# Hinkley Remediation Semiannual Status Report (July through December 2009)

## PG&E Compressor Station, Hinkley, California

Prepared for

## California Regional Water Quality Control Board, Lahontan Region

On behalf of

## Pacific Gas and Electric Company

March 31, 2010

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March 31, 2010

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Subject: Transmittal of Hinkley Remediation Semiannual Status Report (July through December 2009), Pacific Gas and Electric Company (PG&E) Groundwater Remediation Program, Hinkley, California

Dear Mr. Curtis:

Enclosed is the *Hinkley Remediation Semiannual Status Report (July through December 2009), PG&E Groundwater Remediation Program, Hinkley, California* as required by the California Regional Water Quality Control Board, Lahontan Region Cleanup and Abatement Order No. R6V-2008-0002 dated August 6, 2008. The Cleanup and Abatement Order requires PG&E to provide Semiannual Status Reports on all actions taken to remediate chromium levels in groundwater and contain plume migration at the Hinkley site. This Semiannual Status Report contains information derived from the ongoing remediation programs in Hinkley: the Desert View Dairy Land Treatment Unit, the Northwest Area Extraction Wells and South Central Re-injection Area (SCRIA) In-situ Reactive Zone (IRZ), the Central and Source Area In-situ Reactive Zones, and the Northwest Freshwater Injection Area. The time period covered by this Semiannual Status Report is July 1 through December 31, 2009.

If you have any questions regarding this report, please do not hesitate to call me at (530) 520-2959.

Under penalty of perjury and to the best of my knowledge, the attached report is true, complete, and correct.

Sincerely,

Eric Johnson
PG&E Hinkley Remediation Project Manager

Enclosure

cc: Mike Plaziak, Lahontan RWQCB, Victorville
Lisa Dernbach, Lahontan RWQCB, South Lake Tahoe

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This report was prepared under the supervision of California Registered Professionals

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# Acronyms and Abbreviations

| | |
|---|---|
| µg/L | micrograms per liter |
| BCMP | Boundary Control Monitoring Program |
| bgs | below ground surface |
| CAO | Cleanup and Abatement Order |
| Cr(T) | total chromium |
| Cr(VI) | hexavalent chromium |
| DVD | Desert View Dairy |
| EMP | Evaluation Monitoring Program |
| EPA | U.S. Environmental Protection Agency |
| EX | extraction well |
| gpm | gallons per minute |
| IRZ | in-situ reactive zone |
| LTU | land treatment unit |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| N | nitrogen |
| NOA | Northwest Area |
| NWFI | Northwest Freshwater Injection Area |
| PG&E | Pacific Gas and Electric Company |
| SCRIA | South Central Re-Injection Area |
| TDS | total dissolved solids |
| Water Board | California Regional Water Quality Control Board, Lahontan Region |
| WDR | Waste Discharge Requirements |

# 1.0 Introduction

This status report is being submitted to the California Regional Water Quality Control Board, Lahontan Region (Water Board) in compliance with Cleanup and Abatement Order (CAO) No. R6V-2008-0002 (Water Board, 2008a). The CAO requires Pacific Gas and Electric Company (PG&E) to provide semiannual reports on all actions taken to remediate total and hexavalent chromium (Cr[VI]) levels in groundwater and on all actions to contain plume migration at the PG&E Compressor Station in Hinkley, California. The CAO adopted the Boundary Control Monitoring Program (BCMP) as the means to assess plume stability. An amendment to the CAO, adopted November 12, 2008, clarified the plume containment provision (Water Board, 2008b). This report summarizes actions taken in support of ongoing chromium remediation programs in Hinkley: the Desert View Dairy (DVD) Land Treatment Unit (LTU), the Northwest Area (NOA) Extraction Wells and South Central Re-injection Area (SCRIA) In-situ Reactive Zone (IRZ), the Central and Source Area In-situ Reactive Zones (IRZs), the Northwest Freshwater Injection Area (NWFI), and the BCMP.

During the reporting period, PG&E constructed an additional chromium remediation system, as described in the *Notice of Applicability of General Waste Discharge Requirements for the General Site-Wide Remediation Project at the PG&E Compressor Station, Hinkley, San Bernardino County* (Board Order No. R6V-2008-0014), signed April 7, 2009 (Water Board, 2009). The project consists of extracting up to 110 gallons per minute (gpm) of groundwater from within the northwestern portion of the chromium plume, adding a reductant, and injecting the amended water within the plume in the SCRIA. A second element of the project consists of extracting up to 80 gpm of groundwater that is not impacted by chromium from a well south of the compressor station and reinjecting the water in a line of four injection wells outside the northwestern plume boundary to create a hydraulic barrier that will enhance the stability of the chromium plume (referred to as the NWFI). Construction of these two elements began in May 2009, and the systems began operation in October/November 2009.

The time period covered by this report is July 1 to December 31, 2009. The report is organized in accordance with Section 6.3 (Water Board, 2008b) of the CAO, which requires that this report:

- Describe remedial actions implemented pursuant to the cleanup plan.
- Report volume, concentration, and location of discharged wastes.
- Describe any violations and corrective measures.
- Provide groundwater monitoring data.
- Describe the effectiveness of implemented remedies compared to predicted remedy effectiveness.
- Report any adverse environmental or public health impacts and associated remedies.

- Provide recommendations and an implementation schedule for increasing effectiveness if current actions are not achieving plume containment and expected reduction in chromium concentration in groundwater.

# 2.0 Remedial Actions

This section describes the remedial actions implemented pursuant to the cleanup plan.

## 2.1 Desert View Dairy Land Treatment Unit

The DVD LTU includes extraction of upper aquifer groundwater and delivery of chromium-impacted groundwater to a 72-acre LTU. The LTU is irrigated using a subsurface drip irrigation system. The system is designed to allow sufficient contact time between the applied groundwater and carbon in the root zone of the crops planted at the DVD LTU to convert the more mobile hexavalent form of chromium to the much less mobile trivalent form.

The initial DVD LTU extraction system and LTU application began in September 2004 with two extraction wells (EX-01 and EX-02). Full system operation of the LTU began in March 2005. Phase I optimization of the system was implemented in May 2007, with the installation and startup of two additional extraction wells (EX-3 and EX-4). Phase 2A optimization construction began in January 2008. Three new extraction wells (EX-15, EX-16, and EX-20) were connected to the LTU in June 2008. The optimized system continued to operate with seven active extraction wells until October 2009, when the water from the three western wells (EX-15, EX-16, and EX-20) was diverted to the SCRIA. These three wells are currently considered part of the Northwest Area extraction system, described in Section 2.2.

## 2.2 Northwest Area Extraction Wells and South Central Reinjection Area In-situ Reactive Zone

Extraction wells EX-15, EX-16, EX-20, EX-21, and EX-22 are used to enhance plume containment and to provide water for SCRIA IRZ system operations. Wells EX-15, EX-16, and EX-20 were constructed in June 2008 and were connected to the SCRIA in October 2009. Two new wells, EX-21 and EX-22, were completed and connected to the SCRIA in October 2009.

The April 7, 2009 Notice of Applicability issued by the Water Board for the project stipulates that up to 110 gpm may be extracted from these five wells (annual average rate per the Notice of Intent dated September 28, 2008), amended with carbon substrates, and injected into the SCRIA IRZ. This controlled injection of food-grade lactate or ethanol stimulates biological and chemical reduction of Cr(VI) in the upper aquifer to trivalent chromium.

Injections into the SCRIA IRZ system began on October 20, 2009. Continuous operation of the extraction and injection system began on November 16, 2009, with injection into even numbered SCRIA injection wells, and continued through the reporting period. As the system is currently configured, injections into SC-IW-22 and SC-IW-32 are into the shallow screen intervals (80 to 105, and 80 to 110 feet below ground surface [bgs], respectively). In wells SC-IW-24, SC-IW-26, SC-IW-34, and SC-IW-36, amended groundwater is injected into

both the shallow and deep intervals (80 to 110, and 120 to 145 feet bgs, respectively) of the upper aquifer.

## 2.3 Central Area In-situ Reactive Zone

The Central Area IRZ consists of 12 upper aquifer recirculation wells. The first injection of sodium lactate in the Central Area IRZ occurred on November 29, 2007. Continuous groundwater recirculation and daily discharge of sodium lactate began in 2007 and continued into 2008. Operations were originally conducted in a dipole configuration with injection into the odd-numbered recirculation wells and extraction from even-numbered recirculation wells. In mid-October 2008, ethanol was substituted for sodium lactate. Ethanol injection continued through the current reporting period. Reconfiguration of the Central Area IRZ system to allow for injection into previous extraction wells CA-RW-02, -06, -08 and -10 was completed in September 2009 to address remaining areas where reduction of Cr(VI) in groundwater had not yet occurred. The system was restarted with the new configuration on November 11, 2009.

## 2.4 Source Area In-situ Reactive Zone

Startup of the Source Area IRZ system was conducted between April 27 and May 7, 2008. Injection of sodium lactate to the subsurface began on April 27 and continued through August 28, 2008. Ethanol was substituted for lactate on August 29, 2008, and ethanol use continued through this reporting period.

## 2.5 Northwest Freshwater Injection

Freshwater (defined as groundwater extracted from outside the chromium plume) injection in the area along the northwest boundary of the chromium plume is referred to as the Northwest Freshwater Injection Area. The objective of the NWFI system is to create a hydraulic barrier to further enhance chromium plume control. The April 7, 2009 Notice of Applicability allows for groundwater extraction at an average rate up to 80 gpm and re-injection of this water in the area northwest of the plume boundary (Water Board, 2009).

The NWFI system was designed to extract groundwater from a groundwater supply well (presently, PGE-14) located upgradient of the chromium plume, move the water north through an underground conveyance pipeline, and inject the water into four injection wells (IN-01, IN-02, IN-03 and IN-04) located outside the northwest edge of the chromium plume. Construction of the NWFI system commenced in March 2009 and was completed in November 2009.

Initial startup and testing of the NWFI wells began on November 3, 2009 and continued intermittently through November 12, 2009. Operation of the NWFI system will resume the first quarter of 2010.

# 3.0 Volume, Concentration, and Location of Discharges under Orders from the Water Board

Groundwater containing chromium (and for the IRZs, in-situ amendments) is discharged under Order No. R6V-2004-0034 for the LTU, Order No. R6V-2008-0014 for the Northwest Area Extraction Well and SCRIA IRZ Areas, Order No. R6V-2007-0032 for the Central Area IRZ, and Order No. R6V-2008-0014 for the Source Area IRZ. The volume, concentrations, and locations of discharge under each of these Orders are included in Appendixes A, B, C, and D respectively.

# 4.0 Violations of Orders and Corrective Measures

## 4.1 Desert View Dairy Land Treatment Unit

The DVD LTU operated in compliance with the Waste Discharge Requirements (WDRs) with no violations or associated corrective measures during the reporting period, with the possible exception of two unplanned releases of groundwater to the LTU. The first was a result of a leaking pressure relief valve connection in the southeast field; groundwater was discharged to the LTU. The second release was a result of a faulty swing check valve at extraction well, EX-04. Both releases were repaired immediately and described in the *Fourth Quarter 2009 Monitoring Report for the Desert View Dairy Land Treatment Unit, PG&E Hinkley Compressor Station, Hinkley, California* (CH2M HILL, 2010a).

## 4.2 Northwest Area Extraction Wells and SCRIA In-situ Reactive Zone

The Northwest Area extraction wells and the SCRIA IRZ operations operated in compliance with the WDRs with no violations or required corrective measures during the reporting period.

## 4.3 Central Area In-situ Reactive Zone

The Central Area IRZ operated in compliance with the WDRs with no violations or required corrective measures during the reporting period. However, there were exceedances of contingency plan threshold concentrations, as discussed in Section 6.3.1. These exceedances resulted in the implementation of the contingency plan.

## 4.4 Source Area In-situ Reactive Zone

On December 29, 2009 the Water Board issued a Notice of Violation to PG&E for failure to comply with the monitoring and reporting program for the Source Area In-situ Remediation Project. The Notice of Violation cited two areas of violation; 1) failure to monitor wells newly added to the monitoring program by the Water Board in mid-August, and 2) failure to identify concentrations of manganese and iron that exceeded threshold concentrations. On January 25, 2009, however, the Water Board issued a letter retracting one of the reported violations (associated with byproduct threshold concentrations) and clarifying that, at the time of the letter, PG&E was in full compliance with all permit requirements.

Exceedances of contingency plan threshold concentrations resulted in the subsequent implementation of the contingency plan as discussed in Section 6.3.2.

## 4.5 Northwest Freshwater Injection

The NWFI full-scale startup is scheduled for the first quarter 2010. No violations or corrective measures occurred during the initial startup and testing activities that occurred during the reporting period.

## 4.6 Boundary Control Monitoring Program

The BCMP was in compliance with no violations during the reporting period. Under the BCMP, detection monitoring wells that exceed the Cr(VI) control limits are reported and further evaluated under the Evaluation Monitoring Program (EMP). Wells MW-42B2, -47, -56, and -62A exceeded control limits during the first half of 2009 as reported in the *First Quarter 2009 Evaluation Monitoring Report for Boundary Control Monitoring Program, PG&E Hinkley Compressor Station, Hinkley, California* (CH2M HILL, 2009c). Because Cr(VI) concentrations in MW-62A exceeded background levels prior to the CAO compliance date of December 31, 2008, PG&E does not consider it an appropriate sentry well, and during 2009 installed and began monitoring 10 potential sentry monitoring wells downgradient of MW-62A (clusters MW-68 through MW-72).

All of the wells identified in the first half of 2009 remained on the BCMP "watch list" during the current reporting period. No new BCMP control limit exceedances occurred during the reporting period.

# 5.0 Groundwater Monitoring Data

In compliance with the BCMP, PG&E monitors groundwater in accordance with the WDRs for the DVD LTU, NOA extraction wells and SCRIA IRZ, and Central Area and Source Area IRZs.

The BCMP was developed to evaluate plume stability at the Hinkley site and was adopted in the CAO (Water Board 2008a). It uses the August 2008 upper aquifer chromium plume distribution map as the baseline condition. The BCMP assesses plume stability, using the interim site background Cr(VI) concentration (Water Board, 2008a) of 4.0 micrograms per liter (µg/L) to define the chromium plume boundary and the total chromium (Cr[T]) isoconcentration contour of 50 µg/L to define the plume core. The CAO defines the plume containment requirement effective date as December 31, 2008.

Appendix E includes a site map showing the location of the 63 BCMP detection monitoring wells, and a table summarizing the Cr(VI) control limits used to monitor potential changes in the 4- and 50-µg/L plume boundaries and the chromium analytical data for the BCMP and other wells during the reporting period (CH2M HILL, 2010b).

Four monitoring wells (MW-42B2, -47, -56, and -62A) exceeded their respective control limits and entered the EMP during the first half of 2009 (prior to the reporting period). These wells remained on the BCMP "watch list" during this reporting period. No new wells exceeded control limits during the reporting period, and therefore no verification sampling was required or EMP initiated.

The groundwater monitoring data for the DVD LTU, NOA extraction wells and SCRIA IRZ, Central Area IRZ, and Source Area IRZ are included in Appendix F, G, H, and I respectively.

# 6.0 Effectiveness of Implemented Remedies Compared to Predicted Remedy Effectiveness

This section summarizes the effectiveness of implemented remedies in comparison to the predicted remedy effectiveness.

## 6.1 Desert View Dairy Land Treatment Unit

Results from the LTU performance monitoring demonstrate effective groundwater treatment and declining or stable chromium concentrations in groundwater across most of the LTU and surrounding areas.

### 6.1.1 Effectiveness of the DVD LTU Groundwater Treatment

Concentrations of Cr(T) and Cr(VI) in pore water collected from the 5-foot-deep lysimeters were consistently below the threshold limits of 50 µg/L and 21 µg/L, respectively. Concentrations of total dissolved solids (TDS) and nitrate (as N) at the 20-foot deep lysimeters were below the WDR limits of 20,000 milligrams per liter (mg/L) and 75 mg/L, respectively. Lysimeter data are included in Appendix J.

Concentrations of Cr(T) and Cr(VI) in soil samples collected at the LTU were all below the WDR threshold limits of 210 milligrams per kilogram (mg/kg) and 30 mg/kg, respectively (CH2M HILL, 2009a, 1010a). Concentrations of Cr(T) and Cr(VI) in groundwater decreased or were steady in most monitoring wells sampled near the DVD LTU during this reporting period. In the Fourth Quarter 2009, Cr(VI) concentrations at wells MW-31 and -43 continued to decline relative to 2007-2008 monitoring events. Well MW-42B2 has exhibited a gradual increasing trend since 2008, though current Cr(VI) levels are still below historic levels.

A graph of monthly Cr(VI) removal from the LTU groundwater extraction system is presented as Figure K-1 in Appendix K. Approximately 13 pounds of Cr(VI) were removed from the upper aquifer and treated through the LTU during this reporting period. Approximately 124 pounds of Cr(VI) have been removed and treated through the LTU since extraction system startup in September 2004. Figure K-2 includes a graph of the cumulative Cr(VI) removal data, and Figures K-3 show the chromium distribution map from February 2009, respectively.

Groundwater concentrations of TDS and nitrates were consistent with historical pre-LTU discharge conditions. In some cases, these concentrations exceeded receiving water limitations prior to the initiation of LTU discharges. Detected exceedances of receiving water limitations are unrelated to LTU operations, and do not constitute a violation of the WDRs, as described in the DVD quarterly monitoring reports (CH2M HILL, 2009a, 2010a).

Concentrations of Cr(T) in plant tissue samples were below the WDR threshold concentration of 100 mg/kg set forth in the Mitigation Monitoring and Reporting Plan. Cr(T) was not detected above the method detection limit of 0.499 mg/kg in any plant tissue samples (CH2M HILL, 2009a). Similarly, none of the samples tested for Cr(VI) yielded results above the detection limit of 0.0201 mg/kg. There is no threshold concentration specified for Cr(VI) in plant tissue.

### 6.1.2 Effectiveness of the DVD LTU Hydraulic Control

Capture zone maps for the LTU extraction system during Third and Fourth Quarter 2009 are included in Appendix L.

During Third and Fourth Quarter 2009, the capture zone was slightly reduced to the east and west relative to the capture zone observed during the first half of 2009. The reduction is likely due to the interruption of EX-3 pumping during the third quarter, and to the reduced irrigation rates and shutdowns for system repair during the fourth quarter.

Based on water level data, boundary control was maintained for the majority of the plume area in the central and southern portions of the LTU. This is supported by overall declining or stable chromium concentrations in wells located in the capture zone area.

Data from the Third and Fourth Quarter 2009 indicate increasing chromium concentrations at MW-62A, located in the northeast corner of the DVD. In response, PG&E has proposed an increase in pumping levels on the DVD. This increase would address the increasing Cr(VI) levels in MW-62A and would enhance hydraulic capture in DVD LTU fields W1 and S1.

Operation of the NWFI system will further enhance plume boundary control to the northwest, because a hydraulic mound will be created west of the plume. Operation of the SCRIA will further enhance plume control to the northeast and northwest, because 110 gpm of additional groundwater is being pumped at extraction wells EX-15, EX-16, EX-20, and EX-21.

## 6.2 Northwest Area Extraction Wells and SCRIA In-situ Reactive Zone

Results for system startup of the northwest extraction wells for the SCRIA IRZ were presented in the *Fourth Quarter 2009 Monitoring Report for the South Central Re-injection Area and for the Northwest Freshwater Injection Area* (CH2M HILL and Arcadis, 2010c). Appendix B presents flow and groundwater analytical data for the five NOA extraction wells that supply groundwater for SCRIA re-injection activities. Part-time extraction and reinjection began on October 20, 2009 with full time operation commencing on November 16, 2009. Approximately 5.6 million gallons of water and 1.7 pounds of Cr(VI) were extracted from NOA extraction wells EX-15, EX-16, EX-20, and EX-21. The average combined pumping rate during the period of operation of these extraction wells was 105 gpm. This rate was within the average discharge limit (110 gpm) prescribed in the Notice of Applicability.

Post startup groundwater samples were not collected from SCRIA IRZ performance monitoring wells during the reporting period, but will be collected in the First Quarter of 2010 to evaluate treatment effectiveness.

## 6.3 Central Area In-situ Reactive Zone

### 6.3.1 Effectiveness of the Central Area Groundwater Treatment

#### Shallow Unit of Upper Aquifer

Results from the Central Area IRZ monitoring network demonstrate effective treatment of Cr(VI) in the shallow unit of the upper aquifer (located approximately 80 to 115 feet bgs) as groundwater passes through the IRZ. Figure 1 in Appendix H shows a comparison of Cr(VI) isoconcentration contours in the shallow aquifer unit in November 2007 (prior to IRZ startup) to contours following two years of operation. As shown in Figure 1, the IRZ-treated water contained Cr(VI) concentrations below 4 µg/L across the majority of the treatment well line. This has substantially halted the migration of Cr(VI) in groundwater downgradient of the IRZ. Additionally:

- Cr(T) and Cr(VI) concentrations in seven of ten performance monitoring wells (CA-MW-101, -102S, -103, -106S, -201, -203, and -204S) were below 4 µg/L throughout the second half of 2009.
- Treated groundwater continued to arrive at additional downgradient monitoring wells in the second half of 2009, as indicated by decreases in Cr(T), Cr(VI), nitrate, and sulfate concentrations in CA-MW-300- and -400 series wells. In particular, Cr(VI) concentrations decreased to less than 4 µg/L in CA-MW-406 and CA-MW-408 in the second half of 2009.

Despite this success, there were several challenges with operation of the system in the original dipole well configuration:

- Treatment was not complete across the entire area, particularly downgradient of the original extraction locations (i.e. CA-RW-02, CA-RW-04, CA-RW-08, and CA-RW-10) and in the middle of several dipoles (e. g., CA-MW-104S and CA-MW-105) as shown in Figure E-1.
- Several extraction wells began to extract carbon-amended groundwater, which caused fouling, reduced recirculation flow rates, and limited improvements to carbon distribution.
- Wells once used for injection showed limited extraction capacity, thus limiting the effectiveness of reversing injection and extraction wells within the dipoles to improve the distribution of carbon.

To overcome the first challenge and fill in the treatment gaps (i.e., downgradient of extraction wells), the system was reconfigured to allow injection into former extraction wells CA-RW-02, -06, -08, and -10. Rather than use the dipole well design with paired injection and extraction wells along the treatment line, which was found to be prone to well fouling

and limited in its flexibility in injection locations, groundwater in the new configuration is extracted primarily from CA-RW-12. In addition, wells CA-RW-04 and CA-RW-07R are available to provide supplemental extraction as needed. This operation plan was presented to Board staff at a meeting in September 2009, and was documented in Section 7 of the third quarter monitoring report (ARCADIS 2009a). The full-scale operational plan of the reconfigured system consists of the following:

- Inject carbon-amended groundwater into previous extraction wells CA-RW-02, -04, -08 and -10, to treat areas that did not previously receive adequate carbon distribution.
- Use stored reducing capacity in previous injection locations to treat Cr(VI) where carbon is not actively being injected.
- Monitor previous injection locations (i.e., monitoring wells CA-MW-101, -102S, -103, -106S, -201, -203, and -204S) for Cr(VI) concentrations, and modify the injection and pumping scheme when appropriate (e.g., add flow from CA-RW-04 and/or CA-RW-07R, or divert groundwater from the SCRIA if needed).

The switch from the original dipole well configuration to the current configuration offers the following advantages:

- Reduces the frequency of well fouling caused by extraction of carbon-amended groundwater.
- Allows more efficient operation, by targeting areas with weaker Cr(VI)-reducing conditions.
- Provides flexibility, allowing the injection into original extraction locations (CA-RW-01, -03, -05, -09, or -11) and extraction of more water (if needed in the future), using additional extraction wells (i.e. CA-RW-04 and/or CA-RW-07R) or groundwater diverted from the SCRIA.

The new configuration complements the old configuration, achieving treatment in areas that were only partially treated by the original configuration, and is considered full-scale operation of the IRZ. Cr(VI) continues to be treated in the areas of previous injection, as evidenced by the continued observation of Cr(VI) concentrations less than 4 µg/L at CA-MW-101, -102S, -103, -106S, -201, -203, and -204S in November, 1½ months after shutdown of the originally configured system. In some of these locations, reducing conditions have been sustained for longer periods. For example, CA-MW-102S remained reducing, with Cr(VI) concentrations below 4 µg/L in November 2009, 7 months after carbon injections into the associated injection well CA-RW-03 ended.

In the new configuration, carbon is being distributed into new areas, as well as being redistributed in previously treated areas when needed. It is expected that overall treatment will be improved.

As the stored reducing capacity is spent – as evidenced by performance monitoring data – injection flows will be diverted and/or increased to accommodate the changes observed, and to maintain the IRZ.

### Deep Unit of the Upper Aquifer

The Central Area IRZ currently targets the shallow unit of the upper aquifer (located approximately 80 to 115 feet bgs). A comprehensive sampling event of Central Area monitoring wells screened in the deep unit of the upper aquifer was conducted in August 2009 and the smaller set of deep unit compliance wells were sampled in November 2009. A contour map was prepared for the August 2009 event (Figure 2 in Appendix H) when all deep unit wells were sampled. Sampling of the deep unit wells and contouring is planned to continue on a semi-annual basis with the next event scheduled for February 2010.

Analytical results indicate some treatment of Cr(VI) in the deep unit of the upper aquifer, as presented in Figure 2 in Appendix H, although the extent of treatment varies with depth and location. The Central Area injection wells are screened to depths that include 106 to 115 feet bgs. Some deep monitoring wells, shown in pink on Figure 2, have screen intervals above 120 feet bgs, and overlap or are within 5 feet of the injection well screens. Other monitoring wells have screens starting at or below 120 feet bgs, shown in blue on Figure 2. Chromium concentration trends include:

- In several wells with screens partially overlapping the injection well screens, August 2009 Cr(VI) concentrations decreased relative to baseline (pre operation) concentrations. In CA-MW-306D, CA-MW-307D, and CA-MW-409D, Cr(VI) concentrations decreased from 49.3, 71.8, and 11.6 µg/L, respectively, at baseline to 24.2, 0.92, and 5.05 µg/L in August 2009.
- In three of the deeper monitoring wells screened below 120 feet bgs, CA-MW-402D, CA-MW-403D and CA-MW-404D, Cr(VI) concentrations have been below 4 µg/L since the baseline sampling in November 2007. Downgradient of these CA-MW-400 series wells, concentration decreases were observed in the CA-MW-500 series wells at CA-MW-501D (48.0 µg/L in November 2007 to 5.03 µg/L in August 2009) and CA-MW-503D (28.7 µg/L in November 2007 to 6.60 µg/L in August 2009). Concentrations of Cr(VI) also decreased in CA-MW-102D in August (98.9 µg/L) relative to baseline (174 µg/L).
- The remaining deep unit monitoring wells remain relatively unchanged from baseline. The impacts of the Central IRZ are not yet indicated in these areas.

To further address the deep unit of the upper aquifer, injections began into SCRIA injection wells that are screened across the deep unit of the upper aquifer - upgradient of the Central Area IRZ - in November 2009. In the first quarter 2010, decreases in Cr(VI) concentrations began to be observed in some deep unit locations within the SCRIA, as will be discussed in the first quarter monitoring report. Arrival of groundwater treated by the SCRIA deep unit injections will be monitored in the Central Area, and is expected within 1 to 2 years.

Treatment options for the deep unit of the upper aquifer will also be evaluated and included in the 92-49 analysis for the site.

## 6.3.2 Effectiveness of the Central Area Control of Secondary Byproducts

The application of in-situ reductive treatment of Cr(VI) can result in the dissolution of metals (i.e., manganese, iron, arsenic) into groundwater within the IRZ. Downgradient of the IRZ, the dissolved metals will attenuate through geochemical processes including

sorption to soil minerals (and organic matter) under both anaerobic and aerobic conditions, diffusion processes (with movement from areas of high concentration to areas of low concentration) related to groundwater flow patterns, and precipitation or co-precipitation, e.g. as carbonate and sulfide minerals. Central Area results to date show that the downgradient migration of dissolved metals is being controlled through management of reagent injections.

#### 6.3.2.1 Manganese

As expected, dissolved manganese concentrations increased at monitoring locations within the Central Area IRZ (the CA-MW-100- and -200-series wells) after IRZ startup. Groundwater associated with IRZ treatment has also arrived at the first and second rows of sentry monitoring wells (the CA-MW-300- and -400-series), as identified by groundwater tracers eosine and fluorescein and/or changes in redox indicators (e.g., decreasing nitrate concentrations).

During the second half of 2009, manganese was detected above the threshold concentration of 0.226 mg/L in three sentry monitoring wells (CA-MW-301, -307S, and -309). The increase in manganese concentrations at these locations is concurrent with the arrival of groundwater that was injected in the December 2008 timeframe, when reagent injection volumes were increased following the switch to ethanol and system restart in October 2008.

The average reagent injection volume was decreased in upgradient injection locations, as documented in the quarterly monitoring reports (ARCADIS 2009a, ARCADIS 2010a). The effect of the decreased dosing was observed at CA-MW-301, -307S and -309 in November, as manganese concentrations stabilized or decreased. The system continues to be operated at reduced injection rates in the new configuration, and additional decreases in manganese concentrations are expected in the coming months.

#### 6.3.2.2 Iron

Dissolved iron was reported at concentrations above the contingency plan threshold concentration in 21 sentry and contingency monitoring wells in August 2009. The results of the confirmation sampling event in September indicated only a single exceedance for iron, at CA-MW-309.

In the fourth quarter, dissolved iron exceedances were reported at 33 sentry and contingency monitoring wells in November 2009, including 12 locations where arrival of treated water from the IRZ has not yet been detected. Subsequent investigation revealed that the detections of iron in August and November were due to a change in the quantification ion used for analysis with U.S. Environmental Protection Agency (EPA) method 6020. Due to difficulties with calibration, the quantification ion was switched by the laboratory from ion Fe54 to ion Fe57 in the August and November 2009 events. Ion 57 is subject to interference, which explained the numerous detections above the iron threshold concentration during those events.

Going forward, PG&E has proposed to use EPA Method 6010 for iron analysis, in place of EPA Method 6020, to overcome quantification difficulties experienced with EPA Method 6020. PG&E plans to begin use of EPA Method 6010 for the second quarter monitoring event, evaluate the data, and propose a new iron threshold concentration, if needed. In the

meantime, all iron detections above 0.3 mg/L will be reported, but contingency actions will not be implemented unless exceedances are found to be concurrent with other indicators of the arrival of groundwater from the IRZ (e.g., increases in the concentration of dissolved manganese and/or arsenic).

#### 6.3.2.3 Chloride

Chloride was detected in August and November at contingency well CA-MW-505 at slightly above the threshold concentration of 231 mg/L. This detection was likely due to natural variability, rather than IRZ operation. Other than one previous exceedance in this monitoring well, no other chloride exceedances have been detected in the sentry or contingency wells.

## 6.4 Source Area In-situ Reactive Zone

### 6.4.1 Effectiveness of the Source Area Groundwater Treatment

Results from the Source Area IRZ monitoring network demonstrate effective treatment of Cr(VI) (as shown in Figures in Appendix I) for the deep and shallow units of the upper aquifer, respectively. Operation of the southern cluster of injection wells (SA-RW-11 to -16) and the northern line of injection wells (SA-RW-05 to -10) has resulted in the successful treatment of groundwater. Previous results demonstrated treatment of Cr(VI) to concentrations of less than 4 µg/L throughout the majority of the treatment area, and results from the second half of 2009 indicate that treatment was maintained throughout the majority of the area. In particular, decreases in Cr(VI) concentrations were observed at the following locations:

- Decreases in Cr(VI) concentrations of 75 percent or greater were observed at performance monitoring wells SA-SM-02D, SA-SM-03D, SA-SM-04S, SA-SM-10S, and SA-SM-10D.
- Down gradient of the extraction wells, Cr(VI) concentrations decreased to less than 4 µg/L at SA-MW-03S and SA-MW-03D in the second half of 2009. Treated groundwater also arrived at new downgradient location SA-MW-09D in the second half of 2009.

### 6.4.2 Effectiveness of the Source Area Control of Secondary Byproducts

Source Area results to date show the generation and attenuation of secondary byproducts is consistent with expectations.

#### 6.4.2.1 Arsenic

Arsenic concentrations increased in one sentry monitoring well, SA-MW-02D, since arrival of treated groundwater in April 2009. Arsenic concentrations at SA-MW-02D increased from 0.0148 to 0.0332 mg/L from April to November. The increasing trend correlated with the shutdown of nearby extraction well SA-RW-02, which indicates that this extraction well had previously been capturing the arsenic-containing groundwater. SA-RW-02 was shut down because the groundwater extracted from this well contained reduced metals that were clogging injection wells. Reagent injections in the Source Area were scaled back in response to these exceedances, and have continued at a reduced rate through December. The effects

of decreasing reagent injections are expected to be observed in this monitoring well in coming quarters. Arsenic is expected to attenuate downgradient of SA-MW-02D, and has not been observed at downgradient monitoring wells to date.

#### 6.4.2.2 Manganese

Dissolved manganese was detected above threshold concentrations in November and December 2009 at location SA-MW-03 (both the shallow and deep interval), following arrival of treated groundwater in January 2009. Dissolved manganese concentrations increased from 0.0132 mg/L in January to 3.30 mg/L in December in SA-MW-03S, and from 0.00145 to 3.17 mg/L in SA-MW-03D, during the same period. The arrival of treated groundwater and increases in manganese concentrations at well SA-MW-03 reflects increased groundwater extraction at wells SA-RW-01 and SA-RW-03, as extraction at SA-RW-02 was shut down. Reagent injections in the Source Area were scaled back a second time (in November) in response to these exceedances, and continued at a reduced rate through December. The effects of decreasing reagent injections are expected to be observed in well SA-MW03(S/D) in coming quarters.

#### 6.4.2.3 Iron

Dissolved iron was detected above the threshold concentration of 0.3 mg/L in four sentry wells (SA-MW-02D, -09S, -09D, and -10S) and four contingency wells (SA-MW-11S, -12S, -13S, and -14D) during the November 2009 sampling event. The arrival of treated groundwater has only been observed at two of these locations (SA-MW-02D and SA-MW-09D). As discussed in Section 6.3.2, the detection of iron in locations within the IRZ treatment area appears to be associated with the analytical method used by the laboratory. PG&E has proposed, and Regional Board has accepted, future use of EPA Method 6010 in place of EPA Method 6020.

## 6.5 Effectiveness of the Northwest Freshwater Injection System

Initial startup and injection testing of the NWFI system was conducted periodically from November 3 to 12, 2009. However, because the NWFI system was not fully operational for the reporting period, a comparison to the discharge limits or predicted remedy effectiveness is not applicable. Full operation of the NWFI system is expected beginning in the first or second quarter of 2010.

# 7.0 Adverse Environmental or Public Health Impacts and Associated Remedies

## 7.1 Desert View Dairy Land Treatment Unit

There were no adverse environmental or public health impacts created from the DVD LTU during the reporting period.

## 7.2 Northwest Area Extraction Wells and SCRIA In-situ Reactive Zone

There were no adverse environmental or public health impacts created from the NOA Extraction wells and SCRIA IRZ during the reporting period.

## 7.3 Central Area In-situ Reactive Zone

There were no adverse environmental or public health impacts created from the Central Area IRZ during the reporting period.

## 7.4 Source Area In-situ Reactive Zone

There were no adverse environmental or public health impacts created from the Central Area IRZ during the reporting period.

## 7.5 Northwest Freshwater Injection

As stated in Section 6.6, other than initial startup and testing operations in November 2009, the NWFI system was not operational during the reporting period. Commencement of full-scale NWFI operations is scheduled for the first quarter 2010.

# 8.0 Recommendations and Implementation Schedule for Increasing Effectiveness of Remedies

## 8.1 Desert View Dairy Land Treatment Unit

Operation of the DVD-LTU should continue in 2010. As part of PG&E's effort to optimize water application rates to the LTU, an increased application rate study was initiated April 2009. In this study, 50 percent more water was applied to the eastern quarter of Field S2, at valve S4A. The study was designed to monitor the effects of increased irrigation rates on chromium reduction in the treatment zone, and on TDS and nitrate (as N) leaching rates from soil. Baseline lysimeter samples were collected in April 2009, prior to the startup of the study. During the study, monthly samples were collected from the 5-foot-deep lysimeters and analyzed for TDS, nitrate (as N), Cr(T), and Cr(VI). Monthly samples were also collected from the 20-foot-deep lysimeters, and analyzed for TDS and nitrate (as N). Initial results indicate the application of additional irrigation water has no adverse effect on TDS, N or Cr levels at the compliance monitoring points.

In light of the positive results of the study, PG&E recommends increasing extraction and irrigation rates at the LTU. This would allow PG&E to increase extraction rates and improve hydraulic control near MW-62A. Additional recommendations to improve effectiveness at the DVD LTU include:

- Reconfiguring the extraction well pumping priority to further maximize northern capture of the plume.
- Implementing upgraded instrumentation and controls to optimize the system operations and reduce system down-time
- Evaluating the installation of an additional extraction well to improve capture in the northwest area of the DVD LTU.
- Replacement of inoperational lysimeters

## 8.2 Northwest Area Extraction Wells and SCRIA In-situ Reactive Zone

The overall effectiveness of remediation at the Hinkley project site was enhanced by the construction and startup of the combined northwest groundwater extraction and SCRIA reinjection project. Operation began in October 2009, and groundwater extraction and reinjection is expected to continue at approximately 110 gpm in 2010. Extraction rates from each well will be optimized to maximize plume control within the permitted total extraction

rate. Changes in injection rates and locations and reagent concentrations will also be made within the SCRIA to optimize reagent distribution and Cr(VI) treatment, while minimizing the migration of secondary byproducts.

The overall effectiveness of remediation of this system will be evaluated in the next semi-annual status report, after it has been operating for more than 8 months.

## 8.3 Central Area In-situ Reactive Zone

The Central Area IRZ system was reconfigured during the fourth quarter of 2009, to extract from CA-RW-12 and inject carbon-amended groundwater into previous extraction CA-RW-02, -04, -08 and -10 wells. Operation will continue in this configuration in the first half of 2010. In addition, quarterly monitoring will be conducted to assess Cr(VI) concentrations in areas not receiving injections (i.e., monitoring wells CA-MW-101, -102S, -103, -106S, -201, -203, and -204S). Based on the performance monitoring data, the injection flows will be diverted and/or increased as necessary to accommodate the changes observed, and to maintain the IRZ. If additional flow is needed, additional extraction wells CA-RW-04 and/or CA-RW-07R will be brought on-line, or flow will be diverted from the SCRIA.

## 8.4 Source Area In-situ Reactive Zone

Operation of the Source Area IRZ and treatment of Cr(VI) will continue in the first half of 2010. Changes in injection rate and locations and reagent concentrations will be made to optimize total organic carbon distribution and Cr(VI) treatment and to minimize the migration of secondary byproducts.

Expansion of the Source Area system to treat areas outside of Phase I is planned for 2010.

## 8.5 Northwest Freshwater Injection

The overall effectiveness of remediation of the NWFI system will be evaluated in the next semi-annual status report, after it has been operated for more than 8 months.

# 9.0 References


California Regional Water Quality Control Board, Lahontan Region (Water Board). 2008a. *Cleanup and Abatement Order R6V-2008-0002, WDID No. 6B369107001, for Pacific Gas & Electric Company (PG&E) Compressor Station, Hinkley, San Bernardino County.* August 6.

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# Appendix A
# DVD LTU Volume, Concentrations, and Locations of Discharges

**Extracted Water Volumes July 2009 through December 2009**

*Semiannual Status Report, Desert View Dairy Land Treatment Unit*

**Desert View Dairy, Land Treatment Unit**

| Period | EX-01 | EX-02 | EX-03 | EX-04 | EX-15 | EX-16 | EX-20 | Booster Sation[1] |
|---|---|---|---|---|---|---|---|---|
| | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) |
| July 2009 | 10,704,004 | 4,907,672 | 44,760 | 80,571 | 1,035,640 | 1,702,309 | 576,407 | 19,051,363 |
| August2009 | 9,153,029 | 5,349,112 | 0 | 125,550 | 1,046,467 | 1,775,587 | 640,925 | 18,090,670 |
| September 2009 | 10,490,100 | 4,625,220 | 0 | 100,650 | 919,200 | 1,603,200 | 528,120 | 18,266,490 |
| October 2009 | 7,056,361 | 3,778,776 | 1,256,664 | 47,544 | 287782[2] | 479507[2] | 145622[2] | 13,052,256 |
| November 2009 | 3,979,604 | 975,151 | 1,266,075 | 20,900 | --[2] | --[2] | --[2] | 6,241,730 |
| December 2009 | 2,865,275 | 2,382,618 | 1,130,848 | 87,157 | --[2] | --[2] | --[2] | 6,465,898 |
| ***Total*** | 44,248,373 | 22,018,549 | 3,698,347 | 462,372 | 3,001,307 | 5,081,096 | 1,745,452 | 81,168,407 |

***Notes:***

[1] The Booster Station is a sum of flow from EX-01, EX-02, EX-03, EX-04, EX-15, EX-16 and EX-20 until 10/14/09. After 10/14/09, it is a sum of flow from EX-01, EX-02, EX-03 and EX-04.

[2] Extracted volumes are for water directed to the LTU system. Until October 14, 2009, water from EX-15, EX-16, and EX-20 was sent to the DVD-LTU system. After that date, water from these wells was diverted to the NIR-SCRIA system (Refer to Appendix D for volume summary).

**Analytical Results for Extracted Water July 2009 through December 2009**
*Semiannual Status Report, Desert View Dairy Land Treatment Unit*

| Well ID | Sample Date | Sample Type | Total Dissolved Chromium (µg/L) | Hexavalent Chromium (µg/L) | Nitrate as N (µg/L) | TDS (mg/L) | Manganese, Dissolved (mg/L) | Iron, Dissolved (mg/L) |
|---|---|---|---|---|---|---|---|---|
| EX-01 | 08/12/2009 | | 17.2 | 17.2 | 12.6 | 1120 | ND <0.01 | 0.0304 |
| | 11/10/2009 | | 16.6 | 15.5 | 12.7 | 1160 | ND <0.01 | ND <0.02 |
| EX-02 | 08/12/2009 | | 11.7 | 11.4 | 15.2 | 1610 | ND <0.01 | ND <0.02 |
| | 11/10/2009 | | 12.4 | 11.6 | 15.1 | 1670 | ND <0.01 | ND <0.02 |
| EX-03 | 08/12/2009 | | ns | ns | ns | ns | ns | ns |
| | 11/10/2009 | | 27.9 | 27.2 | 15.2 | 1640 | ND <0.01 | 0.0789 |
| EX-04 | 08/12/2009 | | 16.4 | 16.8 | 24.1 | 4240 | ND <0.01 | 0.0766 |
| | 11/10/2009 | | 19.5 | 18.8 | 23.4 | 4200 | ND <0.01 | ND <0.02 |
| EX-15 | 08/12/2009 | | 42.3 | 42.6 | 13.0 | 1000 | ND <0.01 | ND <0.02 |
| | 11/10/2009 | | 47.2 | 46.4 | 13.8 | 1130 | ND <0.01 | ND <0.02 |
| EX-16 | 08/12/2009 | | 44.3 | 43.2 | 11.8 | 1180 | ND <0.01 | ND <0.02 |
| | 11/10/2009 | | 28.6 | 29.2 | 10.7 | 1170 | ND <0.01 | 0.0228 |
| EX-20 | 08/12/2009 | | 50.8 | 50.9 | 13.0 | 1180 | ND <0.01 | ND <0.02 |
| | 08/12/2009 | (dup) | 45.7 | 49.7 | 13.7 | 1170 | ND <0.01 | ND <0.02 |
| Booster Station | 08/12/2009 | | 18.2 | 19.4 | 13.5 | 1280 | ND <0.01 | ND <0.02 |
| | 11/10/2009 | | 16.3 | 16.4 | 14.4 | 1510 | ND <0.01 | ND <0.02 |

***Notes:***
Before October 14, 2009, the Booster Station is a combination of flow from EX-01, EX-02, EX-03, EX-04, EX-15, EX-16 and EX-20
After October 14, 2009, the Booster Station is a combination of flow from EX-01, EX-02, EX-03, EX-04

µg/L = micrograms per liter
mg/L = miligrams per liter
ns = No sample was obtained (pump not on)
ND = Not detected at the reporting limit shown
J = Concentration is estimated based on review of quality control criteria and data validation
UJ = Not detected at the reporting limit shown. The reporting limit is estimated based on review of quality control and data validation criteria

Analytical Methods:
Total Dissolved Chromium and Manganese (EPA 6020A)
Hexavalent Chromium (EPA 7199)
Dissolved Iron ( EPA 6010B)
Nitrate as N (EPA 300.0)
TDS (EPA 160.0)

N

0 500 1,000 Feet

**LEGEND**

- Initial and Phase 1 optimization extraction wells
- NIR-SCRIA Wells (former Phase 2A LTU extraction wells)
- NIR-SCRIA Wells ( in service)
- Multi-Purpose Groundwater Well (not yet in sevice)
- Booster Station
- PG&E Property

**FIGURE A-1**
**DVD LTU EXTRACTION WELLS, NOVEMBER 2009**

FOURTH QUARTER 2009 MONITORING REPORT
DESERT VIEW DAIRY LAND TREATMENT UNIT
HINKLEY, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2010\DVD_DMPWELLSMAP_1109.MXD BKAHLER 3/12/2010 15:05:21

# Appendix B
# Northwest Extraction Wells and SCRIA IRZ Volume, Concentrations, and Locations of Discharges

**Summary of Discharges to Groundwater, SCRIA**

*Semiannual Status Report, SCRIA*

**Recirculated Groundwater**

| Period | SC-IW-21 Total Monthly Volume (gallons) | SC-IW-22 Total Monthly Volume (gallons) | SC-IW-23 Total Monthly Volume (gallons) | SC-IW-24 Total Monthly Volume (gallons) | SC-IW-25 Total Monthly Volume (gallons) | SC-IW-26 Total Monthly Volume (gallons) | SC-IW-32 Total Monthly Volume (gallons) | SC-IW-33 Total Monthly Volume (gallons) | SC-IW-34 Total Monthly Volume (gallons) | SC-IW-35 Total Monthly Volume (gallons) | SC-IW-36 Total Monthly Volume (gallons) | SC-IW-37 Total Monthly Volume (gallons) | Infiltration Gallery Total Monthly Volume (gallons) | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| August 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| September 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| October 2009: | 0 | 6,447 | 0 | 8,630 | 0 | 12,918 | 23,200 | 0 | 20,700 | 0 | 12,200 | 0 | 0 | **84,095** |
| November 2009: | 0 | 292,763 | 0 | 405,040 | 3,112 | 422,592 | 293,100 | 0 | 351,700 | 2,094 | 363,050 | 12,089 | 42,522 | **2,188,062** |
| December 2009: | 0 | 342,495 | 0 | 733,990 | 0 | 558,960 | 329,230 | 0 | 623,460 | 0 | 619,300 | 0 | 28,546 | **3,235,981** |
| Fourth Quarter Subtotal | 0 | 641,705 | 0 | 1,147,660 | 3,112 | 994,470 | 645,530 | 0 | 995,860 | 2,094 | 994,550 | 12,089 | 71,068 | **5,508,138** |
| ***Total:*** | **0** | **641,705** | **0** | **1,147,660** | **3,112** | **994,470** | **645,530** | **0** | **995,860** | **2,094** | **994,550** | **12,089** | **71,068** | **5,508,138** |

**95% Ethanol**

| Period | SC-IW-21 Total Monthly Volume (gallons) | SC-IW-22 Total Monthly Volume (gallons) | SC-IW-23 Total Monthly Volume (gallons) | SC-IW-24 Total Monthly Volume (gallons) | SC-IW-25 Total Monthly Volume (gallons) | SC-IW-26 Total Monthly Volume (gallons) | SC-IW-32 Total Monthly Volume (gallons) | SC-IW-33 Total Monthly Volume (gallons) | SC-IW-34 Total Monthly Volume (gallons) | SC-IW-35 Total Monthly Volume (gallons) | SC-IW-36 Total Monthly Volume (gallons) | SC-IW-37 Total Monthly Volume (gallons) | Infiltration Gallery Total Monthly Volume (gallons) | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| August 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| September 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | **22** |
| October 2009: | 0 | 4 | 0 | 3 | 3 | 5 | 10 | 0 | 9 | 0 | 6 | 0 | 66 | **107** |
| November 2009: | 0 | 125 | 0 | 140 | 0 | 210 | 122 | 0 | 157 | 0 | 136 | 0 | 50 | **940** |
| December 2009: | 0 | 293 | 0 | 587 | 0 | 427 | 284 | 0 | 439 | 0 | 476 | 0 | 17 | **2,523** |
| Fourth Quarter Subtotal | 0 | 422 | 0 | 730 | 3 | 642 | 416 | 0 | 605 | 0 | 617 | 0 | 134 | **3,570** |
| ***Total:*** | **0** | **422** | **0** | **730** | **3** | **642** | **416** | **0** | **605** | **0** | **617** | **0** | **155** | **3,592** |

**Summary of Discharges to Groundwater, SCRIA**

*Semiannual Status Report, SCRIA*

**Tracers: Eosine and Fluorescein**

| Period | SC-IW-21 Total Monthly Volume (pounds) | SC-IW-22 Total Monthly Volume (pounds) | SC-IW-23 Total Monthly Volume (pounds) | SC-IW-24 Total Monthly Volume (pounds) | SC-IW-25 Total Monthly Volume (pounds) | SC-IW-26 Total Monthly Volume (pounds) | SC-IW-32 Total Monthly Volume (pounds) | SC-IW-33 Total Monthly Volume (pounds) | SC-IW-34 Total Monthly Volume (pounds) | SC-IW-35 Total Monthly Volume (pounds) | SC-IW-36 Total Monthly Volume (pounds) | SC-IW-37 Total Monthly Volume (pounds) | Infiltration Gallery and Direct Push Pilot Total Monthly Volume (pounds) | Direct Push Pilot Total Monthly Volume (pounds) | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | **0.0** |
| August 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | **0.0** |
| September 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | **0.0** |
| October 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | **0.2** |
| November 2009: | 0 | 1.1 | 0 | 1.2 | 0 | 1.8 | 0 | 0 | 1.3 | 0 | 1.2 | 0 | 0.2 | 0.0 | **6.8** |
| December 2009: | 0 | 2.1 | 0 | 4.1 | 0 | 3.0 | 2.0 | 0 | 3.1 | 0 | 3.3 | 0 | 0.1 | 0.0 | **17.7** |
| Fourth Quarter Subtotal | 0 | 3.1 | 0 | 5.3 | 0 | 4.8 | 2.0 | 0 | 4.4 | 0 | 4.5 | 0 | 0.4 | 0.2 | **24.7** |
| ***Total:*** | **0.0** | **3.1** | **0.0** | **5.3** | **0.0** | **4.8** | **2.0** | **0** | **4.4** | **0** | **4.5** | **0** | **0.4** | **0.2** | **24.7** |

**Emulsified Vegetable Oil**

| Period | Direct Push Pilot Total Monthly Volume (gallons) |
|---|---|
| ***Total:*** | **86** |

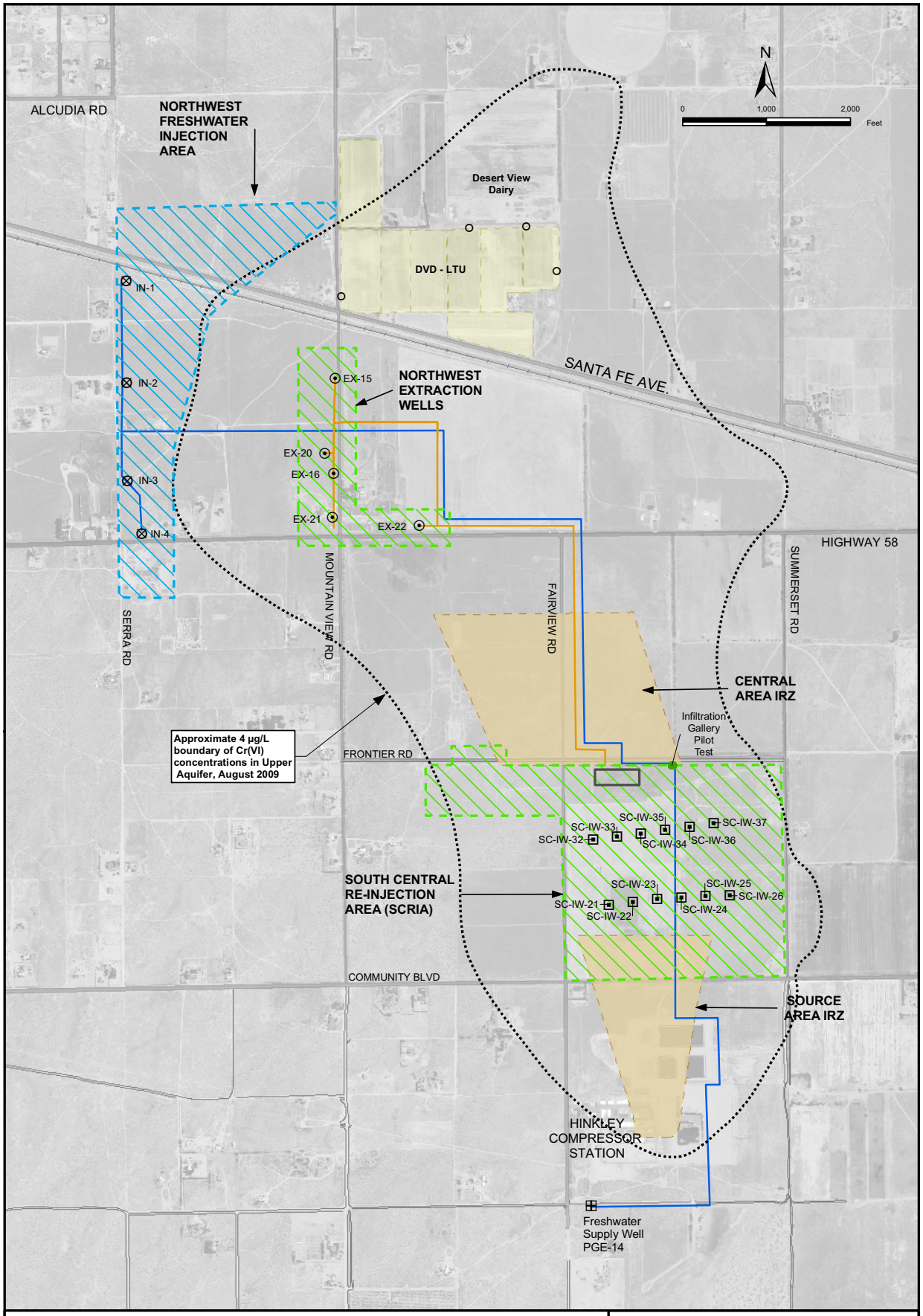
| | |
|---|---|
| **Annual Discharge Limit in NOI (gallons)** | **57,750** |

**Volume and Chromium Concentrations, Northwest Area Extraction Wells for SCRIA**
*Semiannual Status Report, SCRIA IRZ*

| Extraction Well | Operating Period | Extraction Volume and Rate | | | Extraction Well Sampling Results | | |
|---|---|---|---|---|---|---|---|
| | | Extraction Volume (gallons) | Total Days in Period Actively Pumping | Average Extraction Rate (gpm) | Cr(VI) (µg/L) | Cr(T) (µg/L) | TDS (mg/L) |
| **EX-15** | Oct-09 | 0 | 0 | 0 | -- | -- | -- |
| | Nov-09 | 463,100 | 15 | 22 | 46.4 | 47.2 | 1,130 |
| | Dec-09 | 825,541 | 21 | 28 | -- | -- | -- |
| **EX-16** | Oct-09 | 51,661 | 1 | 26 | -- | -- | -- |
| | Nov-09 | 615,588 | 15 | 29 | 29.2 | 28.6 | 1,170 |
| | Dec-09 | 1,104,367 | 21 | 37 | -- | -- | -- |
| **EX-20** | Oct-09 | 4,003 | 1 | 5 | -- | -- | -- |
| | Nov-09 | 235,584 | 15 | 11 | 36.7 | 41.3 | 1,150 |
| | Dec-09 | 411,127 | 21 | 14 | -- | -- | -- |
| **EX-21** | Oct-09 | 0 | 0 | 0 | -- | -- | -- |
| | Nov-09 | 489,600 | 15 | 23 | 25.7 | 26.2 | 1,080 |
| | Dec-09 | 873,436 | 21 | 29 | -- | -- | -- |
| **EX-22** | Oct-09 | 0 | 0 | 0 | -- | -- | -- |
| | Nov-09 | 386,741 | 15 | 18 | 37.5 | 38.3 | 1,270 |
| | Dec-09 | 111,980 | 21 | 4 | -- | -- | -- |
| ***Totals and Average for Quarterly Period*** | | | | | | | |
| | **Q4-2009** | 5,572,728 | | 43 | 35.1 | 36.3 | 1,160 |

NOTES:

1. Extraction from Northwest Area extraction well system for SCRIA re-injection commenced on October 20, 2009.
2. Extraction rates in gallons per minute (gpm) for individual wells calculated from monthly volume and total days operating. Fourth Quarter 2009 average extraction rate calculated from total volume extracted and 91 days in quarterly reporting period.
3. The extraction volumes for wells EX-21 and EX-22 were estimated from November 18th through 25th assuming flow rates were the same as those measured on November 25th through this period.
4. Hexavalent chromium [Cr(VI)] and total dissolved chromium [Cr(T)] in micrograms per liter (µg/L) Total dissolved solids (TDS) in milligrams per liter (mg/L).




**General Permit Remediation Facilities**

- Northwest Area Extraction Well
- South-Central Area Re-Injection Well
- Northwest Area Freshwater Injection Well
- Groundwater Plume Pipeline
- Freshwater Pipeline

**Other Remediation Areas**

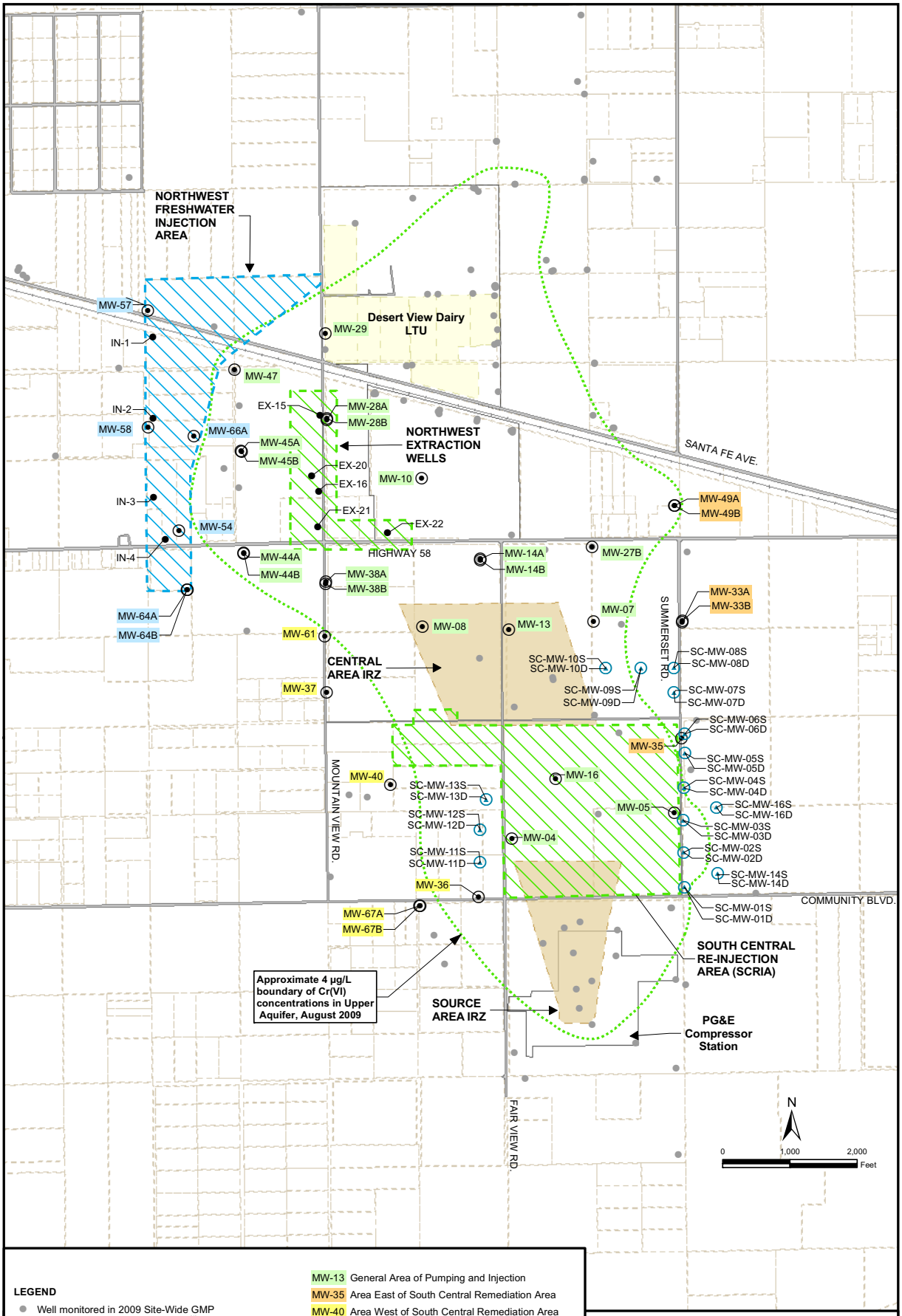
- Land Treatment Unit (LTU) and Extraction Well
- In Situ Reactive Zone (IRZ)

**FIGURE B-1**
**REMEDIATION AREAS AT THE HINKLEY SITE**

GENERAL SITE-WIDE GROUNDWATER REMEDIATION PROJECT
PACIFIC GAS & ELECTRIC CO.
HINKLEY, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\RL_RLTU\2010\REMEDIATION_AREAS.MXD BKAHLER 3/12/2010 15:10:33




**LEGEND**

- Well monitored in 2009 Site-Wide GMP
- NOA Compliance Monitoring Well[1]
- NOA Compliance Monitoring Well, SCRIA[2]

MW-13 General Area of Pumping and Injection
MW-35 Area East of South Central Remediation Area
MW-40 Area West of South Central Remediation Area
MW-13 Area of Freshwater Injection

**Notes:**
(1) Wells are monitored for TDS, Cr(VI), Cr(T), and water levels at frequency designated in Table 2 of the General Permit WDR (Water Board 2009). See Tables 3, 4, and 5 recent monitoring data.

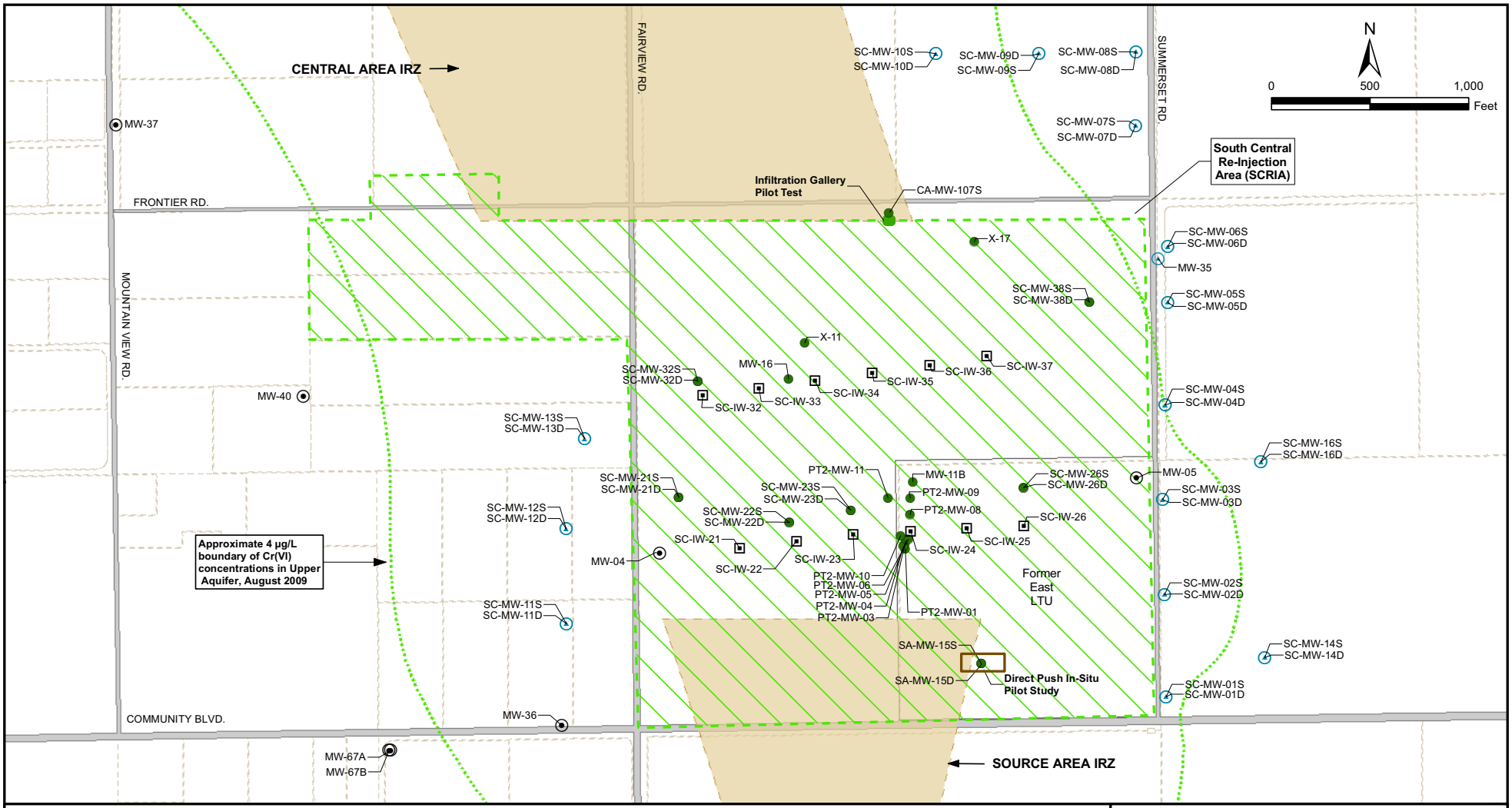
(2) Wells are monitored for parameters associated with in-situ activities identified in the General Permit NOI (Stantec 2008). See Table 6 for recent monitoring data.

**Abbreviations:**
Cr(VI) = Hexavalent Chromium
Cr(T) = Total Chromium
GMP = Groundwater Monitoring Program
SCRIA = South Central Re-Injection Area
TDS = Total Dissolved Solids
WDR = Waste Discharge Requirements
NOA = Notice of Applicability

**FIGURE B-2**
**MONITORING LOCATIONS FOR GENERAL PERMIT GROUNDWATER COMPLIANCE MONITORING**
GENERAL SITE-WIDE GROUNDWATER REMEDIATION PROJECT
PACIFIC GAS & ELECTRIC CO.
HINKLEY, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2010\NOI_GENERAL_PERMIT_WELLS.MXD BKAHLER 3/12/2010 15:14:41




**LEGEND**

- SCRIA Re-Injection Well
- NOA Compliance Monitoring Well(1)
- NOA Compliance Monitoring Well, SCRIA(2)
- SCRIA Performance Monitoring Well

**Notes:**

(1) Well monitored for TDS, Cr(VI), Cr(T), and water levels at frequency designated in Table 2 of the General Permit WDR (Water Board 2009). See Figure 3 for the complete compliance monitoring network.

(2) Well monitored for parameters associated with in-situ activities identified in the General Permit NOI (Stantec 2008). See Table 6,7, and 8 for recent monitoring data.

**Abbreviations:**

Cr(VI) = Hexavalent Chromium
Cr(T) = Total Chromium
SCRIA = South Central Re-Injection Area
TDS = Total Dissolved Solids
IRZ = *In-Situ* Reactive Zone
WDR = Waste Discharge Requirements
NOA = Notice of Applicability
NOI = Notice of Intent

**FIGURE B-3**
**WELLS AND PILOT TEST LOCATIONS IN SOUTH CENTRAL RE-INJECTION AREA**

GENERAL SITE-WIDE GROUNDWATER
REMEDIATION PROJECT
PACIFIC GAS & ELECTRIC CO.
HINKLEY, CALIFORNIA

CH2MHILL

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2010\NOI_GENERAL_PERMIT_PIWELLS.MXD BKAHLER 1/26/2010 13:08:34

# Appendix C
# Central Area IRZ Volume, Concentrations, and Locations of Discharges

**Discharge Volumes, July 2009 through December 2009**

*Semiannual Status Report, Central Area IRZ*

**95% Ethanol**

| Period | CA-RW-01 | CA-RW-02 | CA-RW-03 | CA-RW-04 | CA-RW-05 | CA-RW-06 | CA-RW-07 | CA-RW-08 | CA-RW-09 | CA-RW-10 | CA-RW-11 | CA-RW-12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) |
| July 2009: | 80 | 0 | 0 | 0 | 63 | 0 | 0 | 0 | 151 | 0 | 60 | 0 | 354 |
| August 2009: | 63 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 107 |
| September 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| October 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| November 2009: | 0 | 60 | 0 | 0 | 0 | 66 | 0 | 75 | 0 | 49 | 0 | 0 | 250 |
| December 2009: | 0 | 175 | 0 | 0 | 0 | 177 | 0 | 192 | 0 | 141 | 0 | 0 | 685 |
| ***Total:*** | **143** | **235** | **0** | **0** | **83** | **243** | **0** | **267** | **151** | **190** | **85** | **0** | **1,396** |

**Recirculated Groundwater**

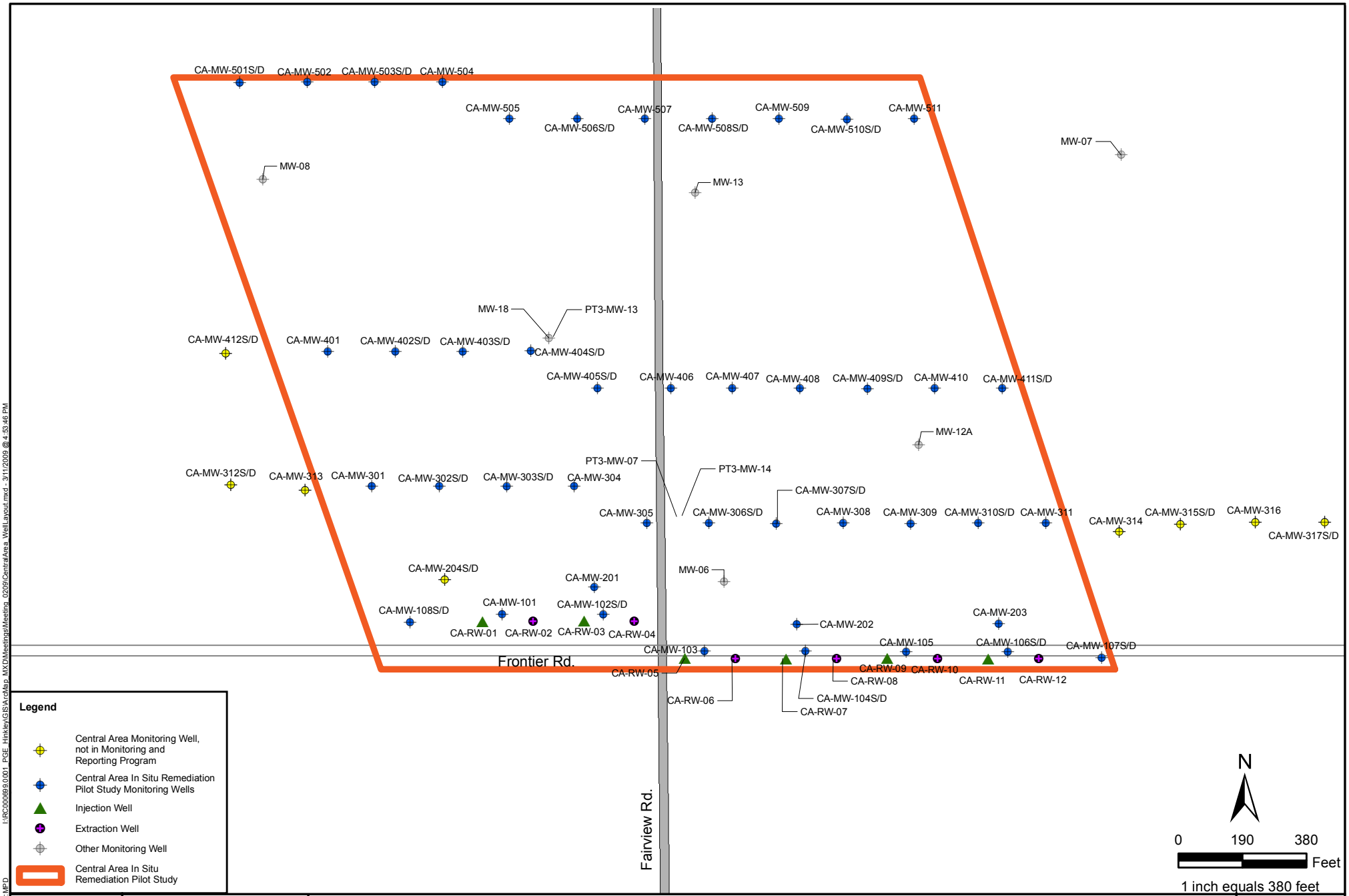
| | CA-RW-01 | CA-RW-02 | CA-RW-03 | CA-RW-04 | CA-RW-05 | CA-RW-06 | CA-RW-07 | CA-RW-08 | CA-RW-09 | CA-RW-10 | CA-RW-11 | CA-RW-12 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) |
| July 2009: | 138,586 | 0 | 1 | 0 | 348,820 | 0 | 0 | 0 | 382,061 | 0 | 787,922 | 0 | 1,657,390 |
| August 2009: | 123,434 | 0 | 802 | 0 | 418,787 | 0 | 0 | 0 | 309,538 | 0 | 540,003 | 0 | 1,392,564 |
| September 2009: | 52,642 | 0 | 49,637 | 0 | 190,513 | 0 | 0 | 0 | 1 | 0 | 110,844 | 0 | 403,637 |
| October 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| November 2009: | 0 | 383,811 | 0 | 0 | 0 | 342,475 | 0 | 389,413 | 0 | 311,491 | 0 | 0 | 1,427,190 |
| December 2009: | 0 | 627,064 | 0 | 0 | 0 | 518,249 | 0 | 557,681 | 0 | 512,507 | 0 | 0 | 2,215,501 |
| ***Total:*** | **314,662** | **1,010,875** | **50,440** | **0** | **958,120** | **860,724** | **0** | **947,094** | **691,600** | **823,998** | **1,438,769** | **0** | **7,096,282** |

**Analytical Results for Extracted Water July 2009 through December 2009**
*Semiannual Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|
| CA-RW-02 | 06-Aug-09 | N | 74.2 | 1.6 | 9.9 | 170 | 0.251 | 0.247 | 0.040 | <ND |
| CA-RW-04 | 06-Aug-09 | N | <0.2 | 3.7 | 0.18 | 82 | 6.34 | 1.93 | 20.4 | <ND |
| | 12-Nov-09 | N | <0.2 | 2.5 | 0.23 | 76 | 2.85 | 2.19 | 7.13 | <ND /UJ |
| CA-RW-06 | 06-Jul-09 | N | --- | 2.2 | --- | --- | --- | --- | --- | --- |
| | 27-Jul-09 | N | --- | 2.7 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | 68.9 | 2.2 | 11 /J | 190 | 0.399 | 0.145 | 0.061 | 0.41175 |
| CA-RW-10 | 27-Jul-09 | N | --- | 3.1 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | 33.4 | 3.1 | 13 /J | 220 | 0.502 | 0.0109 | <ND | <ND |
| CA-RW-12 | 27-Jul-09 | N | --- | 3 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | 7.61 | 3.2 | 12 /J | 180 | 0.233 | 0.00358 | <ND | <ND |
| | 12-Nov-09 | N | 8.34 | 3 | 12 /J | 180 | 0.45 | 0.00598 | <ND | <ND |

Abbreviations:

| | |
|---|---|
| mg/L | Milligrams per liter |
| µg/L | Micrograms per liter |
| ppb | Parts per billion |
| < | Symbol indicates not detected at or above reporting limit as noted |
| --- | Analyte not sampled |
| J | Analyte was present, but reported value may not be accurate or precise. |
| N | Normal |
| ND | Not Detected |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |

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Date: 10/31/2007

Program Manager
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# Central Area Project Layout

Central Area In Situ Remediation Pilot Study

Pacific Gas and Electric Company
Hinkley, California

FIGURE

**2**

# Appendix D
# Source Area IRZ Volume, Concentrations, and Locations of Discharges

**Discharge Volumes July 2009 through December 2009**

*Semiannual Status Report, Source Area IRZ*

## Recirculated Groundwater

| Period | SA-RW-05 | SA-RW-06 | SA-RW-07 | SA-RW-08 | SA-RW-09 | SA-RW-10 | SA-RW-11 | SA-RW-12 | SA-RW-13 | SA-RW-14 | SA-RW-15 | SA-RW-16 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) |
| July 2009 | 26,534 | 23,440 | 244,513 | 71,989 | 234,164 | 251,699 | 109,743 | 193,294 | 333,073 | 175,828 | 269,919 | 62,478 | 1,996,674 |
| August 2009 | 66,787 | 91,285 | 116,384 | 144,500 | 96,472 | 139,196 | 115,058 | 37,171 | 327,716 | 133,244 | 93,679 | 328,102 | 1,689,594 |
| September 2009 | 158,114 | 32,752 | 216,227 | 21,205 | 105,886 | 14,510 | 189,682 | 264,313 | 58,133 | 50,136 | 83,405 | 303,935 | 1,498,298 |
| October 2009 | 138,056 | 21,413 | 148,060 | 16,006 | 172,178 | 17,747 | 2 | 156,280 | 18,341 | 19,566 | 213,329 | 241,744 | 1,162,722 |
| November 2009 | 0 | 87,150 | 241,454 | 158,203 | 31,921 | 272,696 | 0 | 33,257 | 388,481 | 197,362 | 8,929 | 30 | 1,419,483 |
| December 2009 | 70,222 | 151,414 | 251,858 | 167,985 | 1,298 | 86,481 | 175,132 | 101,468 | 144,346 | 57,017 | 191,438 | 98,707 | 1,497,366 |
| ***Total*** | **459,713** | **407,454** | **1,218,496** | **579,888** | **641,919** | **782,329** | **589,617** | **785,783** | **1,270,090** | **633,153** | **860,699** | **1,034,996** | **9,264,137** |

## 95% Ethanol

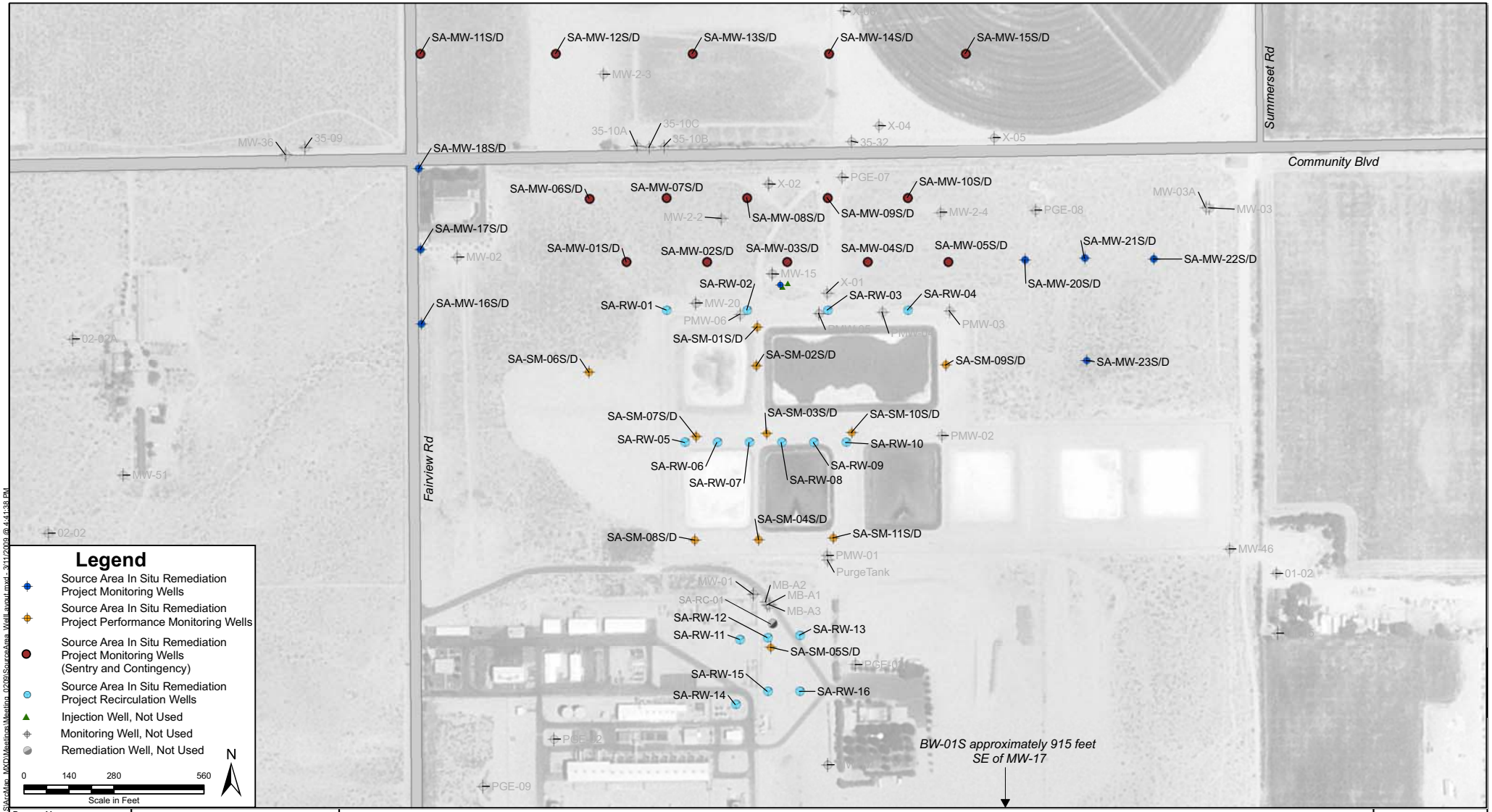
| Period | SA-RW-05 | SA-RW-06 | SA-RW-07 | SA-RW-08 | SA-RW-09 | SA-RW-10 | SA-RW-11 | SA-RW-12 | SA-RW-13 | SA-RW-14 | SA-RW-15 | SA-RW-16 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Monthly Volume (gallons) | Total Volume (gallons) |
| July 2009 | 3 | 0 | 12 | 0 | 9 | 13 | 33 | 50 | 96 | 40 | 73 | 9 | 338 |
| August 2009 | 0 | 18 | 3 | 23 | 0 | 17 | 28 | 10 | 116 | 36 | 26 | 92 | 369 |
| September 2009 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 9 | 12 | 4 | 13 | 55 |
| October 2009 | 11 | 0 | 43 | 0 | 15 | 1 | 0 | 50 | 0 | 0 | 38 | 73 | 232 |
| November 2009 | 0 | 32 | 40 | 18 | 0 | 37 | 0 | 28 | 79 | 35 | 10 | 82 | 361 |
| December 2009 | 0 | 3 | 10 | 5 | 0 | 16 | 5 | 5 | 30 | 12 | 38 | 9 | 133 |
| ***Total*** | **14** | **53** | **108** | **46** | **41** | **84** | **66** | **143** | **330** | **135** | **189** | **278** | **1,487** |

**Analytical Results for Recirculated Water July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Hexavalent Chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|
| SA-RW-01 | 16-Jul-09 | N | 133 | 0.00415 | 0.154 | 0.0829 | 1.8 | 92 | 150 | 0.85 |
| | 09-Nov-09 | N | 101 | 0.00558 | 0.118 /J | 0.146 | 1.4 | 88 | --- | 0.86 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | 0.73 |
| SA-RW-02 | 16-Jul-09 | N | <0.20 | 0.104 | 1.69 | 2.63 | <0.10 | 51 | 356 | 1.9 |
| | 13-Aug-09 | N | <0.2 | 0.12 | 2.67 /J | 3.02 | <0.10 | 43 | 378 | 2.5 |
| | 09-Nov-09 | N | <0.2 | 0.161 | 3.42 /J | 3.24 | <0.10 | 37 | --- | 1.9 |
| SA-RW-03 | 16-Jul-09 | N | 330 | 0.00295 | 0.153 | 0.397 | 2.2 | 82 | 210 | 1.6 |
| | 13-Aug-09 | N | 408 | 0.00345 | 0.165 /J | 0.623 | 2.1 | 88 | 212 | 1.8 |
| | 09-Nov-09 | N | 344 | 0.0106 | 0.140 /J | 0.915 | 1.2 | 85 | --- | 1.9 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | 1 |
| SA-RW-04 | 16-Jul-09 | N | 108 | 0.00151 | 0.241 | 0.00675 | 9.3 | 110 | 264 | 1.7 |
| | 13-Aug-09 | N | 112 | 0.00151 | 0.238 /J | 0.0118 | 9.2 | 110 | 270 | 1.5 |
| | 09-Nov-09 | N | 111 | 0.00171 | 0.158 /J | 0.00674 | 9 | 120 | --- | 1.4 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | 1.2 |

**Notes:**

| | |
|---|---|
| mg/L | Milligrams per liter |
| µg/L | Micrograms per liter |
| < | Symbol indicates not detected at or above laboratory reporting limit as noted |
| --- | Analyte not sampled |
| J | Analyte was present but reported value may not be accurate or precise |
| N | Normal |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |




| | | | |
|---|---|---|---|
| Program Manager<br>Lisa Cope | ARCADIS<br>155 Montgomery Street, Suite 1500<br>San Francisco, California 94104<br>Tel: 415 374 2744<br>Fax: 415 374 2745<br>www.arcadis-us.com | Source Area Project Layout<br><br>In Situ Source Area Remediation Project<br><br>Pacific Gas and Electric Company<br>Hinkley, California | Project Number<br>RC000699.0019 |
| Project Manager<br>Jenifer Beatty | | | Drawing Date<br>03/11/2009 |
| Task Manager<br>Hollis Phillips | | | Figure<br>4 |
| Technical Review<br>Kent Glover | | | |

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# Appendix E
# BCMP and Site-wide GMP Groundwater Monitoring Data, July 2009 through December 2009

## Wells and Control Limits for Boundary Control Detection Monitoring

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Site Area | Well Location[1] Relative to Aug-08 Chromium Plume | BCMP Sampling Frequency | Cr(VI) Control Limit [2] (µg/L) |
|---|---|---|---|---|
| **MW-21B** | North | Fringe | Quarterly | 4.0 |
| **MW-21B1** | North | Fringe | Quarterly | 6.9 |
| **MW-23B** | North | Margin | Quarterly | 41.6 |
| **MW-24A2** | North | Fringe | Annual | 7.0 |
| **MW-24B** | North | Fringe | Annual | 15.2 |
| **MW-28A** | North | Core | Quarterly | 23.1 |
| **MW-28B** | North | Core | Quarterly | 64.2 |
| **MW-29** | North | Margin | Quarterly | 26.1 |
| **MW-30B1** | North | Margin | Quarterly | 6.4 |
| **MW-30B2** | North | Margin | Quarterly | 18.0 |
| **MW-31** | North | Margin | Quarterly | 23.2 |
| **MW-32B1** | North | Fringe | Quarterly | 4.3 |
| **MW-32B2** | North | Fringe | Quarterly | 4.0 |
| **MW-41A** | North | Sentry | Annual | 4.0 |
| **MW-41B** | North | Sentry | Annual | 4.0 |
| **MW-42B1** | North | Margin | Quarterly | 38.0 |
| **MW-42B2** | North | Margin | Quarterly | 26.3 |
| **MW-43** | North | Margin | Quarterly | 30.1 |
| **MW-45A** | North | Margin | Quarterly | 59.2 |
| **MW-45B** | North | Margin | Quarterly | 4.8 |
| **MW-47** | North | Fringe | Quarterly | 8.6 |
| **MW-49A** | North | Sentry | Quarterly | 4.6 |
| **MW-49B** | North | Sentry | Annual | 4.0 |
| **MW-50A** | North | Sentry | Quarterly | 4.0 |
| **MW-50B** | North | Sentry | Quarterly | 4.0 |
| **MW-54** | North | Sentry | Quarterly | 4.0 |
| **MW-55A** | North | Sentry | Annual | 4.0 |
| **MW-55B** | North | Sentry | Annual | 4.0 |
| **MW-56** | North | Fringe | Annual | 6.4 |
| **MW-57** | North | Sentry | Semiannual | 4.0 |
| **MW-58** | North | Sentry | Semiannual | 4.0 |
| **MW-59** | North | Sentry | Semiannual | 4.0 |
| **MW-62A** | North | Sentry | Semiannual | 4.0 |
| **MW-62B** | North | Sentry | Annual | 4.0 |
| **MW-63** | North | Sentry | Annual | 4.0 |
| **MW-66A** | North | Sentry | Quarterly | 4.0 |

## Wells and Control Limits for Boundary Control Detection Monitoring

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Site Area | Well Location[1] Relative to Aug-08 Chromium Plume | BCMP Sampling Frequency | Cr(VI) Control Limit [2] (µg/L) |
|---|---|---|---|---|
| **MW-05** | Central | Sentry | Semiannual | 4.0 |
| **MW-06** | Central | Core | Quarterly | 155.2 |
| **MW-07** | Central | Sentry | Annual | 4.0 |
| **MW-12A** | Central | Fringe | Semiannual | 17.4 |
| **MW-13** | Central | Margin | Semiannual | 65.0 |
| **MW-14A** | Central | Margin | Semiannual | 31.2 |
| **MW-27A** | Central | Margin | Semiannual | 23.5 |
| **MW-33A** | Central | Sentry | Semiannual | 4.0 |
| **MW-33B** | Central | Sentry | Semiannual | 4.0 |
| **MW-35** | Central | Sentry | Semiannual | 4.0 |
| **MW-37** | Central | Sentry | Annual | 4.0 |
| **MW-38A** | Central | Margin | Quarterly | 63.6 |
| **MW-38B** | Central | Margin | Annual | 31.2 |
| **MW-40** | Central | Sentry | Annual | 4.0 |
| **MW-44A** | Central | Margin | Quarterly | 24.3 |
| **MW-44B** | Central | Margin | Quarterly | 22.2 |
| **MW-48** | Central | Sentry | Annual | 4.0 |
| **MW-61** | Central | Sentry | Quarterly | 4.0 |
| **MW-64A** | Central | Sentry | Quarterly | 4.0 |
| **MW-03** | South | Margin | Quarterly | 37.7 |
| **MW-20** | South | Core | Quarterly | 1,612 |
| **MW-39** | South | Sentry | Semiannual | 4.0 |
| **MW-46** | South | Sentry | Quarterly | 4.0 |
| **MW-51** | South | Sentry | Annual | 4.0 |
| **MW-52** | South | Sentry | Semiannual | 4.0 |
| **MW-53** | South | Sentry | Semiannual | 4.0 |
| **MW-67A** | South | Sentry | Quarterly | 4.2 |

**NOTES:**

Table lists the wells used for detection monitoring in the approved chromium plume Boundary Contr Monitoring Program (BCMP), as prescribed in CAO No. R6V-2008-0002.

[1] Sentry, Fringe, Margin, and Core refer to well locations relative to the interpreted chromium plume concentration outlines in the upper aquifer defined in August 2008 groundwater sampling

[2] Hexavalent chromium [Cr(VI)] control limits are used for monitoring changes in plume distribution. The control limits are based on Cr(VI) concentrations, in micrograms per liter (µg/L), measured in prior eight sampling events through August 2008.

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| 02-02A | 02/09/2009 | 0.510 | 218.6 | ND <1 | | | | |
| | 05/13/2009 | 0.510 | 218.6 | ND <1 | | | | |
| | 08/06/2009 | 0.530 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | 0.470 | 218.6 | ND <1 | 3.96 | 10/14/2005 | 7.42 | 02/09/2005 |
| 02-08 | 05/13/2009 | 1.28 | 218.6 | 1.22 | 1.28 | 05/13/2009 | 1.22 | 05/13/2009 |
| 02-26 | 05/13/2009 | 0.380 | 218.6 | ND <1 | 0.380 | 05/13/2009 | 0.0 | 05/13/2009 |
| 23-09 | 08/11/2009 | 1.75 | 218.6 | 2.00 | | | | |
| | 11/24/2009 | 1.80 | 218.6 | 1.75 | 1.80 | 11/24/2009 | 3.70 | 02/17/2004 |
| 23-15 | 02/12/2009 | 2.87 | 218.6 | 2.70 | | | | |
| | 05/14/2009 | 3.93 | 218.6 | 3.76 | | | | |
| | 08/06/2009 | 4.00 | 218.6 | 4.24 | | | | |
| | 11/24/2009 | 4.23 | 218.6 | 4.03 | 5.00 | 06/16/2004 | 7.20 | 02/17/2004 |
| 23-16 | 02/12/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/06/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/24/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/24/2009 | 1.38 | 02/10/2005 |
| 23-19 | 05/14/2009 | 3.49 | 218.6 | 3.55 | | | | |
| | 08/06/2009 | 3.28 | 218.6 | 3.46 | | | | |
| | 08/06/2009 (dup) | 3.26 | 218.6 | 3.14 | | | | |
| | 11/24/2009 | 3.06 | 218.6 | 3.00 | 3.49 | 05/14/2009 | 3.55 | 05/14/2009 |
| 23-20 | 08/11/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 08/11/2009 | 0.0 | 08/11/2009 |
| 23-25 | 08/05/2009 | 0.300 | 218.6 | 1.04 | 0.300 | 08/05/2009 | 1.04 | 08/05/2009 |
| 26-37 | 02/10/2009 | 3.52 | 218.6 | 3.33 | | | | |
| | 05/13/2009 | 3.62 | 218.6 | 3.75 | | | | |
| | 08/04/2009 | 4.03 | 218.6 | 4.43 | | | | |
| | 08/04/2009 (dup) | 4.03 | 218.6 | 4.11 | | | | |
| | 11/13/2009 | 3.67 | 218.6 | 3.58 | 4.30 | 08/06/2008 | 30.0 | 08/12/1994 |
| | 11/13/2009 (dup) | 3.67 | 218.6 | 3.54 | | | | |
| 26-44 | 02/05/2009 | 2.07 | 218.6 | 1.90 | | | | |
| | 05/13/2009 | 0.710 | 218.6 | ND <1 | | | | |
| | 08/04/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/13/2009 | ND <0.2 | 218.6 | ND <1 | 3.90 | 05/25/2001 | 7.90 | 01/24/2002 |
| 26-65 | 02/09/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 02/09/2009 (dup) | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/12/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/12/2009 (dup) | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/04/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/10/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/10/2009 | 5.00 | 07/22/2003 |
| 26-66 | 08/10/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/10/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/10/2009 | 2.20 | 08/23/2005 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period

All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| 27-02 | 11/03/2009 | 1.56 | 218.6 | 1.59 | 1.56 | 11/03/2009 | 1.59 | 11/03/2009 |
| 27-03 | 02/09/2009 | 2.16 | 218.6 | 1.90 | | | | |
| | 02/09/2009 (dup) | 2.17 | 218.6 | 2.05 | | | | |
| | 05/13/2009 | 2.16 | 218.6 | 2.15 | | | | |
| | 08/10/2009 | 2.39 | 218.6 | 2.35 | | | | |
| | 11/12/2009 | 1.67 | 218.6 | 2.04 | 2.39 | 08/10/2009 | 2.95 | 05/31/2006 |
| 27-07 | 11/03/2009 | 1.87 | 218.6 | 2.04 | 1.87 | 11/03/2009 | 2.04 | 11/03/2009 |
| 27-08 | 02/05/2009 | 0.979 | 218.6 | 1.15 | | | | |
| | 05/14/2009 | 1.14 | 218.6 | 1.12 | | | | |
| | 05/14/2009 (dup) | 1.12 | 218.6 | 1.22 | | | | |
| | 08/06/2009 | 1.11 | 218.6 | 1.37 | | | | |
| | 11/12/2009 | 0.890 | 218.6 | 1.21 | 1.98 | 09/14/2006 | 2.08 | 02/15/2007 |
| 27-25 | 02/05/2009 | 18.4 | 218.6 | 20.3 | | | | |
| | 05/15/2009 | 5.33 | 218.6 | 4.82 | 37.0 | 01/30/2006 | 35.8 | 01/16/2006 |
| 27-26 | 11/03/2009 | 1.79 | 218.6 | 1.75 | 2.06 | 01/16/2006 | 2.36 | 01/16/2006 |
| 27-27 | 11/03/2009 | 1.47 | 218.6 | 1.44 | 1.54 | 04/12/2007 | 1.79 | 04/12/2007 |
| 27-38 | 02/05/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | 0.900 | 218.6 | 1.04 | | | | |
| | 08/06/2009 | 1.44 | 218.6 | 1.68 | | | | |
| | 11/12/2009 | 0.700 | 218.6 | ND <1 | 1.81 | 10/15/2007 | 1.79 | 02/13/2008 |
| 27-39 | 02/05/2009 | 0.543 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | 1.29 | 218.6 | 1.46 | | | | |
| | 08/06/2009 | 1.18 | 218.6 | 1.44 | | | | |
| | 11/12/2009 | 0.730 | 218.6 | 1.13 | 1.73 | 02/15/2007 | 2.12 | 04/13/2007 |
| 27-40 | 02/05/2009 | 1.61 | 218.6 | 1.69 | | | | |
| | 05/14/2009 | 1.61 | 218.6 | 1.78 | | | | |
| | 08/06/2009 | 1.66 | 218.6 | 1.84 | | | | |
| | 11/12/2009 | 1.28 | 218.6 | 1.70 | 2.15 | 09/14/2006 | 2.26 | 02/15/2007 |
| 30E-01 | 08/27/2009 | 1.48 | 218.6 | 1.49 | 1.48 | 08/27/2009 | 1.49 | 08/27/2009 |
| 34-01 | 12/17/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 12/17/2009 | 2.24 | 08/16/2007 |
| 34-34 | 12/17/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 12/17/2009 | 0.0 | 12/17/2009 |
| 34-35 | 12/17/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 12/17/2009 | 0.0 | 12/17/2009 |
| 34-36 | 12/17/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 12/17/2009 | 0.0 | 12/17/2009 |
| 34-37 | 12/17/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 12/17/2009 | 0.0 | 12/17/2009 |
| 34-38 | 08/05/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 08/05/2009 | 0.0 | 08/05/2009 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| 35-03 | 02/10/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/19/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/11/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/12/2009 | 0.0 | 11/12/2009 |
| 35-04 | 02/10/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/11/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/12/2009 | 9.10 | 03/26/2002 |
| 36-03 | 02/10/2009 | 0.210 | 218.6 | ND <1 | | | | |
| | 05/13/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/06/2009 | ND <0.2 | 218.6 | ND <1 | 2.30 | 08/16/2001 | 11.6 | 09/25/2002 |
| 36-24 | 05/13/2009 | 1.11 | 218.6 | 1.44 | 2.10 | 07/23/2002 | 5.90 | 08/12/2003 |
| BGS-48 | 08/06/2009 | ND <0.2 | 218.6 | ND <1 | 0.861 | 10/19/2006 | 0.0 | 08/06/2009 |
| CA-MW-315S | 02/06/2009 | 5.38 | 218.6 | 6.03 | 6.51 | 09/24/2008 | 6.84 | 09/24/2008 |
| CA-MW-317D | 02/06/2009 | 4.02 | 218.6 | 4.94 | 4.16 | 09/24/2008 | 4.94 | 02/06/2009 |
| DW-01 | 02/04/2009 | 4.21 | 218.6 | 4.07 | | | | |
| | 05/13/2009 | 4.16 | 218.6 | 4.06 | | | | |
| | 08/07/2009 | 3.92 | 218.6 | 3.67 | | | | |
| | 11/10/2009 | 3.39 | 218.6 | 3.58 | 6.08 | 01/17/2005 | 7.25 | 04/19/2006 |
| DW-02 | 02/04/2009 | ND <1.05 | 218.6 | ND <1 | | | | |
| | 02/04/2009 (dup) | ND <1.05 | 218.6 | ND <1 | | | | |
| | 05/13/2009 | 0.320 | 218.6 | ND <1 | | | | |
| | 08/07/2009 | 0.380 | 218.6 | ND <1 | | | | |
| | 11/10/2009 | ND <0.2 | 218.6 | ND <1 | 1.42 | 06/09/2008 | 12.6 | 04/19/2006 |
| DW-03 | 02/04/2009 | 1.71 | 218.6 | 2.17 | | | | |
| | 05/13/2009 | 2.11 | 218.6 | 1.96 | | | | |
| | 08/07/2009 | 2.19 | 218.6 | 1.91 | | | | |
| | 11/10/2009 | 1.92 | 218.6 | 1.90 | 2.28 | 04/11/2008 | 6.67 | 04/19/2006 |
| EX-01 | 02/04/2009 | 18.6 | 218.6 | 18.6 | | | | |
| | 05/12/2009 | 19.2 | 218.6 | 16.5 | | | | |
| | 08/12/2009 | 17.2 | 218.6 | 17.2 | | | | |
| | 11/10/2009 | 15.5 | 218.6 | 16.6 | 84.2 | 09/13/2004 | 86.9 | 09/13/2004 |
| EX-02 | 02/04/2009 | 11.1 | 218.6 | 9.93 | | | | |
| | 02/04/2009 (dup) | 11.2 | 218.6 | 9.23 | | | | |
| | 05/12/2009 | 10.4 | 218.6 | 9.48 | | | | |
| | 08/12/2009 | 11.4 | 218.6 | 11.7 | | | | |
| | 11/10/2009 | 11.6 | 218.6 | 12.4 | 16.5 | 02/13/2007 | 23.6 | 11/09/2004 |
| EX-03 | 02/04/2009 | 26.5 | 218.6 | 22.6 | | | | |
| | 05/12/2009 | 26.1 | 218.6 | 25.6 | | | | |
| | 11/10/2009 | 27.2 | 218.6 | 27.9 | 34.0 | 06/21/2007 | 32.8 | 08/13/2007 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| EX-04 | 02/04/2009 | 2.61 | 218.6 | 5.11 | | | | |
| | 05/12/2009 | 22.6 | 218.6 | 22.3 | | | | |
| | 08/12/2009 | 16.8 | 218.6 | 16.4 | | | | |
| | 11/10/2009 | 18.8 | 218.6 | 19.5 | 24.6 | 06/04/2008 | 27.5 | 06/04/2008 |
| EX-08 | 02/05/2009 | 2.07 | 218.6 | ND <5.91 | | | | |
| | 08/05/2009 | 5.30 | 218.6 | 4.60 | 5.93 | 08/11/2008 | 7.13 | 08/11/2008 |
| EX-09 | 02/05/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/13/2009 | 0.670 | 218.6 | ND <1 | | | | |
| | 08/05/2009 | 0.920 | 218.6 | 1.11 | | | | |
| | 11/16/2009 | ND <0.2 | 218.6 | ND <1 | 2.78 | 02/13/2008 | 4.10 | 02/13/2008 |
| EX-15 | 02/04/2009 | 25.1 | 218.6 | 21.4 | | | | |
| | 05/12/2009 | 42.4 | 218.6 | 39.9 | | | | |
| | 08/12/2009 | 42.6 | 218.6 | 42.3 | | | | |
| | 11/10/2009 | 46.4 | 218.6 | 47.2 | 47.9 | 06/30/2008 | 47.2 | 11/10/2009 |
| EX-16 | 02/04/2009 | 2.98 | 218.6 | 2.75 | | | | |
| | 05/12/2009 | 46.4 | 218.6 | 44.5 | | | | |
| | 05/12/2009 (dup) | 46.2 | 218.6 | 41.4 | | | | |
| | 08/12/2009 | 43.2 | 218.6 | 44.3 | | | | |
| | 11/10/2009 | 29.2 | 218.6 | 28.6 | 57.0 | 12/14/2006 | 56.5 | 12/14/2006 |
| EX-17 | 02/05/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 02/05/2009 | 0.0 | 02/05/2009 |
| EX-20 | 02/04/2009 | 0.230 | 218.6 | ND <1 | | | | |
| | 03/30/2009 | 53.0 | 218.6 | 59.0 | | | | |
| | 05/12/2009 | 52.5 | 218.6 | 49.1 | | | | |
| | 08/12/2009 | 50.9 | 218.6 | 50.8 | | | | |
| | 08/12/2009 (dup) | 49.7 | 218.6 | 45.7 | | | | |
| | 11/10/2009 | 36.7 | 218.6 | 41.3 | 61.2 | 06/02/2008 | 63.2 | 06/02/2008 |
| EX-21 | 04/10/2009 | 17.1 | 218.6 | 24.0 | | | | |
| | 11/10/2009 | 25.7 | 218.6 | 26.2 | 25.7 | 11/10/2009 | 26.2 | 11/10/2009 |
| EX-22 | 04/03/2009 | 14.9 | 218.6 | 24.2 | | | | |
| | 11/10/2009 | 37.5 | 218.6 | 38.3 | 37.5 | 11/10/2009 | 38.4 | 11/10/2009 |
| | 11/10/2009 (dup) | 37.2 | 218.6 | 38.4 | | | | |
| IN-01 | 04/30/2009 | 1.35 | 218.6 | 1.50 | 1.35 | 04/30/2009 | 1.50 | 04/30/2009 |
| IN-02 | 04/28/2009 | 2.63 | 218.6 | 2.27 | 2.63 | 04/28/2009 | 2.27 | 04/28/2009 |
| IN-03 | 04/22/2009 | 1.75 | 218.6 | 1.83 | 1.75 | 04/22/2009 | 1.83 | 04/22/2009 |
| IN-04 | 04/17/2009 | 0.440 | 218.6 | ND <1 | 0.440 | 04/17/2009 | 0.0 | 04/17/2009 |
| MW-01 | 02/09/2009 | 0.289 | 218.6 | 18.2 | | | | |
| | 08/06/2009 | ND <0.2 | 218.6 | 5.18 | 963.0 | 02/09/2005 | 1490.0 | 08/23/2005 |

NOTES: = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-03 | 02/09/2009 | 28.4 | 218.6 | 27.9 | | | | |
| | 05/15/2009 | 28.4 | 218.6 | 28.2 | | | | |
| | 08/06/2009 | 28.1 | 218.6 | 24.2 | | | | |
| | 11/17/2009 | 28.4 | 218.6 | 27.8 | 110.0 | 05/01/1988 | 140.0 | 08/11/1994 |
| MW-04 | 08/11/2009 | 54.8 | 218.6 | 49.3 | 280.0 | 05/01/1988 | 292.0 | 02/14/2002 |
| MW-05 | 02/06/2009 | 0.800 | 218.6 | ND <1 | | | | |
| | 08/11/2009 | 0.770 | 218.6 | ND <1 | | | | |
| | 11/11/2009 | 0.630 | 218.6 | 1.11 | 10.0 | 05/01/1988 | 7.00 | 02/18/2004 |
| MW-06 | 02/06/2009 | 120 | 3500-Cr | 125 | | | | |
| | 05/15/2009 | 160 | 3500-Cr | 188 | | | | |
| | 06/11/2009 | 186 | 218.6 | 171 | | | | |
| | 08/05/2009 | 148 | 218.6 | 154 | | | | |
| | 11/11/2009 | 118 | 218.6 | 107 | 216.0 | 03/12/2007 | 202.0 | 02/14/2002 |
| MW-07 | 08/11/2009 | 1.50 | 218.6 | 1.41 | 150.0 | 05/01/1988 | 140.0 | 11/11/1999 |
| MW-08 | 08/11/2009 | 0.730 | 218.6 | ND <1 | 88.1 | 01/16/2007 | 67.2 | 01/16/2007 |
| MW-10 | 02/05/2009 | 31.1 | 218.6 | 28.7 | | | | |
| | 08/10/2009 | 31.0 | 218.6 | 27.7 | 100.0 | 05/01/1988 | 93.0 | 11/16/1998 |
| MW-11B | 02/06/2009 | 1470 | 3500-Cr | 1580 | | | | |
| | 03/30/2009 | 1630 | 218.6 | 1580 | 3700.0 | 05/01/1988 | 4200.0 | 05/01/1988 |
| MW-12A | 02/09/2009 | 6.15 | 218.6 | 5.60 | | | | |
| | 08/06/2009 | 7.93 | 218.6 | 7.17 | 170.0 | 05/23/2001 | 530.0 | 10/27/1994 |
| | 08/06/2009 (dup) | 7.74 | 218.6 | 8.11 | | | | |
| MW-13 | 02/09/2009 | 19.9 | 218.6 | 18.2 | | | | |
| | 08/11/2009 | 35.4 | 218.6 | 32.9 | | | | |
| | 11/11/2009 | 11.8 | 218.6 | 12.5 | 87.0 | 02/15/2006 | 310.0 | 02/23/1994 |
| | 11/11/2009 (dup) | 11.7 | 218.6 | 11.2 | | | | |
| MW-14A | 02/09/2009 | 27.6 | 218.6 | 24.9 | | | | |
| | 08/11/2009 | 25.2 | 218.6 | 23.8 | 140.0 | 02/23/1999 | 190.0 | 10/05/1995 |
| MW-14B | 08/11/2009 | 40.2 | 218.6 | 35.9 | 42.1 | 08/11/2006 | 120.0 | 02/27/1996 |
| MW-14C | 02/09/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/11/2009 | ND <0.2 | 218.6 | ND <1 | 20.0 | 05/01/1988 | 2.90 | 02/20/2004 |
| | 08/11/2009 (dup) | ND <0.2 | 218.6 | ND <1 | | | | |
| MW-15 | 02/09/2009 | 0.750 | 218.6 | 6.78 | | | | |
| | 03/30/2009 | 4.20 | 218.6 | 14.3 | | | | |
| | 08/06/2009 | 3.72 | 218.6 | 14.3 | 2600.0 | 05/01/1988 | 4700.0 | 10/04/1995 |
| MW-16 | 03/31/2009 | 39.3 | 218.6 | 36.9 | | | | |
| | 08/12/2009 | 40.4 | 218.6 | 37.1 | | | | |
| | 11/11/2009 | 34.0 | 218.6 | 35.0 | 811.0 | 07/29/1997 | 930.0 | 10/07/1997 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-17 | 02/09/2009 | 26.0 | 218.6 | 21.7 | | | | |
| | 08/06/2009 | 31.0 | 218.6 | 29.6 | 59.0 | 10/08/1997 | 72.3 | 05/22/2002 |
| MW-20 | 02/03/2009 | 1700 | 218.6 | 1500 | | | | |
| | 03/06/2009 | 1440 | 3500-Cr | 1480 | | | | |
| | 05/14/2009 | 1440 | 3500-Cr | 2090 | | | | |
| | 08/06/2009 | 1480 | 3500-Cr | 1780 | | | | |
| | 11/17/2009 | 1120 | 3500-Cr | 1550 | 1710.0 | 02/17/2003 | 2400.0 | 04/09/1997 |
| MW-21B | 02/04/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/10/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/10/2009 | ND <0.2 | 218.6 | ND <1 | 0.290 | 02/03/2005 | 5.10 | 12/02/2003 |
| MW-21B1 | 02/04/2009 | 3.56 | 218.6 | 3.84 | | | | |
| | 05/14/2009 | 2.50 | 218.6 | 3.34 | | | | |
| | 08/10/2009 | 2.70 | 218.6 | 2.58 | | | | |
| | 11/10/2009 | 5.40 | 218.6 | 5.26 | 37.9 | 10/11/2005 | 37.0 | 10/11/2005 |
| MW-21C | 08/05/2009 | ND <0.2 | 218.6 | ND <1 | 2.30 | 09/24/2002 | 55.7 | 11/12/2002 |
| MW-23B | 02/05/2009 | 32.6 | 218.6 | 29.8 | | | | |
| | 05/14/2009 | 34.7 | 218.6 | 35.2 | | | | |
| | 08/05/2009 | 39.2 | 218.6 | 38.3 | | | | |
| | 11/17/2009 | 40.7 | 218.6 | 40.0 | 64.9 | 06/24/2003 | 68.8 | 04/17/2003 |
| | 11/17/2009 (dup) | 39.8 | 218.6 | 40.2 | | | | |
| MW-23C | 02/05/2009 | 8.71 | 218.6 | 9.02 | | | | |
| | 02/05/2009 (dup) | 8.59 | 218.6 | 8.76 | | | | |
| | 05/14/2009 | 8.19 | 218.6 | 8.77 | | | | |
| | 08/05/2009 | 10.6 | 218.6 | 11.6 | | | | |
| | 11/17/2009 | 12.3 | 218.6 | 12.1 | 12.3 | 11/17/2009 | 12.1 | 11/17/2009 |
| MW-24A2 | 08/05/2009 | 3.23 | 218.6 | 4.06 | 7.02 | 08/09/2006 | 12.1 | 12/30/2002 |
| | 08/05/2009 (dup) | 3.19 | 218.6 | 3.95 | | | | |
| MW-24B | 08/05/2009 | 7.15 | 218.6 | 6.64 | 15.9 | 06/06/2005 | 18.6 | 10/12/2005 |
| MW-27A | 02/05/2009 | 18.3 | 218.6 | 19.7 | | | | |
| | 08/06/2009 | 17.0 | 218.6 | 17.7 | 24.5 | 02/20/2004 | 35.4 | 12/01/2003 |
| MW-27B | 02/05/2009 | 1.68 | 218.6 | ND <2.92 | | | | |
| | 08/11/2009 | 1.78 | 218.6 | 2.02 | 15.5 | 02/08/2005 | 20.2 | 02/08/2005 |
| MW-28A | 02/03/2009 | 38.2 | 218.6 | 35.0 | | | | |
| | 03/05/2009 | 44.4 | 218.6 | 35.9 | | | | |
| | 05/13/2009 | 32.9 | 218.6 | 31.9 | | | | |
| | 08/10/2009 | 14.1 | 218.6 | 14.9 | | | | |
| | 11/17/2009 | 11.8 | 218.6 | 12.3 | 44.4 | 03/05/2009 | 35.9 | 03/05/2009 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-28B | 02/03/2009 | 47.9 | 218.6 | 42.4 | | | | |
| | 05/13/2009 | 47.6 | 218.6 | 44.4 | | | | |
| | 08/10/2009 | 53.0 | 218.6 | 48.0 | | | | |
| | 11/17/2009 | 53.4 | 218.6 | 49.5 | 64.0 | 10/16/2007 | 61.6 | 04/13/2007 |
| MW-29 | 02/04/2009 | 25.8 | 218.6 | 22.9 | | | | |
| | 05/14/2009 | 24.3 | 218.6 | 24.2 | | | | |
| | 08/11/2009 | 16.3 | 218.6 | 20.0 | | | | |
| | 11/11/2009 | 20.2 | 218.6 | 22.2 | 25.8 | 02/04/2009 | 27.0 | 02/13/2008 |
| | 11/11/2009 (dup) | 20.2 | 218.6 | 21.4 | | | | |
| MW-30B1 | 02/04/2009 | 5.02 | 218.6 | 5.08 | | | | |
| | 05/14/2009 | 4.30 | 218.6 | 4.45 | | | | |
| | 08/10/2009 | 4.52 | 218.6 | 4.61 | | | | |
| | 11/10/2009 | 4.70 | 218.6 | 4.47 | 96.8 | 10/13/2003 | 88.9 | 10/13/2003 |
| MW-30B2 | 02/04/2009 | 20.4 | 218.6 | 20.0 | | | | |
| | 03/05/2009 | 7.84 | 218.6 | 6.70 | | | | |
| | 05/14/2009 | 6.82 | 218.6 | 6.42 | | | | |
| | 08/10/2009 | 6.99 | 218.6 | 7.06 | | | | |
| | 08/10/2009 (dup) | 7.22 | 218.6 | 6.35 | | | | |
| | 11/10/2009 | 7.01 | 218.6 | 6.56 | 192.0 | 10/11/2004 | 180.0 | 10/11/2004 |
| MW-31 | 02/04/2009 | 18.6 | 218.6 | 18.7 | | | | |
| | 05/14/2009 | 14.9 | 218.6 | 16.2 | | | | |
| | 08/11/2009 | 19.2 | 218.6 | 17.9 | | | | |
| | 11/11/2009 | 16.0 | 218.6 | 15.7 | 34.1 | 04/09/2007 | 37.8 | 04/09/2007 |
| MW-32B1 | 02/05/2009 | 3.94 | 218.6 | 3.80 | | | | |
| | 05/14/2009 | 3.72 | 218.6 | 3.63 | | | | |
| | 08/10/2009 | 3.82 | 218.6 | 3.95 | | | | |
| | 11/10/2009 | 3.73 | 218.6 | 3.59 | 4.42 | 12/06/2006 | 6.30 | 12/03/2003 |
| MW-32B2 | 02/05/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 05/14/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/10/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/10/2009 | ND <0.2 | 218.6 | ND <1 | 0.200 | 08/05/2003 | 1.78 | 04/18/2006 |
| MW-33A | 02/06/2009 | 1.60 | 218.6 | 1.76 | | | | |
| | 08/12/2009 | 1.54 | 218.6 | 1.92 | 2.31 | 09/02/2004 | 8.91 | 02/08/2005 |
| MW-33B | 02/06/2009 | 1.65 | 218.6 | 1.97 | | | | |
| | 08/12/2009 | 1.66 | 218.6 | 1.60 | 2.07 | 08/10/2006 | 5.26 | 02/08/2005 |
| MW-34 | 02/05/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 08/10/2009 | ND <0.2 | 218.6 | ND <1 | 0.460 | 07/15/2003 | 4.03 | 02/22/2006 |
| MW-35 | 02/06/2009 | 1.06 | 218.6 | ND <1 | | | | |
| | 08/12/2009 | 0.970 | 218.6 | 1.21 | 1.52 | 08/10/2006 | 8.24 | 02/08/2005 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-36 | 02/06/2009 | 99.2 | 3500-Cr | 111 | | | | |
| | 08/11/2009 | 83.8 | 218.6 | 77.9 | 295.0 | 10/24/2006 | 260.0 | 10/24/2006 |
| MW-37 | 08/12/2009 | 1.26 | 218.6 | 1.28 | 1.56 | 09/01/2004 | 3.30 | 09/01/2004 |
| MW-38A | 02/04/2009 | 55.3 | 218.6 | 52.2 | | | | |
| | 05/13/2009 | 70.0 | 218.6 | 69.7 | | | | |
| | 06/11/2009 | 72.3 | 218.6 | 79.0 | | | | |
| | 08/12/2009 | 62.1 | 218.6 | 59.8 | | | | |
| | 11/11/2009 | 56.2 | 218.6 | 54.4 | 72.3 | 06/11/2009 | 79.0 | 06/11/2009 |
| | 11/11/2009 (dup) | 58.2 | 218.6 | 54.8 | | | | |
| MW-38B | 08/12/2009 | 7.03 | 218.6 | 6.94 | 51.5 | 02/20/2004 | 47.6 | 04/28/2004 |
| | 08/12/2009 (dup) | 7.08 | 218.6 | 7.01 | | | | |
| MW-39 | 08/07/2009 | 1.07 | 218.6 | 1.53 | 3.04 | 08/22/2005 | 3.22 | 08/22/2005 |
| MW-40 | 08/12/2009 | 0.210 | 218.6 | ND <1 | | | | |
| | 11/11/2009 | ND <0.2 | 218.6 | ND <1 | 0.331 | 02/22/2007 | 1.50 | 02/22/2006 |
| MW-41A | 08/05/2009 | 2.69 | 218.6 | 2.75 | 2.87 | 02/07/2005 | 5.07 | 09/01/2004 |
| MW-41B | 08/05/2009 | 2.74 | 218.6 | 2.89 | 3.65 | 02/07/2005 | 6.39 | 09/01/2004 |
| MW-42B1 | 02/04/2009 | 29.6 | 218.6 | 30.1 | | | | |
| | 05/14/2009 | 27.9 | 218.6 | 25.4 | | | | |
| | 08/11/2009 | 29.2 | 218.6 | 34.6 | | | | |
| | 11/11/2009 | 26.3 | 218.6 | 26.7 | 45.6 | 08/14/2006 | 42.8 | 04/19/2006 |
| MW-42B2 | 02/04/2009 | 26.8 | 218.6 | 25.4 | | | | |
| | 03/05/2009 | 26.6 | 218.6 | 21.5 | | | | |
| | 05/14/2009 | 26.8 | 218.6 | 27.4 | | | | |
| | 08/11/2009 | 31.0 | 218.6 | 32.3 | | | | |
| | 11/11/2009 | 34.7 | 218.6 | 34.1 | 42.8 | 03/11/2004 | 44.2 | 04/29/2004 |
| MW-43 | 02/04/2009 | 8.86 | 218.6 | 8.16 | | | | |
| | 05/14/2009 | 7.31 | 218.6 | 8.00 | | | | |
| | 08/10/2009 | 8.72 | 218.6 | 8.97 | | | | |
| | 11/10/2009 | 8.55 | 218.6 | 7.97 | 28.4 | 06/18/2007 | 29.1 | 04/12/2007 |
| MW-44A | 12/17/2009 | 4.25 J | 218.6 | 4.43 | 26.4 | 08/22/2005 | 26.8 | 08/22/2005 |
| | 12/17/2009 (dup) | 3.47 J | 218.6 | 4.29 | | | | |
| MW-44B | 12/17/2009 | 5.65 | 218.6 | 5.19 | 41.2 | 02/08/2005 | 45.6 | 04/14/2005 |
| MW-45A | 02/03/2009 | 57.2 | 218.6 | 47.2 | | | | |
| | 05/13/2009 | 54.0 | 218.6 | 51.7 | | | | |
| | 08/10/2009 | 52.2 | 218.6 | 55.2 | | | | |
| | 08/10/2009 (dup) | 50.3 | 218.6 | 52.5 | | | | |
| | 11/17/2009 | 46.2 | 218.6 | 45.0 | 59.9 | 02/13/2008 | 55.2 | 08/10/2009 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-45B | 02/03/2009 | 3.40 | 218.6 | 2.90 | | | | |
| | 05/13/2009 | 4.52 | 218.6 | 4.61 | | | | |
| | 08/10/2009 | 2.84 | 218.6 | 2.78 | | | | |
| | 11/17/2009 | 3.04 | 218.6 | 3.16 | 4.75 | 04/07/2008 | 5.77 | 02/13/2008 |
| MW-46 | 02/09/2009 | 0.640 | 218.6 | 1.95 | | | | |
| | 05/15/2009 | 0.680 | 218.6 | 1.11 | | | | |
| | 08/07/2009 | 0.630 | 218.6 | 1.76 | | | | |
| | 11/17/2009 | 0.610 | 218.6 | ND <1 | 0.780 | 11/07/2008 | 4.45 | 09/02/2004 |
| MW-47 | 02/03/2009 | 9.58 | 218.6 | 8.99 | | | | |
| | 03/06/2009 | 9.56 | 218.6 | 9.11 | | | | |
| | 03/06/2009 (dup) | 9.58 | 218.6 | 9.14 | | | | |
| | 05/13/2009 | 9.70 | 218.6 | 9.28 | | | | |
| | 08/10/2009 | 11.4 | 218.6 | 10.5 | | | | |
| | 11/17/2009 | 9.82 | 218.6 | 9.57 | 18.1 | 08/18/2005 | 18.2 | 08/18/2005 |
| MW-47A | 08/07/2009 | 3.36 | 218.6 | 4.01 | 3.36 | 08/07/2009 | 4.01 | 08/07/2009 |
| MW-48 | 08/05/2009 | 1.31 | 218.6 | 1.81 | 1.40 | 02/22/2007 | 3.32 | 02/08/2005 |
| MW-49A | 02/05/2009 | 4.46 | 218.6 | ND <4.72 | | | | |
| | 05/13/2009 | 4.45 | 218.6 | 4.62 | | | | |
| | 08/11/2009 | 4.36 | 218.6 | 4.65 | | | | |
| | 11/17/2009 | 4.10 | 218.6 | 4.09 | 4.58 | 06/12/2008 | 12.2 | 09/01/2004 |
| MW-49B | 08/11/2009 | 2.07 | 218.6 | 2.19 | 2.94 | 12/07/2006 | 10.1 | 02/08/2005 |
| MW-50A | 02/05/2009 | 3.72 | 218.6 | 3.88 | | | | |
| | 05/14/2009 | 3.83 | 218.6 | 3.96 | | | | |
| | 08/07/2009 | 3.68 | 218.6 | 4.14 | | | | |
| | 08/07/2009 (dup) | 3.67 | 218.6 | 4.10 | | | | |
| | 11/12/2009 | 3.51 | 218.6 | 3.45 | 3.93 | 11/04/2008 | 7.36 | 09/01/2004 |
| MW-50B | 02/04/2009 | 2.74 | 218.6 | 2.70 | | | | |
| | 05/14/2009 | 2.72 | 218.6 | 3.00 | | | | |
| | 05/14/2009 (dup) | 2.72 | 218.6 | 2.62 | | | | |
| | 08/11/2009 | 2.66 | 218.6 | 3.29 | | | | |
| | 11/11/2009 | 2.62 | 218.6 | 2.50 | 3.60 | 04/08/2004 | 6.37 | 09/01/2004 |
| MW-51 | 08/07/2009 | 0.550 | 218.6 | 1.09 | 0.570 | 08/15/2006 | 1.58 | 08/25/2004 |
| MW-52 | 02/05/2009 | 1.18 | 218.6 | 1.40 | | | | |
| | 08/06/2009 | 1.13 | 218.6 | 1.29 | 3.89 | 02/17/2006 | 5.36 | 02/17/2006 |
| MW-53 | 08/07/2009 | 0.860 | 218.6 | 1.40 | 0.968 | 08/11/2006 | 1.90 | 02/20/2008 |
| MW-54 | 02/03/2009 | 2.04 | 218.6 | 1.94 | | | | |
| | 05/13/2009 | 2.87 | 218.6 | 3.11 | | | | |
| | 08/10/2009 | 2.28 | 218.6 | 2.14 | | | | |
| | 11/16/2009 | 1.88 | 218.6 | 2.00 | 3.49 | 06/12/2008 | 5.06 | 02/22/2006 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-55A | 08/04/2009 | ND <0.2 | 218.6 | ND <1 | 1.75 | 10/13/2004 | 2.20 | 04/13/2005 |
| MW-55B | 08/05/2009 | ND <0.2 | 218.6 | ND <1 | 0.220 | 08/07/2008 | 2.34 | 02/07/2005 |
| MW-56 | 02/05/2009 | 7.38 | 218.6 | 7.62 | | | | |
| | 02/05/2009 (dup) | 7.84 | 218.6 | 7.88 | | | | |
| | 03/05/2009 | 8.59 | 218.6 | 7.31 | | | | |
| | 05/14/2009 | 7.91 | 218.6 | 7.85 | | | | |
| | 08/05/2009 | 7.04 | 218.6 | 6.83 | | | | |
| | 08/05/2009 (dup) | 6.94 | 218.6 | 7.15 | | | | |
| | 11/17/2009 | 7.51 | 218.6 | 7.62 | 8.59 | 03/05/2009 | 7.88 | 02/05/2009 |
| MW-57 | 02/03/2009 | 2.85 | 218.6 | 2.35 | | | | |
| | 08/10/2009 | 3.03 | 218.6 | 3.25 | 3.03 | 08/10/2009 | 5.01 | 02/14/2008 |
| MW-58 | 02/03/2009 | 1.81 | 218.6 | 1.68 | | | | |
| | 08/11/2009 | 1.71 | 218.6 | 2.06 | 2.08 | 01/25/2006 | 3.17 | 12/06/2007 |
| | 08/11/2009 (dup) | 1.72 | 218.6 | 1.97 | | | | |
| MW-59 | 02/04/2009 | 1.80 | 218.6 | 2.01 | | | | |
| | 08/05/2009 | 1.68 | 218.6 | 1.79 | 2.18 | 06/12/2008 | 3.71 | 02/14/2008 |
| MW-61 | 02/03/2009 | 0.985 | 218.6 | 1.58 | | | | |
| | 05/13/2009 | 1.59 | 218.6 | 1.58 | | | | |
| | 08/12/2009 | 1.83 | 218.6 | 1.86 | | | | |
| | 11/17/2009 | 1.43 | 218.6 | 2.08 | 1.99 | 08/06/2008 | 2.74 | 04/10/2008 |
| | 11/17/2009 (dup) | 1.44 | 218.6 | 1.93 | | | | |
| MW-62A | 02/12/2009 | 7.12 | 218.6 | 7.16 | | | | |
| | 02/12/2009 (dup) | 6.99 | 218.6 | 7.17 | | | | |
| | 03/06/2009 | 7.61 | 218.6 | 6.73 | | | | |
| | 05/14/2009 | 5.86 | 218.6 | 6.67 | | | | |
| | 08/07/2009 | 4.81 | 218.6 | 5.35 | | | | |
| | 11/17/2009 | 10.5 | 218.6 | 13.2 | 10.5 | 11/17/2009 | 13.2 | 11/17/2009 |
| | 11/17/2009 (dup) | 10.5 | 218.6 | 13.1 | | | | |
| MW-62B | 08/07/2009 | ND <0.2 | 218.6 | ND <1 | 0.740 | 08/05/2008 | 0.0 | 08/07/2009 |
| MW-63 | 08/10/2009 | 1.32 | 218.6 | 2.90 | 1.78 | 06/10/2008 | 2.90 | 08/10/2009 |
| MW-64A | 02/03/2009 | 1.82 | 218.6 | 1.66 | | | | |
| | 05/13/2009 | 1.76 | 218.6 | 1.74 | | | | |
| | 08/12/2009 | 1.79 | 218.6 | 1.63 | | | | |
| | 11/16/2009 | 1.73 | 218.6 | 1.57 | 1.82 | 02/03/2009 | 3.05 | 04/10/2008 |
| MW-64B | 02/04/2009 | 0.770 | 218.6 | 2.65 | | | | |
| | 02/04/2009 (dup) | 0.800 | 218.6 | 1.27 | | | | |
| | 08/12/2009 | 0.810 | 218.6 | 2.27 | 0.810 | 08/12/2009 | 2.65 | 02/04/2009 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-66A | 02/03/2009 | 1.23 | 218.6 | 1.17 | | | | |
| | 05/13/2009 | 1.19 | 218.6 | 1.42 | | | | |
| | 08/11/2009 | 1.59 | 218.6 | 1.81 | | | | |
| | 11/18/2009 | 1.26 | 218.6 | 1.29 | 2.15 | 11/07/2008 | 2.43 | 06/19/2007 |
| MW-67A | 02/09/2009 | 0.595 | 218.6 | ND <1 | | | | |
| | 05/13/2009 | 0.920 | 218.6 | ND <1 | | | | |
| | 05/13/2009 (dup) | 0.920 | 218.6 | ND <1 | | | | |
| | 08/12/2009 | 0.830 | 218.6 | 1.07 | | | | |
| | 11/17/2009 | 1.07 | 218.6 | 1.58 | 4.35 | 12/04/2007 | 4.75 | 02/20/2008 |
| MW-67B | 02/09/2009 | 0.418 | 218.6 | ND <3.78 | | | | |
| | 08/12/2009 | 0.640 | 218.6 | ND <1 | 0.660 | 06/13/2008 | 1.09 | 06/13/2008 |
| MW-68D | 04/24/2009 | 7.20 | 218.6 | 6.11 | | | | |
| | 05/14/2009 | 2.56 | 218.6 | 2.78 | | | | |
| | 05/14/2009 (dup) | 2.67 | 218.6 | 2.66 | | | | |
| | 08/04/2009 | 6.78 | 218.6 | 7.25 | | | | |
| | 11/12/2009 | 6.70 | 218.6 | 6.84 | 7.20 | 04/24/2009 | 7.25 | 08/04/2009 |
| MW-68S | 04/24/2009 | 1.20 | 218.6 | 1.42 | | | | |
| | 05/14/2009 | 0.420 | 218.6 | ND <1 | | | | |
| | 08/04/2009 | ND <0.2 | 218.6 | 1.21 | | | | |
| | 11/12/2009 | 0.220 | 218.6 | 1.06 | 1.20 | 04/24/2009 | 1.42 | 04/24/2009 |
| MW-69D | 04/24/2009 | 1.40 | 218.6 | 1.58 | | | | |
| | 05/14/2009 | 0.360 | 218.6 | 2.46 | | | | |
| | 08/04/2009 | 0.260 | 218.6 | 2.05 | | | | |
| | 11/12/2009 | 1.60 | 218.6 | 2.11 | 1.60 | 11/12/2009 | 2.46 | 05/14/2009 |
| MW-69S | 04/24/2009 | 0.840 | 218.6 | 2.15 | | | | |
| | 05/14/2009 | 0.410 | 218.6 | ND <1 | | | | |
| | 08/04/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | ND <0.2 | 218.6 | ND <1 | 0.840 | 04/24/2009 | 2.15 | 04/24/2009 |
| MW-70D | 08/04/2009 | 2.03 | 218.6 | 2.12 | | | | |
| | 11/12/2009 | 3.39 | 218.6 | 3.83 | 3.39 | 11/12/2009 | 3.83 | 11/12/2009 |
| MW-70S | 08/04/2009 | 1.23 | 218.6 | 2.20 | | | | |
| | 11/12/2009 | 1.22 | 218.6 | 2.36 | 1.23 | 08/04/2009 | 2.36 | 11/12/2009 |
| MW-71D | 08/04/2009 | 1.04 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | 1.70 | 218.6 | 1.88 | 1.70 | 11/12/2009 | 1.88 | 11/12/2009 |
| MW-71S | 08/04/2009 | 2.09 | 218.6 | 2.50 | | | | |
| | 11/12/2009 | 2.39 | 218.6 | 2.78 | 2.39 | 11/12/2009 | 2.78 | 11/12/2009 |
| MW-72D | 08/04/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/12/2009 | 0.0 | 11/12/2009 |

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table

## Chromium Sampling Results for Wells Sampled in the GMP, January 2009 - December 2009

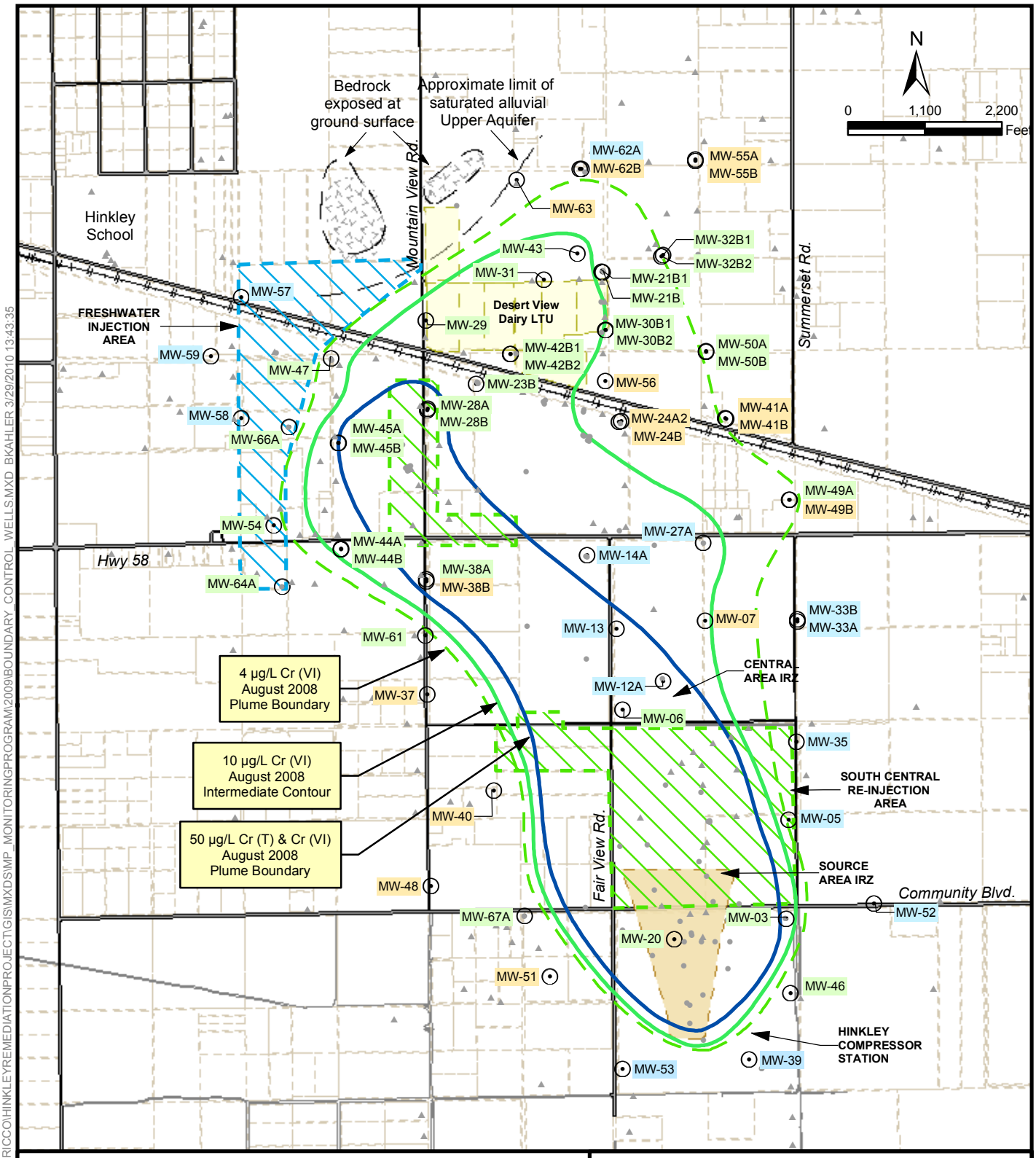
*Semiannual Status Report, Boundary Control Monitoring Program*

| Well ID | Sample Date | Hexavalent Chromium (µg/L) | Method | Total Chromium (µg/L) | Historical Max. Concentrations from the PG&E Database (values of 0.0 = ND) Historical data are shown in Appx. D | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Hex. Cr (µg/L) | Date of Max. Conc. | Total Cr (µg/L) | Date of Max. Conc. |
| MW-72S | 08/04/2009 | 2.97 | 218.6 | 3.30 | | | | |
| | 11/12/2009 | 5.42 | 218.6 | 5.57 | 5.42 | 11/12/2009 | 5.57 | 11/12/2009 |
| | 11/12/2009 (dup) | 5.39 | 218.6 | 5.57 | | | | |
| MW-73D | 11/13/2009 | 0.860 | 218.6 | 1.17 | 0.860 | 11/13/2009 | 1.17 | 11/13/2009 |
| MW-73S | 11/13/2009 | 0.860 | 218.6 | ND <1 | 0.860 | 11/13/2009 | 0.0 | 11/13/2009 |
| MW-74D | 11/13/2009 | 2.62 | 218.6 | 2.44 | 2.62 | 11/13/2009 | 2.44 | 11/13/2009 |
| MW-74S | 11/16/2009 | 4.35 | 218.6 | 5.28 | 4.35 | 11/16/2009 | 5.28 | 11/16/2009 |
| MW-75D | 11/16/2009 | 0.520 | 218.6 | ND <1 | 0.520 | 11/16/2009 | 0.0 | 11/16/2009 |
| MW-76D | 11/16/2009 | ND <0.2 | 218.6 | ND <1 | 0.0 | 11/16/2009 | 0.0 | 11/16/2009 |
| MW-76S | 11/16/2009 | 4.39 | 218.6 | 3.60 | 4.39 | 11/16/2009 | 4.21 | 11/16/2009 |
| | 11/16/2009 (dup) | 4.36 | 218.6 | 4.21 | | | | |
| PGE-06 | 02/19/2009 | 0.730 | 218.6 | ND <1 | 0.730 | 02/19/2009 | 0.0 | 02/19/2009 |
| PGE-14 | 02/11/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 11/12/2009 | ND <0.2 | 218.6 | ND <1 | | | | |
| | 12/30/2009 | ND <0.2 | 218.6 | ND <1 | 2.00 | 05/24/2001 | 3.70 | 12/06/2001 |
| PGE-15 | 02/19/2009 | 2.86 | 218.6 | 2.49 | 2.86 | 02/19/2009 | 2.49 | 02/19/2009 |
| PMW-03 | 02/09/2009 | 466 | 3500-Cr | 584 | | | | |
| | 02/09/2009 (dup) | 459 | 3500-Cr | 574 | | | | |
| | 08/07/2009 | 2110 | 3500-Cr | 2380 | 3890.0 | 02/17/2003 | 5800.0 | 04/10/1997 |
| SA-MW-22D | 02/09/2009 | 142 | 218.6 | 134 | | | | |
| | 08/07/2009 | 146 | 218.6 | 138 | 148.0 | 08/07/2009 | 142.0 | 08/07/2009 |
| | 08/07/2009 (dup) | 148 | 218.6 | 142 | | | | |
| X-17 | 02/05/2009 | 50.7 | 218.6 | 56.2 | | | | |
| | 04/30/2009 | 87.8 | 218.6 | 85.6 | | | | |
| | 04/30/2009 (dup) | 87.8 | 218.6 | 89.6 | | | | |
| | 08/06/2009 | 89.1 | 218.6 | 107 | 90.0 | 03/02/1998 | 131.0 | 09/25/2008 |

NOTES:
All concentrations are in micrograms per liter (µg/L)
(dup) Results shown are for a duplicate groundwater sample taken on this date
NA Sample not analyzed for this parameter
ND Parameter is not detected at the reporting limit shown

Data Qualifiers:
J Concentration is estimated based on QA/QC evaluation and data validation criteria
UJ Parameter is not detected at the estimated reporting limit shown (reporting limit is estimated based on QA/QC evaluation and data validation criteria)

NOTES: [ ] = Well sampled during the Fourth Quarter 2009 groundwater monitoring period
All other notes are included on the last page of this table




**LEGEND**

- Groundwater Monitoring Well
- Supply Well or Other Well
- MW-47 Well used for Boundary Control Detection Monitoring

**Sampling Frequency for BCMP Detection Monitoring Wells**

- Quarterly
- Semiannual
- Annual

# FIGURE 1
# WELLS USED FOR BOUNDARY CONTROL DETECTION MONITORING

SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS & ELECTRIC CO. COMPRESSOR STATION
HINKLEY, CALIFORNIA

BAO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2009\BOUNDARY_CONTROL_WELLS.MXD BKAHLER 3/29/2010 13:43:35

# Appendix F
# DVD LTU Groundwater Monitoring Data, July 2009 through December 2009

**Analytical Results for DVD LTU Groundwater Monitoring Wells, July 2009 through December 2009**
*Semiannual Status Report, Desert View Dairy Land Treatment Unit*

| Well ID | Sample Date | Sample Type | Total Chromium (µg/L) 6020A | Hexavalent Chromium (µg/L) 218.6 | Nitrate as N (mg/L) 300.0 | TDS (mg/L) 160.0 |
|---|---|---|---|---|---|---|
| MW-21B | 08/10/2009 | | ND <1 | ND <0.2 | ND <5 | 545 |
| | 11/10/2009 | | ND <1 | ND <0.2 | 1.08 | 568 |
| MW-21B1 | 08/10/2009 | | 2.58 | 2.70 | 6.10 | 1310 |
| | 11/10/2009 | | 5.26 | 5.40 | 11.4 | 1110 |
| MW-29 | 08/11/2009 | | 20.0 | 16.3 | 15.0 J | 3600 |
| | 11/11/2009 | | 22.2 | 20.2 | 15.1 | 2440 |
| | 11/11/2009 | (dup) | 21.4 | 20.2 | 15.8 | 2400 |
| MW-30B1 | 08/10/2009 | | 4.61 | 4.52 | 10.0 | 980 |
| | 11/10/2009 | | 4.47 | 4.70 | 12.2 | 1060 |
| MW-30B2 | 08/10/2009 | | 7.06 | 6.99 | 10.0 | 1010 |
| | 08/10/2009 | (dup) | 6.35 | 7.22 | 10.0 | 1020 |
| | 11/10/2009 | | 6.56 | 7.01 | 11.6 | 1040 |
| MW-31 | 08/11/2009 | | 17.9 | 19.2 | 15.0 J | 2560 |
| | 11/11/2009 | | 15.7 | 16.0 | 18.0 | 2740 |
| MW-32B1 | 08/10/2009 | | 3.95 | 3.82 | ND <5 | 539 |
| | 11/10/2009 | | 3.59 | 3.73 | 3.98 | 597 |
| MW-32B2 | 08/10/2009 | | ND <1 | ND <0.2 | ND <5 | 380 |
| | 11/10/2009 | | ND <1 | ND <0.2 | ND <1 | 373 |
| MW-42B1 | 08/11/2009 | | 34.6 | 29.2 | 14.0 J | 1450 |
| | 11/11/2009 | | 26.7 | 26.3 | 15.8 | 1380 |
| MW-42B2 | 08/11/2009 | | 32.3 | 31.0 | 13.0 J | 1130 |
| | 11/11/2009 | | 34.1 | 34.7 | 13.9 | 1140 |
| MW-43 | 08/10/2009 | | 8.97 | 8.72 | 12.0 | 1450 |
| | 11/10/2009 | | 7.97 | 8.55 | 13.1 | 1480 |
| MW-50B | 08/11/2009 | | 3.29 | 2.66 | 5.50 J | 747 |
| | 11/11/2009 | | 2.50 | 2.62 | 5.56 | 726 |

***Notes:***
ND = Not detected at the reporting limit shown
(dup) = Field duplicate samples
J = Concentration is estimated based on review of quality control criteria and data validation
NS = Not sampled
VS = Verification sampling

# Appendix G
# Northwest Extraction Wells and SCRIA IRZ Groundwater Monitoring Data, 2008-2009

Groundwater Elevations in Remediation Areas, November 2009

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Groundwater Elevation Measured November 2009 | Groundwater Elevation Predicted Level [2] | Groundwater Elevation Trigger Level [3] |
|---|---|---|---|
| | (elevations in feet above mean sea level) | | |
| MW-04 | 2,110.1 | --- | --- |
| MW-05 | 2,109.4 | --- | --- |
| MW-13 | 2,098.6 | --- | --- |
| MW-14A | 2,096.7 | --- | --- |
| MW-16 | 2,106.8 | --- | --- |
| MW-28A | 2,092.8 | 2,090 | 2,081 |
| MW-29 | 2,090.6 | 2,090 | 2,080 |
| MW-33A | 2,102.9 | --- | --- |
| MW-37 | 2,097.7 | --- | --- |
| MW-38A | 2,095.0 | --- | --- |
| MW-40 | 2,114.4 | --- | --- |
| MW-44A | 2,094.4 (1) | 2,094 | 2,082 |
| MW-44B | 2,094.4 (1) | 2,094 | 2,082 |
| MW-45A | 2,093.1 | --- | --- |
| MW-47 | 2,091.1 | 2,093 | 2,079 |
| MW-49A | 2,100.3 | --- | --- |
| MW-49B | 2,099.6 | --- | --- |
| MW-54 | 2,094.4 | 2,096 | 2,082 |
| MW-57 | 2,084.1 | --- | --- |
| MW-58 | 2,092.3 | 2,095 | 2,079 |
| MW-61 | 2,101.7 | 2,094 | 2,087 |
| MW-64A | 2,095.3 | --- | --- |
| MW-64B | 2,090.5 | --- | --- |
| MW-66A | 2,090.8 | 2,095 | 2,079 |
| MW-67A | 2,114.7 | --- | --- |
| MW-67B | 2,115.0 | --- | --- |
| EX-09 | 2,089.7 | 2,092 | 2,075 |

**Notes:**

1 Groundwater elevations at wells MW-44A and MW44B were collected in December 2009

2 Groundwater elevations predicted by the PG&E groundwater model based upon a) Extraction of 110 gallons per minute from wells in the Northwest Extraction Area, and injection of this water into wells in the South Central Re-Injection area in-situ reduction zone, and b) The extraction of freshwater at 80 gallons per minute from south of the compressor station, and injection of this water near the northwestern plume boundary.

3 Trigger levels were adopted from the Amended Waste Discharge Requirements for the DVD LTU Extraction System Optimization Project – Attachment C (Water Board, 2007). Trigger levels are used to identify potential adverse drawdown of the water table resulting from Northwest area extraction wells.

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|
| ***NOA Chromium Monitoring Wells*** | | | | |
| MW-04 | 12-Aug-2008 | 61.6 | 59.4 | semiannual |
| | 11-Aug-2009 | 54.8 | 49.3 | |
| MW-05 | 05-Aug-2008 | 0.62 | ND <1 | quarterly |
| | 06-Feb-2009 | 0.80 | ND <1 | |
| | 11-Aug-2009 | 0.77 | ND <1 | |
| | 11-Nov-2009 | 0.63 | 1.11 | |
| MW-07 | 12-Aug-2008 | 1.50 | ND <1 | semiannual |
| | 11-Aug-2009 | 1.50 | 1.41 | |
| MW-08 | 05-Aug-2008 | 8.72 | 8.47 J | semiannual |
| | 11-Aug-2009 | 0.73 | ND <1 | |
| MW-10 | 05-Aug-2008 | 27.6 | 26.9 | semiannual |
| | 05-Feb-2009 | 31.1 | 28.7 | |
| | 10-Aug-2009 | 31.0 | 27.7 | |
| MW-13 | 05-Aug-2008 | 9.62 | 9.15 | quarterly |
| | 09-Feb-2009 | 19.9 | 18.2 | |
| | 11-Aug-2009 | 35.4 | 32.9 | |
| | 11-Nov-2009 | 11.8 | 12.5 | |
| | 11-Nov-2009 (dup) | 11.7 | 11.2 | |
| MW-16 | 13-Aug-2008 | 44.4 | 42.5 | quarterly |
| | 31-Mar-2009 | 39.3 | 36.9 | |
| | 12-Aug-2009 | 40.4 | 37.1 | |
| | 11-Nov-2009 | 34.0 | 35.0 | |
| MW-27B | 11-Aug-2008 | 1.63 | 1.79 | semiannual |
| | 05-Feb-2009 | 1.68 | ND <2.92 | |
| | 11-Aug-2009 | 1.78 | 2.02 | |
| MW-28B | 13-Aug-2008 | 49.7 | 52.3 | quarterly |
| | 06-Nov-2008 | 49.4 | 48.0 | |
| | 03-Feb-2009 | 47.9 | 42.4 | |
| | 13-May-2009 | 47.6 | 44.4 | |
| | 10-Aug-2009 | 53.0 | 48.0 | |
| | 17-Nov-2009 | 53.4 | 49.5 | |
| MW-29 | 07-Aug-2008 | 18.7 | 19.6 | quarterly |
| | 06-Nov-2008 | 10.6 | 10.8 | |
| | 04-Feb-2009 | 25.8 | 22.9 | |
| | 14-May-2009 | 24.3 | 24.2 | |
| | 11-Aug-2009 | 16.3 | 20.0 | |
| | 11-Nov-2009 | 20.2 | 22.2 | |
| | 11-Nov-2009 (dup) | 20.2 | 21.4 | |
| MW-33A | 11-Aug-2008 | 1.44 | 1.74 | semiannual |
| | 06-Feb-2009 | 1.60 | 1.76 | |
| | 12-Aug-2009 | 1.54 | 1.92 | |

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|
| ***NOA Chromium Monitoring Wells*** | | | | |
| MW-33B | 11-Aug-2008 | 1.44 | 1.65 | semiannual |
| | 06-Feb-2009 | 1.65 | 1.97 | |
| | 12-Aug-2009 | 1.66 | 1.60 | |
| MW-35 | 12-Aug-2008 | 1.20 | 1.28 | semiannual |
| | 06-Feb-2009 | 1.06 | ND <1 | |
| | 12-Aug-2009 | 0.97 | 1.21 | |
| | 18-Nov-2009 | 0.89 | 1.03 | |
| MW-36 | 12-Aug-2008 | 108 | 118 | semiannual |
| | 06-Feb-2009 | 99.2 | 111 | |
| | 11-Aug-2009 | 83.8 | 77.9 | |
| MW-37 | 06-Aug-2008 | 1.29 | ND <1 | semiannual |
| | 12-Nov-2008 | 1.21 | 1.20 | |
| | 12-Aug-2009 | 1.26 | 1.28 | |
| MW-39 | 06-Aug-2008 | 0.76 | ND <1 | semiannual |
| | 07-Aug-2009 | 1.07 | 1.53 | |
| MW-40 | 06-Aug-2008 | 0.24 | ND <1 | quarterly |
| | 12-Aug-2009 | 0.21 | ND <1 | |
| | 11-Nov-2009 | ND <0.2 | ND <1 | |
| MW-44A* | 12-Aug-2008 | 15.3 | 13.5 | quarterly |
| | 17-Dec-2009 | 4.25 J | 4.43 | |
| | 17-Dec-2009 (dup) | 3.47 J | 4.29 | |
| MW-44B* | 06-Aug-2008 | 6.41 | 6.42 | quarterly |
| | 17-Dec-2009 | 5.65 | 5.19 | |
| MW-45B | 12-Aug-2008 | 4.26 | 4.62 | quarterly |
| | 06-Nov-2008 | 3.03 | 2.26 | |
| | 03-Feb-2009 | 3.40 | 2.90 | |
| | 13-May-2009 | 4.52 | 4.61 | |
| | 10-Aug-2009 | 2.84 | 2.78 | |
| | 17-Nov-2009 | 3.04 | 3.16 | |
| MW-47 | 11-Aug-2008 | 6.03 | 6.24 | quarterly |
| | 06-Nov-2008 | 8.30 | 7.19 | |
| | 03-Feb-2009 | 9.58 | 8.99 | |
| | 06-Mar-2009 | 9.58 | 9.14 | |
| | 13-May-2009 | 9.70 | 9.28 | |
| | 10-Aug-2009 | 11.4 | 10.5 | |
| | 17-Nov-2009 | 9.82 | 9.57 | |
| MW-49A | 12-Aug-2008 | 4.13 | 4.56 | semiannual |
| | 07-Nov-2008 | 3.54 | 4.85 | |
| | 05-Feb-2009 | 4.46 | ND <4.72 | |
| | 13-May-2009 | 4.45 | 4.62 | |
| | 11-Aug-2009 | 4.36 | 4.65 | |
| | 17-Nov-2009 | 4.10 | 4.09 | |

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|
| ***NOA Chromium Monitoring Wells*** | | | | |
| MW-53 | 06-Aug-2008 | 0.74 | 1.22 | semiannual |
| | 07-Aug-2009 | 0.86 | 1.40 | |
| MW-54 | 12-Aug-2008 | 3.24 | 3.61 | quarterly |
| | 07-Nov-2008 | 1.83 | 1.88 | |
| | 03-Feb-2009 | 2.04 | 1.94 | |
| | 13-May-2009 | 2.87 | 3.11 | |
| | 10-Aug-2009 | 2.28 | 2.14 | |
| | 16-Nov-2009 | 1.88 | 2.00 | |
| MW-58 | 13-Aug-2008 | 1.66 | 2.16 | semiannual |
| | 03-Feb-2009 | 1.81 | 1.68 | |
| | 11-Aug-2009 | 1.72 | 2.06 | |
| MW-61 | 06-Aug-2008 | 1.99 | 2.04 | quarterly |
| | 07-Nov-2008 | 1.31 | 1.02 | |
| | 03-Feb-2009 | 0.99 | 1.58 | |
| | 13-May-2009 | 1.59 | 1.58 | |
| | 12-Aug-2009 | 1.83 | 1.86 | |
| | 17-Nov-2009 | 1.43 | 2.08 | |
| | 17-Nov-2009 (dup) | 1.44 | 1.93 | |
| MW-66A | 13-Aug-2008 | 2.04 | 1.99 | quarterly |
| | 07-Nov-2008 | 2.15 | 1.96 | |
| | 03-Feb-2009 | 1.23 | 1.17 | |
| | 13-May-2009 | 1.19 | 1.42 | |
| | 11-Aug-2009 | 1.59 | 1.81 | |
| | 18-Nov-2009 | 1.26 | 1.29 | |
| ***Perimeter SCRIA Monitoring Wells*** | | | | |
| SC-MW-01D | 24-Apr-2009 | 1.40 | 1.60 | quarterly |
| | 27-Aug-2009 | 1.18 | 1.43 | |
| | 13-Nov-2009 | 1.20 | 1.23 | |
| | 13-Nov-2009 (dup) | 1.20 | 1.19 | |
| SC-MW-01S | 24-Apr-2009 | 0.56 | 1.20 | quarterly |
| | 27-Aug-2009 | 0.56 | 1.03 | |
| | 13-Nov-2009 | 0.60 | ND <1 | |
| SC-MW-02D | 24-Apr-2009 | 247 | 202 | quarterly |
| | 27-Aug-2009 | 243 | 258 | |
| | 13-Nov-2009 | 253 | 236 | |
| SC-MW-02S | 24-Apr-2009 | 0.48 | 1.20 | quarterly |
| | 27-Aug-2009 | 0.26 | ND <1 | |
| | 13-Nov-2009 | 0.22 | ND <1 | |
| SC-MW-03D | 16-Apr-2009 | 246 | 221 | quarterly |
| | 27-Aug-2009 | 220 | 232 | |
| | 13-Nov-2009 | 379 | 353 | |

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|
| ***Perimeter SCRIA Monitoring Wells*** | | | | |
| SC-MW-03S | 16-Apr-2009 | 2.00 | 1.90 | quarterly |
| | 27-Aug-2009 | 4.42 | 5.32 | |
| | 13-Nov-2009 | 26.0 | 24.9 | |
| SC-MW-04D | 03-Apr-2009 | 1.10 | 1.30 | quarterly |
| | 27-Aug-2009 | 1.34 | 1.74 | |
| | 13-Nov-2009 | 3.71 | 3.72 | |
| SC-MW-04S | 03-Apr-2009 | 0.77 | ND <1 | quarterly |
| | 27-Aug-2009 | 0.70 | ND <1 | |
| | 13-Nov-2009 | 0.62 | ND <1 | |
| SC-MW-05D | 03-Apr-2009 | 1.10 | 1.10 | quarterly |
| | 27-Aug-2009 | 1.17 | 1.56 | |
| | 16-Nov-2009 | 1.25 | 1.68 | |
| SC-MW-05S | 03-Apr-2009 | 1.00 | 1.20 | quarterly |
| | 27-Aug-2009 | 1.67 | 2.15 | |
| | 16-Nov-2009 | 1.25 | 2.42 | |
| | 16-Nov-2009 (dup) | 1.34 | 2.45 | |
| SC-MW-06D | 03-Apr-2009 | 1.20 | 1.70 | quarterly |
| | 27-Aug-2009 | 1.31 | 1.59 | |
| | 16-Nov-2009 | 1.48 | 1.65 | |
| SC-MW-06S | 03-Apr-2009 | 1.20 | 1.20 | quarterly |
| | 27-Aug-2009 | 0.85 | 1.74 | |
| | 16-Nov-2009 | 1.03 | 1.16 | |
| SC-MW-07D | 13-Apr-2009 | 1.20 | 1.60 | quarterly |
| | 27-Aug-2009 | 1.15 | 1.80 | |
| | 16-Nov-2009 | 1.32 | 1.17 | |
| SC-MW-07S | 13-Apr-2009 | 1.50 | 1.80 | quarterly |
| | 27-Aug-2009 | 0.95 | 2.21 | |
| | 17-Nov-2009 | 1.32 | 1.37 | |
| SC-MW-08D | 10-Apr-2009 | 1.50 | ND <1 | quarterly |
| | 27-Aug-2009 | 1.47 | 2.00 | |
| | 17-Nov-2009 | 1.62 | 1.57 | |
| | 17-Nov-2009 (dup) | 1.61 | 1.61 | |
| SC-MW-08S | 10-Apr-2009 | 1.60 | 1.10 | quarterly |
| | 27-Aug-2009 | 1.76 | 2.87 | |
| | 17-Nov-2009 | 2.01 | 1.97 | |
| SC-MW-09D | 10-Apr-2009 | 1.80 | 1.30 | quarterly |
| | 26-Aug-2009 | 2.71 | 2.85 | |
| | 17-Nov-2009 | 2.41 | 2.25 | |
| SC-MW-09S | 10-Apr-2009 | 1.40 | ND <1 | quarterly |
| | 26-Aug-2009 | 1.33 | 1.88 | |
| | 17-Nov-2009 | 1.46 | 1.73 | |

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|
| ***Perimeter SCRIA Monitoring Wells*** | | | | |
| SC-MW-10D | 10-Apr-2009 | 1.60 | ND <1 | quarterly |
| | 26-Aug-2009 | 1.54 | 2.19 | |
| | 17-Nov-2009 | 1.52 | 1.46 | |
| SC-MW-10S | 10-Apr-2009 | 1.70 | 1.10 | quarterly |
| | 26-Aug-2009 | 1.83 | 2.23 | |
| | 17-Nov-2009 | 2.56 | 2.54 | |
| SC-MW-11D | 24-Apr-2009 | ND <0.2 | ND <1 | quarterly |
| | 28-Aug-2009 | ND <0.2 | ND <1 | |
| | 19-Nov-2009 | ND <0.2 | ND <1 | |
| SC-MW-11S | 24-Apr-2009 | ND <0.2 | 2.00 | quarterly |
| | 28-Aug-2009 | ND <0.2 | ND <1 | |
| | 19-Nov-2009 | ND <0.2 | ND <1 | |
| SC-MW-12D | 16-Apr-2009 | ND <0.2 | ND <1 | quarterly |
| | 28-Aug-2009 | ND <0.2 | ND <1 | |
| | 18-Nov-2009 | ND <0.2 | ND <1 | |
| SC-MW-12S | 16-Apr-2009 | 7.00 | 7.10 | quarterly |
| | 28-Aug-2009 | 17.9 | 21.7 | |
| | 18-Nov-2009 | 10.6 | 10.8 | |
| SC-MW-13D | 13-Apr-2009 | 4.80 | 5.90 | quarterly |
| | 28-Aug-2009 | ND <0.2 | ND <1 | |
| | 17-Nov-2009 | ND <0.2 | ND <1 | |
| SC-MW-13S | 13-Apr-2009 | 5.50 | 5.10 | quarterly |
| | 28-Aug-2009 | 0.41 | 2.46 | |
| | 17-Nov-2009 | 8.11 | 8.03 | |
| SC-MW-14D | 30-Jun-2009 | 2.70 | 2.50 | quarterly |
| | 27-Aug-2009 | 0.76 | ND <1 | |
| | 18-Nov-2009 | 0.70 | ND <1 | |
| SC-MW-14S | 30-Jun-2009 | 0.80 | ND <1 | quarterly |
| | 27-Aug-2009 | 0.74 | 1.46 | |
| | 18-Nov-2009 | 0.81 | 1.16 | |
| SC-MW-16D | 30-Jun-2009 | 1.50 | 1.50 | quarterly |
| | 28-Aug-2009 | 0.99 | 1.26 | |
| | 18-Nov-2009 | 0.93 | 1.14 | |
| SC-MW-16S | 30-Jun-2009 | 0.92 | 1.10 | quarterly |
| | 28-Aug-2009 | 0.83 | 1.15 | |
| | 18-Nov-2009 | 0.77 | 1.07 | |

**Groundwater Chromium Results for NOA Monitoring Wells, November 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Cr(VI) (µg/L) | Cr(T) (µg/L) | NOA Sampling Frequency |
|---|---|---|---|---|

NOTES:
1. Table lists hexavalent chromium [Cr(VI)] and total dissolved chromium ([Cr(T)]) results and chromium sampling frequency for monitoring wells specified in the General Permit Notice of Applicability (NOA); including NOA Table 2 (Water Board 2009b) and Notice of Intent (NOI) submittals (Stantec 2008a-b). The NOA prescribed August 2008 chromium plume boundaries as baseline condition for General Permit remediation activities.

2. Discharges to groundwater from the South Central Re-injection Area (SCRIA) facilities commenced on October 20, 2009. Chromium results during SCRIA operations are shaded in grey on this table.

Data notes:
Chromium results in micrograms per liter (µg/L)
(dup) Results shown are for a field duplicate groundwater sample taken on this date
ND Parameter is not detected at the reporting limit shown
J Concentration is estimated based on QA/QC evaluation and data validation criteria

Wells may be sampled more frequently than required for chromium if the well is included in other monitoring programs at the site.

* Wells MW-44A and MW-44B were not sampled September 2008 through November 2009 due to property-owner access issues. Owner allowed one-time sampling of MW-44A and MW-44B on December 17, 2009.

**Groundwater TDS, Sulfate and Nitrate Results, Baseline Sampling August 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Pre-Discharge Water Quality Results | | | |
|---|---|---|---|---|---|
| | | TDS (mg/L) | Nitrate as N (mg/L) | Sulfate (mg/L) | TOC (mg/L) |
| ***Area West of South Central Remediation Area*** | | | | | |
| MW-36 | 11-Aug-2009 | 387 | 1.3 J | 83.2 | -- |
| MW-37 | 12-Aug-2009 | 299 | ND <1 | 37.9 | -- |
| MW-40 | 12-Aug-2009 | 293 | ND <1 | 41.5 | -- |
| MW-61 | 12-Aug-2009 | 614 | ND <1 | 164 | -- |
| MW-67A | 12-Aug-2009 | 284 | ND <1 | 40.6 | -- |
| MW-67B | 12-Aug-2009 | 315 | ND <1 | 35.6 | -- |
| ***Area of Freshwater Injection*** | | | | | |
| MW-54 | 10-Aug-2009 | 674 | ND <5 | 181 | -- |
| MW-57 | 10-Aug-2009 | 317 | ND <5 | 46.4 | -- |
| MW-58 | 11-Aug-2009 | 1,030 | 15 J | 274 | -- |
| | 11-Aug-2009 (dup) | 1,000 | 15 J | 274 | -- |
| MW-64A | 12-Aug-2009 | 370 | ND <1 | 56.3 | -- |
| MW-64B | 12-Aug-2009 | 403 | 1.1 | 57.3 | -- |
| MW-66A | 11-Aug-2009 | 411 | ND <5 UJ | 46.9 | -- |
| ***General Area of Pumping and Injection*** | | | | | |
| MW-04 | 11-Aug-2009 | 547 | 7 J | 90.2 | -- |
| MW-05 | 11-Aug-2009 | 798 | 9.3 J | 132 | 2.3 |
| MW-07 | 11-Aug-2009 | 1,110 | 18 J | 190 | 3.3 |
| MW-08 | 11-Aug-2009 | 362 | ND <0.5 UJ | 29.2 | -- |
| MW-10 | 10-Aug-2009 | 922 | 11.0 | 202 | -- |
| MW-13 | 11-Aug-2009 | 1,030 | 14 J | 196 | -- |
| MW-14A | 11-Aug-2009 | 1,070 | 16 J | 200 | -- |
| MW-14B | 11-Aug-2009 | 657 | 4.9 J | 113 | -- |
| MW-16 | 12-Aug-2009 | 1,330 | 11.3 | 344 | -- |
| MW-27B | 11-Aug-2009 | 1,020 | 12 J | 205 | -- |
| MW-28A | 10-Aug-2009 | 1,500 | 11.0 | 304 | -- |
| MW-28B | 10-Aug-2009 | 1,030 | 12.0 | 274 | -- |
| MW-29 | 11-Aug-2009 | 3,600 | 15 J | 1100 | -- |
| MW-38A | 12-Aug-2009 | 1,230 | 13.7 | 230 | -- |
| MW-38B | 12-Aug-2009 | 632 | 3.0 | 151 | -- |
| | 12-Aug-2009 (dup) | 642 | 3.0 | 148 | -- |
| MW-44A | (no well access) | -- | -- | -- | -- |
| MW-44B | (no well access) | -- | -- | -- | -- |
| MW-45A | 10-Aug-2009 | 906 | 10.0 | 241 | -- |
| | 10-Aug-2009 (dup) | 908 | 9.9 | 242 | -- |
| MW-45B | 10-Aug-2009 | 505 | ND <5 | 67.5 | -- |
| MW-47 | 10-Aug-2009 | 794 | 7.8 | 193 | -- |
| ***Area East of South Central Remediation Area*** | | | | | |
| MW-33A | 12-Aug-2009 | 1,040 | 23.8 | 215 | 3.0 |
| MW-33B | 12-Aug-2009 | 778 | 8.5 | 209 | 1.5 |

All notes are found on the last page of this table

**Groundwater TDS, Sulfate and Nitrate Results, Baseline Sampling August 2009**

*Semiannual Status Report, NOA Extraction Wells and SCRIA IRZ*

| Well ID | Sample Date | Pre-Discharge Water Quality Results | | | |
|---|---|---|---|---|---|
| | | TDS (mg/L) | Nitrate as N (mg/L) | Sulfate (mg/L) | TOC (mg/L) |
| ***Area East of South Central Remediation Area*** | | | | | |
| MW-35 | 12-Aug-2009 | 922 | 14.2 | 158 | 2.8 |
| MW-49A | 11-Aug-2009 | 1,230 | 12 J | 268 | 2.4 |
| MW-49B | 11-Aug-2009 | 1,120 | 13 J | 448 | 2.4 |

NOTES:
All wells were sampled in August 2009 with the exception of wells MW-44A and MW-44B for which access to the property was not granted by the property owner. Access to MW-44A and MW-44B was allowed for a one-time sampling event on December 17, 2009. The TDS results for the two wells sampled in December are:
MW-44A = 738 mg/L, MW-44B = 527 mg/L

TDS = Total Dissolved Solids
TOC = Total Organic Carbon
mg/L = milligrams per liter
(dup) Results shown are for a duplicate groundwater sample.
ND Parameter is not detected at the reporting limit shown
J Concentration is estimated based on data validation criteria
UJ Parameter is not detected at the reporting limit shown. The reporting limit is estimated based on data validation criteria
-- Not analyzed or not applicable

Analytical Methods: TDS (SM 2540C), Nitrate as N (EPA 300.0), Sulfate (EPA 300.0), TOC (SM 5310C)

All notes are found on the last page of this table

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| **Compliance Monitoring Wells** | | | | | | | | | | | | | | | | | | | | |
| SC-MW-01D | 24-Apr-09 | B | 1.6 | 1.4 | 0.00171 | 0.410 J | 0.00879 | --- | --- | 2.7 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 87 | <0.10 | 770 |
| | 27-Aug-09 | B | 1.43 | 1.18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | 1.23 | <1.20 | 0.00154 | 0.270 | <0.00100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| | 13-Nov-09 | FD | 1.19 | <1.20 | 0.00145 | 0.253 | <0.00100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-01S | 24-Apr-09 | B | 1.2 | 0.56 | 0.00235 | <0.0500 | 0.00882 | --- | --- | 2.7 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 74 | <0.10 | 602 |
| | 27-Aug-09 | B | 1.03 | 0.56 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | <1 | <0.60 | 0.00198 | 0.203 | 0.00295 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | ND | ND | --- | <0.10 | --- |
| SC-MW-02D | 24-Apr-09 | B | 202 | 247 | 0.00247 | 0.0849 J | 0.0148 | --- | --- | 1.4 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 68 | <0.10 | 604 |
| | 27-Aug-09 | B | 258 | 243 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | 236 | 253 | 0.00117 | 0.290 | 0.00738 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-02S | 24-Apr-09 | B | 1.2 | 0.48 | 0.00503 | 0.210 J | 0.0220 | --- | --- | 4.3 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 120 | <0.10 | 783 |
| | 27-Aug-09 | B | <1 | 0.26 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | <1 | <0.22 | 0.00364 | 0.321 | 0.0333 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-03D | 16-Apr-09 | B | 221 | 246 | 0.00367 | <0.0500 | 0.00727 | --- | --- | 0.90 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 26 | <0.10 | 380 |
| | 27-Aug-09 | B | 232 | 220 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | 353 | 379 | 0.00177 | 0.0674 | 0.00310 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-03S | 16-Apr-09 | B | 1.9 | 2 | 0.00713 | 0.205 | 0.0305 | --- | --- | 5.6 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 140 | <0.10 | 900 |
| | 27-Aug-09 | B | 5.32 | 4.42 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | 24.9 | 26.0 | 0.00279 | 0.232 | 0.00189 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-04D | 03-Apr-09 | B | 1.3 | 1.1 | 0.00326 | 0.107 | 0.0189 | --- | --- | 6.4 | <1.0 | <1.0 | <1.0 | <1.0 | 4.4 | --- | --- | 97 | <0.10 | 973 |
| | 27-Aug-09 | B | 1.74 | 1.34 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | 3.72 | 3.71 | 0.00224 | 0.281 | 0.00513 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-04S | 03-Apr-09 | B | <1 | 0.77 | 0.00261 | 0.145 | 0.0105 | --- | --- | 4.2 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 73 | <0.10 | 750 |
| | 27-Aug-09 | B | <1 | 0.70 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Nov-09 | | <1 | <0.62 | 0.00264 | 0.235 | 0.00297 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-05D | 03-Apr-09 | B | 1.1 | 1.1 | 0.00253 | 0.0661 | 0.00536 | --- | --- | 4.2 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 97 | <0.10 | 877 |
| | 27-Aug-09 | B | 1.56 | 1.16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Aug-09 | B, FD | 1.49 | 1.17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Nov-09 | | 1.68 | <1.25 | 0.00223 | 0.397 J | 0.00177 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-05S | 03-Apr-09 | B | 1.2 | 1 | 0.00344 | 0.112 | 0.0151 | --- | --- | 3.5 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 89 | <0.10 | 840 |
| | 27-Aug-09 | B | 2.15 | 1.67 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Nov-09 | | 2.42 | <1.25 | 0.00233 | 0.411 J | 0.0100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| | 16-Nov-09 | FD | 2.45 | <1.34 | 0.00214 | 0.375 J | 0.0102 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| SC-MW-06D | 03-Apr-09 | B | 1.7 | 1.2 | 0.00302 | 0.180 | 0.0143 | --- | --- | 4.5 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 110 | <0.10 | 1,000 |
| | 27-Aug-09 | B | 1.59 | 1.31 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Nov-09 | | 1.65 | <1.48 | 0.00240 | 0.334 J | <0.00100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | ND | ND | --- | <0.10 | --- |
| SC-MW-06S | 03-Apr-09 | B | 1.2 | 1.2 | 0.00260 | 0.0869 | 0.0157 | --- | --- | 4.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 98 | <0.10 | 960 |
| | 27-Aug-09 | B | 1.74 | 0.85 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Nov-09 | | 1.16 | <1.03 | 0.00226 | 0.627 J | 0.0101 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-07D | 13-Apr-09 | B | 1.6 | 1.2 | 0.00322 | 0.112 | 0.00383 | --- | --- | 4.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 120 | <0.10 | 1,150 |
| | 27-Aug-09 | B | 1.80 | 1.15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Nov-09 | | 1.17 | <1.32 | 0.00294 | 0.263 J | 0.00198 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-07S | 13-Apr-09 | B | 1.8 | 1.5 | 0.00333 | 0.520 | 0.0193 | --- | --- | 3.6 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 130 | <0.10 | 1,180 |
| | 27-Aug-09 | B | 2.21 | 0.95 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 1.37 | <1.32 | 0.00255 | 0.470 | 0.00721 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | ND | ND | --- | <0.10 | --- |
| SC-MW-08D | 10-Apr-09 | B | <1 | 1.5 | 0.00295 | 0.121 | 0.00137 | --- | --- | 3.2 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 110 | <0.10 | 1,110 |
| | 27-Aug-09 | B | 2.00 | 1.47 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 1.57 | <1.62 | 0.00312 | 0.417 | <0.00100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| | 17-Nov-09 | FD | 1.61 | <1.61 | 0.00269 | 0.403 | <0.00100 | --- | --- | --- | 1.6 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-08S | 10-Apr-09 | B | 1.1 | 1.6 | 0.00321 | 0.0521 | 0.0134 | --- | --- | 3.5 | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 J | --- | --- | 100 | <0.10 | 1,040 |
| | 27-Aug-09 | B | 2.87 | 1.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 1.97 | 2.01 | 0.00287 | 0.404 | 0.00397 | --- | --- | --- | 4.8 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-09D | 10-Apr-09 | B | 1.3 | 1.8 | 0.00226 | 0.123 | 0.0175 | --- | --- | 3.7 | <1.0 | <1.0 | <1.0 | <1.0 | 1.8 J | --- | --- | 100 | <0.10 | 965 |
| | 26-Aug-09 | B | 2.85 | 2.71 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 2.25 | 2.41 | 0.00212 | 0.344 | 0.00101 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-09S | 10-Apr-09 | B | <1 | 1.4 | 0.00262 | 0.146 | 0.0104 | --- | --- | 4.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 97 | <0.10 | 1,060 |
| | 26-Aug-09 | B | 1.88 | 1.33 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 1.73 | <1.46 | 0.00252 | 0.716 | 0.0106 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-10D | 10-Apr-09 | B | <1 | 1.6 | 0.00164 | 0.139 | 0.00125 | --- | --- | 4.2 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 94 | <0.10 | 1,120 |
| | 26-Aug-09 | B | 1.83 | 1.54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Aug-09 | B, FD | 2.19 | 1.54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 1.46 | <1.52 | 0.00159 | 0.439 | 0.00195 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-10S | 10-Apr-09 | B | 1.1 | 1.7 | 0.00313 | 0.218 | 0.0158 | --- | --- | 4.1 | <1.0 | <1.0 | <1.0 | <1.0 | 1.2 J | --- | --- | 100 | <0.10 | 1,120 |
| | 26-Aug-09 | B | 2.23 | 1.83 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 2.54 | 2.56 | 0.00214 | 0.455 | 0.00739 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| SC-MW-11D | 24-Apr-09 | B | <1 | <0.2 | 0.00364 | 0.130 J | 0.101 | --- | --- | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 26 | <0.10 | 324 |
| | 28-Aug-09 | B | <1 | <0.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-Nov-09 | | <1 | <0.2 | 0.00164 | 0.146 | 0.112 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-11S | 24-Apr-09 | B | 2 | <0.2 | 0.0118 | 10.1 J | 0.220 | --- | --- | 24 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 550 | <0.10 | 1,240 |
| | 28-Aug-09 | B | <1 | <0.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-Nov-09 | | <1 | <0.2 | 0.00617 | 0.239 | 0.228 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-12D | 16-Apr-09 | B | <1 | <0.2 | 0.00709 | <0.0500 | 0.0438 | --- | --- | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 25 | <0.10 | 326 |
| | 28-Aug-09 | B | <1 | <0.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | <1 | <0.2 | 0.00143 | 0.128 | 0.165 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-12S | 16-Apr-09 | B | 7.1 | 7 | 0.00877 | <0.0500 | 0.0666 | --- | --- | 8.2 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | 180 | <0.10 | 750 |
| | 28-Aug-09 | B | 21.7 | 17.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | 10.8 | 10.6 | 0.00578 | 0.418 | 0.0784 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | 0.72 | ND | ND | --- | <0.10 | --- |
| SC-MW-13D | 13-Apr-09 | B | 5.8 | 4.8 | 0.0138 | 2.38 | 0.0878 | --- | --- | 32 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 55 | <0.10 | 755 |
| | 13-Apr-09 | B, FD | 5.9 | 4.8 | 0.0139 | 2.29 | 0.0875 | --- | --- | 31 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | --- | --- | 63 | <0.10 | 777 |
| | 28-Aug-09 | B | <1 | <0.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Aug-09 | B, FD | <1 | <0.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | <1 | <0.2 | 0.0123 | 0.137 | 0.106 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-13S | 13-Apr-09 | B | 5.1 | 5.5 | 0.0127 | 0.185 | 0.00482 | --- | --- | 7.6 | <1.0 | <1.0 | <1.0 | <1.0 | 0.72 J | --- | --- | 110 | <0.10 | 556 |
| | 28-Aug-09 | B | 2.46 | 0.41 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Nov-09 | | 8.03 | 8.11 | 0.00762 | 0.189 | 0.0240 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-14S | 30-Jun-09 | B | <1 | 0.8 | 0.00271 | 0.0505 | 0.0246 | --- | --- | 3.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | <0.10 | 653 |
| | 27-Aug-09 | B | 1.46 | 0.74 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | 1.16 | <0.81 | 0.00196 | 0.175 | 0.0106 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | 0.0398 | --- | <0.10 | --- |
| SC-MW-14D | 30-Jun-09 | B | 2.5 | 2.7 | 0.00334 | <0.0500 | 0.0177 | --- | --- | 2.4 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | <0.10 | 628 |
| | 30-Jun-09 | B, FD | 2.5 | 2.7 | 0.00325 | <0.0500 | 0.0176 | --- | --- | 2.5 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | <0.10 | 628 |
| | 27-Aug-09 | B | <1 | 0.76 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | <1 | <0.70 | 0.00268 | 0.190 | 0.00202 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-16S | 30-Jun-09 | B | 1.1 | 0.92 | 0.00260 | 0.0562 | 0.0258 | --- | --- | 3.4 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | <0.10 | 873 |
| | 28-Aug-09 | B | 1.15 | 0.83 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | 1.07 | <0.77 | 0.00274 | 0.206 | 0.00531 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |
| SC-MW-16D | 30-Jun-09 | B | 1.5 | 1.5 | 0.00364 | <0.0500 | 0.0103 | --- | --- | 3.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | <0.10 | 558 |
| | 28-Aug-09 | B | 1.26 | 0.99 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Nov-09 | | 1.14 | <0.93 | 0.00236 | 0.163 | 0.0135 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | ND | ND | --- | <0.10 | --- |

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| MW-35 | 06-Feb-09 | B | <1 | 1.06 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Feb-09 | B | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,062 |
| | 12-May-09 | B | --- | --- | --- | --- | --- | 14.1 | 182 | 2.58 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 926 |
| | 12-May-09 | B | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,025 |
| | 12-Aug-09 | B | 1.21 | 0.97 | | | | 14.2 | 158 | 2.79 | | | | | | | | | | 922 |
| | 18-Nov-09 | | 1.03 | <0.89 | 0.00273 | 0.200 | <0.00100 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 UJ | ND | ND | --- | <0.10 | --- |
| **Performance Monitoring Wells** | | | | | | | | | | | | | | | | | | | | |
| SC-MW-21D | 12-Mar-09 | B | <1 | 1.1 | 0.00492 | <0.0500 | 0.237 | 0.11 | 42 | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 372 |
| SC-MW-21S | 12-Mar-09 | B | 158 | 162 | 0.00287 | <0.0588 UB | 0.0414 | 10 | 170 | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 777 |
| SC-MW-22D | 31-Mar-09 | B | <1 | <0.2 | 0.00501 | <0.0500 | 0.232 | 2.6 | 110 | 1.7 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 572 |
| SC-MW-22S | 31-Mar-09 | B | 78.2 | 75.4 | 0.00220 | <0.0500 | 0.0185 | 9.9 | 140 | 2.4 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 790 |
| | 13-Oct-09 | | 66.4 | 80.2 | <0.00196 UB | 0.181 | 0.0179 | 10 J | 140 | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 1.6 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| SC-MW-23D | 31-Mar-09 | B | <1 | <0.2 | 0.00457 | 0.0744 | 0.212 | <0.10 | 26 | 2.0 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 360 |
| SC-MW-23S | 31-Mar-09 | B | <1 | 0.98 | 0.00174 | 0.0585 | 0.0733 | 16 | 150 | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 910 |
| SC-MW-26D | 05-Mar-09 | B | 1,010 | 1,120 | 0.00154 | 0.0971 | 0.00544 | 5.6 | 170 | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 644 |
| | 13-Oct-09 | | 1,110 | 1,200 | <0.00102 UB | 0.0648 | <0.00100 | 5.9 | 160 | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 13-Oct-09 | FD | 1,090 | 1,200 | <0.00168 UB | 0.0551 | <0.00100 | 5.8 | 160 | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 1.8 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| SC-MW-26S | 05-Mar-09 | B | 4.7 | 3.4 | 0.00224 | 0.156 | 0.0326 | 11 | 200 | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 972 |
| | 13-Oct-09 | | 23.1 | 24.9 | <0.00123 UB | <0.0500 | 0.00381 | 13 J | 210 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 2.6 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| SC-MW-32D | 31-Mar-09 | B | <1 | <0.2 | 0.00487 | 0.952 | 0.0774 | <0.10 | 17 J | 1.4 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 316 |
| | 31-Mar-09 | B, FD | <1 | <0.2 | 0.00480 | 0.957 | 0.0736 | <0.10 | 17 J | 1.4 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 318 |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 1.2 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| SC-MW-32S | 31-Mar-09 | B | 42.8 | 41.2 | 0.00169 | 0.0589 | 0.0247 | 9.5 | 300 | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,250 |
| | 13-Oct-09 | | 58.4 | 66.2 | <0.00100 | 0.0556 | 0.00439 | 9.7 J | 340 | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 2.5 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| SC-MW-38D | 05-Mar-09 | B | 162 | 170 | 0.00110 | 0.114 | 0.0128 | 8.7 | 170 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 738 |
| | 05-Mar-09 | B, FD | 161 | 174 | 0.00127 | 0.0919 | 0.0118 | 8.8 | 170 | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 732 |
| SC-MW-38S | 05-Mar-09 | B | 4.8 | 4.3 | 0.00340 | 0.136 | 0.0143 | 10 | 160 | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 835 |

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| MW-11B | 06-Feb-09 | B | 1,580 | 1,470 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 675 (a) |
| | 30-Mar-09 | B | 1,580 | 1,630 | 0.00126 | 0.187 | 0.00614 | --- | --- | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| MW-16 | 31-Mar-09 | B | 36.9 | 39.3 | <0.00100 | <0.0500 | <0.00100 | 10 | 310 | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,350 |
| | 12-May-09 | B | --- | --- | --- | --- | --- | 9.48 | 361 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,320 |
| | 12-Aug-09 | B | 37.1 | 40.4 | --- | --- | --- | 11.3 | 344 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,330 |
| | 11-Nov-09 | | 35.0 | 34.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PT2-MW-01 | 30-Mar-09 | | <1 | <0.2 | 0.00120 | 0.252 | 0.356 | --- | --- | 3.4 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 3.1 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| PT2-MW-03 | 31-Mar-09 | | 19.5 | 21.3 | 0.00111 | <0.0500 | 0.0615 | 11 | 200 | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,300 |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 3.1 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| PT2-MW-04 | 30-Mar-09 | | <1 | <0.2 | 0.00530 | 0.774 | 1.26 | --- | --- | 3.5 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 2.7 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| PT2-MW-05 | 31-Mar-09 | | 35.4 | 36.4 | <0.00100 | <0.0500 | <0.00100 | 10 | 220 | 2.9 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,070 |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 86 | --- | --- | --- | --- | --- | 7.73 | ND | --- | --- | --- |
| PT2-MW-06 | 31-Mar-09 | | 26.3 | 29.4 | <0.00100 | <0.0500 | <0.00100 | 12 | 170 | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 957 |
| | 31-Mar-09 | FD | 30.9 | 30.3 | 0.00103 | <0.0500 | <0.00100 | 12 | 170 | 2.8 J | --- | --- | --- | --- | --- | --- | --- | --- | --- | 960 |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 150 | --- | --- | --- | --- | --- | 156 | ND | --- | --- | --- |
| PT2-MW-08 | 30-Mar-09 | | 433 | 448 | 0.00119 | 0.0510 | 0.00133 | --- | --- | 1.6 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 13-Oct-09 | | 434 | 451 | <0.00100 | <0.0500 | <0.00100 | 6.4 | 140 | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 1.3 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| PT2-MW-09 | 30-Mar-09 | | 799 | 809 | 0.00129 | 0.0621 | 0.00102 | --- | --- | 1.7 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 30-Mar-09 | FD | 745 | 856 | <0.00100 | 0.127 | 0.00118 | --- | --- | 1.6 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 1.6 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| PT2-MW-10 | 30-Mar-09 | | 380 | 372 | 0.00106 | <0.0500 | <0.00100 | --- | --- | 1.8 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 13-Oct-09 | | 502 | 539 | <0.00100 | <0.0500 | 0.00107 | 7.2 | 180 | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| PT2-MW-11 | 31-Mar-09 | | 452 | 550 | <0.00100 | <0.0500 | <0.00100 | --- | --- | 1.9 J | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- | --- | --- | --- |
| | 13-Oct-09 | | 312 | 370 | <0.00119 UB | <0.0500 | <0.00100 | 6.8 | 220 | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| X-11 | 13-Oct-09 | B | 85.8 | 97.0 | <0.00100 | <0.0500 | <0.00100 | 10 J | 340 | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | <0.10 | --- |
| | 14-Dec-09 | | --- | --- | --- | --- | --- | --- | --- | 2.5 | --- | --- | --- | --- | --- | ND | ND | --- | --- | --- |
| X-17 | 05-Feb-09 | B | 56.2 | 50.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Feb-09 | B, FD | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 950 |
| | 30-Apr-09 | B | 85.6 | 87.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 30-Apr-09 | B, FD | 89.6 | 87.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | | 107 | 89.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Groundwater Analytical Results for SCRIA In Situ Byproducts and Performance Monitoring
*Semiannual Status Report, NOA SCRIA IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium, dissolved µg/L | Hexavalent chromium µg/L | Arsenic, dissolved mg/L | Iron, dissolved mg/L | Manganese, dissolved mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Total Organic Carbon mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Eosine µg/L | Fluorescein µg/L | Chloride mg/L | Ethanol mg/L | Total Dissolved Solids mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Receiving water limits in NOI, page 7-3 and 7-5** | | | 325 | 441 | 0.010 | 0.300 | 0.226 | 10 | 308 | | 10 | 10 | 10 | 10 | 10 | 100 | 100 | 0.231 | 0.760 | 1,010* |
| **Maximum Baseline Concentration** | | | 1,580 | 1,630 | 0.0139 | 10.1 | 0.237 | | | | | | | | | | | 550 | | |
| **Injection Wells** | | | | | | | | | | | | | | | | | | | | |
| SC-IW-25S | 30-Apr-09 | B, G | 1,110 | 1,140 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-25D | 30-Apr-09 | B, G | 1,030 | 1,130 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-34D | 30-Apr-09 | B, G | 50.7 | 51.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-35S | 30-Apr-09 | B, G | 114 | 122 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-35D | 30-Apr-09 | B, G | 163 | 170 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-36S | 30-Apr-09 | B, G | 1,230 | 1,200 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-36D | 30-Apr-09 | B, G | 1,420 | 1,490 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SC-IW-37S | 30-Apr-09 | B, G | 331 | 344 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SCRIA Influent** | | | | | | | | | | | | | | | | | | | | |
| SCRIA Influent | 21-Dec-09 | | 39.3 | 36.6 | 0.00138 | 1.02 | 0.0321 | 10 J | 310 | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | 978 J |

Notes:

| | |
|---|---|
| (a) | This TDS concentration was measured in the field during purging and sampling |
| < | Symbol indicates not detected at or above reporting limit as noted |
| --- | Analyte not sampled |
| B | Baseline sample collected prior to October 20, 2009. Samples collected from PT2-MW series in the vicinity of the Cell 2 pilot study were not considered baseline. |
| FD | Field duplicate |
| G | Grab sample |
| J | Analyte was present, but reported value may not be accurate or precise. |
| mg/L | Milligrams per liter |
| µg/L | Micrograms per liter |
| ND | Analyte was not detected |
| UB | The analyte was detected in a blank and is considered not detected in the sample above the limit indicated |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |
| * | Receiving water limitation for total dissolved solids for the area of groundwater pumping and injection established in the NOA. |

# Appendix H
# Central Area IRZ Groundwater Monitoring Data
# July 2009 through December 2009

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-101 | 05-Aug-09 | N | <1 | <0.2 | 2.2 | 1.2 | 58 | 2.86 | 2.45 | 0.546 | <ND |
| | 11-Nov-09 | N | 2.71 | <0.2 | 2.1 | 5.8 | 140 | 1.45 | 0.766 | 0.161 | <ND |
| | 14-Dec-09 | N | --- | --- | 2.1 | --- | --- | --- | --- | --- | --- |
| CA-MW-102S | 06-Aug-09 | N | 5.26 | 0.61 | 2.6 | 2.7 | 95 | 0.746 /J | 1.19 | 3.24 | <ND |
| | 12-Nov-09 | N | 3.11 | 0.75 | 2.4 | 2.4 | 140 | 0.618 | 1.33 | 1.12 | 0.746 /J |
| CA-MW-102D | 26-Aug-09 | N | 95.0 | 98.9 | 0.86 | 2.5 | 61 | --- | --- | <ND | <ND |
| CA-MW-103 | 06-Aug-09 | N | <1 | <0.2 | 3.4 | <0.10 | 55 | 2.46 /J | 0.905 | 7.47 | <ND |
| | 12-Nov-09 | N | <1 | <0.2 | 1.9 | 6.3 | 150 | 0.822 | 0.872 | 3.08 | <ND |
| | 14-Dec-09 | N | --- | --- | 3.3 | --- | --- | --- | --- | --- | --- |
| CA-MW-104S | 06-Aug-09 | N | 29.9 | 28.4 | 2.6 | 15 /J | 180 | 0.271 /J | 0.00658 | <ND | <ND |
| | 12-Nov-09 | N | 32.7 | 30.9 | 2.4 | 15 /J | 160 | 0.330 | 0.0192 | <ND | <ND |
| | 14-Dec-09 | N | --- | --- | 2.4 | --- | --- | --- | --- | --- | --- |
| CA-MW-104D | 26-Aug-09 | N | 229 | 220 | 1.8 | 10 /J | 160 | --- | --- | <ND | <ND |
| CA-MW-105 | 06-Aug-09 | N | 18.9 | 17.8 | 2.6 | 12 /J | 230 | 0.321 /J | 0.0130 | <ND | <ND |
| | 12-Nov-09 | N | 39.0 | 37.7 | 2.3 | 14 /J | 230 | 0.380 | 0.0191 | <ND | <ND |
| | 14-Dec-09 | N | --- | --- | 2.0 | --- | --- | --- | --- | --- | --- |
| CA-MW-106S | 06-Aug-09 | N | <1 | <0.2 | 2.8 | 9.2 /J | 240 | 0.327 /J | 0.191 | <ND | <ND |
| | 12-Nov-09 | N | 1.01 | 0.53 | 2.6 | 12 /J | 190 | 0.315 | 0.0263 | <ND | <ND |
| CA-MW-106D | 26-Aug-09 | N | 71.0 | 68.7 | 3.3 | 11 /J | 430 | --- | --- | <ND | <ND |
| CA-MW-107S | 06-Aug-09 | N | 16.4 | 13.9 | 3.1 | 15 /J | 220 | 0.728 /J | 0.0104 | <ND | <ND |
| | 04-Nov-09 | N | 14.3 | 13.8 | 3.1 | 14 /J | 210 | 0.519 | 0.00130 | <ND | <ND |
| | 03-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | <ND |
| | 03-Dec-09 | N | 11.0 | 12.9 | 3.2 | 15 | 220 | 0.357 | <0.00100 | --- | --- |
| CA-MW-107D | 06-Aug-09 | N | 122 | 119 | 2.9 | 12 /J | 340 | 0.404 /J | <0.00100 | <ND | <ND |
| | 12-Nov-09 | N | 122 | 110 | 2.6 | 12 /J | 370 | 0.826 | <0.00100 | <ND | <ND |
| CA-MW-108S | 05-Aug-09 | N | 61.8 | 62.8 | 2.1 | 14 /J | 250 | 0.310 | 0.00296 | <ND | <ND |
| | 12-Nov-09 | N | 59.8 | 59.0 | 2.1 | 14 /J | 250 | 0.370 | <0.00100 | <ND | <ND |
| CA-MW-108D | 05-Aug-09 | N | 3.78 | 3.37 | 0.78 | 0.42 | 81 | 0.101 | 0.0877 | <ND | <ND |
| | 11-Nov-09 | N | 3.62 | 3.54 | 0.83 | 0.46 | 85 | 0.266 | 0.0284 | <ND | <ND |
| CA-MW-201 | 05-Aug-09 | N | 2.49 | 1.18 | 2.8 | 0.82 | 110 | 0.164 | 0.0372 | 2.96 | <ND |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12-Nov-09 | N | 2.01 | 1.39 | 2.6 | 1.4 | 130 | 0.287 | 0.0212 | 6.00 | <ND |
| CA-MW-202 | 05-Aug-09 | N | 61.6 | 65.1 | 2.5 | 15 /J | 210 | 0.193 | 0.0438 | <ND | <ND |
| | 05-Aug-09 | FD | 55.8 | 64.0 | 2.4 | 15 /J | 210 | 0.207 | 0.0447 | <ND | <ND |
| | 12-Nov-09 | N | 15.4 | 16.0 | 2.3 | 12 /J | 200 | 0.484 | 0.0314 | <ND | <ND |
| CA-MW-203 | 05-Aug-09 | N | <1 | <0.2 | 4.1 | <0.10 | 78 | 1.76 | 2.39 | 0.082 | <ND |
| | 12-Nov-09 | N | <1 | <1.05 | 3.3 | 1.6 | 200 | 1.44 | 1.92 | <ND | <ND |
| CA-MW-204S | 05-Aug-09 | N | <1 | <0.2 | 2.0 | <0.10 | 36 | 1.15 | 1.52 | 0.550 | <ND |
| | 12-Nov-09 | N | <1 | <0.2 | 1.8 | <0.10 | 23 | 1.52 | 1.68 | 0.317 | <ND |
| CA-MW-204D | 05-Aug-09 | N | 25.3 | 26.7 | 0.91 | 1.1 | 56 | 0.0655 | 0.0279 | <ND | <ND |
| | 12-Nov-09 | N | 37.4 | 40.0 | 0.77 | 1.2 | 55 | 0.558 | 0.0578 | <ND | <ND |
| CA-MW-301 | 05-Aug-09 | N | 2.23 | 1.03 | 2.5 | 1.1 | 47 | 0.327 /J | 1.46 | 0.316 | <ND |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.141 /J | --- | --- | --- |
| | 10-Nov-09 | N | 13.8 | 10.4 | 2.2 | 2.8 | 98 | 0.424 /J | 0.862 | 0.365 | <ND |
| CA-MW-302S | 05-Aug-09 | N | 21.4 | 19.6 | 2.4 | 4.1 | 120 | 0.198 /J | 0.185 | 1.83 | <ND |
| | 05-Aug-09 | FD | 20.5 | 20.2 | 2.4 | 4.1 | 120 | 0.494 /J | 0.169 | 1.74 | <ND |
| | 11-Nov-09 | N | 17.6 | 17.2 | 1.6 | 2.6 | 76 | 0.345 | 0.0463 | 0.545 | <ND |
| CA-MW-302D | 05-Aug-09 | N | 82.9 | 91.4 | 1.0 | 3.6 | 100 | 0.186 /J | 0.00389 | <ND | <ND |
| | 11-Nov-09 | N | 81.6 | 86.8 | 0.93 | 3.2 | 110 | 0.230 | <0.00100 | <ND | <ND |
| | 11-Nov-09 | FD | 81.7 | 85.2 | 0.89 | 3.2 | 100 | 0.265 | 0.00108 | <ND | <ND |
| CA-MW-303S | 05-Aug-09 | N | 14.3 | 15.4 | 2.8 | 4.4 | 130 | 0.164 /J | 0.00211 | 5.68 | <ND |
| | 11-Nov-09 | N | 20.8 | 21.6 | 2.6 | 4.2 | 100 | 0.440 | 0.00174 | 6.86 | <ND |
| CA-MW-303D | 25-Aug-09 | N | 82.9 | 85.9 | 1.3 | 12 | 150 | --- | --- | <ND | <ND |
| CA-MW-304 | 05-Aug-09 | N | 31.3 | 36.3 | 2.7 | 4.6 | 140 | 0.199 /J | 0.00119 | 0.594 | 12.7 |
| | 11-Nov-09 | N | 36.4 | 38.4 | 2.7 | 4.0 | 130 | 0.518 | <0.00100 | 0.623 /J | 14.1 |
| CA-MW-305 | 05-Aug-09 | N | 17.9 | 19.6 | 2.5 | 3.7 | 160 | 0.153 /J | <0.00100 | 0.437 | 4.34 /J |
| | 11-Nov-09 | N | 13.9 | 14.1 | 2.5 | 3.3 | 160 | 0.445 | <0.00100 | 0.451 /J | 6.54 /J |
| CA-MW-306S | 05-Aug-09 | N | 94.0 | 108 | 2.5 | 9.7 | 180 | 0.209 /J | 0.00124 | 0.061 | 2.29 |
| | 11-Nov-09 | N | 95.4 | 105 | 2.3 | 8.7 | 200 | 0.520 | <0.00100 | 0.108 /J | 5.87 |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-306D | 06-Aug-09 | N | 22.7 | 24.2 | 2.1 | 2.6 | 240 | 0.216 /J | <0.00100 | 0.269 | 0.419 |
| | 11-Nov-09 | N | 15.1 | 16.2 | 2.1 | 2.2 | 280 | 0.405 | <0.00100 | 0.200 | 0.307 /J |
| CA-MW-307S | 06-Aug-09 | N | 1.27 | 0.92 | 3.1 | 0.63 | 220 | 0.271 /J | 1.30 | <ND | <ND |
| | 06-Aug-09 | FD | 1.21 | 1.03 | 3.1 | 0.60 | 220 | 0.289 /J | 1.30 | <ND | <ND |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.0608 /J | --- | --- | --- |
| | 12-Nov-09 | N | 8.21 | 8.05 | 2.4 | 3.1 | 310 | 0.514 | 1.39 | <ND | <ND |
| CA-MW-307D | 25-Aug-09 | N | 14.6 | 0.92 | 20 | 1.0 | 60 | --- | --- | <ND | <ND |
| CA-MW-308 | 06-Aug-09 | N | 3.86 | 3.70 | 2.9 | 13 /J | 210 | 0.275 /J | 0.00388 | <ND | <ND |
| | 12-Nov-09 | N | 4.32 | 4.30 | 2.6 | 14 /J | 220 | 0.483 | 0.108 | <ND | <ND |
| CA-MW-309 | 06-Aug-09 | N | <1 | <0.2 | 3.8 | 1.2 | 64 | 0.416 /J | 1.15 | 0.172 | <ND |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.429 /J | --- | --- | --- |
| | 12-Nov-09 | N | <1 | <0.2 | 3.2 | 0.67 | 82 | 0.796 | 1.08 | --- | --- |
| | 12-Nov-09 | FD | <1 | <0.2 | 3.4 | 0.64 | 84 | 0.826 | 1.06 | 0.130 | <ND |
| CA-MW-310S | 06-Aug-09 | N | 9.53 | 10.4 | 3.3 | 14 /J | 200 | 0.277 /J | 0.00192 | <ND | <ND |
| | 12-Nov-09 | N | 5.46 | 5.40 | 2.8 | 13 /J | 200 | 0.514 | 0.00120 | <ND | <ND |
| CA-MW-310D | 06-Aug-09 | N | 22.9 | 24.3 | 2.6 | 13 /J | 210 | 0.297 /J | <0.00100 | <ND | <ND |
| | 12-Nov-09 | N | 21.7 | 22.5 | 2.4 | 13 /J | 270 | 0.550 | <0.00100 | <ND | <ND |
| CA-MW-311 | 06-Aug-09 | N | 32.2 | 33.5 | 3.0 | 14 /J | 220 | 0.317 /J | <0.00100 | <ND | <ND |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.0600 /J | --- | --- | --- |
| | 12-Nov-09 | N | 17.4 | 18.1 | 2.8 | 14 /J | 200 | 0.578 | 0.00109 | <ND | <ND |
| CA-MW-312D | 05-Aug-09 | N | 10.0 | 8.21 | 1.5 | 1.2 | 260 | 0.227 /J | 0.0712 | <ND | <ND |
| | 11-Nov-09 | N | 14.8 | 15.3 | 1.4 | 1.4 | 270 | 0.539 | 0.00639 | <ND | <ND |
| CA-MW-313 | 05-Aug-09 | N | 11.0 | 10.3 | 2.4 | 9.4 /J | 310 | 1.62 /J | 0.127 | <ND | <ND |
| | 11-Nov-09 | N | 11.9 | 10.3 | 2.4 | 11 /J | 290 | 2.02 | 0.0719 | <ND | <ND |
| CA-MW-314 | 26-Aug-09 | N | 6.69 | 5.78 | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-315S | 26-Aug-09 | N | 10.0 | 8.92 | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-316 | 26-Aug-09 | N | 3.70 | 3.17 | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-317S | 26-Aug-09 | N | 5.32 | 4.80 | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-317D | 26-Aug-09 | N | 5.48 | 4.49 | --- | --- | --- | --- | --- | --- | --- |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-401 | 03-Aug-09 | N | 24.4 | 27.2 | 2.1 | 5.0 | 120 | 0.230 | 0.00124 | 0.325 | <ND |
| | 03-Aug-09 | FD | 26.3 | 26.3 | 2.4 | 5.0 | 120 | 0.253 | 0.00111 | 0.316 | <ND |
| | 10-Nov-09 | N | 30.7 | 32.8 | 2.1 | 5.7 | 130 | 0.324 | <0.00100 | 0.471 | <ND |
| CA-MW-402S | 03-Aug-09 | N | 10.9 | 11.2 | 2.6 | 2.4 | 110 | 0.270 | 0.00127 | 6.59 | <ND |
| | 10-Nov-09 | N | 16.9 | 17.8 | 2.5 | 2.8 | 99 | 0.338 | <0.00100 | 8.33 | <ND |
| | 10-Nov-09 | FD | 16.4 | 17.7 | 2.5 | 2.8 | 96 | 0.366 | <0.00100 | 8.18 | <ND |
| CA-MW-402D | 25-Aug-09 | N | <1 | <0.2 | 0.88 | <0.10 | 32 | --- | --- | <ND | <ND |
| CA-MW-403S | 03-Aug-09 | N | 15.0 | 16.4 | 2.6 | 3.7 | 140 | 0.242 | <0.00100 | 4.33 | <ND |
| | 10-Nov-09 | N | 17.6 | 17.7 | 2.6 | 3.8 | 170 | 0.357 | <0.00100 | 4.38 | 1.38 /J |
| CA-MW-403D | 25-Aug-09 | N | <1 | <0.2 | 0.79 | <0.10 | 30 | --- | --- | <ND | <ND |
| CA-MW-404S | 04-Aug-09 | N | 31.3 | 32.1 | 2.6 | 9.8 | 260 | 0.414 | 0.00431 | 0.087 | 1.92 |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.0626 /J | --- | --- | --- |
| | 10-Nov-09 | N | 36.2 | 39.4 | 2.8 | 9.3 /J | 290 | 0.463 | <0.00100 | 0.125 /J | 1.40 /J |
| CA-MW-404D | 25-Aug-09 | N | <1 | <0.2 | 1.0 | <0.10 | 56 | --- | --- | <ND | <ND |
| CA-MW-405S | 03-Aug-09 | N | 8.92 | 8.12 | 2.8 | 9.1 | 220 | 0.356 | 0.00374 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | 0.0597 /J | --- | --- | --- |
| | 11-Nov-09 | N | 18.4 | 19.9 | 2.7 | 11 /J | 240 | 0.629 | 0.00115 | <ND | <ND |
| | 11-Nov-09 | FD | 21.2 | 20.0 | 2.8 | 11 /J | 240 | 0.646 | 0.00123 | <ND | <ND |
| CA-MW-405D | 03-Aug-09 | N | 64.0 | 67.4 | 1.1 | 5.8 | 100 | 0.134 | 0.0197 | <ND | <ND |
| | 10-Nov-09 | N | 66.8 | 70.6 | 0.85 | 5.8 | 100 | 0.217 | 0.0274 | <ND | <ND |
| CA-MW-406 | 04-Aug-09 | N | 2.18 | 2.39 | 3.0 | 1.1 | 280 | 0.463 | 0.00639 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 /UJ | --- | --- | --- |
| | 11-Nov-09 | N | 1.63 | 1.58 | 2.9 | 0.67 | 250 | 0.611 | 0.00237 | <ND | <ND |
| CA-MW-407 | 04-Aug-09 | N | 18.3 | 18.0 | 3.6 | 5.1 | 140 | 0.420 | 0.00464 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | 0.199 /J | --- | --- | --- |
| | 11-Nov-09 | N | 14.1 | 14.0 | 3.0 | 7.2 | 260 | 0.638 | 0.00168 | <ND | <ND |
| CA-MW-408 | 04-Aug-09 | N | 2.34 | 1.98 | 3.9 | 1.5 | 71 | 0.256 | 0.00333 | 0.093 /J | <ND |
| | 11-Nov-09 | N | 1.22 | 1.20 | 3.6 | 0.65 | 81 | 0.530 | 0.00187 | 0.053 | <ND |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-409S | 04-Aug-09 | N | 2.21 | 1.98 | 3.2 | 9.2 | 200 | 0.354 | 0.00528 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | 0.0670 /J | --- | --- | --- |
| | 11-Nov-09 | N | 10.9 | 13.3 | 3.1 | 11 /J | 210 | 0.715 | <0.00100 | <ND | <ND |
| CA-MW-409D | 25-Aug-09 | N | 5.09 | 5.05 | 3.6 | 6.5 | 170 | --- | --- | <ND | <ND |
| CA-MW-410 | 04-Aug-09 | N | 28.7 | 32.3 | 2.9 | 15 /J | 250 | 0.348 | 0.00254 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 /UJ | --- | --- | --- |
| | 11-Nov-09 | N | 28.3 | 32.9 | 2.9 | 15 /J | 260 | 0.675 | <0.00100 | <ND | <ND |
| CA-MW-411S | 04-Aug-09 | N | 31.1 | 32.9 | 2.5 | 15 /J | 290 | 0.826 | 0.0209 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 /UJ | --- | --- | --- |
| | 10-Sep-09 | FD | --- | --- | --- | --- | --- | 0.0529 /J | --- | --- | --- |
| | 11-Nov-09 | N | 31.4 | 32.8 | 2.5 | 15 /J | 260 | 0.779 | 0.00516 | <ND | <ND |
| CA-MW-411D | 25-Aug-09 | N | 5.36 | 5.25 | 3.1 | 13 /J | 170 | --- | --- | <ND | <ND |
| | 25-Aug-09 | FD | 5.10 | 5.38 | 3.0 | 13 /J | 170 | --- | --- | <ND | <ND |
| CA-MW-412S | 05-Aug-09 | N | 22.0 | 21.0 | 2.4 | 4.9 | 120 | 0.164 | 0.0308 | 0.078 | <ND |
| | 10-Nov-09 | N | 27.4 | 28.0 | 2.1 | 5.2 | 110 | 0.339 | 0.0107 | 0.145 | <ND |
| CA-MW-412D | 04-Aug-09 | N | 58.3 | 65.9 | 2.2 | 14 /J | 220 | 0.321 | 0.00471 | <ND | <ND |
| | 11-Sep-09 | N | --- | --- | --- | --- | --- | 0.0703 /J | --- | --- | --- |
| | 10-Nov-09 | N | 59.6 | 63.3 | 1.8 | 10 /J | 220 | 0.433 | 0.00216 | <ND | <ND |
| CA-MW-501S | 03-Aug-09 | N | 27.6 | 26.5 | 3.0 | 12 /J | 300 | 0.363 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 09-Sep-09 | FD | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 09-Nov-09 | N | 35.1 | 31.6 | 2.7 | 12 /J | 310 | 0.296 /J | <0.00100 | <ND | <ND |
| CA-MW-501D | 25-Aug-09 | N | 5.27 | 5.03 | 1.1 | 2.1 | 130 | --- | --- | <ND | <ND |
| CA-MW-502 | 03-Aug-09 | N | 20.5 | 19.9 | 3.0 | 11 | 350 | 0.386 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 09-Nov-09 | N | 26.4 | 23.1 | 2.8 | 9.8 /J | 300 | 0.330 /J | 0.00142 | <ND | <ND |
| CA-MW-503S | 03-Aug-09 | N | 13.6 | 15.1 | 3.0 | 9.8 | 320 | 0.417 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | 0.0615 | --- | --- | --- |
| | 09-Nov-09 | N | 17.0 | 16.0 | 2.9 | 8.9 | 270 | 0.332 /J | <0.00100 | <ND | <ND |
| CA-MW-503D | 25-Aug-09 | N | 6.77 | 6.60 | 1.1 | 2.7 | 84 | --- | --- | <ND | <ND |
| CA-MW-504 | 03-Aug-09 | N | 13.0 | 13.8 | 3.3 | 8.5 | 220 | 0.381 | <0.00100 | 0.018 /J | <ND |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | 0.0509 | --- | --- | --- |
| | 09-Nov-09 | N | 13.2 | 11.8 | 3.2 | 7.6 | 180 | 0.298 /J | <0.00100 | 0.187 | <ND |
| CA-MW-505 | 04-Aug-09 | N | 32.1 | 32.1 | 2.5 | 12 /J | 400 | 0.574 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 10-Nov-09 | N | 26.5 | 27.6 | 2.8 | 11 /J | 350 | 0.527 /J | <0.00100 | 0.059 | <ND |
| CA-MW-506S | 04-Aug-09 | N | 15.6 | 16.6 | 3.2 | 12 /J | 220 | 0.347 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 10-Nov-09 | N | 15.8 | 16.9 | 3.1 | 11 /J | 210 | 0.365 /J | <0.00100 | <ND | <ND |
| | 10-Nov-09 | FD | 16.2 | 16.9 | 3.0 | 11 /J | 210 | 0.456 /J | <0.00100 | <ND | <ND |
| CA-MW-506D | 25-Aug-09 | N | 43.1 | 44.4 | 2.8 | 12 | 290 | --- | --- | <ND | <ND |
| CA-MW-507 | 04-Aug-09 | N | 50.2 | 50.2 | 2.9 | 14 /J | 210 | 0.346 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 10-Nov-09 | N | 21.7 | 24.2 | 2.9 | 16 /J | 200 | 0.497 /J | 0.00178 | <ND | <ND |
| CA-MW-508S | 04-Aug-09 | N | 12.1 | 12.8 | 3.1 | 14 /J | 160 | 0.307 | 0.00152 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 10-Nov-09 | N | 14.9 | 15.9 | 2.9 | 15 /J | 180 | 0.460 /J | 0.00154 | <ND | <ND |
| CA-MW-508D | 25-Aug-09 | N | 16.0 | 16.1 | 3.0 | 12 | 160 | --- | --- | <ND | <ND |
| CA-MW-509 | 04-Aug-09 | N | 11.3 | 12.9 | 2.9 | 19 /J | 250 | 0.356 | <0.00100 | <ND | <ND |
| | 04-Aug-09 | FD | 12.2 | 12.8 | 2.9 | 18 /J | 260 | 0.331 | <0.00100 | <ND | <ND |
| | 09-Sep-09 | N | --- | --- | --- | --- | --- | <0.0500 | --- | --- | --- |
| | 10-Nov-09 | N | 12.7 | 13.1 | 2.7 | 19 /J | 260 | 0.499 /J | <0.00100 | <ND | <ND |
| CA-MW-510S | 04-Aug-09 | N | 11.2 | 11.1 | 2.9 | 17 | 290 | 0.387 | 0.00107 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | 0.0553 /J | --- | --- | --- |
| | 10-Sep-09 | FD | --- | --- | --- | --- | --- | 0.0550 /J | --- | --- | --- |
| | 10-Nov-09 | N | 7.41 | 7.80 | 3.1 | 18 /J | 290 | 0.587 /J | 0.00212 | <ND | <ND |
| CA-MW-510D | 26-Aug-09 | N | 5.42 | 4.90 | 3.3 | 14 /J | 170 | --- | --- | <ND | <ND |
| | 26-Aug-09 | FD | 5.82 | 4.82 | 3.4 | 14 /J | 170 | --- | --- | <ND | <ND |

**Results for Primary Performance Parameters July 2009 through December 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Total Dissolved Chromium µg/L | Hexavalent Chromium µg/L | Total Organic Carbon mg/L | Nitrate as Nitrogen mg/L | Sulfate mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Fluorescein ppb | Eosine ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-511 | 04-Aug-09 | N | 1.30 | 1.80 | 3.5 | 16 | 220 | 0.463 | 0.00287 | <ND | <ND |
| | 10-Sep-09 | N | --- | --- | --- | --- | --- | 0.0515 /J | --- | --- | --- |
| | 10-Sep-09 | FD | --- | --- | --- | --- | --- | 0.0618 /J | --- | --- | --- |
| | 10-Nov-09 | N | 1.76 | 1.82 | 3.4 | 18 /J | 220 | 0.495 /J | <0.00100 | <ND | <ND |
| CA-RW-02 | 06-Aug-09 | N | --- | 74.2 | 1.6 | 9.9 | 170 | 0.251 | 0.247 | 0.040 | <ND |
| CA-RW-04 | 06-Aug-09 | N | --- | <0.2 | 3.7 | 0.18 | 82 | 6.34 | 1.93 | 20.4 | <ND |
| | 12-Nov-09 | N | --- | <0.2 | 2.5 | 0.23 | 76 | 2.85 | 2.19 | 7.13 | <ND /UJ |
| CA-RW-06 | 06-Jul-09 | N | --- | --- | 2.2 | --- | --- | --- | --- | --- | --- |
| | 27-Jul-09 | N | --- | --- | 2.7 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | --- | 68.9 | 2.2 | 11 /J | 190 | 0.399 | 0.145 | 0.061 | 0.412 |
| CA-RW-10 | 27-Jul-09 | N | --- | --- | 3.1 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | --- | 33.4 | 3.1 | 13 /J | 220 | 0.502 | 0.0109 | <ND | <ND |
| CA-RW-12 | 27-Jul-09 | N | --- | --- | 3.0 | --- | --- | --- | --- | --- | --- |
| | 06-Aug-09 | N | --- | 7.61 | 3.2 | 12 /J | 180 | 0.233 | 0.00358 | <ND | <ND |
| | 12-Nov-09 | N | --- | 8.34 | 3.0 | 12 /J | 180 | 0.450 | 0.00598 | <ND | <ND |

**Abbreviations:**

| | |
|---|---|
| mg/L | Milligrams per liter |
| µg/L | Micrograms per liter |
| ppb | Parts per billion |
| < | Symbol indicates not detected at or above reporting limit as noted |
| --- | Analyte not sampled |
| FD | Field duplicate |
| J | Analyte was present, but reported value may not be accurate or precise. |
| N | Normal |
| ND | Not Detected |
| NG | Normal, Grab |
| UB | The reporting limit was elevated due to the analyte being detected above the reporting limit in the blank associated with the analysis of the sample. |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |

**Results for Secondary Performance Parameters July 2009 through November 2009**

*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Arsenic-Dissolved mg/L | Methane µg/L | Sulfide mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Calcium-Dissolved mg/L | Sodium-Dissolved mg/L | Magnesium-Dissolved mg/L | Orthophosphate mg/L | Ammonia as nitrogen mg/L | Chloride mg/L | Ethanol mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-101 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | 1.5 | 0.00694 | 7,900.00 | <0.050 | 390 | 111 | 121 | 20.3 | <0.10 | <0.10 | 83 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00433 | 2,700 | <0.050 | 318 | 104 | 110 | 19.4 | <0.10 | <0.10 | 94 | <0.10 |
| CA-MW-102S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00843 | 530 | <0.050 | 522 | 130 | 158 | 22.4 | <0.10 | <0.10 | 120 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00611 | 1,900 | <0.050 | 490 | 136 | 163 | 23.3 | <0.10 | <0.10 | 110 | <0.10 |
| CA-MW-103 | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00498 | 4,700.00 | 0.15 | 468 | 131 | 165 | 22 | <0.10 | <0.10 | 110 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | 6.2 | 0.002 | 410 | <0.050 | 342 | 112 | 130 | 20.1 | <0.10 | <0.10 | 97 | <0.10 |
| CA-MW-104S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 1,500.00 | <0.050 | 388 | 137 | 154 | 23.6 | <0.10 | <0.10 | 110 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 50 | <0.050 | 388 | 133 | 133 | 23.7 | <0.10 | <0.10 | 100 | <0.10 |
| CA-MW-105 | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00112 | 510 | <0.050 | 408 | 165 | 162 | 28.4 | <0.10 | <0.10 | 120 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.29 J/UB | <0.050 | 396 | 168 | 168 | 27.4 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-106S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 6.8 | <0.050 | 412 | 159 | 167 | 26.8 | <0.10 | <0.10 | 110 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.29 J/UB | <0.050 | 436 | 128 | 174 | 22 | <0.10 | <0.10 | 96 | <0.10 |
| CA-MW-107S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00111 | <0.230 /UB | <0.050 | 456 | 6.15 | 5.69 | 30.2 | <0.10 | <0.10 | 130 | <0.10 |
| | 04-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 2.7 | <0.050 | 458 | --- | --- | --- | <0.10 | 0.17 | 110 | <0.10 |
| | 03-Dec-09 | N | --- | --- | --- | --- | --- | 0.00104 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-107D | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.120 /UB | <0.050 | 412 | 223 | 156 | 37.4 | <0.10 | <0.10 | 160 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.1 J/UB | <0.050 | 410 | 221 | 159 | 35.2 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-108S | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00103 | <2.300 /UB | <0.050 | 338 | 270 | 269 | 46.6 | <0.10 | <0.10 | 140 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 110 | <0.050 | 336 | 174 | 139 | 25.5 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-108D | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00201 | 4.9 | <0.050 | 152 | 73.4 | 67.5 | 15.6 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00244 | 7.2 | <0.050 | 156 | 78.2 | 68.5 | 15.5 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-201 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 4.6 | <0.050 | 558 | 131 | 189 | 25.2 | <0.10 | <0.10 | 130 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 9.4 | <0.050 | 514 | 137 | 182 | 22.9 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-202 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 1,700.00 | <0.050 | 372 | 157 | 162 | 26.7 | <0.10 | <0.10 | 140 | <0.10 |
| | 05-Aug-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 1,800.00 | <0.050 | 370 | 157 | 167 | 27.1 | <0.10 | <0.10 | 140 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | 0.99 | <0.00100 | 1,300 | <0.050 | 381 | 148 | 154 | 24.3 | <0.10 | <0.10 | 110 | <0.10 |

**Results for Secondary Performance Parameters July 2009 through November 2009**
*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Arsenic-Dissolved mg/L | Methane µg/L | Sulfide mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Calcium-Dissolved mg/L | Sodium-Dissolved mg/L | Magnesium-Dissolved mg/L | Orthophosphate mg/L | Ammonia as nitrogen mg/L | Chloride mg/L | Ethanol mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-203 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00384 | 12,000.00 | 0.6 | 642 | 151 | 172 | 27 | <0.10 | <0.10 | 110 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | 6.7 | 0.00141 | 780 | <0.050 | 482 | 142 | 177 | 25.3 | <0.10 | <0.10 | 92 | <0.10 |
| CA-MW-204S | 05-Aug-09 | N | --- | --- | --- | --- | --- | 0.00969 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-09 | N | --- | --- | --- | --- | --- | 0.0143 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-204D | 05-Aug-09 | N | --- | --- | --- | --- | --- | 0.00362 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-09 | N | --- | --- | --- | --- | --- | 0.00377 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-301 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00375 | 290 | <0.050 | 438 | 94.5 | 151 | 16.6 | <0.10 | <0.10 | 92 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00245 | 250 | <0.050 | 422 | 109 /J | 142 | 20.2 /J | <0.10 | <0.10 | 100 | <0.10 |
| CA-MW-302S | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 660 | <0.050 | 466 | 120 | 156 | 19.3 | <0.10 | <0.10 | 100 | <0.10 |
| | 05-Aug-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 720 | <0.050 | 466 | 122 | 155 | 20.8 | <0.10 | <0.10 | 100 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00123 | 33 | <0.050 | 372 | 91.7 | 130 | 16.5 | <0.10 | <0.10 | 87 | <0.10 |
| CA-MW-302D | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00162 | <0.520 /UB | <0.050 | 187 | 82 | 74.1 | 14.4 | <0.10 | <0.10 | 98 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.0016 | 3.1 /J | <0.050 | 186 | 78.5 | 73.4 | 13.4 | <0.10 | <0.10 | 100 | <0.10 |
| | 11-Nov-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00181 | <0.22 /UB | <0.050 | 188 | 79.4 | 73.3 | 13.4 | <0.10 | <0.10 | 100 | <0.10 |
| CA-MW-303S | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.830 /UB | <0.050 | 534 | 135 | 189 | 23.6 | <0.10 | <0.10 | 140 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 0.52 | <0.050 | 548 | 122 | 187 | 21.7 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-304 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.500 /UB | <0.050 | 496 | 155 | 171 | 26.8 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 0.71 | <0.050 | 523 | 143 | 165 | 26.3 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-305 | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 25 | <0.050 | 436 | 131 | 172 | 23 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 35 | 0.2 | 457 | 133 | 164 | 24 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-306S | 05-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.190 /UB | 0.3 | 392 | 142 | 157 | 23.9 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 2 | <0.050 | 414 | 156 | 154 | 27.1 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-306D | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00146 | <0.390 /UB | <0.050 | 314 | 121 | 170 | 20.6 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00106 | 17 | <0.050 | 292 | 133 | 163 | 23.3 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-307S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00198 | 2,900.00 | <0.050 | 474 | 140 | 186 | 24.6 | <0.10 | <0.10 | 120 | <0.10 |
| | 06-Aug-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00209 | 2,900.00 | <0.050 | 468 | 150 | 195 | 26.1 | <0.10 | <0.10 | 130 | <0.10 |
| | 12-Nov-09 | N | 12 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00155 | 3,700 | <0.050 | 410 | 161 | 185 | 27.5 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-308 | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00111 | 5,400.00 | <0.050 | 416 | 161 | 166 | 25.5 | <0.10 | <0.10 | 140 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 3,700 | 0.3 | 416 | 152 | 168 | 25.2 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-309 | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00223 | 6,800.00 | <0.050 | 644 | 136 | 202 | 22.7 | <0.10 | <0.10 | 120 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00349 | 9,500 | <0.050 | 588 | 126 | 196 | 21.1 | <0.10 | <0.10 | 110 | <0.10 |
| | 12-Nov-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00338 | 9,600 | <0.050 | 594 | 126 | 192 | 21 | <0.10 | <0.10 | 110 | <0.10 |

**Results for Secondary Performance Parameters July 2009 through November 2009**
*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Arsenic-Dissolved mg/L | Methane µg/L | Sulfide mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Calcium-Dissolved mg/L | Sodium-Dissolved mg/L | Magnesium-Dissolved mg/L | Orthophosphate mg/L | Ammonia as nitrogen mg/L | Chloride mg/L | Ethanol mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-310S | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00189 | <2.400 /UB | <0.050 | 452 | 165 | 167 | 27 | <0.10 | <0.10 | 120 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00159 | 3.2 | <0.050 | 454 | 152 | 179 | 24.5 | <0.10 | <0.10 | 110 | <0.10 |
| CA-MW-310D | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00103 | <0.650 /UB | <0.050 | 392 | 169 | 150 | 29.5 | <0.10 | <0.10 | 130 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 2.5 | <0.050 | 392 | 168 | 158 | 29 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-311 | 06-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00115 | <0.990 /UB | <0.050 | 432 | 177 | 168 | 28.9 | <0.10 | <0.10 | 130 | <0.10 |
| | 12-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00113 | 1.3 | <0.050 | 456 | 156 | 165 | 25.5 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-312D | 05-Aug-09 | N | --- | --- | --- | --- | --- | 0.00328 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-09 | N | --- | --- | --- | --- | --- | 0.00338 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-313 | 05-Aug-09 | N | --- | --- | --- | --- | --- | 0.00132 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-09 | N | --- | --- | --- | --- | --- | 0.00127 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-401 | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.0013 | <0.130 /UB | <0.050 | 400 | 125 | 133 | 18.3 /J | <0.10 | <0.10 | 120 | <0.10 |
| | 03-Aug-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00117 | <0.370 /UB | <0.050 | 412 | 122 | 136 | 19.0 /J | <0.10 | <0.10 | 120 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.3 /UB | <0.050 | 416 | 127 /J | 167 | 20.0 /J | <0.10 | <0.10 | 100 | <0.10 |
| CA-MW-402S | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00127 | <0.210 /UB | <0.050 | 464 | 130 | 166 | 22.7 /J | <0.10 | <0.10 | 150 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.43 /UB | <0.050 /UJ | 536 | 122 /J | 192 | 23.7 /J | <0.10 | <0.10 | 130 | <0.10 |
| | 10-Nov-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.39 /UB | <0.050 | 541 | 122 /J | 195 | 24.1 /J | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-403S | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.001 | <0.420 /UB | <0.050 | 444 | 133 | 149 | 20.5 /J | <0.10 | <0.10 | 130 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.36 /UB | <0.050 | 452 | 139 /J | 175 | 23.2 /J | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-404S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.130 /UB | <0.050 | 450 | 184 | 190 | 29.7 | <0.10 | <0.10 | 140 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 0.81 | <0.050 | 444 | 181 /J | 190 | 29.3 /J | <0.10 | <0.10 | 150 | <0.10 |
| CA-MW-405S | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00145 | <0.600 /UB | <0.050 | 414 | 156 | 155 | 24.2 /J | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00119 | <0.2 /UB | <0.050 | 444 | 156 | 169 | 29.2 | <0.10 | <0.10 | 130 | <0.10 |
| | 11-Nov-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00106 | <0.33 /UB | <0.050 | 438 | 154 | 166 | 29.5 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-405D | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00289 | 20 | <0.050 | 228 | 80 | 75.7 | 10.2 /J | <0.10 | <0.10 | 75 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00268 | 21 | <0.050 | 236 | 85.3 /J | 92.7 | 12.7 /J | <0.10 | <0.10 | 77 | <0.10 |
| CA-MW-406 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00152 | <0.120 /UB | <0.050 | 448 | 169 | 212 | 27.1 | <0.10 | <0.10 | 130 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 19 | <0.050 | 466 | 151 | 179 | 27.6 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-407 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00166 | 6,500.00 | <0.050 | 592 | 177 | 190 | 27.9 | <0.10 | <0.10 | 100 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 3,500 | 0.1 | 447 | 170 | 164 | 31.9 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-408 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00111 | 12,000.00 | <0.050 | 618 | 139 | 203 | 21.7 | <0.10 | <0.10 | 110 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 15,000 | <0.050 | 598 | 130 | 177 | 23.2 | <0.10 | <0.10 | 110 | <0.10 |

**Results for Secondary Performance Parameters July 2009 through November 2009**
*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Arsenic-Dissolved mg/L | Methane µg/L | Sulfide mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Calcium-Dissolved mg/L | Sodium-Dissolved mg/L | Magnesium-Dissolved mg/L | Orthophosphate mg/L | Ammonia as nitrogen mg/L | Chloride mg/L | Ethanol mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-409S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00159 | 4.2 | <0.050 | 496 | 185 | 171 | 29.5 | <0.10 | <0.10 | 120 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 4 | 0.2 | 492 | 176 | 162 | 31.8 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-410 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00157 | <1.500 /UB | <0.050 | 412 | 177 | 162 | 29.1 | <0.10 | <0.10 | 130 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | 1.5 | 0.1 | 425 | 9.82 | 6.76 | 31.8 | <0.10 | <0.10 | 130 | <0.10 |
| CA-MW-411S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00186 | <1.200 /UB | <0.050 | 324 | 193 | 160 | 32.5 | <0.10 | <0.10 | 170 | <0.10 |
| | 11-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00134 | 0.77 | <0.050 | 372 | 174 | 149 | 30.3 | <0.10 | <0.10 | 150 | <0.10 |
| CA-MW-412S | 05-Aug-09 | N | --- | --- | --- | --- | --- | 0.00148 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-09 | N | --- | --- | --- | --- | --- | 0.00147 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-412D | 04-Aug-09 | N | --- | --- | --- | --- | --- | 0.00227 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-09 | N | --- | --- | --- | --- | --- | 0.00172 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CA-MW-501S | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00106 | <1.800 /UB | <0.050 | 414 | 195 | 159 | 30.3 /J | <0.10 | <0.10 | 140 | <0.10 |
| | 09-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 /UJ | <0.00100 | <0.33 /UB | <0.050 | 444 | 177 | 175 | 29.2 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-502 | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <1.200 /UB | <0.050 | 418 | 204 | 153 | 31.6 /J | <0.10 | <0.10 | 150 | <0.10 |
| | 09-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.39 /UB | 0.1 | 475 | 183 | 169 | 29.3 | <0.10 | <0.10 | 140 | <0.10 |
| CA-MW-503S | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00103 | <1.200 /UB | <0.050 | 436 | 210 | 176 | 31.2 /J | <0.10 | <0.10 | 160 | <0.10 |
| | 09-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.34 /UB | <0.050 | 500 | 176 | 177 | 29.3 | <0.10 | <0.10 | 150 | <0.10 |
| CA-MW-504 | 03-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00101 | <0.710 /UB | <0.050 | 514 | 192 | 148 | 29.4 /J | <0.10 | <0.10 | 150 | <0.10 |
| | 09-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.1 J/UB | <0.050 | 552 | 167 | 168 | 27 | <0.10 | <0.10 | 120 | <0.10 |
| CA-MW-505 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00145 | <0.200 /UB | <0.050 | 382 | 277 | 161 | 46.8 | <0.10 | <0.10 | 270 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 /UJ | <0.00100 | <0.17 /UB | <0.050 | 389 | 224 /J | 164 | 39.4 /J | <0.10 | <0.10 | 240 | <0.10 |
| CA-MW-506S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00113 | <0.140 /UB | <0.050 | 440 | 164 | 169 | 27.9 | <0.10 | <0.10 | 110 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.18 /UB | <0.050 | 479 | 154 /J | 176 | 26.5 /J | <0.10 | <0.10 | 110 | <0.10 |
| | 10-Nov-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.18 /UB | <0.050 | 474 | 153 /J | 184 | 26.5 /J | <0.10 | <0.10 | 110 | <0.10 |
| CA-MW-507 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.0012 | <0.310 /UB | <0.050 | 408 | 161 | 148 | 27 | <0.10 | <0.10 | 110 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.46 /UB | 0.2 | 430 | 151 /J | 160 | 26.5 /J | <0.10 | <0.10 | 110 | <0.10 |
| CA-MW-508S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00155 | <0.220 /UB | 0.3 | 426 | 148 | 157 | 25 | <0.10 | <0.10 | 89 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.11 /UB | 0.2 | 431 | 142 /J | 165 | 24.8 /J | <0.10 | <0.10 | 96 | <0.10 |
| CA-MW-509 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00163 | <0.120 /UB | <0.050 | 412 | 175 | 173 | 29.5 | <0.10 | <0.10 | 150 | <0.10 |
| | 04-Aug-09 | FD | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00101 | <0.140 /UB | <0.050 | 416 | 186 | 177 | 29.9 | <0.10 | <0.10 | 150 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.00100 | <0.13 /UB | <0.050 | 414 | 172 /J | 179 | 29.2 /J | <0.10 | <0.10 | 150 | <0.10 |

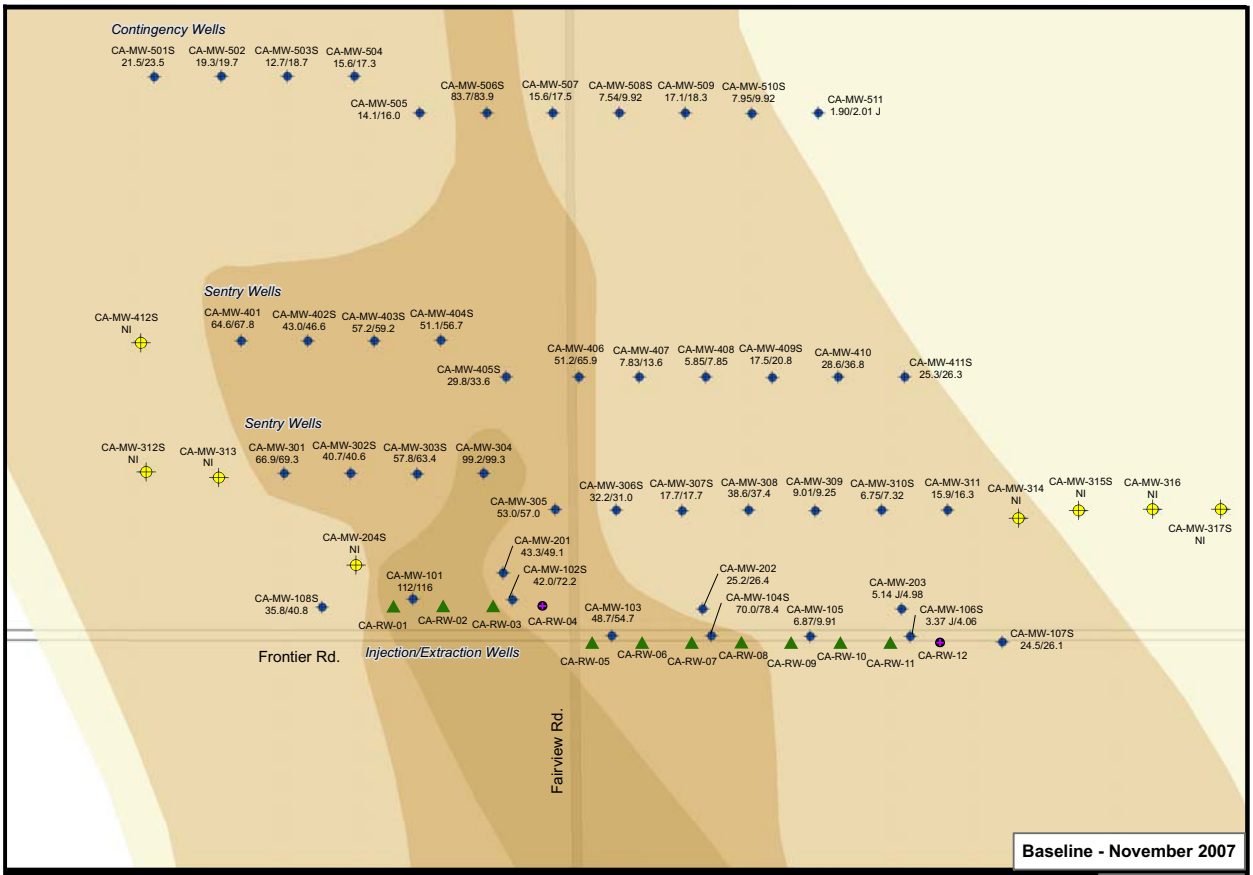
**Results for Secondary Performance Parameters July 2009 through November 2009**

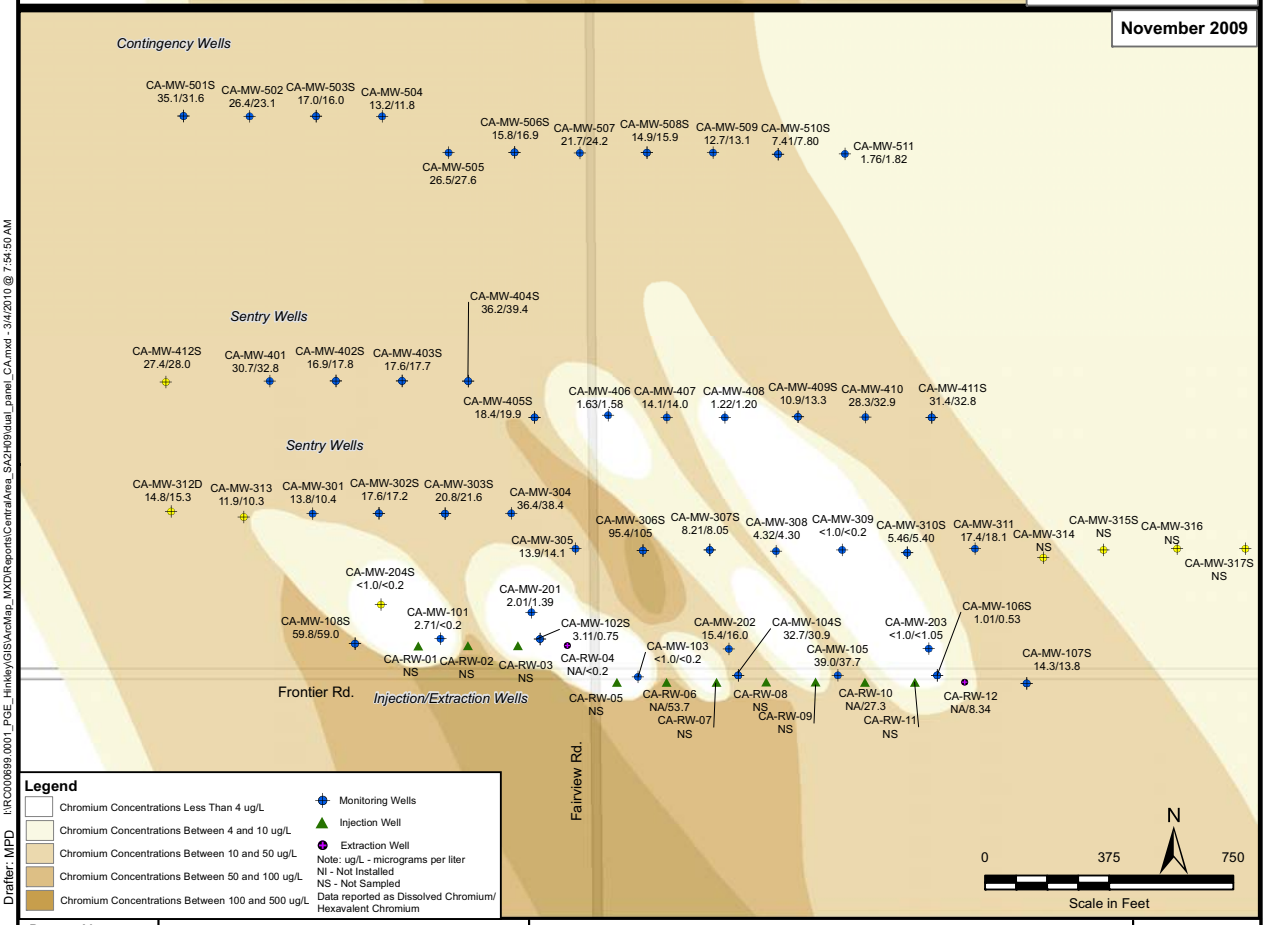
*Status Report, Central Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Arsenic-Dissolved mg/L | Methane µg/L | Sulfide mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Calcium-Dissolved mg/L | Sodium-Dissolved mg/L | Magnesium-Dissolved mg/L | Orthophosphate mg/L | Ammonia as nitrogen mg/L | Chloride mg/L | Ethanol mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA-MW-510S | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00216 | <0.140 /UB | <0.050 | 424 | 193 | 205 | 32.2 | <0.10 | <0.10 | 160 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00184 | <0.17 /UB | <0.050 | 460 | 168 /J | 199 | 28.6 /J | <0.10 | <0.10 | 170 | <0.10 |
| CA-MW-511 | 04-Aug-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.00212 | <0.160 /UB | <0.050 | 496 | 174 | 193 | 30.4 | <0.10 | <0.10 | 120 | <0.10 |
| | 10-Nov-09 | N | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 0.0015 | <0.34 /UB | <0.050 | 510 | 165 /J | 200 | 29.0 /J | <0.10 | <0.10 | 130 | <0.10 |
| CA-RW-02 | 06-Aug-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 298 | --- | --- | --- | --- | --- | --- | --- |
| CA-RW-04 | 06-Aug-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 596 | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 540 | --- | --- | --- | --- | --- | --- | --- |
| CA-RW-06 | 06-Aug-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 358 | --- | --- | --- | --- | --- | --- | --- |
| CA-RW-10 | 06-Aug-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 434 | --- | --- | --- | --- | --- | --- | --- |
| CA-RW-12 | 06-Aug-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 452 | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | 444 | --- | --- | --- | --- | --- | --- | --- |

**Abbreviations:**

| | |
|---|---|
| mg/L | Milligrams per liter |
| < | Symbol indicates not detected at or above reporting limit as noted |
| --- | Analyte not sampled |
| FD | Field duplicate |
| J | Analyte was present, but reported value may not be accurate or precise. |
| N | Normal |
| UB | The reporting limit was elevated due to the analyte being detected above the reporting limit in the blank associated with the analysis of the sample. |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |

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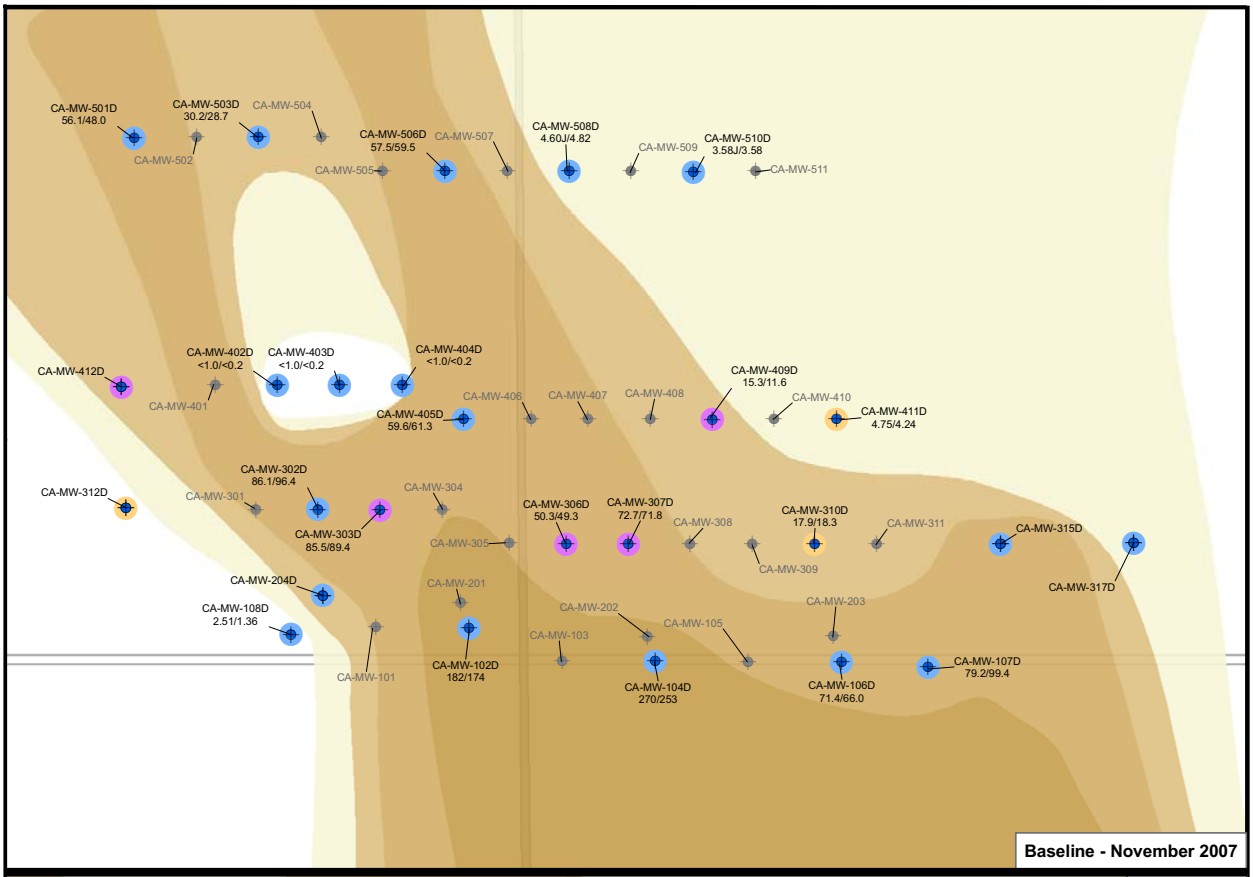
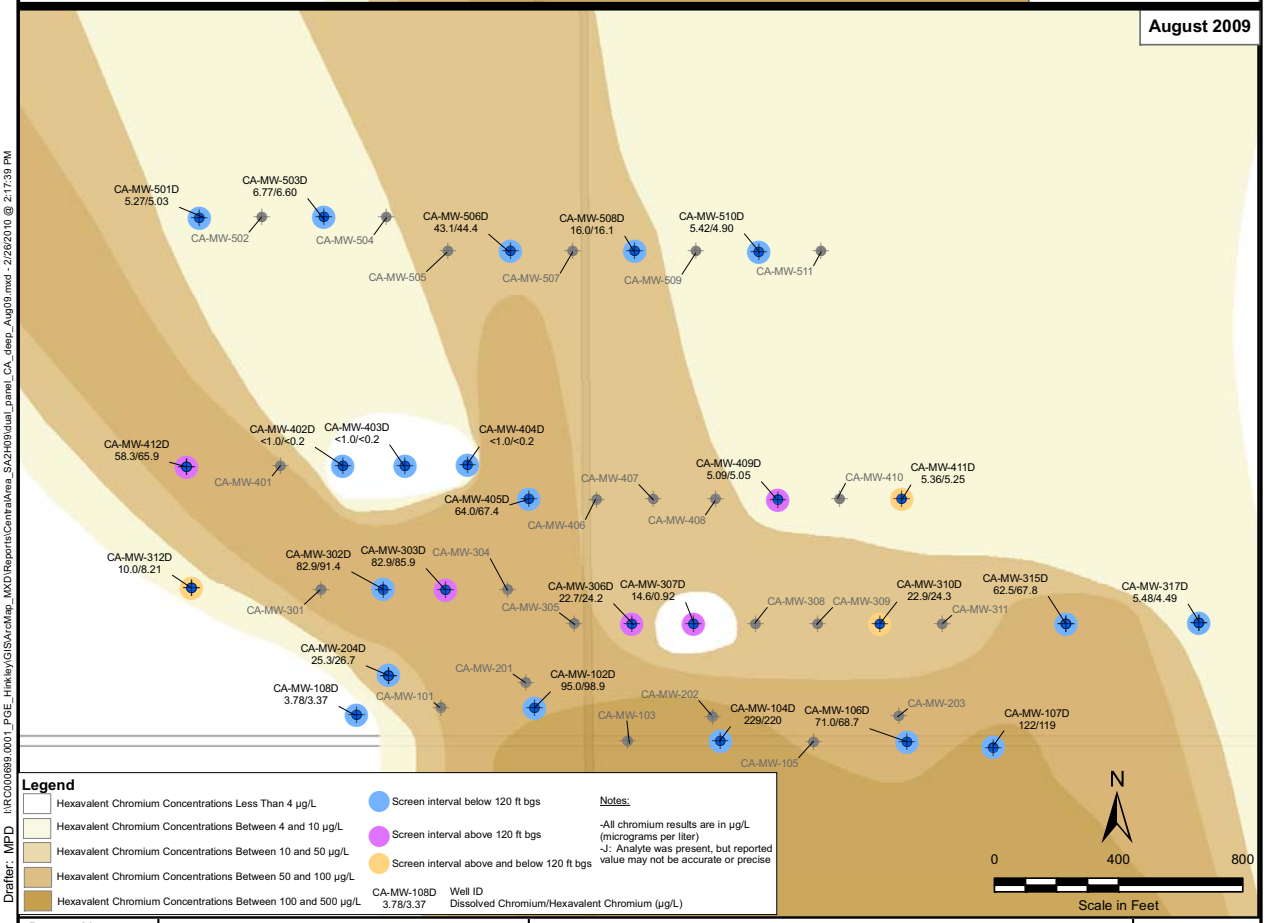
| | | |
|---|---|---|
| Program Manager<br>Lisa Cope | ARCADIS<br>100 Montgomery Street, Suite 300<br>San Francisco, California 94104<br>Tel: 415 374 2744<br>Fax: 415 374 2745<br>www.arcadis-us.com | Central Area<br>Shallow Aquifer Unit of the Upper Aquifer<br>Comparison of Isoconcentration Contours<br>Baseline and After 2 Years of IRZ Operation<br>Central Area In Situ Remediation Pilot Study<br><br>Pacific Gas and Electric Company<br>Hinkley, California |
| Project Manager<br>Jenifer Beatty | | FIGURE |
| Task Manager<br>Allison Turner | | 1 |
| Technical Review<br>Frank Lenzo | | |

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| | |
|---|---|
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| Project Manager | Jenifer Beatty |
| Task Manager | Allison Turner |
| Technical Review | Frank Lenzo |

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# Central Area

## Deep Aquifer Unit of the Upper Aquifer Comparison of Concentration Contours Baseline and After 2 Years of IRZ Operation

Central Area In Situ Remediation Pilot Study

Pacific Gas and Electric Company
Hinkley, California

FIGURE

**2**

# Appendix I
# Source Area IRZ Groundwater Monitoring Data
# July 2009 through December 2009

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-RW-01 | 16-Jul-09 | N | --- | 133 | 0.00415 | 0.154 | 0.0829 | 1.8 | --- | 92 | --- | --- | --- | --- | --- | 150 | 0.85 |
| | 09-Nov-09 | N | --- | 101 | 0.00558 | 0.118 /J | 0.146 | 1.4 | --- | 88 | --- | --- | --- | --- | --- | --- | 0.86 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.73 |
| SA-RW-02 | 16-Jul-09 | N | --- | <0.20 | 0.104 | 1.69 | 2.63 | <0.10 | --- | 51 | --- | --- | --- | --- | --- | 356 | 1.9 |
| | 13-Aug-09 | N | --- | <0.2 | 0.12 | 2.67 /J | 3.02 | <0.10 | --- | 43 | --- | --- | --- | --- | --- | 378 | 2.5 |
| | 09-Nov-09 | N | --- | <0.2 | 0.161 | 3.42 /J | 3.24 | <0.10 | --- | 37 | --- | --- | --- | --- | --- | --- | 1.9 |
| SA-RW-03 | 16-Jul-09 | N | --- | 330 | 0.00295 | 0.153 | 0.397 | 2.2 | --- | 82 | --- | --- | --- | --- | --- | 210 | 1.6 |
| | 13-Aug-09 | N | --- | 408 | 0.00345 | 0.165 /J | 0.623 | 2.1 | --- | 88 | --- | --- | --- | --- | --- | 212 | 1.8 |
| | 09-Nov-09 | N | --- | 344 | 0.0106 | 0.140 /J | 0.915 | 1.2 | --- | 85 | --- | --- | --- | --- | --- | --- | 1.9 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 |
| SA-RW-04 | 16-Jul-09 | N | --- | 108 | 0.00151 | 0.241 | 0.00675 | 9.3 | --- | 110 | --- | --- | --- | --- | --- | 264 | 1.7 |
| | 13-Aug-09 | N | --- | 112 | 0.00151 | 0.238 /J | 0.0118 | 9.2 | --- | 110 | --- | --- | --- | --- | --- | 270 | 1.5 |
| | 09-Nov-09 | N | --- | 111 | 0.00171 | 0.158 /J | 0.00674 | 9 | --- | 120 | --- | --- | --- | --- | --- | --- | 1.4 |
| | 14-Dec-09 | N | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1.2 |
| SA-MW-01S | 14-Jul-09 | N | 644 | 692 | 0.00159 | 0.0722 | <0.00100 | 4.6 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 236 | 1.3 |
| | 12-Aug-09 | N | 808 | 763 | 0.0017 | 0.115 | <0.00100 | 4.3 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 226 | 1.5 |
| | 04-Nov-09 | N | 910 | 968 | 0.00159 | 0.231 | <0.00100 | 4.3 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.0 |
| SA-MW-01D | 14-Jul-09 | N | 497 | 528 | 0.00157 | 0.0659 | <0.00100 | 2.4 | <0.10 | 94 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 172 | 0.97 |
| | 12-Aug-09 | N | 534 | 528 | 0.00153 | 0.093 | <0.00100 | 2.5 | <0.10 | 93 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 188 | 1.0 |
| | 04-Nov-09 | N | 343 | 373 | 0.00186 | 0.167 | <0.00100 | 1.8 | <0.10 | 88 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.79 |
| SA-MW-02S | 14-Jul-09 | N | 884 | 932 | <0.00100 | 0.106 | <0.00100 | 5.1 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 206 | 1.2 |
| | 12-Aug-09 | N | 783 | 881 | <0.00100 | 0.121 | <0.00100 | 5.3 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 218 | 1.3 |
| | 05-Nov-09 | N | 1,010 | 1,070 | <0.00100 | 0.164 /J | <0.00100 | 4.9 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.3 |
| SA-MW-02D | 14-Jul-09 | N | 23.0 | 14.6 | 0.0205 | 0.308 | 0.254 | 0.22 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 246 | 2.1 |
| | 12-Aug-09 | N | 15.1 | 9.99 | 0.0269 | 0.297 | 0.244 | 0.51 | 0.1 | 150 | <1.0 | <1.0 | <1.0 | <1.0 | 1.9 | 217 | 2.2 |
| | 04-Nov-09 | N | 20.0 | 23.8 | 0.0332 | 0.379 | 0.203 | 0.71 | <0.10 | 150 | <1.0 | <1.0 | <1.0 | <1.0 | 0.81 | --- | 1.8 |
| SA-MW-03S | 14-Jul-09 | N | 5.11 | 4.16 | 0.0016 | 0.0554 | 0.0181 | 0.14 | <0.10 | 25 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 543 | 2.8 |
| | 12-Aug-09 | N | 1.86 | 1.47 | 0.00151 | 0.238 | 0.0132 | 0.13 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 517 | 2.6 |
| | 05-Nov-09 | N | <1 | <0.2 | 0.00487 | 0.229 /J | 1.01 | <0.10 | <0.10 | 35 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.9 |
| | 03-Dec-09 | N | --- | --- | --- | --- | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-MW-03D | 14-Jul-09 | N | 8.16 | 6.44 | 0.00141 | 0.118 | 0.0031 | 0.16 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 531 | 3.0 |
| | 14-Jul-09 | FD | 8.13 | 6.48 | 0.00145 | 0.111 | 0.00313 | 0.16 | <0.10 | 27 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 541 | 2.9 |
| | 12-Aug-09 | N | 7.75 | 7.81 | 0.00161 | 0.135 | <0.00100 | 0.15 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 516 | 2.7 |
| | 05-Nov-09 | N | <1 | <0.2 | 0.00566 | 0.209 /J | 1.07 | <0.10 | <0.10 | 35 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.7 |
| | 05-Nov-09 | FD | <1 | <0.2 | 0.00566 | 0.199 /J | 1.1 | <0.10 | <0.10 | 34 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.8 |
| | 03-Dec-09 | N | --- | --- | --- | --- | 3.17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-04S | 14-Jul-09 | N | 549 | 570 | <0.00100 | 0.0752 | <0.00100 | 7.1 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 252 | 1.6 |
| | 12-Aug-09 | N | 518 | 562 | <0.00100 | 0.371 | 0.00575 | 7.3 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 264 | 1.8 |
| | 05-Nov-09 | N | 491 | 562 | 0.00114 | 0.209 /J | <0.00100 | 8.2 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |
| SA-MW-04D | 14-Jul-09 | N | 74.6 | 79.6 | 0.00146 | <0.0500 | <0.00100 | 8.4 | <0.10 | 85 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 214 | 1.3 |
| | 12-Aug-09 | N | 75.4 | 84.1 | 0.0016 | 0.111 | <0.00100 | 9.9 | <0.10 | 89 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 250 | 1.4 |
| | 05-Nov-09 | N | 72.0 | 71.1 | 0.00165 | 0.185 /J | 0.00106 | 9.9 /J | <0.10 | 41 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.5 |
| SA-MW-05S | 14-Jul-09 | N | 20.5 | 19.2 | 0.0014 | 0.0669 | 0.00138 | 16 | <0.10 | 140 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 384 | 2.5 |
| | 12-Aug-09 | N | 16.9 | 16.3 | 0.00109 | 0.221 | 0.00203 | 16 | <0.10 | 140 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 401 | 2.6 |
| | 05-Nov-09 | N | 33.8 | 32.9 | 0.00132 | 0.300 /J | <0.00100 | 17 /J | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.1 |
| SA-MW-05D | 14-Jul-09 | N | 7,420 | 7,520 | 0.00187 | 0.517 | 0.00442 | 3.1 | <0.10 | 250 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 156 | 3.1 |
| | 12-Aug-09 | N | 7,530 | 7,230 | 0.00214 | 0.151 | 0.00194 | 3.4 | <0.10 | 240 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 222 | <2.5 |
| | 05-Nov-09 | N | 8,210 | 8,140 | 0.0023 | 0.268 /J | <0.00100 | 2.4 | <0.10 | 270 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.78 |
| SA-MW-06S | 14-Jul-09 | N | 1,460 | 1,260 | 0.00132 | 0.273 | 0.00651 | 4.3 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 194 | 1.2 |
| | 12-Aug-09 | N | 1,680 | 1,820 | 0.00119 | 0.128 | 0.00197 | 3.9 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 182 | 0.93 |
| | 03-Nov-09 | N | 1,740 | 1,740 | 0.00166 | 0.2 | <0.00100 | 4 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.2 |
| SA-MW-06D | 14-Jul-09 | N | 154 | 176 | 0.0015 | <0.0500 | <0.00100 | 0.59 | <0.10 | 67 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 143 | 0.64 |
| | 12-Aug-09 | N | 173 | 166 | 0.00179 | 0.0691 | <0.00100 | 0.72 | <0.10 | 74 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 148 | 0.63 |
| | 12-Aug-09 | FD | 157 | 168 | 0.00126 | 0.0652 | <0.00100 | 0.72 | <0.10 | 74 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 147 | 0.64 |
| | 03-Nov-09 | N | 222 | 226 | 0.00191 | 0.118 | <0.00100 | 0.74 | <0.10 | 72 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.87 |
| SA-MW-07S | 14-Jul-09 | N | 279 | 301 | <0.00100 | 0.054 | <0.00100 | 5.9 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 221 | 1.2 |
| | 11-Aug-09 | N | 332 | 318 | <0.00100 | 0.112 | <0.00100 | 6 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 223 | 1.3 |
| | 03-Nov-09 | N | 307 | 298 | <0.00100 | 0.212 | <0.00100 | 5.7 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.2 |

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-MW-07D | 14-Jul-09 | N | 434 | 529 | 0.00173 | 0.0723 | <0.00100 | 2.7 | <0.10 | 88 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 196 | 0.91 |
| | 14-Jul-09 | FD | 437 | 492 | 0.00222 | 0.0748 | <0.00100 | 2.7 | <0.10 | 90 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 178 | 0.96 |
| | 11-Aug-09 | N | 446 | 455 | 0.00213 | 0.199 | 0.00268 | 2.7 | <0.10 | 89 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 182 | 0.86 |
| | 11-Aug-09 | FD | 486 | 450 | 0.00187 | 0.166 | 0.00207 | 2.7 | <0.10 | 88 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 184 | 0.89 |
| | 03-Nov-09 | N | 434 | 480 | 0.00217 | 0.165 | <0.00100 | 2.7 | <0.10 | 89 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.97 |
| | 03-Nov-09 | FD | 442 | 474 | 0.00219 | 0.159 | <0.00100 | 2.7 | <0.10 | 89 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.88 |
| SA-MW-08S | 13-Jul-09 | N | 45.6 | 49.6 | 0.00218 | 0.0777 | 0.052 | 2.8 | <0.10 | 90 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 211 | 1.5 |
| | 11-Aug-09 | N | 39.8 | 40.2 | 0.00264 | 0.73 | 0.0661 | 3.1 | <0.10 | 91 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 218 | 1.5 |
| | 04-Nov-09 | N | 39.5 | 41.3 | 0.00251 | 0.214 | 0.0713 | 3.4 | <0.10 | 91 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.4 |
| SA-MW-08D | 13-Jul-09 | N | 319 | 273 | 0.0014 | 0.0875 | <0.00100 | 2.5 | <0.10 | 92 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 189 | 0.97 |
| | 11-Aug-09 | N | 312 | 345 | 0.00186 | 0.116 | 0.00136 | 2.5 | <0.10 | 90 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 600 | 1.1 |
| | 03-Nov-09 | N | 296 | 336 | 0.00183 | 0.193 | <0.00100 | 2.4 | <0.10 | 90 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.0 |
| SA-MW-09S | 13-Jul-09 | N | 500 | 389 | <0.00100 | 0.0901 | 0.00303 | 8.1 | <0.10 | 140 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 261 | 1.6 |
| | 11-Aug-09 | N | 439 | 471 | <0.00100 | 0.157 | 0.00389 | 8.3 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 263 | 1.5 |
| | 04-Nov-09 | N | 389 | 442 | <0.00100 | 0.353 | 0.00228 | 8.9 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.4 |
| SA-MW-09D | 13-Jul-09 | N | 81.2 | 84.8 | <0.00100 | 0.0595 | 0.00569 | 1.1 | <0.10 | 48 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 486 | 3.1 |
| | 11-Aug-09 | N | 73.0 | 76.6 | <0.00100 | 0.16 | 0.00566 | 1.1 | <0.10 | 43 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 492 | 2.6 |
| | 04-Nov-09 | N | 49.2 | 49.6 | 0.00117 | 0.386 | 0.00237 | 0.73 | <0.10 | 59 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.9 |
| SA-MW-10S | 13-Jul-09 | N | 7.77 | 6.01 | <0.00100 | 0.122 | 0.00503 | 16 | <0.10 | 140 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 390 | 2.8 |
| | 11-Aug-09 | N | 13.9 | 14.4 | <0.00100 | 0.263 | 0.00369 | 15 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 398 | 2.7 |
| | 04-Nov-09 | N | 32.7 | 31.6 | 0.00106 | 0.533 | 0.00186 | 16 /J | <0.10 | 140 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.4 |
| SA-MW-10D | 13-Jul-09 | N | 2,200 | 2,290 | 0.00151 | 0.161 | 0.00212 | 3.7 | <0.10 | 160 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 180 | 1.1 |
| | 13-Jul-09 | FD | 2,100 | 2,270 | 0.00142 | 0.166 | 0.00173 | 3.6 | <0.10 | 160 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 178 | 1.1 |
| | 11-Aug-09 | N | 1,890 | 2,200 | 0.00182 | 0.116 | <0.00100 | 3.1 | <0.10 | 150 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 176 | 1.1 |
| | 04-Nov-09 | N | 2,180 | 1,910 | 0.00286 | 0.247 | 0.00126 | 2.2 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.70 |
| | 04-Nov-09 | FD | 2,230 | 2,110 | 0.0025 | 0.235 | 0.00129 | 2.2 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.72 |
| SA-MW-11S | 13-Jul-09 | N | 970 | 990 | 0.0018 | 0.161 | 0.0177 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Aug-09 | N | 979 | 1,090 | 0.00438 | 9.41 | 0.145 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Sep-09 | N | --- | --- | --- | 0.0854 /J | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 993 | 974 | 0.00238 | 0.303 /J | 0.00337 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-MW-11D | 13-Jul-09 | N | 89.0 | 61.5 | 0.00184 | 0.0638 | 0.00242 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Aug-09 | N | 89.6 | 96.6 | 0.00205 | 0.0707 | <0.00100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 101 | 99.5 | 0.00187 | 0.123 /J | 0.0015 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-12S | 13-Jul-09 | N | 539 | 590 | <0.00100 | 0.0853 | 0.00177 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 564 | 614 | 0.00118 | 0.17 | <0.00100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-09 | N | 541 | 535 | 0.00146 | 0.379 | 0.00718 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-12D | 13-Jul-09 | N | 69.8 | 79.1 | 0.00163 | 0.0535 | 0.00146 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 85.8 | 92.4 | 0.00191 | 0.0907 | 0.0017 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 92.2 | 90.9 | 0.00201 | 0.142 /J | 0.00243 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-13S | 13-Jul-09 | N | 823 | 831 | <0.00100 | 0.903 | 0.0185 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 810 | 970 | <0.00100 | 0.196 | <0.00100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 904 | 890 | <0.00100 | 0.835 /J | 0.0158 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-13D | 13-Jul-09 | N | 18.8 | 10.7 | 0.00191 | <0.0500 | 0.00299 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 19.4 | 22.2 | 0.0019 | 0.0793 | <0.00100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 20.8 | 19.7 | 0.00194 | 0.102 /J | <0.00100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-14S | 13-Jul-09 | N | 80.7 | 83 | 0.00112 | 0.411 | 0.022 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 80.2 | 90.9 | 0.00128 | 0.645 | 0.0324 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 85.9 | 85 | 0.00132 | 0.167 /J | 0.00268 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-14D | 13-Jul-09 | N | 54.5 | 63.8 | <0.00100 | 0.0639 | 0.00206 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 63.6 | 71.9 | 0.00156 | 0.173 | 0.00127 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-09 | N | 69.7 | 66.2 | 0.0015 | 0.947 /J | 0.0292 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SA-MW-15S | 14-Jul-09 | N | 116 | 118 | <0.00100 | 0.0958 | 0.00419 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 105 | 111 | <0.00100 | 0.238 | 0.00116 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-09 | N | 96.7 | 91.2 | 0.00101 | 0.307 /J | 0.00599 | 13 /J | <0.10 | 120 | --- | --- | --- | --- | --- | --- | 2.0 |
| | 17-Nov-09 | NG | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1.8 |
| | 14-Dec-09 | NG | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1.7 |
| | 21-Dec-09 | NG | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 2.1 |
| SA-MW-15D | 14-Jul-09 | N | 258 | 292 | <0.00100 | 0.055 | 0.00531 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | N | 254 | 280 | 0.00103 | 0.182 | 0.00587 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Aug-09 | FD | 257 | 281 | <0.00100 | 0.18 | 0.00623 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-09 | N | 239 | 255 | 0.00106 | 0.167 /J | 0.00328 | 5.5 | <0.10 | 110 | --- | --- | --- | --- | --- | --- | 1.2 |
| SA-MW-16S | 03-Nov-09 | N | 338 | 350 | 0.0032 | 0.175 | 0.00318 | 1.5 | <0.10 | 88 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.87 |
| SA-MW-16D | 03-Nov-09 | N | <1 | 0.8 | 0.00123 | 0.105 | 0.00819 | 0.28 | <0.10 | 80 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.69 |
| SA-MW-17S | 04-Nov-09 | N | 145 | 141 | 0.00321 | 0.227 | 0.00588 | 2.2 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-MW-17D | 03-Nov-09 | N | 4.37 | 0.67 | 0.0015 | 0.134 | 0.00139 | 0.3 | <0.10 | 65 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.63 |
| SA-MW-18S | 03-Nov-09 | N | 527 | 554 | <0.00100 | 0.742 | 0.0092 | 11 /J | <0.10 | 300 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |
| SA-MW-18D | 03-Nov-09 | N | 141 | 133 | 0.00343 | 0.13 | 0.00425 | 0.72 | <0.10 | 58 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.78 |
| SA-MW-20S | 03-Nov-09 | N | 195 | 191 | 0.00151 | 0.475 | 0.00698 | 13 /J | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.4 |
| SA-MW-20D | 03-Nov-09 | N | 2,510 | 2,500 | 0.0037 | 0.143 | 0.00233 | 1 | <0.10 | 98 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.80 |
| SA-MW-21S | 03-Nov-09 | N | 36.3 | 34.9 | 0.00265 | 0.245 | 0.00638 | 7.3 | <0.10 | 220 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |
| SA-MW-21D | 03-Nov-09 | N | 103 | 95.8 | 0.00152 | 0.262 | 0.00306 | 2.2 | <0.10 | 270 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.80 |
| SA-MW-22S | 03-Nov-09 | N | 5.71 | 3.33 | 0.00175 | 2.71 | 0.0929 | 20 /J | <0.10 | 150 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 3.0 |
| SA-MW-22D | 03-Nov-09 | N | 131 | 130 | 0.00166 | 0.466 | 0.0038 | 8.2 | <0.10 | 240 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.5 |
| | 03-Nov-09 | FD | 133 | 130 | 0.00174 | 0.466 | 0.00376 | 8.1 | <0.10 | 250 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | --- |
| SA-SM-01S | 15-Jul-09 | N | 976 | 1,100 | <0.00100 | 0.097 | 0.00503 | 4.7 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 194 | 1.2 |
| | 13-Aug-09 | N | 1,180 | 1,120 | <0.00100 | 0.181 | 0.00237 | 4.9 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 200 | 0.94 |
| | 05-Nov-09 | N | 1,140 | 1,090 | <0.00100 | 0.247 /J | 0.00398 | 3.8 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.3 |
| SA-SM-01D | 15-Jul-09 | N | <1.00 | <0.20 | 0.0768 | 1.07 | 3.48 | <0.10 | <0.10 | 87 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 294 | 3.1 |
| | 13-Aug-09 | N | <1 | <0.2 | 0.0673 | 1.03 | 3.48 | <0.10 | <0.10 | 68 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 340 | 2.1 |
| | 05-Nov-09 | N | <1 | <0.2 | 0.115 | 1.54 /J | 3.7 | <0.10 | <0.10 | 27 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.5 |
| SA-SM-02S | 16-Jul-09 | N | 958 | 1,090 | 0.00165 | 0.431 | 0.0186 | 1.8 | <0.10 | 96 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 364 | 2.0 |
| | 13-Aug-09 | N | 1,910 | 1,870 | 0.00152 | 0.231 | 0.018 | 2.5 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 202 /J | 1.7 |
| | 05-Nov-09 | N | 1,380 | 1,300 | 0.00177 | 0.215 /J | 0.0377 | 1.5 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.8 |
| SA-SM-02D | 16-Jul-09 | N | <1.00 | <0.20 | 0.00445 | 0.264 | 1.14 | <0.10 | <0.10 | 16 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 430 | 2.5 |
| | 16-Jul-09 | FD | <1.00 | <0.20 | 0.00457 | 0.265 | 1.18 | <0.10 | <0.10 | 16 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 434 | 2.4 |
| | 13-Aug-09 | N | <1 | <0.2 | 0.0773 | 2.37 | 8.12 | <0.10 | <0.10 | <2.1 /UB | 31 | <1.0 | <1.0 | 39 | <0.50 | 491 /J | 47 |
| | 05-Nov-09 | N | <1 | <0.2 | 0.207 | 3.32 /J | 7.52 | <0.10 | <0.10 | 41 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.7 |
| | 05-Nov-09 | FD | <1 | <0.2 | 0.191 | 3.24 /J | 7.66 | --- | --- | --- | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.5 |
| SA-SM-03S | 15-Jul-09 | N | <1.00 | <0.20 | 0.00949 | 2.32 | 2.4 | <0.10 | <0.10 | 49 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 394 | 2.4 |
| | 13-Aug-09 | N | 1.80 | <0.2 | 0.00894 | 2.83 | 1.63 | <0.10 | <0.10 | 71 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 392 | 2.2 |
| | 04-Nov-09 | N | <1 | <0.2 | 0.0166 | 4.79 | 2.23 | <0.10 | <0.10 | 84 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.4 |
| SA-SM-03D | 15-Jul-09 | N | 1.31 | <0.20 | 0.0141 | 0.477 | 2.12 | <0.10 | <0.10 | 97 | 20 | <1.0 | <1.0 | 7.6 | <0.50 | 304 | 17 |
| | 13-Aug-09 | N | 1.23 | <0.2 | 0.039 | 1.55 | 2.04 | <0.10 | <0.10 | 28 | 5.6 | <1.0 | <1.0 | <1.0 | <0.50 | 404 | 6.5 |
| | 04-Nov-09 | N | <1 | <0.2 | 0.0459 | 1.29 | 2.7 | <0.10 | <0.10 | 92 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.0 |

**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

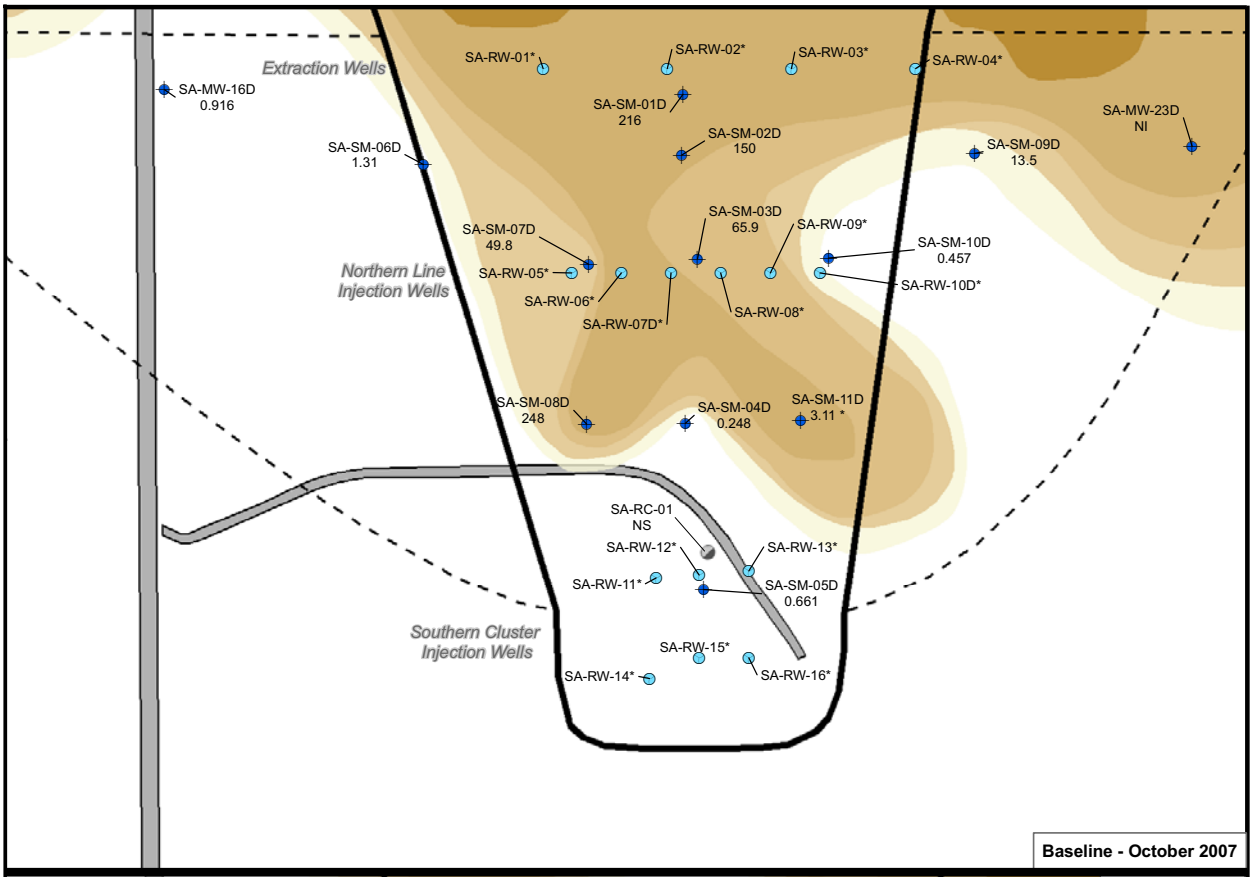
| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-SM-04S | 15-Jul-09 | N | 6.35 | 2.73 | 0.00324 | 0.232 | 0.598 | 0.56 | <0.10 | 19 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 512 | 3.3 |
| | 13-Aug-09 | N | 5.94 | <0.2 | 0.00875 | 1.68 | 1.52 | 0.18 | <0.10 | <8.3 /UB | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 504 | 3.0 |
| | 04-Nov-09 | N | 2.22 | <0.2 | 0.0101 | 3.54 | 2.7 | <0.10 | <0.10 | 5.3 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.8 |
| SA-SM-04D | 15-Jul-09 | N | <1.00 | <0.20 | <0.00100 | 0.15 | 0.0676 | <0.10 | <0.10 | 20 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 156 | 0.95 |
| | 13-Aug-09 | N | <1 | <0.2 | <0.00100 | 0.155 | 0.0582 | 0.13 | <0.10 | 22 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 152 | 0.74 |
| | 04-Nov-09 | N | <1 | <0.2 | <0.00100 | 0.215 | 0.0623 | <0.10 | <0.10 | 18 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.99 |
| SA-SM-05S | 15-Jul-09 | N | 1.78 | <0.20 | 0.0353 | 16.7 | 8.4 | <0.10 | <0.10 | 96 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 359 | 3.2 |
| | 13-Aug-09 | N | 1.96 | <0.2 | 0.0333 | 16.9 | 8.73 | <0.10 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 336 | 3.0 |
| | 04-Nov-09 | N | 1.44 | <0.2 | 0.0352 | 16.6 | 10.2 | <0.10 | <0.10 | 73 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.8 |
| SA-SM-05D | 15-Jul-09 | N | <1.00 | 0.38 | 0.00528 | 0.177 | 0.179 | <0.10 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 157 | 1.1 |
| | 13-Aug-09 | N | <1 | 0.23 | 0.00434 | 0.228 | 0.178 | <0.10 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 156 | 1.1 |
| | 04-Nov-09 | N | <1 | <0.2 | 0.00489 | 0.246 | 0.177 | <0.10 | <0.10 | 27 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.95 |
| SA-SM-06S | 15-Jul-09 | N | 240 | 275 | 0.00470 | 0.0614 | 0.00586 | 2.5 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 178 | 1.8 |
| | 13-Aug-09 | N | 305 | 319 | 0.00358 | 0.488 | 0.0149 | 2.7 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 181 | 1.3 |
| | 04-Nov-09 | N | 282 | 293 | 0.00443 | 0.218 | 0.0113 | 3.2 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |
| SA-SM-06D | 15-Jul-09 | N | 1.40 | 1.21 | 0.00102 | <0.0500 | 0.0142 | 0.30 | <0.10 | 72 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 144 | 0.77 |
| | 15-Jul-09 | FD | 1.37 | 1.20 | 0.00112 | <0.0500 | 0.0125 | 0.30 | <0.10 | 72 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 147 | 0.80 |
| | 13-Aug-09 | N | 1.32 | 1.20 | 0.00100 | 0.0957 | 0.0100 | 0.30 | <0.10 | 72 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 148 | 0.80 |
| | 13-Aug-09 | FD | 1.36 | 1.20 | 0.00118 | 0.102 | 0.00906 | 0.30 | <0.10 | 71 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 152 | 0.64 |
| | 04-Nov-09 | N | 1.23 | 1.15 | 0.00103 | 0.121 | 0.0124 | 0.31 | <0.10 | 70 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 0.68 |
| | 04-Nov-09 | FD | 1.25 | 1.15 | <0.00100 | 0.130 | 0.0120 | 0.31 | <0.10 | 70 | --- | --- | --- | --- | --- | --- | 0.61 |
| SA-SM-07S | 15-Jul-09 | N | <1.00 | <0.20 | 0.00960 | 0.807 | 2.12 | 1.4 | <0.10 | 110 | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 | 282 | 1.9 |
| | 13-Aug-09 | N | <1 | <0.2 | 0.00872 | 0.948 | 2.44 | 0.10 | <0.10 | 78 | <1.0 | <1.0 | <1.0 | <1.0 | 0.82 | 397 | 1.9 |
| | 09-Nov-09 | N | <1 | <0.2 | 0.0106 | 1.35 /J | 2.58 | 0.12 | <0.10 | 61 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 441 | 2.0 |
| SA-SM-07D | 15-Jul-09 | N | 14.3 | 14.4 | 0.00743 | 0.0688 | 1.30 | 0.11 | <0.10 | 78 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 252 | 1.5 |
| | 13-Aug-09 | N | 10.6 | 10.0 | 0.0102 | 0.179 | 1.48 | <0.10 | <0.10 | 70 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 277 | 1.4 |
| | 09-Nov-09 | N | 17.0 | 16.3 | 0.00884 | 0.134 /J | 1.48 | <0.10 | <0.10 | 77 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 270 | 1.3 |
| SA-SM-08S | 15-Jul-09 | N | 25.7 | 16.9 | 0.00600 | 0.193 | 0.793 | 0.31 | <0.10 | 42 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 527 | 2.8 |
| | 13-Aug-09 | N | 20.0 | 13.4 | 0.00606 | 0.308 | 0.970 | 0.21 | <0.10 | 36 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 536 | 2.4 |
| | 09-Nov-09 | N | 32.8 | 19.6 | 0.00473 | 0.284 /J | 0.816 | 0.33 | <0.10 | 46 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 543 | 2.4 |
| | 09-Nov-09 | FD | 32.5 | 19.3 | 0.00490 | 0.289 /J | 0.786 | 0.32 | <0.10 | 44 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 551 | 2.6 |
| SA-SM-08D | 15-Jul-09 | N | 372 | 407 | 0.00119 | 0.0636 | <0.00100 | 2.3 | <0.10 | 97 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 148 | 1.0 |
| | 13-Aug-09 | N | 313 | 343 | 0.00102 | 0.107 | 0.00143 | 2.1 | <0.10 | 99 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 153 | 0.79 |
| | 09-Nov-09 | N | 576 | 639 | 0.00136 | 0.0946 /J | <0.00100 | 2.9 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 157 | 0.84 |

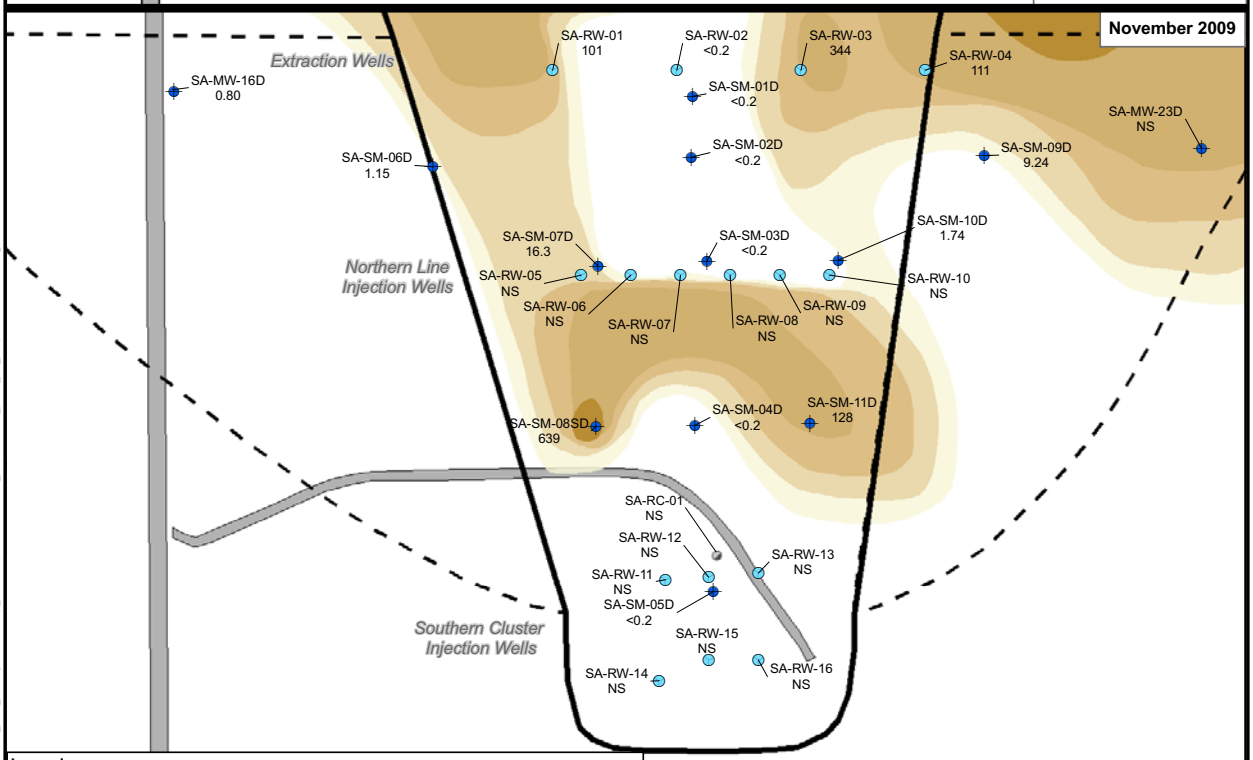
**Analytical Results July 2009 through December 2009**
*Semiannual Status Report, Source Area IRZ*

| Location Name: | Sample Date: | Sample Type: | Chromium-Dissolved µg/L | Hexavalent chromium µg/L | Arsenic-Dissolved mg/L | Iron-Dissolved mg/L | Manganese-Dissolved mg/L | Nitrate as Nitrogen mg/L | Nitrite as Nitrogen mg/L | Sulfate mg/L | Acetic Acid mg/L | Butanoic (Butyric) Acid mg/L | Lactic Acid mg/L | Propionic Acid mg/L | Pyruvic Acid mg/L | Alkalinity, bicarb. as CaCO3 mg/L | Total Organic Carbon mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SA-SM-09S | 16-Jul-09 | N | 195 | 217 | 0.00158 | 0.288 | 0.0159 | 9.7 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 286 | 1.8 |
| | 13-Aug-09 | N | 261 | 280 | <0.00100 | 0.222 | 0.00722 | 8.3 | <0.10 | 130 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 188 /J | 1.8 |
| | 05-Nov-09 | N | 379 | 341 | 0.00153 | 0.181 /J | 0.00909 | 6.6 | <0.10 | 120 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.5 |
| SA-SM-09D | 16-Jul-09 | N | 8.62 | 10.4 | 0.00232 | 0.119 | 0.00135 | 3.8 | <0.10 | 64 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 190 | 0.85 |
| | 13-Aug-09 | N | 8.02 | 8.53 | 0.00204 | 0.112 | <0.00100 | 4.0 | <0.10 | 64 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 377 /J | 0.88 |
| | 13-Aug-09 | FD | 8.01 | 8.47 | 0.00198 | 0.112 | <0.00100 | 4.0 | <0.10 | 64 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 194 /J | 0.86 |
| | 05-Nov-09 | N | 10.1 | 9.24 | 0.00247 | 0.114 /J | 0.00135 | 4.5 | <0.10 | 66 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.0 |
| SA-SM-10S | 16-Jul-09 | N | 10.1 | 9.25 | 0.00335 | 0.348 | 0.406 | 2.1 | <0.10 | 63 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 360 | 1.8 |
| | 13-Aug-09 | N | 10.9 | 5.84 | 0.00306 | 0.208 | 0.553 | 1.2 | <0.10 | 42 | <1.0 | <1.0 | <1.0 | <1.0 | 0.77 /J | 374 /J | 1.8 |
| | 05-Nov-09 | N | 2.43 | <0.2 | 0.00601 | 0.288 /J | 0.565 | 0.41 | <0.10 | 26 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 2.1 |
| SA-SM-10D | 16-Jul-09 | N | 53.4 | 61.7 | 0.00361 | 0.117 | 0.291 | 0.24 | <0.10 | 35 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 264 | 1.2 |
| | 13-Aug-09 | N | 10.6 | 4.34 | 0.00280 | 0.190 | 0.521 | 0.13 | <0.10 | 30 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 162 /J | 0.89 |
| | 05-Nov-09 | N | 21.0 | 1.74 | 0.00624 | 0.453 /J | 0.647 | 0.14 | <0.10 | 33 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | --- | 1.6 |
| SA-SM-11S | 15-Jul-09 | N | 10.0 | 11.2 | 0.00126 | <0.0500 | <0.00100 | 9.4 | <0.10 | 92 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 265 | 1.8 |
| | 13-Aug-09 | N | 8.93 | 8.40 | 0.00130 | 0.182 | 0.00102 | 8.4 | <0.10 | 86 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 284 | 1.5 |
| | 10-Nov-09 | N | 7.89 | 7.58 | 0.00139 | 0.457 | 0.00103 | 5.8 | <0.10 | 73 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 340 | 2.0 |
| SA-SM-11D | 15-Jul-09 | N | 115 | 118 | 0.00358 | 0.0504 | <0.00100 | 3.1 | <0.10 | 68 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 163 | 0.92 |
| | 13-Aug-09 | N | 120 | 123 | 0.00372 | 0.117 | 0.00125 | 3.3 | <0.10 | 66 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 174 | 0.89 |
| | 10-Nov-09 | N | 121 | 128 | 0.00452 | 0.171 | <0.00100 | 3.2 | <0.10 | 68 | <1.0 | <1.0 | <1.0 | <1.0 | <0.50 | 178 | 0.76 |

**Notes:**

| | |
|---|---|
| mg/L | Milligrams per liter |
| µg/L | Micrograms per liter |
| < | Symbol indicates not detected at or above laboratory reporting limit as noted |
| --- | Analyte not sampled |
| FD | Field Duplicate |
| J | Analyte was present but reported value may not be accurate or precise |
| N | Normal |
| UB | The analyte was detected in a blank and is considered not detected in the sample above the limit indicated. |
| UJ | The analyte was not detected above reporting limit. However, the reporting limit is approximate and may be inaccurate or imprecise. |




**Legend**

- Chromium Concentrations Less Than 4 ug/L
- Chromium Concentrations Between 4 and 10 ug/L
- Chromium Concentrations Between 10 and 50 ug/L
- Chromium Concentrations Between 50 and 100 ug/L
- Chromium Concentrations Between 100 and 500 ug/L
- Chromium Concentrations Greater Than 500 ug/L
- Phase I from Response to Comments on Source Area Report of Waste Discharge, August 2006
- Phase II from Response to Comments on Source Area Report of Waste Discharge, August 2006
- Monitoring Wells
- Recirculation Well

Note: ug/L - micrograms per liter
NI - Not Installed
NS - Not Sampled
* - Data not considered for contouring

N

0 250 500
Scale in Feet

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| | |
|---|---|
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| Project Manager | Jenifer Beatty |
| Task Manager | Allison Turner |
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# Source Area

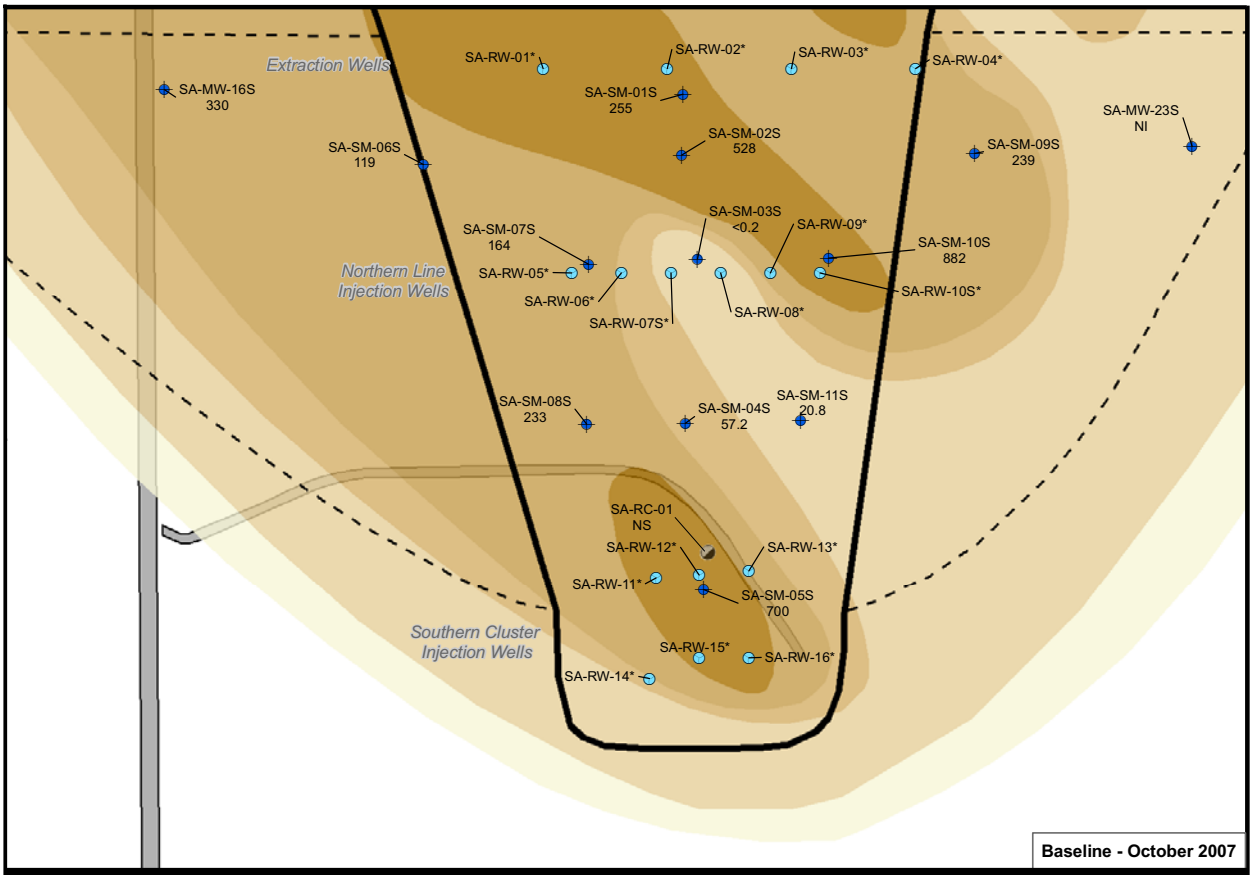
Deep Aquifer Unit of the Upper Aquifer
Comparison of Isoconcentration Contours
Baseline and After 19 Months of IRZ Operation

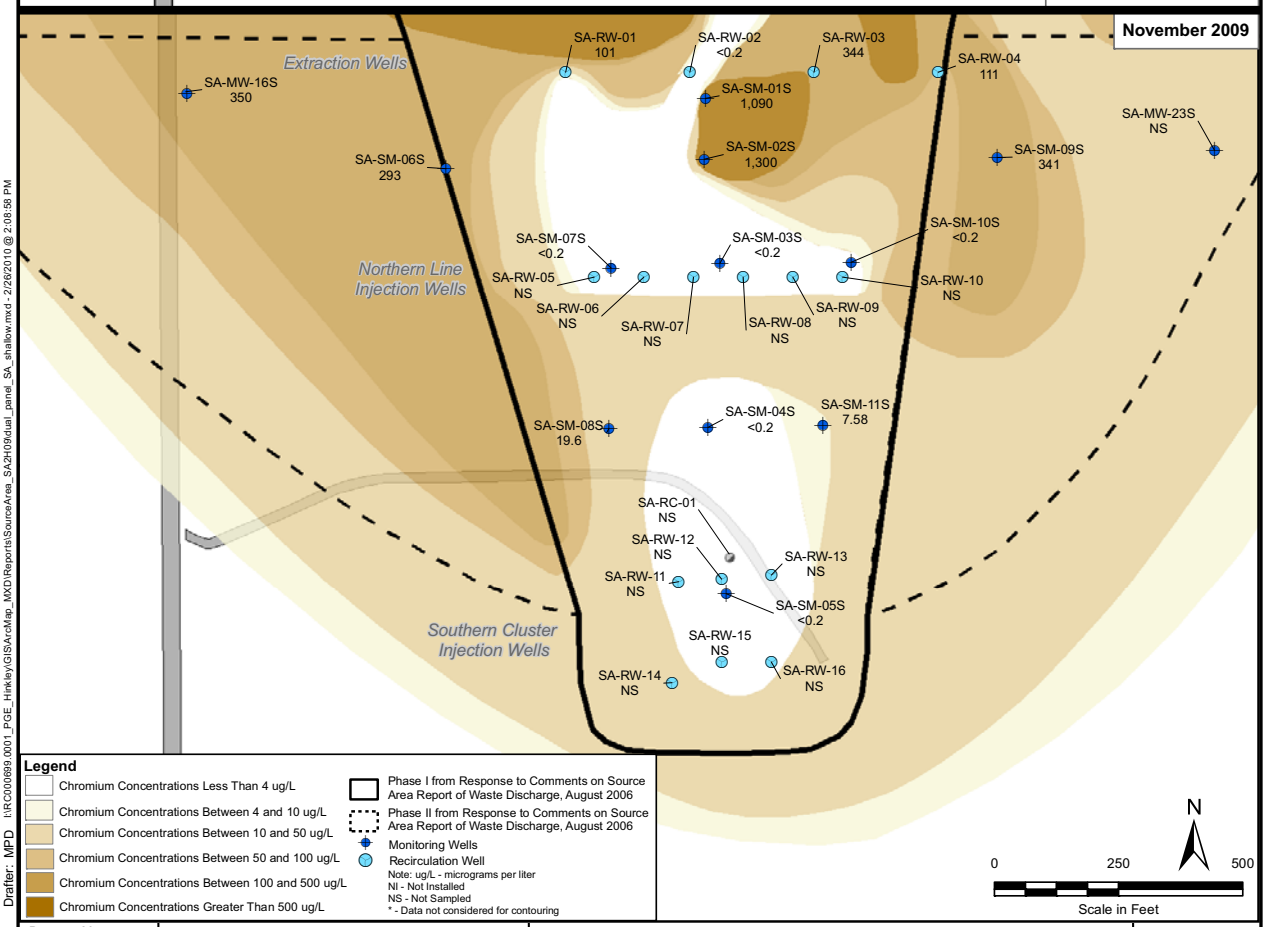
Source Area In Situ Remediation Project

Pacific Gas and Electric Company
Hinkley, California

FIGURE

1

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| | |
|---|---|
| Program Manager | Lisa Cope |
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| Task Manager | Allison Turner |
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# Source Area

Shallow Aquifer Unit of the Upper Aquifer
Comparison of Isoconcentration Contours
Baseline and After 19 Months of IRZ Operation

Source Area In Situ Remediation Project

Pacific Gas and Electric Company
Hinkley, California

FIGURE

**2**

# Appendix J
# DVD LTU Lysimeter Data, July and November 2009

Analytical Results for Lysimeter Samples

*Third Quarter 2009 Monitoring Report, Desert View Dairy Land Treatment Unit*

| | | | | Analytes for 5 ft lysimeters | | | Analytes for 20 ft lysimeters | | |
|---|---|---|---|---|---|---|---|---|---|
| **Field no.** | **Depth (ft)** | **Lysimeter ID** | **Sample Date** | **Total Diss. Chromium (ug/L) EPA 6020A** | **Hexavalent Chromium (ug/L) EPA 7199** | **EC (uS/cm) EPA 120.1** | **Nitrate as N (mg/L) EPA 300.0** | **EC (uS/cm) EPA 120.1** | **TDS (mg/L) EPA 160.0** |
| **W1** | 5 | DVD-LW-05 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 5 | DVD-LW-06 | 07/30/2009 | 33.1 | ND <0.2 | 9850 | | | |
| | 20 | DVD-LS-01 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-02 | 07/30/2009 | | | | ND <0.5 | 7710 | 5750 |
| **S1** | 5 | DVD-LW-07 | 07/30/2009 | 15.6 | 16.1 | 2040 | | | |
| | 5 | DVD-LW-08 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-03 | 07/30/2009 | | | | 1.14 | 6940 | 5050 |
| | 20 | DVD-LS-04 | 07/30/2009 | | | | ND <0.5 | 4070 | 3060 |
| **S2** | 5 | DVD-LW-09 | 07/30/2009 | 1.1 | 0.88 | 3450 | | | |
| | 5 | DVD-LW-10 | 07/30/2009 | ND <1 | 0.63 | 2490 | | | |
| | 20 | DVD-LS-05 | 07/30/2009 | | | | 0.517 | 3100 | 2290 |
| | 20 | DVD-LS-06 | 07/30/2009 | | | | 0.93 | 5690 | 4720 |
| **S3** | 5 | DVD-LW-11 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 5 | DVD-LW-12 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-07 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-08 | 07/30/2009 | | | | *Insufficient Vol* | | |
| **S4** | 5 | DVD-LW-03 | 07/30/2009 | ND <1 | ND <0.2 | 3220 | | | |
| | 5 | DVD-LW-04 | 07/30/2009 | 1.35 | ND <0.2 | 3700 | | | |
| | 20 | DVD-LS-09 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-10 | 07/30/2009 | | | | *Insufficient Vol* | | |
| **S5** | 5 | DVD-LW-13 | 07/30/2009 | 1.06 | 0.28 | 4350 | | | |
| | 5 | DVD-LW-14 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-11 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-12 | 07/30/2009 | | | | *Insufficient Vol* | | |
| **S6** | 5 | DVD-LW-01 | 07/30/2009 | ND <1 | 0.24 | 3530 | | | |
| | 5 | DVD-LW-02 | 07/30/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-13 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-14 | 07/30/2009 | | | | *Insufficient Vol* | | |
| **SE1** | 5 | DVD-LW-15 | 07/30/2009 | 3.54 | 3.27 | 3640 | | | |
| | 5 | DVD-LW-16 | 07/30/2009 | 1.15 | 0.31 | 4090 | | | |
| | 20 | DVD-LS-15 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-16 | 07/30/2009 | | | | *Insufficient Vol* | | |
| | | | | | | | | | |
| | | **[WDR Criteria]** | | **[50]** | **[21]** | | **[75]** | | **[20,000]** |

**Notes:**

DVD-LW-XX = Permanently installed wick-style (or "PCAPS") lysimeter used for long-term monitoring of pore water at 5 feet bgs. (PCAPS = passive capillary sampler)

DVD-LS-XX = Permanently installed suction lysimeter used for long-term monitoring of pore water at 20 feet bgs

ND = Not detected at the reporting limit shown

EC = electrical conductivity

TDS = total dissolved solids

*Insufficient vol* = Sample not analyzed due to insufficient sample volume

Individual sample results in **bold** type exceed the WDR criteria. Compliance is based on statistical analysis of all lysimeter results as specified in the WDR.

Analytical Results for Lysimeter Samples

*Fourth Quarter 2009 Monitoring Report, Desert View Dairy Land Treatment Unit*

| | | | | Analytes for 5 ft lysimeters | | | Analytes for 20 ft lysimeters | | |
|---|---|---|---|---|---|---|---|---|---|
| **Field no.** | **Depth (ft)** | **Lysimeter ID** | **Sample Date** | **Total Diss. Chromium (ug/L) EPA 6020A** | **Hexavalent Chromium (ug/L) EPA 7199** | **EC (uS/cm) EPA 120.1** | **Nitrate as N (mg/L) EPA 300.0** | **EC (uS/cm) EPA 120.1** | **TDS (mg/L) EPA 160.0** |
| **W1** | 5 | DVD-LW-05 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 5 | DVD-LW-06 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-01 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-02 | 11/19/2009 | | | | ND <1 | 8320 | 6730 |
| **S1** | 5 | DVD-LW-07 | 11/19/2009 | 6.36 | 6.35 | 2840 | | | |
| | 5 | DVD-LW-08 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-03 | 11/19/2009 | | | | ND <1 | 5480 | 4200 |
| | 20 | DVD-LS-04 | 11/19/2009 | | | | ND <1 | 3840 | 2880 |
| **S2** | 5 | DVD-LW-09 | 11/19/2009 | 1.06 | 0.72 | 3510 | | | |
| | 5 | DVD-LW-10 | 11/19/2009 | ND <1 | 0.6 | 2630 | | | |
| | 20 | DVD-LS-05 | 11/19/2009 | | | | ND <1 | 2950 | 2080 |
| | 20 | DVD-LS-06 | 11/19/2009 | | | | ND <1 | 4630 | 3870 |
| **S3** | 5 | DVD-LW-11 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 5 | DVD-LW-12 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-07 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-08 | 11/19/2009 | | | | *Insufficient Vol* | | |
| **S4** | 5 | DVD-LW-03 | 11/19/2009 | ND <1 | 0.21 | 3800 | | | |
| | 5 | DVD-LW-04 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-09 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-10 | 11/19/2009 | | | | *Insufficient Vol* | | |
| **S5** | 5 | DVD-LW-13 | 11/19/2009 | ND <1 | ND <0.2 | 5590 | | | |
| | 5 | DVD-LW-14 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-11 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-12 | 11/19/2009 | | | | *Insufficient Vol* | | |
| **S6** | 5 | DVD-LW-01 | 11/19/2009 | ND <1 | ND <0.2 | 3750 | | | |
| | 5 | DVD-LW-02 | 11/19/2009 | *Insufficient Vol* | | | | | |
| | 20 | DVD-LS-13 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-14 | 11/19/2009 | | | | *Insufficient Vol* | | |
| **SE1** | 5 | DVD-LW-15 | 11/19/2009 | 2.48 | 2.43 | 3550 | | | |
| | 5 | DVD-LW-16 | 11/19/2009 | 12.1 | 11.3 | 2040 | | | |
| | 20 | DVD-LS-15 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | 20 | DVD-LS-16 | 11/19/2009 | | | | *Insufficient Vol* | | |
| | | | | | | | | | |
| | | **[WDR Criteria]** | | **[50]** | **[21]** | | **[75]** | | **[20,000]** |

**Notes:**

DVD-LW-XX = Permanently installed wick-style (or "PCAPS") lysimeter used for long-term monitoring of pore water at 5 feet bgs. (PCAPS = passive capillary sampler)

DVD-LS-XX = Permanently installed suction lysimeter used for long-term monitoring of pore water at 20 feet bgs

ND = Not detected at the reporting limit shown

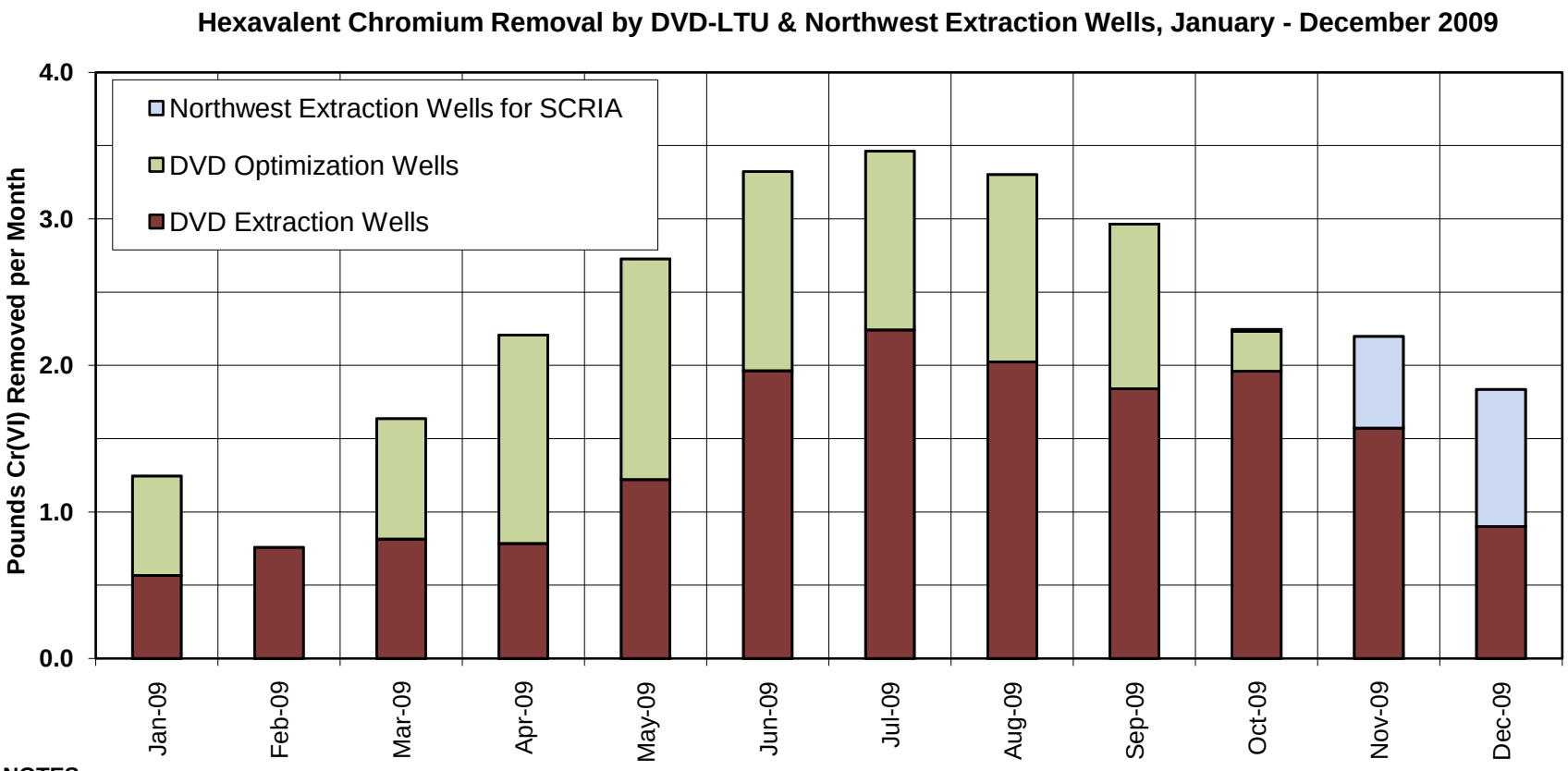
EC = electrical conductivity

TDS = total dissolved solids

*Insufficient vol* = Sample not analyzed due to insufficient sample volume

Individual sample results in **bold** type exceed the WDR criteria. Compliance is based on statistical analysis of all lysimeter results as specified in the WDR.

# Appendix K
# Hexavalent Chromium Removal by DVD Extraction System



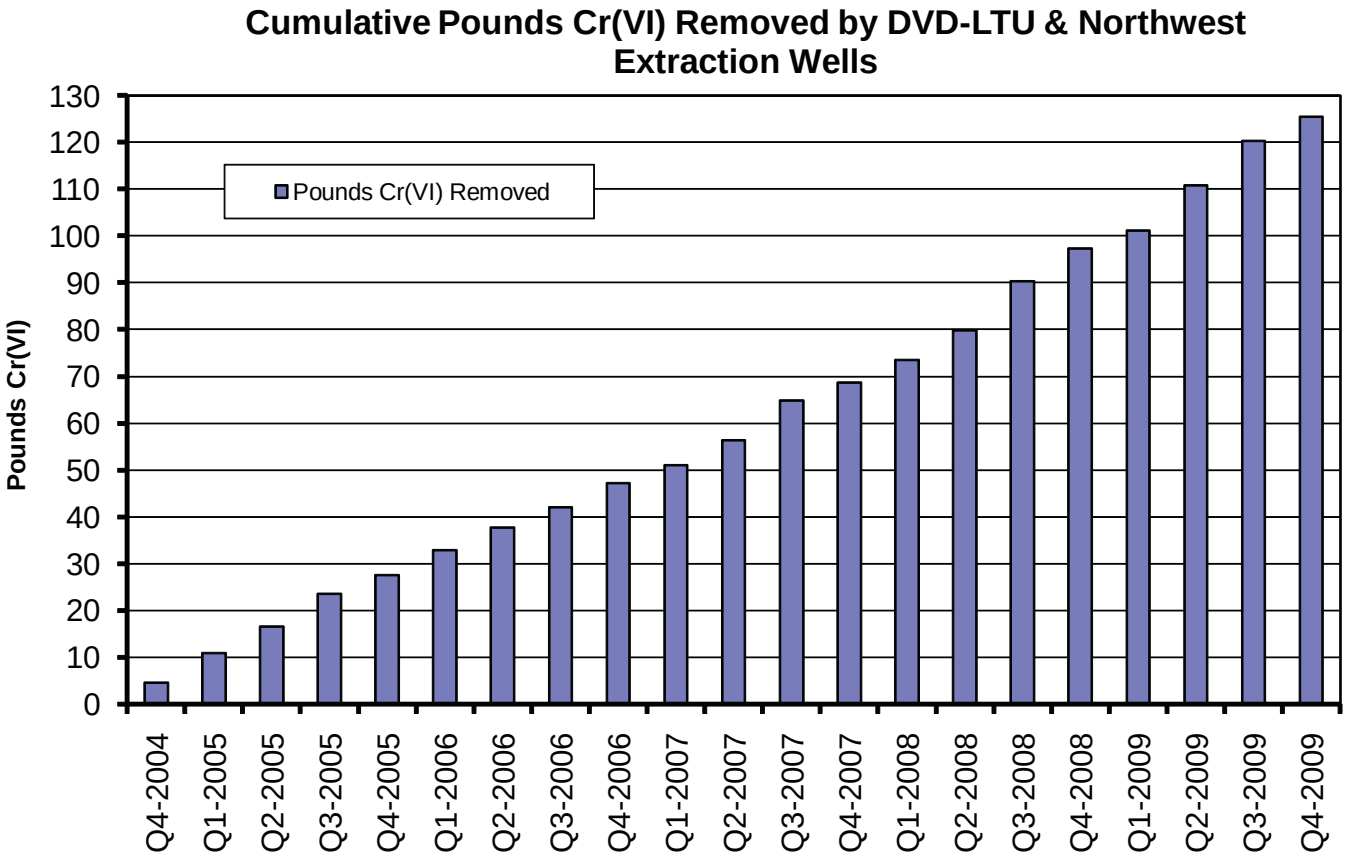

**NOTES:**

1. DVD Extraction Wells consist of wells EX-01, EX-02, EX-03 and EX-04.
2. DVD Optimization Wells consist of wells EX-15, EX-16 and EX-20. These wells were disconnected from the DVD-LTU Extraction System and connected to the SCRIA system (Northwest Extraction Wells) on October 14 , 2009. EX-21 and EX-22 were also added to the Northwest system.
3. Total 28.21 lbs. hexavalent chromium [Cr(VI)] were removed from Upper Aquifer during DVD-LTU & Northwest operations from January 2009 to December 2009. Estimate based on quarterly extraction volumes and chromium sampling data.

**FIGURE K-1**
**MONTHLY POUNDS Cr(VI) REMOVED FROM UPPER AQUIFER, JANUARY 2009-DECEMBER 2009**
DVD PERFORMANCE MONITORING
HINKLEY, CALIFORNIA

CH2MHILL

ES031210012819BAO Monthly_Rem_Chart.ai 3/12/10 ez




| Quarterly Operation Period | DVD Wells | | Optimization Wells | | Northwest Wells | |
|---|---|---|---|---|---|---|
| | Total Volume Extracted (gallons) | Pounds Cr(VI) Removed | Total Volume Extracted (gallons) | Pounds Cr(VI) Removed | Total Volume Extracted (gallons) | Pounds Cr(VI) Removed |
| Q4-2004 | 10,642,999 | 4.46 | -- | -- | -- | -- |
| Q1-2005 | 25,633,643 | 6.40 | -- | -- | -- | -- |
| Q2-2005 | 29,312,673 | 5.68 | -- | -- | -- | -- |
| Q3-2005 | 45,251,482 | 6.90 | -- | -- | -- | -- |
| Q4-2005 | 27,808,140 | 4.08 | -- | -- | -- | -- |
| Q1-2006 | 34,816,728 | 5.28 | -- | -- | -- | -- |
| Q2-2006 | 36,022,136 | 4.83 | -- | -- | -- | -- |
| Q3-2006 | 30,460,324 | 4.44 | -- | -- | -- | -- |
| Q4-2006 | 34,979,675 | 5.16 | -- | -- | -- | -- |
| Q1-2007 | 24,607,191 | 3.74 | -- | -- | -- | -- |
| Q2-2007 | 35,807,194 | 5.40 | -- | -- | -- | -- |
| Q3-2007 | 57,801,470 | 8.45 | -- | -- | -- | -- |
| Q4-2007 | 27,414,012 | 3.88 | -- | -- | -- | -- |
| Q1-2008 | 34,477,266 | 4.75 | -- | -- | -- | -- |
| Q2-2008 | 37,766,595 | 5.21 | 2,574,685 | 1.19 | -- | -- |
| Q3-2008 | 50,248,258 | 6.77 | 9,126,127 | 3.68 | -- | -- |
| Q4-2008 | 28,842,091 | 3.82 | 8,550,310 | 3.22 | -- | -- |
| Q1-2009 | 16,750,633 | 2.35 | 3,976,423 | 1.50 | -- | -- |
| Q2-2009 | 38,762,406 | 5.43 | 11,149,707 | 4.29 | -- | -- |
| Q3-2009 | 45,580,668 | 5.82 | 9,827,855 | 3.62 | -- | -- |
| Q4-2009 | 24,846,973 | 3.34 | 912,911 | 0.27 | 5,572,728 | 1.58 |

**NOTES:**

1. The DVD-LTU Extraction System consists of DVD wells (EX-01, EX-02, EX-03, EX-04). DVD Optimization wells (EX-15, EX-16, EX-20) were tied into the SCRIA system on October 14, 2009 (Northwest wells). EX-21 and EX-22 were also added to the Northwest system.

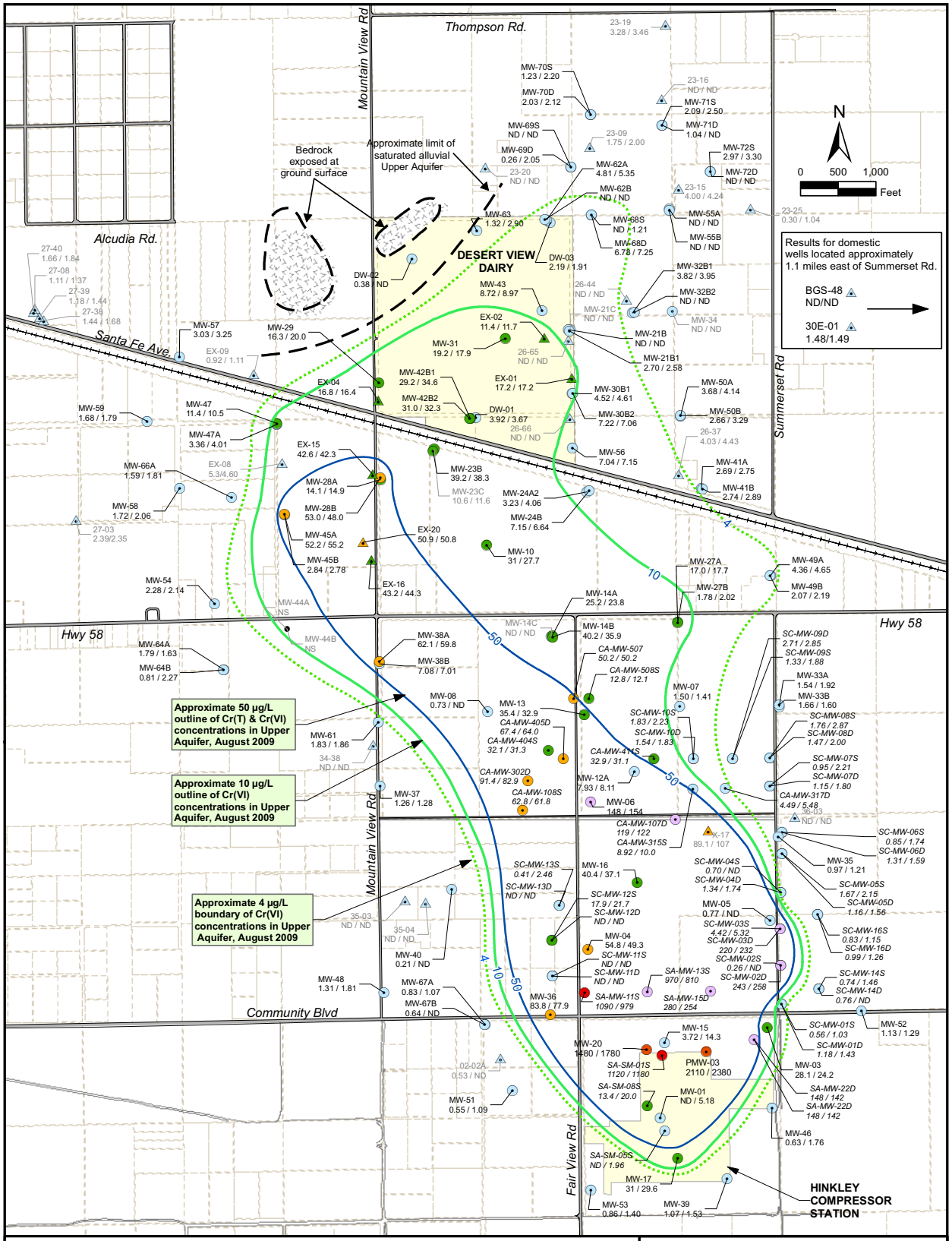
2. Total 125.5 lbs. hexavalent chromium [Cr(VI)] were removed from Upper Aquifer during DVD-LTU & Northwest operations, September 2004 through December 2009. Estimate based on quarterly extraction volumes and bimonthly/quarterly chromium sampling data.

* The 4th quarter 2004 extraction totals include September 2004 extraction and Cr(VI) data for DVD well EX-01.

**FIGURE K-2**
**CUMULATIVE POUNDS CR(VI) REMOVED FROM UPPER AQUIFER, SEPTEMBER 2004 THROUGH DECEMBER 2009**
DVD PERFORMANCE MONITORING
HINKLEY, CALIFORNIA

CH2MHILL

ES031210012819BAO Cum_Quarterly.ai 3/29/10 dash




**LEGEND**

August 2009 Groundwater Monitoring Results

Total Dissolved Chromium [Cr(T)]
Hexavalent Chromium [Cr(VI)]

MW-61 ← Well ID
1.99/2.04 ← Cr(VI)/Cr(T) concentrations, micrograms per liter (µg/L)

ND = not detected
NS = not sampled

Cr(VI) Concentrations by Well Type

| Monitoring Well | Supply Well or Other Well |
|---|---|
| < 10 µg/L | < 10 µg/L |
| 10 - < 50 µg/L | 10 - < 50 µg/L |
| 50 - < 100 µg/L | 50 - < 100 µg/L |
| 100 - < 1,000 µg/L | 100 - < 1,000 µg/L |
| >= 1,000 µg/L | >= 1,000 µg/L |

**Notes:**

1. The concentration contours are based on chromium results from the site-wide GMP sampling conducted August 4-13, 2009 and results for selected wells sampled for IRZ and other monitoring in August 2009 (shown in italics). Results from long-screen supply wells and lower aquifer wells (shown in gray shade) were not used for contouring.
2. Concentration contours represent the maximum extent of Cr(VI) or Cr(T) at any depth within the upper aquifer. Some groundwater results for wells located within the 50 and 10 µg/L contours are less than 50 and 10 µg/L.

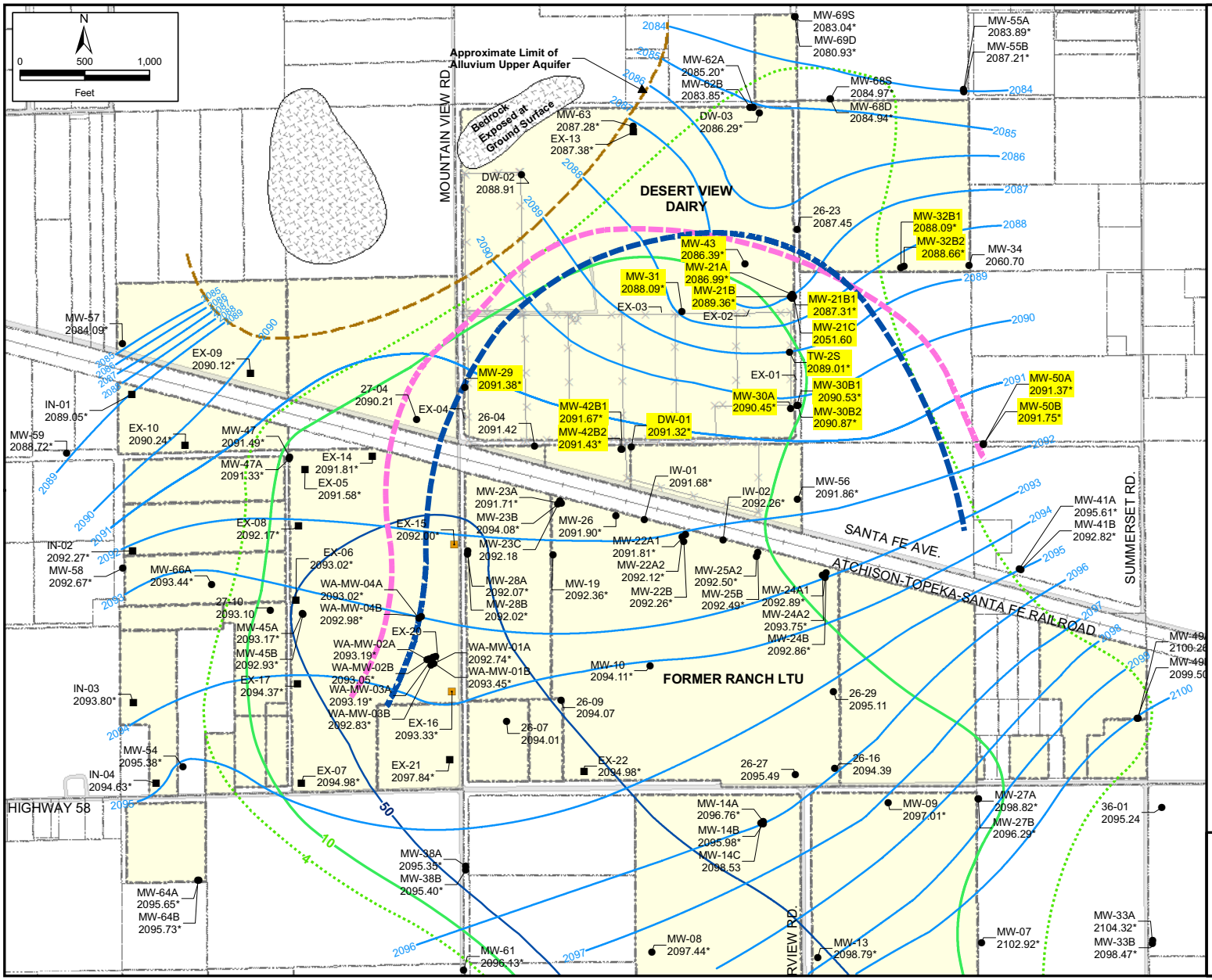
**FIGURE K-3**
**HEXAVALENT AND TOTAL CHROMIUM CONCENTRATIONS, AUGUST 2009 AND INTERPRETED MAXIMUM PLUME OUTLINE IN UPPER AQUIFER**

SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS & ELECTRIC CO. COMPRESSOR STATION
HINKLEY, CALIFORNIA

CH2MHILL

BAO \\2INFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2009\MP_CRT_DISTRIBUTION_AUGUST09.MXD 10/13/2009 17:19:15

# Appendix L
# DVD LTU Groundwater Elevations and Observed Capture Zone, 2009



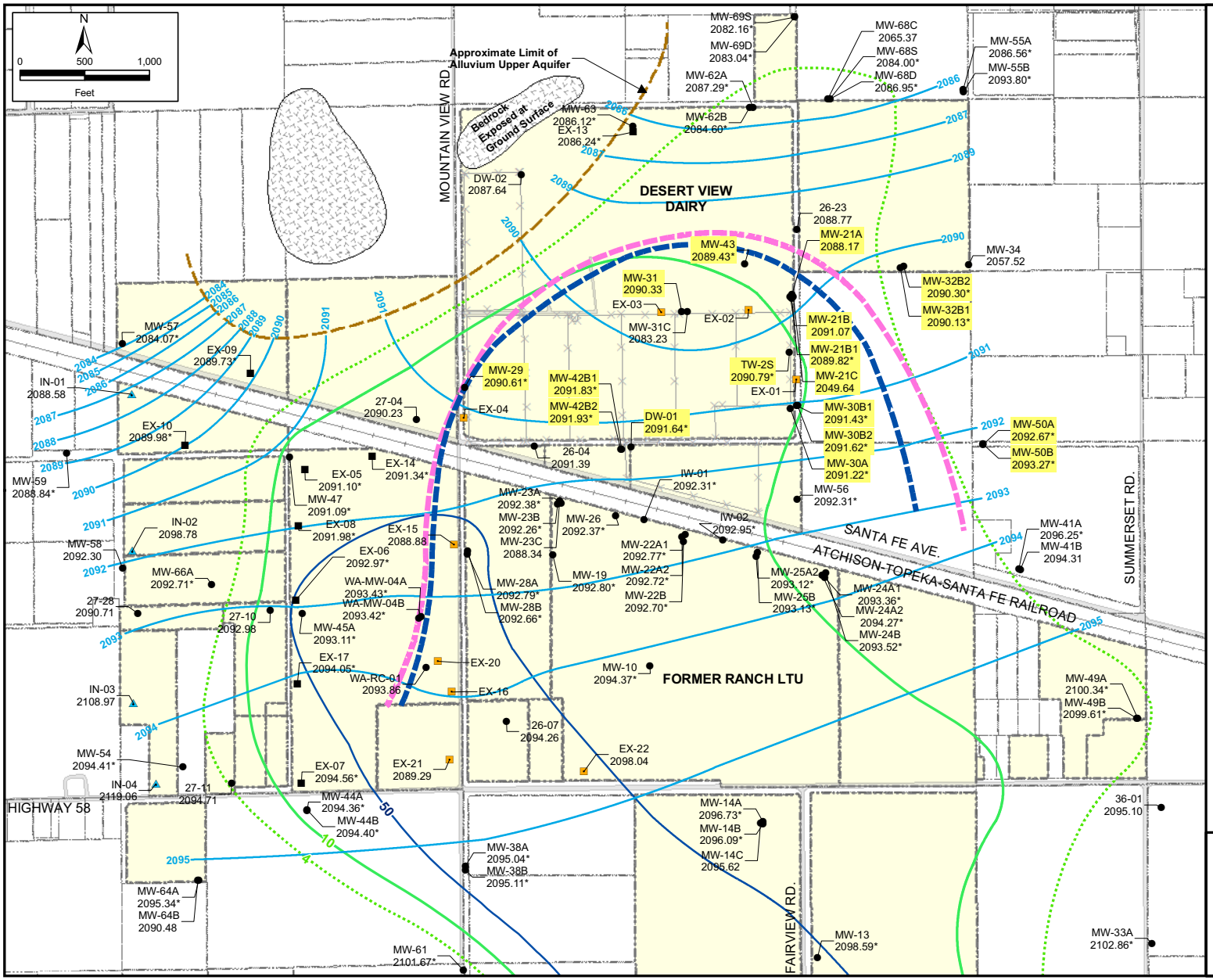

**LEGEND**

- Groundwater Monitoring Well
- Multiple-Purpose Groundwater Well
- Active Extraction Well
- **MW-50B** LTU Performance Monitoring Well
- **2093.10** Groundwater elevation, (feet above MSL) from August 3, 2009 monitoring.
- **2093.14*** Groundwater elevation, (feet above MSL) August 3, 2009 used for contouring.
- **NA** Measurement not available
- Potentiometric Elevation Contours from Upper Aquifer Monitoring Well Data (feet above MSL, 1 ft interval)
- Estimated Capture Zone Using Single Event Data (August 3, 2009) Water Level Measurements
- Estimated Capture Zone Using Single Event Data (May 11-12, 2009) Water Level Measurements
- Approximate 4 µg/L boundary of Cr(VI) concentration in Upper Aquifer, August 2009
- Approximate 10 µg/L boundary of Cr(VI) concentration in Upper Aquifer, August 2009
- Approximate 50 µg/L boundary of Cr(VI) & Cr(T) concentration in Upper Aquifer, August 2009
- DVD LTU Plot Boundary
- PG&E Property

**Notes:**
1. Extraction wells EX-01 and EX-03 were not operating during 3rd Quarter 2009 water level monitoring event.

**FIGURE L-1**
**PERFORMANCE WELL LOCATIONS, GROUNDWATER ELEVATIONS, AND OBSERVED CAPTURE ZONE AUGUST 2009**
THIRD QUARTER 2009 MONITORING REPORT
DESERT VIEW DAIRY LAND TREATMENT UNIT
HINKLEY, CALIFORNIA

BAO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2009\MP_AUG2009LTUQTR_GWE_CZ.MXD 10/27/2009 16:40:14




**LEGEND**

- Groundwater Monitoring Well
- Multiple-Purpose Groundwater Well
- Active Extraction Well
- Freshwater Injection Well
- **MW-50B** LTU Performance Monitoring Well
- **2093.10** Groundwater elevation, (feet above MSL) from November 9, 2009 monitoring.
- **2093.14*** Groundwater elevation, (feet above MSL) November 9, 2009 used for contouring.
- **NA** Measurement not available
- Estimated Capture Zone Using Single Event Data (November 9, 2009) Water Level Measurements
- Estimated Capture Zone Using Single Event Data (August 3, 2009) Water Level Measurements
- Approximate 4 µg/L boundary of Cr(VI) concentration in Upper Aquifer, August 2009
- Approximate 10 µg/L boundary of Cr(VI) concentration in Upper Aquifer, August 2009
- Approximate 50 µg/L boundary of Cr(VI) & Cr(T) concentration in Upper Aquifer, August 2009
- Potentiometric Elevation Contours from Upper Aquifer Monitoring Well Data (feet above MSL, 1 ft interval)
- DVD LTU Plot Boundary
- PG&E Property

**Note:**

1. During early November, wells EX-15, EX-16, and EX-20 were not operating while the extraction system was being tied into the General Permit groundwater remediation system.
2. Water levels were measured in freshwater injeciton wells IN-01, IN-02, IN-03 and IN-04 during injection testing period November 3-12, 2009.

**FIGURE L-2**
**PERFORMANCE WELL LOCATIONS, GROUNDWATER ELEVATIONS, AND OBSERVED CAPTURE ZONE NOVEMBER 2009**
FOURTH QUARTER 2009 MONITORING REPORT
DESERT VIEW DAIRY LAND TREATMENT UNIT
HINKLEY, CALIFORNIA

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\HINKLEYREMEDIATIONPROJECT\GIS\MXDS\MP_MONITORINGPROGRAM\2009\MP_NOV2009LTUQTR_GWE_CZ.MXD BKAHLER 1/15/2010 13:28:06