CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MEETING OF JUNE 10 AND 11, 2009
Victorville

ITEM: 14

SUBJECT: **STATUS REPORT ON PACIFIC GAS AND ELECTRIC COMPANY'S CLEANUP EFFORTS AT THE HINKLEY COMPRESSOR STATION CHROMIUM PLUME, SAN BERNARDINO COUNTY**

CHRONOLOGY: December 29, 1987 – The Water Board issued Cleanup and Abatement Order (CAO) No. 6-87-160 to Pacific Gas and Electric Company (PG&E) because wastewater containing hexavalent chromium was discharged at its Hinkley Compressor Station in a manner that polluted groundwater.

April 9, 2008 – The Water Board issued General WDRs No. R6V-2008-0014 that permitted various types of remediation and plume control activities.

August 6, 2008 – The Water Board issued CAO No. R6V-2008-0002 that required plume containment, continued groundwater remediation, a final cleanup feasibility study and final cleanup implementation.

November 12, 2008 – The Water Board issued Amended CAO No. R6V-2008-0002A1 that established background concentrations of hexavalent and total chromium in groundwater.

April 7, 2009 – The Water Board issued Amended CAO No. R6V-2008-0002A2 that allowed certain lateral spreading of the chromium plume associated with remediation activities permitted under an April 7, 2009 Notice of Applicability for the General WDRs No. R6V-2008-0014.

DISCUSSION: PG&E owns and operates the Hinkley Compressor Station southeast of the town of Hinkley in the Mojave Desert. The facility is a natural gas compressor station operating on a pipeline running from Texas to San Francisco, California. The compressor station began operating in 1952 and discharged untreated cooling tower water containing hexavalent chromium (Cr(VI)) to unlined ponds until 1964. Wastewater percolated through soil to the water table, approximately 80 feet below, creating a chromium plume in groundwater. The plume extends north from the Compressor

Station approximately two miles and is about a mile wide at its widest.

Concentrations of hexavalent chromium and total chromium in groundwater have been detected at over 7,000 micrograms per liter (μg/L). The Maximum Contaminant Level (MCL) for total chromium is 50 μg/L; there currently is no MCL for hexavalent chromium, but the Office of Environmental Health Hazard Assessment is expected to establish a Public Health Goal for hexavalent chromium in the near future. Based on that Public Health Goal, the Department of Public Health will establish an MCL for hexavalent chromium.

Through various CAOs, the Water Board has required containment and cleanup of the chromium plume and has prescribed waste discharge requirements (WDRs) for PG&E to implement containment and cleanup activities. In 2008, CAO No. R6V-2008-0002 required PG&E to submit a feasibility study report by September 2010 that assesses remediation strategies proposed for the site. If PG&Eproposes a final cleanup strategy that will result in cleanup to concentrations higher than background water quality, the report must include a detailed analysis of different cleanup strategies, one of which must achieve background water quality, if feasible.

The State Water Board's Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, requires that cleanup and abatement promote "... attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored ...." Resolution No. 92-49 also requires cleanup to conform to the provisions of State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. The key element of that Policy is "[w]henever the existing quality of water is better than the quality established in policies ..., such existing high quality will be maintained until is has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies." Resolution No. 92-49 also contains provisions for designation of a containment zone, which is "a specific portion of a water bearing unit where the Regional Water Board finds ... it is unreasonable to remediate to the level that achieves water quality objectives."

Background chromium concentrations in groundwater in the Hinkley Valley were established in CAO No. R6V-2008-0002A1 as a result of a peer-reviewed background water quality study required of PG&E by the Water Board. Maximum and average background concentrations were established as follows:

Maximum hexavalent chromium = 3.1 μg/L;
Average hexavalent chromium = 1.2 μg/L;
Maximum total chromium = 3.2 μg/L;
Average total chromium = 1.5 μg/L.

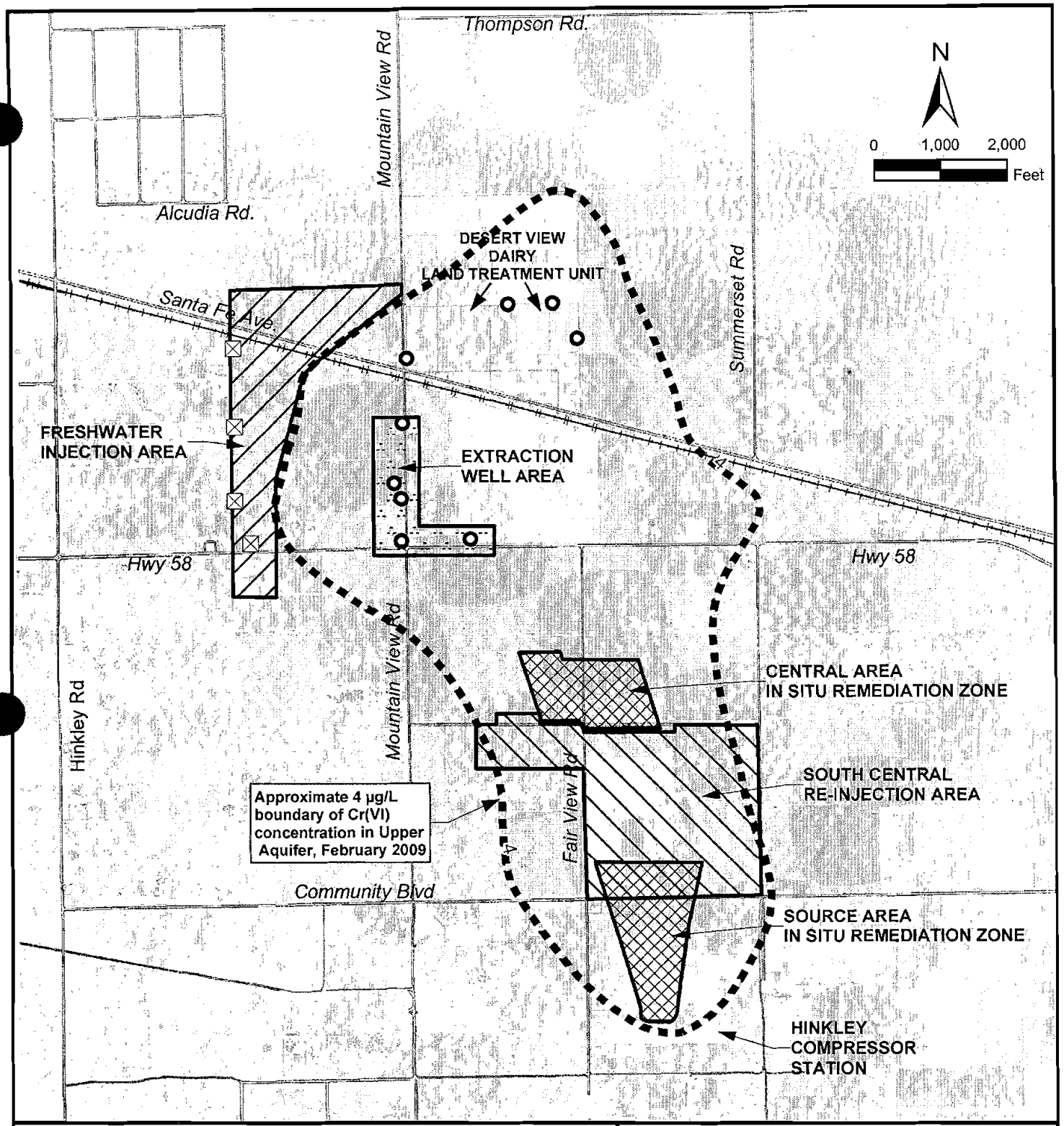
PG&E's remediation projects at the site include land treatment through subsurface irrigation of fodder crops and in-situ treatment in the groundwater through biologically-mediated reduction (chemical conversion) of hexavalent chromium to trivalent chromium. Trivalent chromium precipitates out of solution and binds with the soil or aquifer materials. The in-situ groundwater treatment involves the addition of a carbon source to the groundwater, typically lactate or ethanol, to stimulate bacterial growth that creates reducing conditions in the groundwater. These treatment techniques have been successful in starting to remediate the hexavalent chromium plume.

The Water Board will be asked in the future to set cleanup levels for chromium in groundwater and to approve a final cleanup plan for the site considering Resolution No. 92-49 and the feasibility study report that is required by September 2010. PG&E will provide a presentation at the June 10, 2009 Water Board meeting that discusses its current and planned activities at the site and the challenges they foresee in establishing and implementing a final remedy for the site.

RECOMMENDATION: No action is recommended at this time, but the Board may provide comment and direction to staff.

Enclosure: 1. Remedial Features at the Hinkley Site

ENCLOSURE 1



LEGEND

- Extraction Well
- Freshwater Injection well
- Freshwater Injection Area
- South Central Re-injection Area
- Extraction Well Area
- Source and Central Area In Situ Remediation Zone

Notes:
1. The concentration contour line is based on Cr(VI) and Cr(T) results from the site-wide Groundwater Monitoring Program sampling event conducted February 3-19, 2009 and from selected wells sampled in February 2009 for IRZ monitoring.

REMEDIAL FEATURES AT THE HINKLEY SITE

HINKLEY GROUNDWATER REMEDIATION PROJECT
PACIFIC GAS & ELECTRIC CO. COMPRESSOR STATION
HINKLEY, CALIFORNIA

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