

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**REVISED MONITORING AND REPORTING
PROGRAM NO. R6V-2007-(PROPOSED)**

WDID NO. 6B369107001

FOR

**PACIFIC GAS AND ELECTRIC COMPANY
REVISED CENTRAL AREA IN-SITU
REMEDATION PILOT STUDY PROJECT**

San Bernardino County

I. MONITORING

Pre-Injection Groundwater Monitoring

- A. Clarification of terms: Injection wells and extraction wells comprise the recirculation system at the southern portion of Pilot Study Cell 3, in the upgradient groundwater flow direction (refer to Attachment 1). Groundwater flows to the northwest. Within 200 feet of the project's southern boundary are two rows of monitoring wells used to assess the in-situ remediation process. North of the monitoring wells are two rows of sentry wells. The sentry monitoring wells are being revised from locations of 180 and 400 feet in the downgradient groundwater flow direction from injection wells, to 400 and 800 feet. Contingency wells locations are also being revised to approximately 1,600 feet downgradient from injections wells, instead of 1,000 feet. The revised location of contingency wells is on the pilot study northern boundary. In addition, six pairs of nested wells are being included in the project to evaluate the vertical effect of remediation and potential mounding of injections cross gradient to groundwater flow. The revised well locations and nested well locations are shown in Table 1.

Table 1. Well Terms and Location

Wells	Location from Southern Boundary
Injection and Extraction	<100 ft (Treatment area) (CA-MW-100 & 200 series)
Monitoring Wells	<200 ft (CA-MW-100 & 200 series)
Sentry	400 & 800 ft (CA-MW-300 & 400 series)
Contingency	1,600 ft (CA-MW-500 series)
Nested (shallow and middle zone in upper aquifer)	1) At each end of injection well line (CA-MW-106 & 107 & CA-MW-101 & 108). 2) Near each end of 1 st row of sentry wells (CA-MW-301 & 302 and CA-MW-310 & 311). 3) Along center line of groundwater flow through 1 st and 2 nd rows of sentry wells (CA-MW-305 & 306 and CA-MW-405 & 406)

03-0029

- B. Collect background data prior to the initial injection to groundwater for the tracer test and in-situ remediation. Sample all monitoring wells and extraction wells for the constituents listed in Table 2. In addition, collect field measurements for pH, specific conductance, temperature, dissolved oxygen, and oxidation-reduction potential (ORP).
- C. The depth to groundwater shall be determined to at least 0.01-foot increments in all wells sampled prior to the initial injection.

Tracer Test

- A. Maintain a log of the volume and concentration of the tracers (potassium bromide, fluorescein, and eosin) injected in Cell 3. Record the volume of distilled water injected for dilution of initial injected concentration, if used. Calculate the diluted concentration of tracers following distilled water injection.
- B. During tracer testing, maintain a log recording the date, time, monitoring or extraction well location, and measured bromide tracer concentration from field probes or note color observation for fluorescein and eosin.
- C. Collect groundwater samples from monitoring wells for laboratory confirmation of potassium bromide, fluorescein, eosin, and other constituents listed in Table 2. The reporting limit for each constituent shall be in accordance to limits listed in Table 2.
- D. Following injection of tracers, concentrations will be monitored in the first and second row of downgradient monitoring wells, i.e., the CA-MW-100 and 200 series. If tracers are detected, additional downgradient and cross-gradient monitoring wells must be sampled in the subsequent sampling event until the non-detect boundary line is defined. Where detected, tracers must continue to be monitored in subsequent sampling events, until the concentrations decline below 100 micrograms per liter for two consecutive sampling events.

Post-Injection Groundwater Monitoring

- A. Monitoring wells shall be sampled at the mid-screen length after the initial reagent injection for the constituents in Table 2 below. Water analysis for chloride is only required if hydrochloric acid is injected into wells for screen rehabilitation. Water analysis for bromide, fluorescein, and eosin is only required if injected for tracer testing.

All groundwater monitoring wells, sentry wells, and contingency wells shall be sampled for the following constituents using the methods provided below:

TABLE 2. Monitoring Parameters

Constituents	Analytical Method	Reporting Limit (mg/L)
Total Chromium	EPA 6010	0.005
Hexavalent Chromium	EPA 7199	0.001
Bromide*, Chloride**	EPA 300	0.1
Methane	RSK 175	0.002
Eosin*	spectrofluorophotometer	0.008
Fluorescein*	spectrofluorophotometer	0.002
Ethanol	EPA 1400	10
Total Organic Carbon	EPA 415.1	1.0
Volatile fatty acids (VFA)***	EPA 300.M	1.0
Calcium, Sodium, Magnesium	EPA 200.7	1.0
Bicarbonate Alkalinity	EPA 310.1	10
Phosphorus (as phosphate)	EPA 300	0.1
Ammonia	EPA 350.2	10
Nitrate/Nitrite	EPA 300	0.02
Sulfate	EPA 300	1.0
Sulfide	EPA 376.1	1.0
Dissolved iron	EPA 6010	0.05
Manganese	EPA 6010	0.01
Arsenic	EPA 6010	0.01
pH	EPA 150.1	1-14
pH, Bromide, temperature, dissolved oxygen, specific conductance, ORP	Field measurements	

Notes:

*To be analyzed only if tracers are discharged at site

**To be analyzed only if hydrochloric acid is discharged at site

***Includes lactate acid (lactate), acetate, pyruvate, prionate, butyrate

- B. The depth to groundwater shall be determined to at least 0.01-foot increments according to the monitoring frequency identified in Table 3 until the end of the pilot study.
- C. Monitoring wells, installed downgradient of the treatment zone, shall be used to assess tracer migration and in-situ bioremediation efficiency. Sentry wells and contingency wells shall be used to verify hexavalent chromium transformation in groundwater. Sentry and contingency wells shall also be used to confirm bioremediation effectiveness, tracer diffusion, potential mobilized metals, and other constituents.

Table 3 shows the monitoring frequency to be implemented at the monitoring wells, sentry wells, and contingency wells, based upon an estimate groundwater velocity in the treatment zone of up to 4 feet per day.

Table 3. Monitoring Frequency

Monitoring Location	Begin Sampling
1 st & 2 nd rows monitoring wells	30 days after initial tracer or reagent injections and then monthly for three more months. Quarterly sampling thereafter.
1 st row sentry wells (400 ft)	60 days (2 months) after initial injections and then monthly for two more months. Quarterly sampling thereafter.
2 nd row sentry wells (800 ft)	120 days (4 months) after initial injections and then quarterly sampling thereafter.
Contingency wells (1,600 ft)	10 months after initial injections and then quarterly thereafter.

D. Contingency Plan

The injection of lactate, whey, EVO, and 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. For instance, like hexavalent chromium, iron, manganese, and arsenic may also reduce and become mobilized in groundwater. In addition, reducing conditions may generate gases, such as methane and hydrogen sulfide. Water samples will be collected from the sentry and contingency wells during routine sampling discussed before in Item B. If any of the reagents, mobilized metals, or tracers are found at elevated concentrations at or downgradient of sentry wells or elevated levels of gases are found in any well, the following contingency plan will be implemented:

Mobilized Constituents in Groundwater: In the event that any of the parameters are detected at trigger concentrations (refer to Table 4) at a sentry well, reagent injection will be scaled back by at least half the original amount or volume, or completely halted within 5 working days of receipt of laboratory results. In addition, if any of the parameters are detected above trigger concentrations in the second row of sentry wells, located 800 ft from the recirculation system, the Discharger will notify the Water Board within 5 days. The Discharger will then consult with the Water Board staff to determine if these results are likely to indicate the potential for migration beyond the pilot test boundaries. If necessary, and directed by Water Board staff, the Discharger must implement the Contingency Plan (refer to Table 5). In the latter case, injections must be scaled back or halted within 5 days of

consulting with Water Board staff. Within 14 days of being notified by Water Board staff, the Discharger must begin the process of implementing air sparging or another equally effective remediation method for the constituent exceeding the water quality standard. The chosen remediation method must be in operation within 120 days of notification by Water Board staff. The chosen remediation method must restore the aquifer to pre-pilot study conditions and restore water quality to levels listed in waste discharge requirements, preventing migration outside the pilot study boundaries.

In the event that any of the parameters listed in Table 4 are detected at water quality standards in contingency monitoring wells on the pilot study boundaries, the applicant will notify the Water Board within two working days of receipt of laboratory results of violations being detected. Within 14 days of notification, the Discharger will submit a proposal to the Water Board to contain such migration outside the pilot study boundaries. The proposal shall include a monitoring plan to adequately monitor groundwater outside the pilot study boundaries downgradient of the area where violations were observed.

The proponent shall maintain a field log noting when and how the Contingency Plan is implemented.

TABLE 4
Contingency Plan Threshold Concentrations

Parameter	Aqueous Concentration (mg/L)
Hexavalent & Total Chromium	*
Reagents or VFAs ¹	10
Arsenic ²	0.01
Bromide ^{3†}	2.3
Chloride [†]	*
Eosin [†]	0.1 ⁶
Ethanol [†]	760
Fluorescein [†]	0.1 ⁶
Iron (Fe ²⁺ and Fe ³⁺) ⁵	0.3
Manganese	**

Note:

¹Volatile Fatty Acids; includes lactic acids, acetate, pyruvate, propionate, and butyrate. Standard based on bench-scale study results.

²Federal Primary MCL for drinking water

³Federal Suggested No-Adverse-Response Level (SNARL)

⁴Taste and Odor Threshold

⁵California Secondary MCL for drinking water

⁶Color Detection

†to be analyzed if hydrochloric acid or applicable tracer is used

*Concentration limit to be set based upon the maximum background concentration detected in groundwater, as demonstrated in quarterly monitoring reports

**Concentration limit to be set at 125 percent of the maximum background concentration measured in groundwater prior to initial injection of reagents

**TABLE 5.
Contingency Plan Schedule**

Task	Schedule
Notify Water Board staff	Within 5 days of lab results for sentry wells
Scale back or halt reagent, tracer, or well rehabilitation compounds injections	Within 5 days of notification by Water Board staff that the Contingency Plan must be implemented.
Begin process ¹ of Implementing air sparging or other equally effective remediation method	Within 14 days of notification by Water Board staff that the Contingency Plan must be implemented.
Activate air sparging or alternate remediation method in groundwater	Within 120 days of notification by Water Board staff that the Contingency Plan must be implemented.
Notify Water Board staff	Within 2 days of lab results showing exceedence of water quality standards at contingency wells
Submit proposal to prevent migration outside of pilot study boundaries and to conduct monitoring beyond contingency wells.	Within 14 days of notification to Water Board for contingency wells

¹ prepare designs, apply for drilling permit, order necessary parts and equipment, etc.

E. Mobile Air Monitoring Program

Air monitoring shall be conducted in accordance with the following air monitoring program to evaluate the potential production of gases created from anaerobic reducing conditions. Air monitoring shall include a hand-held instrument that is capable of detecting hydrogen sulfide at a concentration of one part per billion. Odors shall be recorded in a log to document potential nuisance conditions.

Monitor for gases in general atmosphere and in monitoring wells and extraction wells prior to collecting water elevation data and groundwater samples. If air monitoring indicates that a gas is present, additional air sampling shall be conducted to determine risk to field personnel. If a risk is indicated, appropriate safety equipment shall be worn before proceeding to ventilate wells. After wells are ventilated, conduct air monitoring until safe levels are reached for at least 5 minutes. If gas levels or odors do not recede, reagent injections shall be reduced or halted until air monitoring indicates gases are at safe levels and odors have been abated.

II. REPORTING REQUIREMENTS

Quarterly status reports and the project completion report shall be submitted to the Water Board in accordance to the schedule listed in Board Order No. R6V-2007-(PROPOSED).

Ordered by: _____ Dated:
HAROLD J. SINGER
EXECUTIVE OFFICER

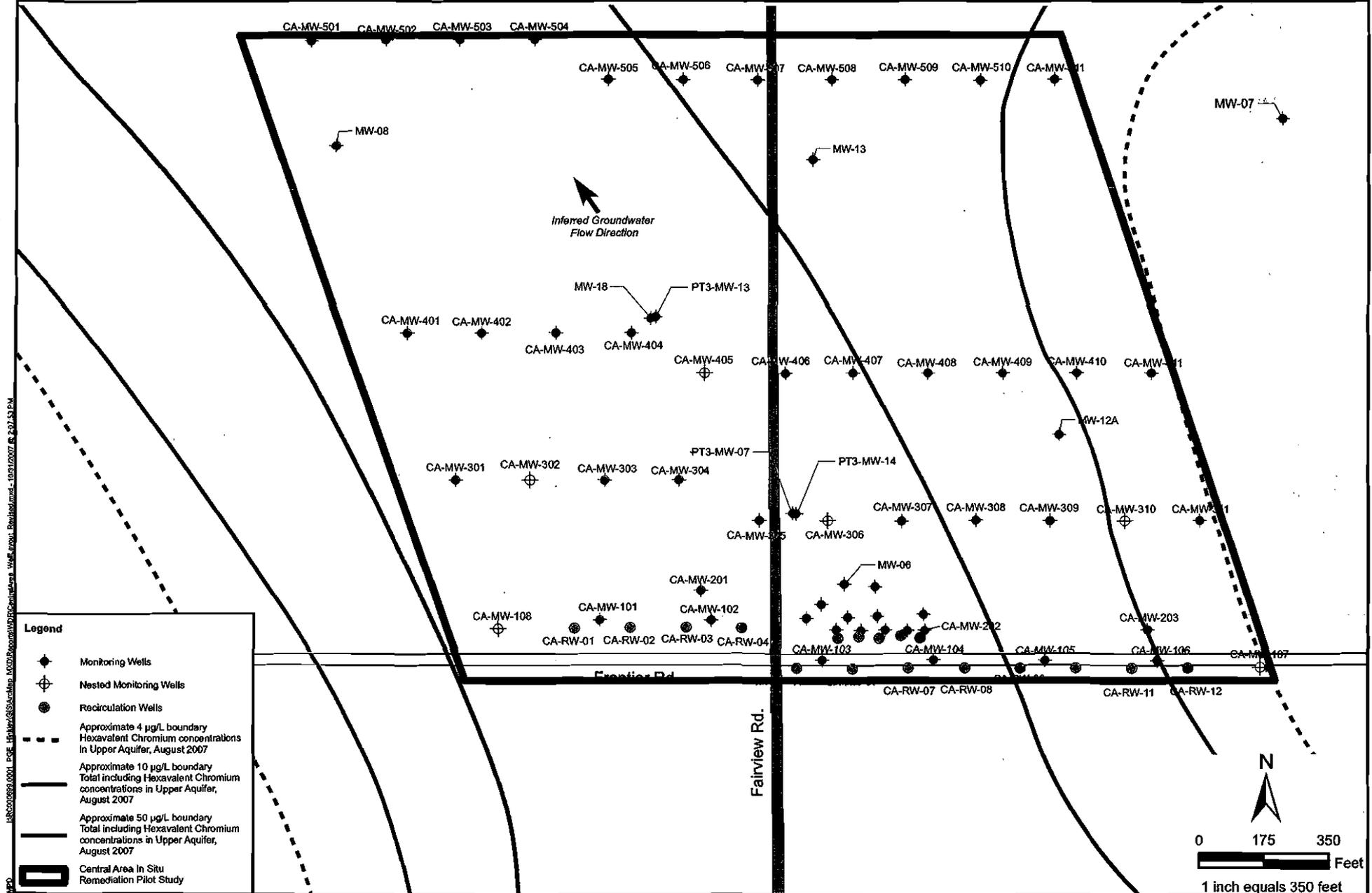
Attachment: Figure of Well Locations

(PG&E, Proposed Rev Central Area WDRM&R 10-30-07)

Proposed

ATTACHMENT

03-0036



Legend

- ◆ Monitoring Wells
- ⊕ Nested Monitoring Wells
- Recirculation Wells
- - - Approximate 4 µg/L boundary Hexavalent Chromium concentrations in Upper Aquifer, August 2007
- Approximate 10 µg/L boundary Total including Hexavalent Chromium concentrations in Upper Aquifer, August 2007
- Approximate 50 µg/L boundary Total including Hexavalent Chromium concentrations in Upper Aquifer, August 2007
- ▭ Central Area In Situ Remediation Pilot Study

Program Manager
Lisa Cope

Project Manager
Eric Putnam

Task Manager
Hollis Phillips

Technical Review
Frank Lenzo

ARCADIS

155 Montgomery Street, Suite 1500
San Francisco, California 94104
Tel: 415 374 2744
Fax: 415 374 2745
www.arcadis-us.com

**Well Layout
Revised Central Area In Situ
Remediation Project**

Pacific Gas and Electric Company: Hinkley Compressor Station
Hinkley, California

ATTACHMENT
B

03-0037
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ENCLOSURE 2

03-0038



**Pacific Gas and
Electric
Company**

Eric P. Johnson
Hinkley Remediation Project
Manager
Gas Transmission and
Distribution

350 Salem Street
Chico, CA 95926
(530) 520-2959 (cell)
(530) 896 4285 (office)
(530) 896 4657 (fax)
epj1@pge.com

October 10, 2007

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

Subject: Comments on Tentative Revised Waste Discharge Requirements for the Central Area In Situ Remediation Pilot Study Project

Dear Mr. Curtis:

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to review and comment on the tentative revised Waste Discharge Requirements (WDRs) for the Central Area In Situ Remediation Pilot Study Project at the Hinkley Compressor Station. PG&E concurs with the planned action to adopt the revised WDRs for the Central Area at the Board Meeting in November 2007. We have the following comments on the tentative revised WDRs. The majority of these comments are text edits for clarity; however, there are also a few technical comments for your consideration.

Board Order

1. **Page 3, Section 7.** The text, "Biofouling of the injection well, however, reduced the flow rate of lactate to the aquifer. Bromide used as a tracer experienced limited movement laterally from the injection well, providing only limited information of groundwater flow conditions. Information was able to show a range of groundwater velocities. These velocities suggested greater than expected flow conditions between injection and extraction wells, indicated shorten travel time...", should be changed to "Groundwater velocities downgradient of the recirculation system were estimated using hydraulic properties calculated from the breakthrough of tracer in the pilot test. These velocities suggested greater than expected flow conditions between the line of injection and extraction wells and downgradient monitoring wells, indicating a shorter travel time..." This edit will clarify that the breakthrough of the tracer, despite the fouling of the injection well, was used to estimate hydraulic parameters, i.e. mobile porosity, and groundwater velocities downgradient of the recirculation system, rather than between the injection and extraction wells.

03-0039

2. **Page 3, Section 11.** The maximum concentration of hexavalent chromium during the June 2006 baseline sampling was 334 µg/L detected in PT3-MW-11, rather than 325 µg/L.
3. **Page 6, Section 21, Third Paragraph.** “If either tracer migrates” should be changed to “As tracer migrates” and the sentence describing attenuation should be changed to, “By the time groundwater travels 800 feet to the second row of sentry monitoring wells, tracer concentrations are expected to be less than 0.1 mg/L and no color should be detected.”
4. **Page 6, Section 21, Fifth Paragraph of Section.** The second sentence should be changed to, “In addition, concentrations of reagents are designed to ensure anaerobic conditions will be created throughout the treatment zone, while minimizing the potential to produce byproducts.”
5. **Page 7, Section 24.** Reference should be to section 23, rather than section 22.
6. **Page 8, Section I.A.1.** The second sentence should be edited to read “These revised WDRs additionally allow for the discharge of...”
7. **Page 8, Section I.A.1.** “acids for well rehabilitation” should be changed to “compounds for well rehabilitation,” in order to be inclusive of the bases and hydrogen peroxide.
8. **Page 8, Section I.A.1.** The requirement to pilot test ethanol should be removed. Lactate was previously pilot tested and ethanol is expected to have similar results as lactate, as detailed in information submitted to Harold Singer on September 24, 2007.
9. **Page 8, Section I.A.3.** We would prefer to set the discharge limits for well rehabilitation compounds on volumes alone, rather than concentrations. If concentrations are required, the maximum concentration should be increased to 7% rather than 5% because based on experience, maximum effectiveness is achieved at 7%.
10. **Page 8, Section I.A.4.** The requirement to pilot test ethanol should be removed, and the following text should be added, “The volume will be blended into groundwater recirculated within the injection zone.”
11. **Page 8, Section I.B, Second Paragraph.** The last text in the paragraph, “outside the pilot study boundaries,” should be moved to follow “The groundwater quality” in the first sentence for clarity.
12. **Page 9, Section I.B.2.** Add text, “outside the pilot study boundaries” after “Groundwaters” in the first sentence.
13. **Page 9, Section I.B.4.** Add text, “outside the pilot study boundaries” between “concentrations” and “that individually”.
14. **Page 9, Section I.B.5.** This section should be removed, because the concentration limits for hexavalent chromium and total chromium have been removed from the WDRs.

15. **Page 10, Concentration and Reporting Limits Table.** The note on the dissolved manganese concentration should be changed to, "Concentration limit to be set at 125 percent of the maximum background concentration measured in groundwater prior to the initial injection of reagents."
16. **Page 11, Section I.D.6.** This section should be removed as it appears to be a vestige of an earlier draft.
17. **Attachments A and B.** Updated Attachments A and B for the revised WDRs are attached to this letter. Please replace the Attachments in the tentative revised WDRs with these figures.

Monitoring and Reporting Program

18. **Page 1, Table 1.** Nested wells were located in the Central Area as listed in Table 1 of the tentative revised WDRs where possible. However, in some instances the lower permeable unit did not exist at the ends of the rows of wells. In those cases, nested wells were constructed at the location closest to the end of the row that did have two permeable units. To clarify this in the text, the well IDs should be included in the nested well location description in Table 1 as follows:
 - 1) At each end of the injection well line (CA-MW-107 and CA-MW-108).
 - 2) In the first row of sentry wells (CA-MW-302, CA-MW-306, and CA-MW-310).
 - 3) In the second row of sentry wells (CA-MW-405).
19. **Page 2 Section I. Tracer Test, B.** The requirement to maintain a log of tracer concentrations measured with a field probe should be removed, because fluorescein and eosine will not be measured with a field probe.
20. **Page 2 Section I. Tracer Test, D.** For clarity, we propose that this section should be changed to, "Following injection of tracers, tracer concentrations will be monitored in the first row of downgradient monitoring wells, i.e. the CA-MW-100 series. If tracers are detected, additional downgradient wells must be sampled in the subsequent sampling event until the non-detect boundary line is defined. Where detected, tracers will continue to be monitored in subsequent sampling events, until the concentrations decline below 100 micrograms per liter."
21. **Page 2, Section I. Post-Injection Groundwater Monitoring, A.** To make this section consistent with Tracer Test, D, the statement "Water analysis for bromide, fluorescein, and eosine is only required if injected for tracer testing," should be added to the end of the first paragraph and these constituents should be removed from Table 2.
22. **Page 3, Table 2.** "Dissolved Organic Carbon" should be changed to "Total Organic Carbon" to make it consistent with the rest of the document.
23. **Page 3, Section I. Post-Injection Groundwater Monitoring, C.** The requirement to pilot test ethanol should be removed, as discussed above.
24. **Page 4, Section I. Post-Injection Groundwater Monitoring, D, Second Paragraph.** Replace the second sentence with the following: "In addition, if any of the parameters are detected above trigger concentrations in the second row of sentry wells, 800 feet from the

recirculation system or in situ reduction zone, the Discharger will notify the Water Board within 5 working days. The Discharger will then consult with the Water Board staff to determine if these results are likely to indicate the potential for migration of constituents beyond the pilot test boundaries. If necessary, the Board will then direct the Discharger to implement the Contingency Plan for air sparging (refer to Table 5)."

25. **Page 4, Section I. Post-Injection Groundwater Monitoring, D, Second Paragraph.** The time to implement air sparging should be changed from 90 days to 180 days in this paragraph and in Table 5 to allow for system design, construction, installation, and shakedown.
26. **Page 5, Section I. Post-Injection Groundwater Monitoring, D, Third Paragraph of Section.** The time to submit a proposal to the Water Board to prevent migration outside the project boundaries should be changed from seven to 30 days in this section and Table 5.
27. **Page 5, Table 4.** The note on the dissolved manganese concentration should be changed to, "Concentration limit to be set at 125 percent of the maximum background concentration measured in groundwater prior to the initial injection of reagents." Both iron and manganese should be listed as "dissolved" iron and manganese. Tracers, bromide, fluorescein, and eosine should be removed from Table 4. The tracers were not included in the original WDR, and the contingency plan, i.e. air sparging, is not applicable to tracers.
28. **Page 6, Table 5 –** To clarify that implementation in the field will not be required within 14 days, the second item in Table 5 should be changed to, "Begin process¹ of implementing air sparging or other equally effective remediation method."
29. **Page 6, Section I.E., Second Paragraph, Line 5.** "indicted" should be changed to "indicated."
30. **Pages 6 and 7, Section II.** All of the text regarding reporting on ethanol pilot testing should be removed from this section.

Thank you for allowing PG&E the opportunity to comment on the tentative revised WDRs. If you have any question, or need additional information, please do not hesitate to call me.

Sincerely,

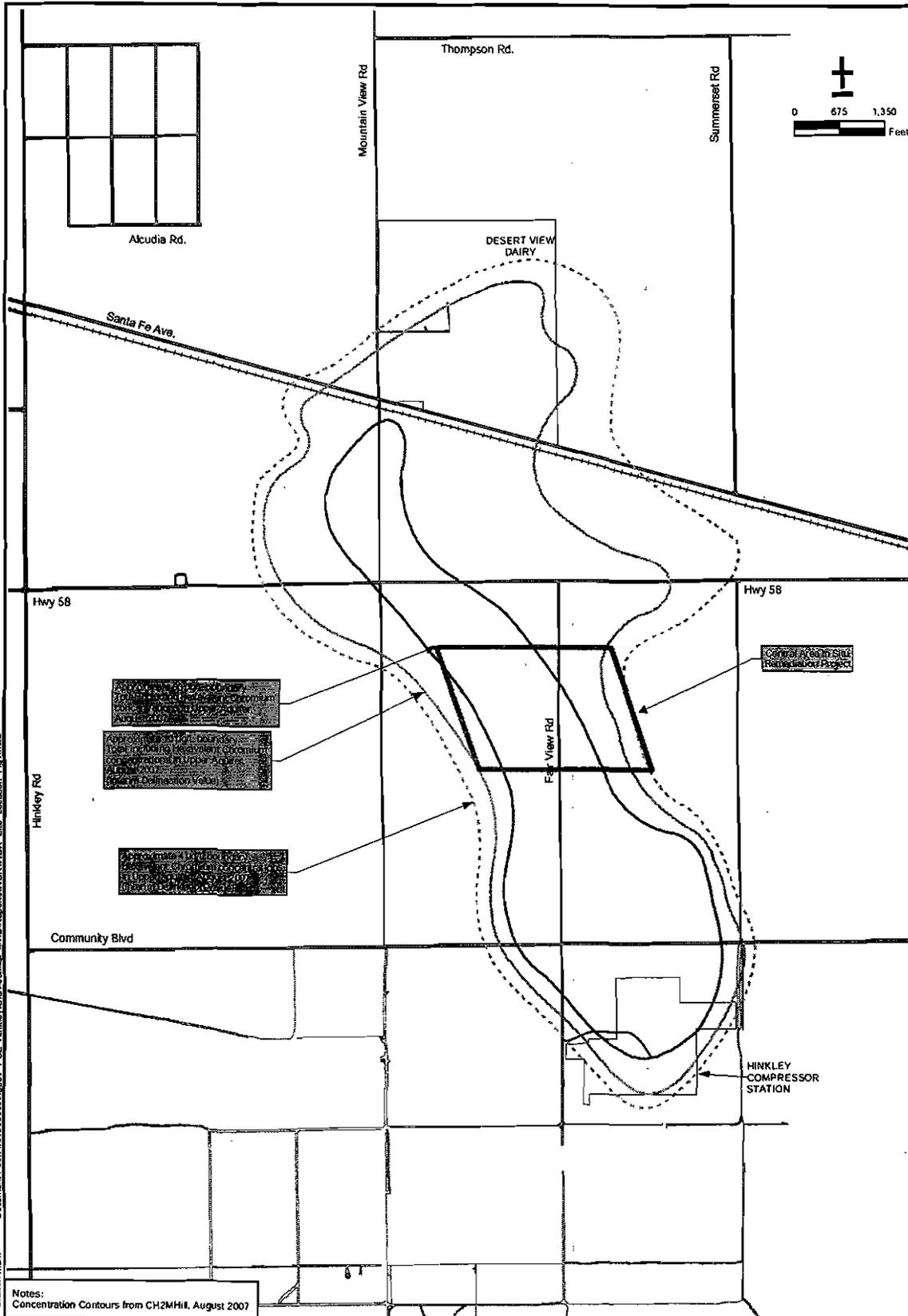


Eric P. Johnson
Hinkley Remediation Project Manager

Enclosure (Updated Attachments A and B)

cc: Lisa Dernbach, RWQCB Lahontan Region, South Lake Tahoe

03-0042



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 Drafter: MLM

Notes:
 Concentration Contours from CH2MHILL, August 2007

Date: 05/07/2007
 Program Manager
 Lisa Cope
 Project Manager
 Eric Putnam
 Task Manager
 Hollis Phillips
 Technical Review
 Frank Lenzo

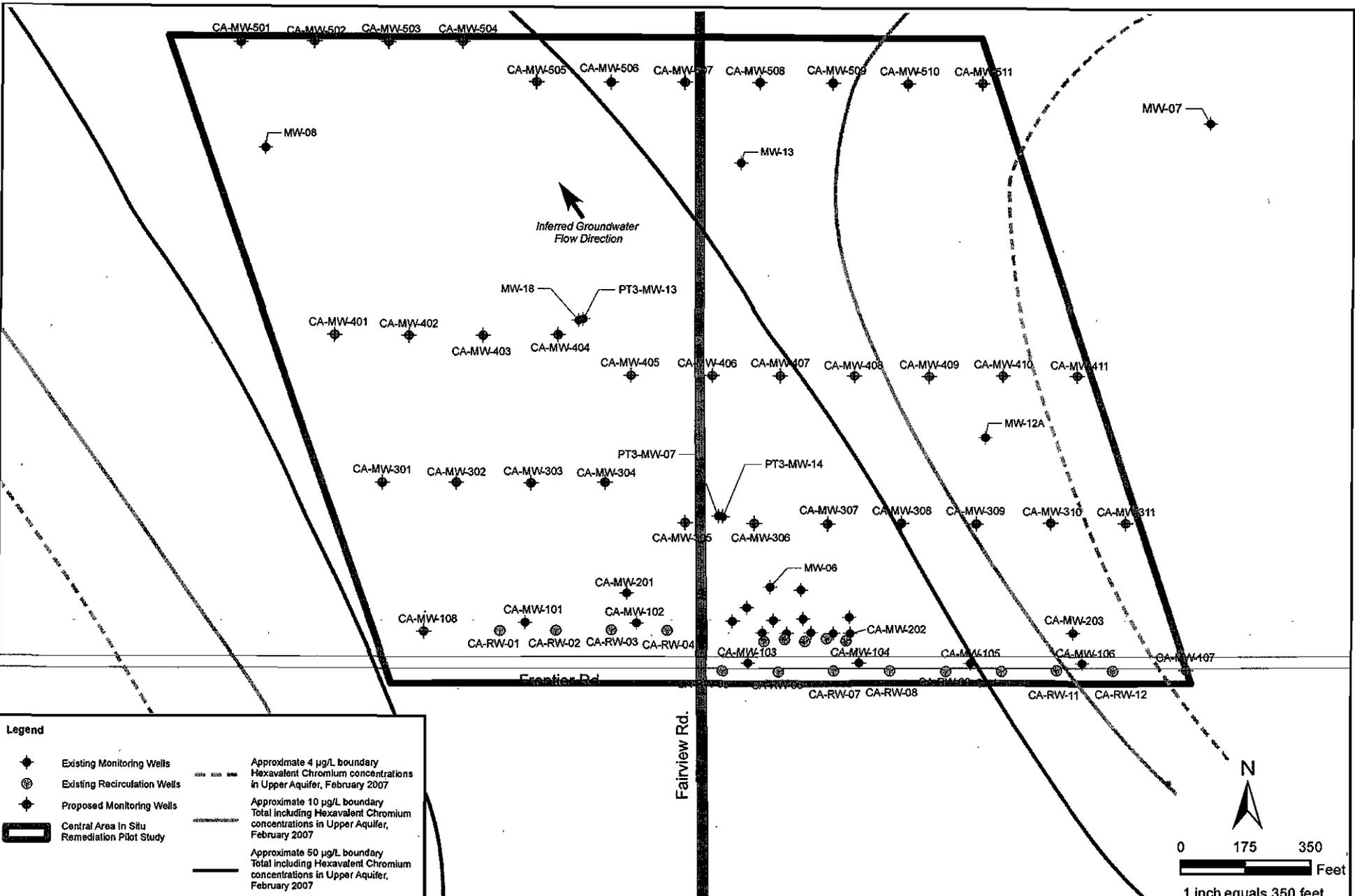

 155 Montgomery Street, Suite 1500
 San Francisco, California 94104
 Tel: 415 374 2744
 Fax: 415 374 2745
 www.arcadis-us.com

Site Plan
 Revised Central Area In Situ
 Remediation Project
 Pacific Gas and Electric Company: Hinkley Compressor Station
 Hinkley, California

ATTACHMENT

 A

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Legend

- ◆ Existing Monitoring Wells
- ⊕ Existing Recirculation Wells
- ◆ Proposed Monitoring Wells
- ▭ Central Area In Situ Remediation Pilot Study

- - - - - Approximate 4 µg/L boundary Hexavalent Chromium concentrations in Upper Aquifer, February 2007
 - - - - - Approximate 10 µg/L boundary Total including Hexavalent Chromium concentrations in Upper Aquifer, February 2007
 - - - - - Approximate 50 µg/L boundary Total including Hexavalent Chromium concentrations in Upper Aquifer, February 2007

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Lisa Cope

Project Manager
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Technical Review
Frank Lenzo



155 Montgomery Street, Suite 1500
San Francisco, California 94104
Tel: 415 374 2744
Fax: 415 374 2745
www.arcadis-us.com

**Well Layout
Revised Central Area In Situ
Remediation Project**

Pacific Gas and Electric Company; Hinkley Compressor Station
Hinkley, California

ATTACHMENT
B

03-0044

ENCLOSURE 3

03-0045



California Regional Water Quality Control Board Lahontan Region



Linda S. Adams
Secretary for
Environmental Protection

2501 Lake Tahoe Boulevard, South Lake Tahoe, California 96150
(530) 542-5400 • Fax (530) 544-2271
www.waterboards.ca.gov/lahontan

Arnold Schwarzenegger
Governor

NOV 13 2007

Eric P. Johnson
Pacific Gas and Electric Company
350 Salem Street
Chico, CA 95926

RESPONSE TO PG&E COMMENTS ON TENTATIVE WASTE DISCHARGE REQUIREMENTS FOR THE REVISED CENTRAL AREA IN-SITU REMEDIATION PILOT STUDY, PG&E COMPRESSOR STATION, HINKLEY, SAN BERNADINO COUNTY

Thank you for your October 10, 2007 comments on the Tentative Waste Discharge Requirements (WDR) and the Monitoring and Reporting (M&R) Program for the Revised Central Area In-Situ Remediation Pilot Study (Project) at the PG&E Compressor Station, Hinkley.

The comments list 17 areas of recommended changes to the proposed WDR and 13 areas of recommended changes to the proposed Monitoring and Reporting Program. Water Board staff has reviewed your comments and provides responses below (not in numerical order).

Responses to WDR Comments

1. Comments Nos. 1-7, 22, 28 and 29 provide suggested edits and clarification to language in the WDR.

Response: We concur with the comments and have made the requested changes in the proposed WDR.

2. Ethanol pilot testing (Comment Nos. 8, 10, 23, 30): The Discharger objects to the requirement to conduct pilot testing prior to implementing full-scale discharge of up to 400,000 gallons of ethanol. The basis for the objection is that the Discharger had provided information to the Water Board showing that ethanol break down is similar to that of lactate. Requests that references to ethanol pilot testing be removed from the WDR and M&R.

Response: The sections referencing ethanol pilot testing have been removed from the proposed WDR and M&R.

3. Comments Nos. 9, 11, 15, and 17 provide suggested edits and clarification to language in the WDR.

Response: We concur with the comments and have made the requested changes in the proposed WDR.

4. Comment Nos. 12-13 (Section 1.B.2 & 4.): Suggests adding text, "outside the pilot study boundaries" in the first sentence of each subsection to clarify the receiving water limitation.

Response: The suggested text would be redundant since the opening paragraph under Receiving Water Limitations states that, "The discharge of waste shall not cause a violation of any applicable water quality standards outside the pilot study boundaries." Therefore, the suggested text will not be added as suggested.

5. Comment No. 14 (Page 9, Section 1.D.5.): Comment requests that under Receiving Water Limitation, this section be removed stating that the migration of hexavalent and total chromium outside the project boundaries shall not exceed the maximum background concentrations.

Response: The limitation on preventing the migration of chromium outside the project boundaries in concentrations greater than background is necessary to ensure that pilot study activities do not add more chromium to receiving waters than what is there already. Such an instance is possible if pilot study discharges cause trivalent chromium in soil to convert to hexavalent chromium, causing total chromium concentration to increase in groundwater above background concentrations. The section is relevant for the project and will remain in the proposed WDR.

6. Comment No. 16--General Requirements and Prohibitions (Page 11, Section 1.D.6): Comment notes that paragraph regarding maintaining the integrity of the land treatment unit should be removed as it is a vestige of an earlier draft.

Response: The requirement to maintain the integrity of the LTU refers to items that make up the project area for the purpose of complying with the proposed WDR. For instance, the prohibition prevents the removal of monitoring wells that would prevent the discharger from complying with requirements in the M&R. Thus, the requirement is applicable and relevant for the project and will remain in the proposed WDR.

7. Comment No. 18 (Page 1, Table 1, M&R): States that Discharger's attempts to install some nested monitoring wells at locations specified in the tentative WDR were not possible due to local geology. Suggests language that some nested well were installed at alternate locations that are nearby to the locations listed in the tentative WDR. These alternate locations are still able to meet the monitoring intent for conducting multi-depth sampling within the Upper Aquifer.

Response: Water Board staff acknowledges the Discharger's attempts to install nested monitoring wells at locations specified in the tentative WDR. We agree that the nested wells installed at alternate and nearby locations will be able to meet the intent of the monitoring requirement. Therefore, the proposed M&R will cite the monitoring well numbers and list the alternate locations.

8. Comment No. 19 (Tracer Test, M&R): Comment states that the requirement to maintain a field log of tracer measurements with a field probe should be removed because fluorescein and eosine concentrations cannot be measured in the field.

Response: Water Board staff concurs that tracer dye concentrations cannot be measured in the field. But since color can be observed, the requirement to maintain a field log will remain in the proposed M&R with the following corrected language, "During tracer testing, main a field log recording the date, time, monitoring or extraction well location, and color observation (or lack thereof) for fluorescein and eosine."

9. Comment No. 20 (Tracer Test, M&R): Provides suggested clarification to language in the M&R for tracer monitoring.

Response: Water Board staff concurs with the suggest clarification. In addition, the last sentence in the paragraph will specify that tracer monitoring shall continue, "until the concentrations decline below 100 micrograms per liter for two consecutive sampling events."

10. Comment No. 21 (Post-injection Groundwater Monitoring, M&R): To make this section consistent with Tracer Test D (Comment 20), suggests adding the statement, "Water analysis for bromide, fluorescein, and eosine is only required if injected for tracer testing," and these constituents should be removed from Table 2.

Response: Water Board staff concurs with the suggested language but not to removing the tracer constituents from Table 2. Rather, the tracer constituents must remain in Table 2 so that the laboratory analytical methods and reporting limits are specified. A symbol will be placed next to each tracer constituent in the table noting that analysis is requirement only when that tracer is injected at the site.

11. Comment Nos. 24-26 (Contingency Plan, Pages 4-5, M&R): Offers suggested language concerning corrective actions in the Contingency Plan and an extended timeframe for implementing those actions.

Response: Water Board Staff concurs with the suggested language changes in the Contingency Plan but not with the proposed extended implementation schedule. Staff believes that doubling to quadrupling the implementation schedule is excessive and does not take into account the potential threat to nearby (within 700 feet) residences and domestic wells to the project boundaries.

Board staff, however, does agree that it is reasonable to extend the schedule of some corrective actions but to a lesser extent than what was suggested. For instance, rather than extend the schedule from 5 to 30 days for implementing the Contingency Plan, we believe the plan could be implemented within 14 days. And instead of changing the time from 90 to 180 days to begin operating air sparging or another remediation method to prevent constituent migration outside the pilot study boundaries, we believe that 120 days is reasonable.

12. Comment No. 27 (Table 4, M&R): Suggests that the note in this section be changes to account for varying concentrations of background manganese. Also, recommends that the word, "dissolved" be place before iron and manganese. And, lastly, recommends that tracers, bromide, fluorescein, and eosin, be removed from the table as they were not in the original WDR and because the contingency plan, i.e., air sparging, is not applicable to tracers.

Response: Water Board staff concurs with the suggested language concerning the note for background manganese concentration and will make the change. The suggestion to add the word, "dissolved" before iron and manganese, however, is unnecessary because the second column in the table adequately clarifies that listed constituents are aqueous concentrations. Staff also does not agree that listed tracer constituents should be removed from Table 4. The constituents shall remain in the table due to the potential threat to nearby residences and domestic wells in the chance that tracers are detected in contingency wells. The contingency plan will include a statement that corrective action proposals must be appropriate for the detected constituent(s) found in contingency wells.

You will be receiving a copy of the proposed WDR within a few days. The proposed WDR and negative declaration are still scheduled to be brought before the Water Board for consideration on November 28, 2007, in Barstow.

Please contact Lisa Dernbach at (530) 542-5424 or me at (530) 542-5460, if you should have any questions.



Chuck Curtis, P.E.
Cleanup and Enforcement Division Manager

C: Mailing List