, ammonia, phosphorous, sulfate, sulfide, nitrate, nitrite, ethanol, pH (lab), bicarbonate alkalinity, tracers (if injected), and chloride (if hydrochloric acid used for well rehabilitation), methane, and volatile fatty acids	Sentry Wells: CVI, CT, arsenic, manganese, iron, tracers (if injected), volatile fatty acids, and ethanol
Reporting	Submit one combined Quarterly Report for the In Situ Project Area and the Silewide Groundwater Remediation Project.	Combines reporting for the 3 current IRZ projects and the Silewide Groundwater Remediation Project Report into one report.	WDR Quarterly Report separate from Silewide Report	WDR Quarterly Report separate from Silewide Report	Quarterly Silewide Groundwater Remediation Project Report

Summary of the Existing and Proposed Operational, Monitoring, and Contingency Plan Requirements for the In Situ Projects
Notice of Intent for Coverage Under General Permit for Site-wide Groundwater Remediation: In Situ Remediation Projects
 Pacific Gas and Electric Company Hinkley Compressor Station
 Hinkley, California

	Proposed under NOI for the IRZ Area under REV-2008-0014 (General WDRs)	Changes Relative to the General WDRs and/or each IRZ project	Source Area IRZ under REV-2008-0054 (original WDRs), REV-2008-0054A1 (MRP revision), and REV-2008-0014 (Source Area NOA under General WDRs)	Central Area IRZ under REV-2007-0032 (Central Area WDRs)	SCRIA under REV-2008-0014 (General Site-Wide Project NOA under General WDRs)
CONTINGENCY PLAN					
Threshold Exceedance in 1st Row Sentry Wells	The well will be re-sampled during the following quarter. If the concentration for the analyte is the same or higher, the Board will be notified within 5 days of receipt of the final laboratory data and reagent injections will be scaled back to at least half of the original injection rate. If the concentration in the second sample is higher than the threshold concentration, an appropriate response will be proposed for Board concurrence.	Allows for resampling to confirm the exceedance. Includes evaluation of attenuation if second sample is above threshold, but shows a decrease in concentration.	Immediately resample the wells showing the exceedance. Scale back the reagent injection by at least half within 5 working days of receipt of final laboratory results for the resampling event if exceedances are confirmed and notify the Board.	Scale back reagent injection by at least half within 5 working days of receipt of final laboratory results, without re-sampling.	Reduce carbon dosing into injection wells, reduce injection rates, or modify areas for injection, without re-sampling.
Threshold Exceedance in 2nd Row Sentry Wells	The well will be re-sampled during the following month. If the concentration for the analyte is the same or higher, the Board will be notified within 5 days of receipt of the final laboratory data and reagent injections will be scaled back to at least half of the original injection rate. Within 14 days of the notification, an evaluation of whether or not the parameter is expected to attenuate before groundwater travels to the contingency wells will be presented to the Board. If it is not likely that the parameter will attenuate before reaching the contingency wells, a program to prevent migration of mobilized metals, injected reagents, or tracers downgradient of the contingency wells will be proposed.	Allows for resampling to confirm the exceedance. Includes evaluation of attenuation. If the second sample is above the threshold, but shows a decrease in concentration compared to the first sample.	Immediately resample the wells showing the exceedance. For confirmed exceedances, submit a proposal to prevent further migration to the Board within 14 days of the notification of exceedance. Implement the remediation and monitoring plan within 90 days of the original exceedance notification.	Notify the Board within 5 days of receipt of final laboratory results and consult with the Board, without re-sampling. If Discharger cannot indicate that migration beyond the project boundaries are unlikely, reagent injection must be scaled back or halted within 5 days of consultation. Within 14 days of notification, Discharger must begin process of implementing remedial measures to address constituent. Remedial system should be operational within 120 days following Board consultation.	Not Applicable
Threshold Exceedance in Contingency Wells	Notify the Board within 2 days. The well will be re-sampled the following month. If the concentration is confirmed to be above the threshold concentration, a remediation plan to prevent further migration and restore groundwater quality where the violation was observed will be proposed to the Board within 14 days of the notification.	Allows for re-sampling within the month of the detection and does not start time-line for proposing and implementing mitigation actions until receipt of confirmatory results.	Immediately resample the wells showing the exceedance. Notify Board within 2 working days of receipt of laboratory results. Within 14 days of exceedance notification, submit a proposal to prevent further migration, and to restore wellhead quality. Remediation plan shall be implemented within 90 days of original exceedance notification.	Notify the Board within 2 days, without re-sampling. Within 14 days of the notification, submit a proposal to contain migration outside of project boundaries	Not Applicable

Abbreviations:
 CrVI = hexavalent chromium
 Cr = total dissolved chromium
 IRZ = In Situ Reactive Zone
 MRP = Monitoring and Reporting Program
 NOA = Notice of Applicability
 NOI = Notice of Intent
 SCRIA = South Central Re-injection Area
 TOC = total organic carbon
 WDRs = Waste Discharge Requirements

Table 2. Proposed Monitoring Well Network

**Notice of Intent for Coverage under a General Permit for Site-Wide Groundwater Remediation:
In Situ Remediation Projects**

Pacific Gas and Electric Company Hinkley Compressor Station
Hinkley, California

First Row of Sentry Wells	Second Row of Sentry Wells	Contingency Wells
CA-MW-301	CA-MW-401	CA-MW-501S
CA-MW-302D	CA-MW-402S	CA-MW-502
CA-MW-302S	CA-MW-403S	CA-MW-503S
CA-MW-303S	CA-MW-404S	CA-MW-504
CA-MW-304	CA-MW-405D	CA-MW-505
CA-MW-305	CA-MW-405S	CA-MW-506S
CA-MW-306D	CA-MW-406	CA-MW-507
CA-MW-306S	CA-MW-407	CA-MW-508S
CA-MW-307S	CA-MW-408	CA-MW-509
CA-MW-308	CA-MW-409S	CA-MW-510S
CA-MW-309	CA-MW-410	CA-MW-511
CA-MW-310D	CA-MW-411S	
CA-MW-310S	CA-MW-412D	
CA-MW-311	CA-MW-412S	
CA-MW-312D	SC-MW-08D	
CA-MW-313	SC-MW-08S	
SC-MW-01D	SC-MW-09D	
SC-MW-01S	SC-MW-09S	
SC-MW-02D	SC-MW-10D	
SC-MW-02S	SC-MW-10S	
SC-MW-03D		
SC-MW-03S		
SC-MW-04D		
SC-MW-04S		
SC-MW-05D		
SC-MW-05S		
SC-MW-06D		
SC-MW-06S		
SC-MW-07D		
SC-MW-07S		
SC-MW-11D		
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SC-MW-15S		
SC-MW-16D		
SC-MW-16S		
SA-MW-16S		
SA-MW-16D		
SA-MW-17S		
SA-MW-17D		
SA-MW-18S		
SA-MW-18D		

**Table 3. Contingency Plan Threshold Concentrations
 Notice of Intent for Coverage under a General Permit for Site-Wide Groundwater Remediation:
 In Situ Remediation Projects**

Pacific Gas and Electric Company Hinkley Compressor Station
 Hinkley, California

Monitoring Parameter	Threshold Concentration	Basis for Limit
Dissolved Arsenic	0.01 mg/L	Federal Primary MCL
Dissolved Manganese ¹	0.789 mg/L	Baseline Concentrations
Dissolved Iron ¹	12.6 mg/L	Baseline Concentrations
Chloride ¹	231 mg/L	Baseline Concentrations
Eosine	100 µg/L	Color Detection
Fluorescein	100 µg/L	Color Detection

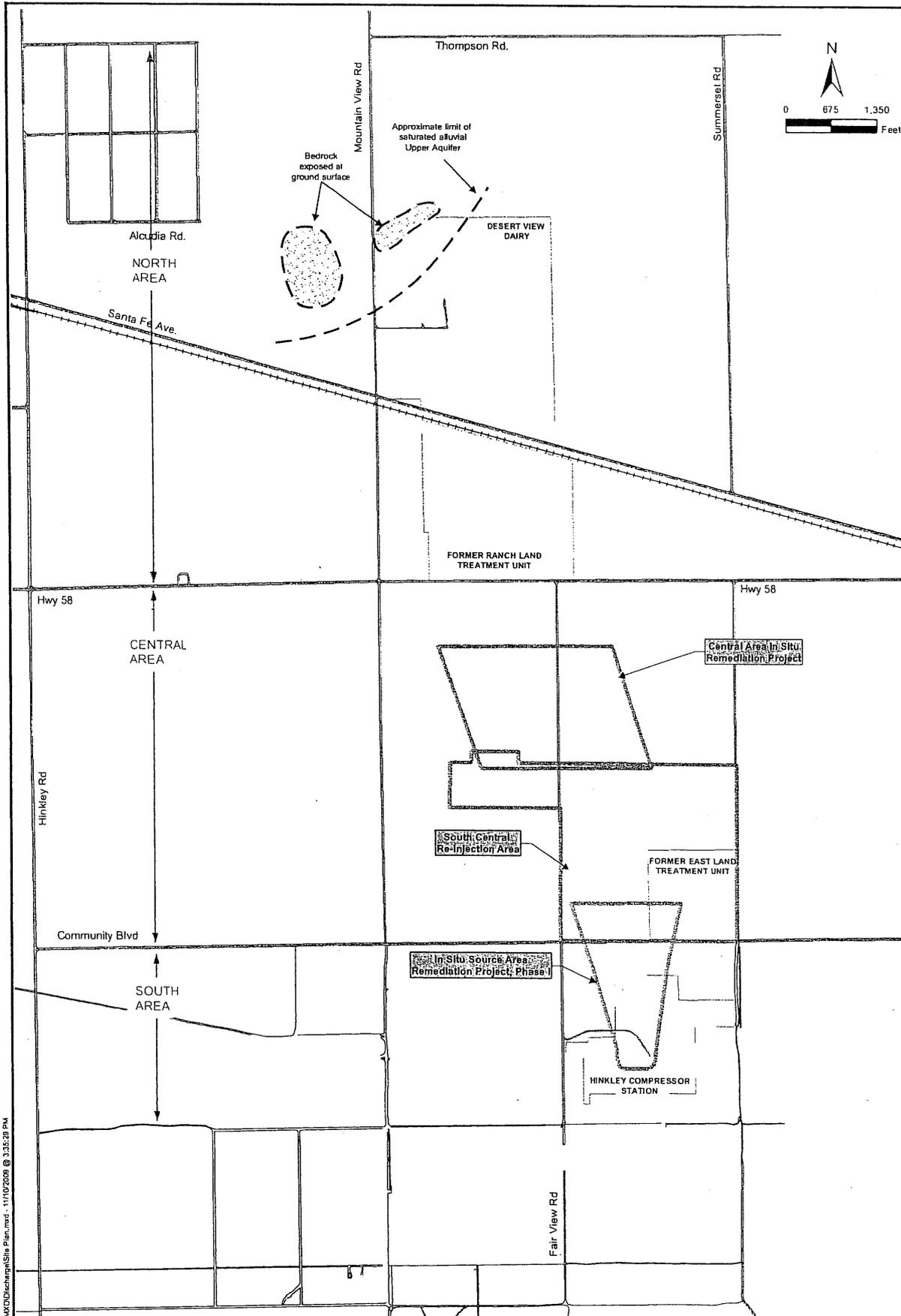
Notes:

¹ Threshold concentrations will be based on a 125 percent increase over the maximum baseline concentrations. Values presented here are based on maximum concentrations detected during baseline sampling of the existing monitoring well networks in the Central Area, Source Area, and South Central Re-injection Area. If elevated baseline concentrations are detected in new monitoring wells not influenced by the existing systems, threshold concentrations will be adjusted.

Abbreviations:

MCL
 µg/L
 mg/L

Maximum Contaminant Level
 micrograms per liter
 milligrams per liter



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Site Plan and Current IRZ Systems
 Pacific Gas and Electric Company
 Hinkley, California

Project Number
 RC000699.0001
 Date
 11/09/2009
 Figure
1

From: "Johnson, Eric" <EPJ1@PGE.COM>
To: "Chuck Curtis" <CCurtis@waterboards.ca.gov>, "Lisa Dernbach" <LDernbach@...>
Date: 2/11/2010 5:22 PM
Subject: PG&E responses to Board staff questions concerning proposed consolidation of IRZ permits
Attachments: 021110 IRZ NOI Revised Table 3.xls

<<021110 IRZ NOI Revised Table 3.xls>>

Chuck and Lisa:

Here are our responses to your questions.

Question 1: Table 2 proposes a monitoring well network for the project. We question why the deeper CA-MW-500 series wells are not included in the contingency program. In addition, it appears that wells to the west of the existing 500 series wells are needed, as well as one or more wells west of the 400 series sentry wells. In the southern portion of the project, wells SA-MW-20 through -22 appear to be needed in the program. Also in this area, it seems that wells SA-MW-01 through 05 or -06 through -10 are needed to evaluate the effectiveness of the source area treatment.

Response 1: The CA-MW-500 series wells included in Table 2 are the same wells that were specified in the current Central Area WDR/MRP. For consistency purposes, wells that were not included in the current MRP were not included on Table 2. However, PG&E agrees that all the deeper-screened 500-series wells are appropriate for inclusion in the MRP.

PG&E also agrees that monitoring wells to the west of the CA-MW-400 and CA-MW-500 series wells would be useful. As you are aware, it has not been possible to obtain access to install or monitor new wells in this area. During construction of the site-wide project, PG&E was unable to gain access to the properties needed to expand the well network to the west, as originally proposed in that NOI. Board staff was apprised of this situation, and agreed in an e-mail dated February 17, 2009 that monitoring of wells MW-37, MW-40, and MW-61 along with CA-MW-312 and CA-MW-412 would be sufficient. PG&E is willing to install one or more additional wells in this area, if your recent letter to the landowners results in better access.

Regarding wells SA-MW-20 to SA-MW-22, PG&E is willing to incorporate these into the compliance monitoring well network. However, it is anticipated that the compliance monitoring well network will need to be adjusted as the Source Area injection and extraction well network is expanded to the east.

Although not included in Table 2, PG&E agrees that continued sampling of key performance monitoring wells in the IRZ Area is important to monitor treatment effectiveness and optimize system performance. We propose that performance monitoring be performed at wells SA-MW-01 to SA-MW-10. The suggested monitoring frequency is annual, unless more frequent data is useful for system optimization. However, threshold criteria should not be assigned to performance monitoring wells.

Question 2: Table 3 presents proposed threshold concentrations for the project. The footnote for manganese, iron and chloride indicates, "Threshold concentrations will be based on a 125 percent increase over the maximum baseline concentrations." We can approve an increase of 25 percent over baseline, but not an increase of 125 percent over baseline. Please provide the Water Board the well data used for the proposed thresholds for these parameters.

Response 2: The revised Table 3 (attached) presents the maximum baseline concentrations that were detected in groundwater. These concentrations were used to determine the proposed threshold concentrations, also shown in Table 3. The threshold concentrations were calculated as 25 percent above the maximum baseline concentration. The "125 percent increase" was incorrectly phrased.

Additionally, PG&E is reviewing the laboratory analytical methods and field procedures currently used for iron, to assess the variability of iron concentrations reported in groundwater samples collected across the site. The results will be used to develop an appropriate iron threshold concentration against which we can evaluate potential impacts from IRZ system operation. In the interim, PG&E will report concentrations of iron that are over the 0.3 mg/l threshold that is presently set for iron - based on the California secondary Maximum Contaminant Limit for drinking water.

Eric Johnson
Hinkley Remediation Project Manager

Revised Table 3. Contingency Plan Threshold Concentrations
Notice of Intent for Coverage under a General Permit for Site-Wide Groundwater Remediation: In Situ Remediation Projects
 Pacific Gas and Electric Company Hinkley Compressor Station
 Hinkley, California

Monitoring Parameter	Proposed Threshold Concentration	Basis for Limit	Well ID	Sample Date	Maximum Baseline Concentration (mg/L)
Dissolved Arsenic	0.017 mg/L ¹	Federal Primary MCL	SC-MW-13D	4/13/2009	0.0138
Dissolved Manganese	0.789 mg/L ¹	Baseline Concentrations	SA-SM-03S	10/23/2007	0.631
Chloride	688 mg/L ¹	Baseline Concentrations	SC-MW-11S	4/24/2009	550
Dissolved Iron	0.3 mg/L ²	Secondary MCL	SC-MW-11S	4/24/2009	10.1 J
Eosine	100 µg/L	Color Detection			
Fluorescein	100 µg/L	Color Detection			

Notes:

¹ Threshold concentrations will be based on a 25 percent increase over the maximum baseline concentrations. Values presented here are based on maximum concentrations detected during baseline sampling of the existing monitoring well networks in the Central Area, Source Area, and South Central Re-Injection Area. If elevated baseline concentrations are detected in new monitoring wells not influenced by the existing systems, threshold concentrations will be adjusted accordingly.

² Based on January 25, 2010 correspondence with the LRWQCB, the secondary MCL for iron is being utilized as an interim threshold concentration. PG&E is reviewing laboratory analytical methods and field sampling techniques to assess potential sources of iron reported in groundwater. PG&E will propose an appropriate threshold concentration following completion of this evaluation.

Abbreviations:

- J Analyte was present, but reported value may not be accurate or precise.
- MCL Maximum Contaminant Level
- µg/L micrograms per liter
- mg/L milligrams per liter

