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"The State Water Board's mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations."



Lahontan Water Board's Actions Requiring PG&E to Clean Up Waste Chromium Discharged from the Hinkley Compressor Station

Project Background

The Pacific Gas and Electric Company's (PG&E's) Hinkley Compressor Station is located in Hinkley, California, approximately one mile north of the Mojave River and 8 miles west of Barstow in San Bernardino County. The Station is used to compress natural gas for transportation through pipelines to Central and Northern California.

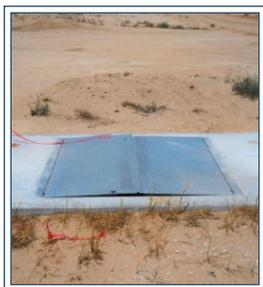
Between 1954 and 1964, hexavalent chromium in wastewater leached from unlined ponds to groundwater, about 80 feet below ground surface. Hexavalent chromium was then carried in groundwater in a generally northward direction. Hexavalent chromium in groundwater is presently detected above 3.1 parts per billion (ppb) in areas up to four miles north of the Compressor Station and almost two miles in width in the vicinity of Highway 58. Under orders by the California Regional Water Quality Control Board, Lahontan Region (Water Board), PG&E continues to install monitoring wells to define the downgradient extent of the plume, and to implement cleanup actions to remove chromium from groundwater.



Cleanup Alternatives and Upcoming Draft Environmental Impact Report

The Water Board is the lead agency that is overseeing the actions of PG&E to investigate and clean up (also called remediation) chromium-contaminated groundwater at and in the vicinity of the PG&E Hinkley Compressor Station. The Water Board's goal is to require PG&E to develop and implement the fastest feasible groundwater cleanup strategy, while understanding and limiting the impacts of cleanup activities as much as possible. As a part of achieving this goal, the Water Board is required by law to evaluate a range of cleanup options and their impacts. This evaluation is called an Environmental Impact Report.

Since September 2010, Water Board staff has reviewed eleven cleanup options proposed by PG&E. In each review, Water Board staff required PG&E to re-work its proposals to achieve the most aggressive, shortest-term options. In these options, PG&E evaluated a combination of five technologies to clean up the contaminated groundwater:



- Groundwater extraction: contaminated groundwater is pumped from the subsurface (also called the aquifer) to remove the chromium and contain the contamination plume.
- Agricultural re-use (also called land treatment or agricultural units): extracted groundwater is used to irrigate forage crops for livestock. Hexavalent chromium in the extracted groundwater is converted to trivalent chromium by contact with organic matter in the soil as it infiltrates through the soil. Hexavalent chromium is the toxic form of chromium, while trivalent chromium has very low toxicity.
- Subsurface treatment (also called in-situ treatment or in-situ reactive zones): carbon substances are injected into the groundwater to turn the hexavalent chromium into trivalent chromium.
- Above-ground treatment (also called ex-situ treatment or pump and treat): extracted groundwater is processed through a water treatment plant to remove the hexavalent chromium using physical and/or chemical treatment.

- Subsurface freshwater injection: this method creates barriers of freshwater within the aquifer to prevent the downgradient movement of contaminated groundwater.

Estimates provided by PG&E indicate that the most aggressive combination of these technologies would result in groundwater hexavalent chromium levels of no greater than 3.1 ppb in 29 years.

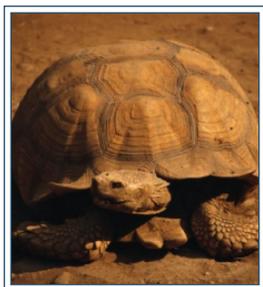
While it's the Water Board's goal to require PG&E to clean up the contaminated groundwater as quickly as possible, there are trade-offs between faster cleanup and environmental impacts. For example, aggressively extracting groundwater from the subsurface could mean that groundwater levels may be lowered in certain areas which may dry up some supply wells in affected areas. Extensive subsurface treatment could result in increased concentrations of chemical by-products, such as manganese, in groundwater. Using additional land for more agricultural units would require use of larger areas of land that may currently be habitat for the desert tortoise or the Mojave ground squirrel, which are listed threatened species under state and federal regulation.

Prior to setting cleanup requirements for PG&E, the Water Board must comply with the California Environmental Quality Act (CEQA). While CEQA does not mandate a specific cleanup requirement, it does mandate a full and accurate analysis of the environmental effects of implementing the cleanup alternatives. This will be done in an Environmental Impact Report.

As described above, many of the cleanup options may have adverse environmental effects that must be disclosed in the CEQA analysis, along with all feasible actions to mitigate these adverse effects. The Water Board will be seeking comments from the public on the EIR between February and April 2012. Comments should focus on the following:

- 1) Does the EIR accurately identify the adverse environmental impacts of the alternatives?
- 2) Are there other mitigation actions that should be considered to address the identified adverse impacts?

Detailed information on PG&E's current proposal is contained in PG&E's September 15, 2011 Addendum #3 to the September 2010 Feasibility Study, which was prepared in response to reviews from the US Environmental Protection Agency, the California Department of Toxic Substances Control, and Water Board staff.



Background Study Peer Review

In summer 2011, the Water Board requested a peer review of the 2007 Background Chromium Study since the study deviated from the Water Board-approved and peer-reviewed workplan.

Three experts were selected to provide peer review of the Background Study. The peer reviewers have expertise in the fields of hydrogeology, statistics, and chemistry. Their peer review comments were received in early October 2011 and are posted on the PG&E Hinkley page of the Water Board's website at http://www.waterboards.ca.gov/lahtontan/water_issues/projects/pge/index.shtml.

Water Board staff is currently evaluating the peer reviewer's comments and will be making a recommendation to the Water Board at a regularly scheduled meeting in early 2012. This meeting will be publicly noticed.

Cleanup and Abatement Order Issued to PG&E

The Water Board Executive Officer issued an Amended Cleanup and Abatement Order (CAO) requiring PG&E to provide permanent whole house replacement water to parties with domestic and community wells affected by PG&E's chromium release. The CAO, issued on October 11, 2011, requires that PG&E conduct the following actions for residences of affected wells within one mile of the plume boundary:

1. Provide interim water supply (e.g., bottled water with specific quality requirements).
2. Submit a feasibility study on methods to provide permanent replacement water supply for all indoor domestic uses.
3. Provide permanent replacement water supply.

The full CAO can be viewed on the PG&E Hinkley page on the Water Board's website.

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Chromium Plume Under Investigation

The chromium plume in Hinkley groundwater continues to be investigated.

PG&E is under orders by the Water Board to determine the full extent of the plume. During spring and summer 2011, about new 60 multi-depth monitoring wells were installed in the Hinkley area. Chromium was detected in water samples on Sonoma Street to the north, on Dixie Road to the east, and west of Serra Road to the west.

Some drilling to the north is currently

suspended due to potential impacts to desert tortoise and Mojave ground squirrel habitat. PG&E is working with the appropriate state and federal agencies on a plan that will allow investigation work to continue while still protecting desert tortoise and Mojave ground squirrel habitat. PG&E is also working with these agencies on long-term permits to allow the proposed cleanup to proceed, including mitigation for any effects to these species and their habitat.

The chromium plume map for 3rd quarter 2011 can be viewed on the Water Board's website.

