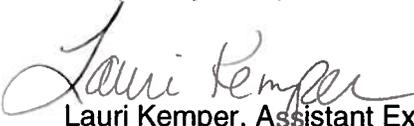


Lahontan Regional Water Quality Control Board

MEMORANDUM

DATE: October 25, 2012

TO: Patty Kouyoumdjian, Executive Officer

FROM: 
Lauri Kemper, Assistant Executive Officer

SUBJECT: RESPONSE TO COMMENTS RECEIVED AND PROSECUTION TEAM RECOMMENDATIONS ON DRAFT CLEANUP AND ABATEMENT ORDER FOR ADDITIONAL CHROMIUM PLUME INVESTIGATION, PG&E HINKLEY COMPRESSOR STATION

The Prosecution Team reviewed comments received from interested persons, the Project Navigator- consultant for the Community Advisory Committee, and PG&E during the public review and comment period for the Draft Cleanup and Abatement Order for Additional Chromium Plume Investigation. In this memo we provide responses and in the attachment, we provide a proposed Cleanup and Abatement Order for your consideration.

The proposed changes to the draft CAO are based in part on additional information received since August regarding chromium detections in domestic wells in the Harper Dry Lake Valley. We have suggested changes to the CAO to require additional investigation in this area. We have also added a requirement for PG&E to provide interim water supply and whole-house replacement water supply to the property owner of domestic well 34-65 on Community Boulevard. Additional changes are primarily clarifications based on comments received by the public, Project Navigator, and PG&E, as well as changes required based on the August sampling results. We feel these changes are generally not major changes, and do not require the Lahontan Water Board to re-circulate the draft CAO for another round of review by members of the public, Project Navigator, and PG&E.

The Prosecution Team is recommending that you issue the draft CAO with our proposed changes to require PG&E to conduct further investigative actions for defining the chromium plume in groundwater from historic releases at the Hinkley Compressor Station, provide alternate water supply, and conduct remediation activities allowing for the expansion of the southeast plume boundary.

Responses to comments received in the July 25, 2012 draft CAO

1. Seventy-nine Hinkley residents signed a petition stating their support of the draft CAO, as written and without changes. If changes are made, the residents request even more monitoring wells than are being proposed to better define the plume boundaries in the north, south, east, and west. They also recommend that monitoring wells be placed next to

domestic wells that previously had non-detect chromium concentrations and now have chromium, manganese, uranium, or possibly arsenic.

Response: Support of the draft CAO is noted. Where gaps exist in defining the plume boundary, additional wells will be required. Also, where remediation byproducts potentially affected domestic wells or gaps exist between monitoring points, additional monitoring locations will be required.

2. Property owner supports the draft CAO but believes it needs to be modified to address deficiencies in PG&E's chromium plume maps. The 3.1 ppb (parts per billion) Cr(VI)/3.2 ppb Cr(T) plume lines are not being drawn accurately to monitoring wells having chromium detections (for the map of interpreted maximum plume outline in upper aquifer). Also chromium contour lines are not being connected to monitoring wells on the eastern boundary showing chromium above maximum background levels. Further, contour lines are not being drawn to all wells (not domestic) in the north showing chromium above maximum background levels to Thompson Road for the deep zone of the upper aquifer (Figure 3-3). Request that the 1,000 ppb chromium contour line be required in the CAO so that plume maps reflect the current status of the hot spot near the compressor station.

Response: Support of the draft CAO is noted and requirements will be added to ensure that chromium boundary lines representing the maximum plume extent based on well data are drawn on maps for both the shallow and deep zones of the upper aquifer. Suggestion to add a 1,000 ppb chromium contour line on plume maps is a reasonable one for understanding the size of the chromium hotspot near the compressor station and to document changes that occur with time and remedial actions.

3. Project Navigator:
The Independent Review Panel (IRP) Manager on behalf of the Community Advisory Committee provided these comments. First, supports allowable plume expansion in the southeastern area to improve hydraulic control of the plume in the north. Second, the proposed use of domestic wells for further plume characterization may be no more than academic compared to the large acreage of plume as a whole. And third, further plume investigation could simply distract from more important initiatives, such as installing the WHRW Systems, completing the EIR, starting up additional in-situ treatment systems, finalizing the remedy feasibility study and initiating the 2-year long comprehensive background study. IRP Manager recommends that visioning/planning technical exchange meetings take place to determine if new plume definition demands are valuable or academic.

Response: Support for allowing plume expansion in the draft CAO to ensure plume containment in other areas is noted. Concerning the use of domestic wells for drawing the chromium plume boundary where access to private lands has not been provided, we agree this task may indeed result in only an insignificant expansion of the total plume size. Thus, this task is not onerous for PG&E and would not require significant changes be made to future plume maps. The requirement would achieve the goal of better defining the extent of the chromium plume out to maximum background levels in groundwater as has been previously required and establish current boundaries to adjust the replacement water program and to plan future cleanup actions.

Chromium plume investigation and delineation in groundwater has been a requirement of the Lahontan Water Board since the first CAO was issued in 1987. As the detection level for chromium has been lowered over the years, new orders have been issued to further define the plume boundaries. The draft CAO is consistent with past CAOs requiring PG&E to define the plume boundaries to the latest standard(s), in this case the maximum background levels of 3.1 ppb Cr(VI) and 3.2 ppb Cr(T).

Further plume definition should not distract from completing the EIR which is being undertaken by the Lahontan Water Board as lead agency, not PG&E. Nor should it distract PG&E from conducting the proposed supplemental background study, which is not a current requirement of the Water Board. Feasibility studies required of the Discharger have been accepted by the Lahontan Water Board and none are currently outstanding. Therefore, further plume definition will not prevent the Discharger from completing other tasks required by the Water Board. As the Lahontan Water Board has stated its desire to see the chromium plume continue to be defined as soon as feasible, it is reasonable to issue this requirement as described in the attached Order. In the meantime, Lahontan Water Board staff is open to attending technical meetings where new data and/or information are provided as it relates to chromium plume definition.

4. PG&E comments:

- a. There is no scientific basis for the proposed 2 ppb chromium (both hexavalent and total) threshold in the draft CAO (for installing new monitoring wells).

Response: Studies have shown that wells with relatively long screened intervals (such as occurs in domestic wells) do not provide accurate information on groundwater quality. The reason being that groundwater samples withdrawn from such wells would be a composite of the concentrations over the entire screened interval. The result is that measured concentrations are less than the true maximum. Thus, detected concentrations in long-screen domestic wells are not invalid; they just represent a composite or average of concentrations across the well screen.

State guidance documents¹ recommend that to avoid dilution, the monitoring well screen length should be kept to the minimum length appropriate for intercepting a contaminant plume. In the saturated zone, the screen length should generally not exceed 10 feet.

Groundwater monitoring reports submitted by PG&E consistently show, for the most part, higher chromium detections in monitoring wells compared to domestic wells; the former wells are assumed to have shorter screen lengths compared to the latter wells. Monitoring wells installed over the past two years in the northern plume area (north of Santa Fe Avenue) commonly show either hexavalent or total chromium at higher concentrations compared to nearby (within 1,600 ft) domestic wells, as depicted in examples shown in the following table from Second Quarter 2012:

¹ DTSC, 1995, Monitoring Well Design and Construction for Hydrogeologic Characterization, and DTSC, 2001, Monitoring Requirements for Permitted Hazardous Waste Facilities

Domestic Well No.	Cr(VI)/Cr(T) in ppb	Monitoring Well No.	Cr(VI)/Cr(T) in ppb
14-11	2.3/2.2	MW-113S2	3.3/3.7
14-12	2.5/2.5	MW-111S1	3.1/3.3
14-13	3.1/2.9	MW-140S1	4.4/4.9
14-13	3.1/2.9	MW-139S1	12.6/13.2
15-13	2.8/2.5	MW-142S1	9.0/9.8
23-25	2.1/2.3	MW-86S	5.1/5.9
04N-03	1.6/2.1	MW-130S1	5.0/5.7

Laboratory results of water samples collected from domestic wells are just as valid as water samples collected from monitoring wells, with the former reflecting less than the maximum concentration and the latter reflecting the maximum or near maximum concentration. Chromium detections of 2.0 ppb or greater in domestic wells exceed the average background chromium levels of 1.2 ppb Cr(VI)/1.5 ppb Cr(T) (CAO R6V-2008-0002A1) and therefore indicate a threatened discharge from historical releases. Based on this information, it is reasonable to require that PG&E investigate and define the extent of the chromium plume in these areas. To prevent redundant monitoring wells being installed in areas having multiple domestic wells with chromium concentration of 2.0 ppb or greater, the CAO has been modified to cite a radius of every one-quarter mile or 1,320 feet for monitoring well installation and within one mile of the chromium plume boundary. This change will significantly reduce the number of monitoring well locations by about two-thirds the number that would have been required in the draft CAO.

- b. The draft CAO requirement to replicate domestic well chromium concentrations using monitoring wells is impracticable and unsupported by the record.

Response: The request was supported by data provided in quarterly groundwater monitoring reports. The Second Quarter 2012 report shows six locations where monitoring well chromium results were unable to replicate higher domestic well concentrations. It appears that a majority of these locations are in the northeast plume area near Mount General and may be associated with bedrock high spots. Because this is likely an isolated situation, Lahontan Water Board staff agrees to delete the requirement to replicate domestic well results in the CAO.

- c. The draft CAO's directive to delineate the plume using domestic wells data would result in an artificially expanded plume without a scientific or factual basis.

Response: PG&E's August 20, 2012 Technical Memorandum indicates that up to six proposed monitoring well locations have been waiting for access to private properties for approximately one year. With no reason provided as to why access has been denied, this period of time is considered extensive and requires an alternative process be established for delineating the chromium plume on maps.

As already discussed, laboratory results of water samples collected from domestic wells may be relied upon to show the presence of chromium. Detected chromium is detected chromium. There is no indication that the use of domestic wells will result in false-positives. PG&E has provided no data or information to support the statement that older private wells may be leaching chromium into the water and thus should not be used for plume contouring. It is more likely that the use of domestic wells will result in false-negatives, as discussed by the 2011 independent peer-review panel's discussions of the

2008 Background Study. It has also previously been discussed that groundwater monitoring reports submitted by PG&E indicate that long-screen domestic wells have a high tendency for having diluted chromium results in water samples compared to shorter-screen monitoring wells. Therefore, it is appropriate to use domestic wells to draw the chromium plume boundary in instances where the plume line is inferred as a result of the inability to secure access to private properties for installing monitoring wells.

To realistically apply this requirement, the CAO has been modified to limit the distance of domestic wells used for plume contouring to be within one-half mile of the plume line that would normally be drawn using monitoring wells. According to the Second Quarter 2012 Groundwater Monitoring Report, one domestic well in the northern portion of the chromium plume would fall into this category and result in stepping out the plume boundary line 200 feet to the east. In the eastern plume area, another domestic well also falls into this category and would result in the plume line extending about 1,000 feet to the east from MW-152. These two locations make the exercise for re-drawing the plume boundary a reasonable attainment without requiring extensive resources from PG&E.

- d. The draft CAO would improperly require the installation of monitoring wells upgradient of the plume.

Response: The comment indicates an “upgradient” groundwater flow direction but does not define how the term applies in the Hinkley Valley or clarify where the term applies to the chromium plume. Rather, the First Quarter and Second Quarter 2012 Groundwater Monitoring Reports do not contain potentiometric maps showing the calculated direction of groundwater flow in relation to the chromium plume. Past monitoring reports indicate a history of supply wells for the compressor station pulling chromium, nitrate, and other constituents southward, in the direction towards the Mojave River. These supply wells are located on Fairview Road, Summerset Road, and Highcrest Road. This example reflects how chromium can be pulled towards another direction not considered to be in the downgradient flow to the north.

The example given in the comment of an upgradient well is domestic well 34-65, which is located west of the compressor station on Community Boulevard. In June 2011, PG&E submitted information showing that domestic well 34-65, at address 21928 Community Boulevard, had a hexavalent chromium detection of 3.3 ppb. Subsequent detections of hexavalent chromium concentrations exceeding the maximum background level throughout 2011 put the domestic well into the Domestic Well Sampling Program. Concurrently, PG&E presented information to Water Board staff that indicated the well location appeared to be in the upgradient groundwater flow direction and the chromium detection was likely an anomalous situation of natural chromium. For these reasons, Water Board staff verbally concurred with the conclusion that chromium in the well 34-65 did not appear to be associated with historical releases at the compressor station.

Since then, however, groundwater monitoring reports list three additional domestic wells in the same vicinity as well 34-65 having hexavalent chromium concentrations exceeding the maximum background level. These monitoring reports contain no data or potentiometric map with an interpretation of “upgradient” groundwater flow. Further, PG&E has included these three well owners into its expanded whole house replacement water program, but has refused bottled water and whole house replacement water to the owner of well 34-65. No information on why the neighbors in this area are in PG&E’s

program and the owner of well 34-65 is not. Based upon the newer information showing four domestic supply wells in this area with hexavalent chromium concentrations above the maximum background concentrations, Prosecution Team staff are no longer convinced that the information from well 34-65 is indicative of natural chromium in an upgradient direction. PG&E must provide additional information and written justification of its interpretation that these wells are truly upgradient of any discharges from PG&E. No data or potentiometric map with an interpretation of "upgradient" is provided in groundwater monitoring reports. We understand that PG&E is completing the western plume investigation and results should be available by the end of the calendar year. Until such time that a current justification has been accepted by the Water Board the CAO requires PG&E to provide bottled water to the owner of well 34-65 and to offer a whole house replacement water system.

- e. The draft CAO imposes impracticable deadlines.

Response: Lahontan Water Board staff agrees that the deadline listed in Order No. I.B. for submitting a technical report for further chromium plume definition in groundwater was too short to be practicable. The deadline has been revised to better reflect a timeline involving a workplan submittal, investigation activities, and report submittal.

- f. (1) The draft CAO recites incorrect and obsolete regulatory history as it relates to Paragraph 3 in the August 6, 2008 CAO and more recent orders for plume containment.

Response: Finding No. 3 in the draft Order correctly describes the history and requirements of CAO R6V-2008-0002. Later on, Finding No. 7 describes revisions made to Paragraph 3 in CAO R6V-2008-0002 in an amended order and new plume containment requirements listed within. The Discharger's compliance history and record is not made a part of this Finding section, titled "Regulatory History."

- (2) The draft CAO exceeds the Regional Board's authority by ordering PG&E to investigate areas that are not linked to PG&E's discharge.

Response: When issuing a CAO pursuant to Water Code section 13304, a regional water board is required to make findings that a person has caused or permitted, or threatens to cause or permit, any waste to be discharged or deposited where it is, or probably will be discharged, into waters of the state and creates, or threatens to create, a condition of pollution or nuisance. When issuing an investigative order pursuant to Water Code section 13267, a regional water board must make findings that a person has discharged, is discharging, or is suspected of having discharged waste within its region. In either case, the regional board's findings must be supported by "substantial evidence."

The California Supreme Court has stated that substantial evidence is evidence of "probable legal significance," which is reasonable in nature, credible and of solid value. *Ofsevit v. Trustees of California State Universities and Colleges* (1978) 21 Cal.3d 773 n. 9. "Substantial evidence" means facts, reasonable assumptions based on facts and expert opinions supported by facts. *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4th 1004, 1019. Importantly, an agency may also rely on the opinion of its staff in reaching decisions, and "the opinion of staff has been recognized as constituting substantial evidence." *Browning-Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866, citing *Coastal Southwest Dev. Corp. v. California Coastal Conservation Com.* (1976) 55 Cal.App.3d 525, 535-526. State Water Board Resolution 92-49 further delineates the

types of evidence that may be considered substantial when naming dischargers in a CAO, including direct or circumstantial evidence. Resolution 92-49, § II. A. Such direct or circumstantial evidence includes “[i]ndustry-wide operational practices that historically have led to discharges, such as leakage of pollutants from wastewater collection and conveyance systems, sumps, storage tanks, landfills and clarifiers.”

The fact that there has been a significant discharge of chromium caused by PG&E is not in dispute and the Lahontan Water Board has already made this determination in prior CAOs. What the draft CAO requires is that PG&E delineate the full extent of the chromium plume it has created. This requirement fits directly within the Lahontan Water Board’s authority under Water Code section 13267 and is specifically prescribed as one of the necessary elements of corrective action by the State Water Board in Resolution 92-49. Resolution 92-49, § II. A. 3. The draft CAO, taken in context with prior CAOs issued to PG&E, makes findings that are supported by substantial evidence, that all chromium detections above the maximum background levels are associated with PG&E’s historical releases between 1952 and 1964. Lahontan Water Board has evidence to show that PG&E let chromium impacts to groundwater migrate unchecked for more than 30 years and then migrate during the next 21 years during intermittent plume containment actions. Consistent hexavalent chromium detections along the length of the plume from the compressor station to the northernmost monitoring well (MW-154S1) in the Hinkley Valley showing 12.1 ppb is, in all likelihood, associated with PG&E’s historical releases (except where those monitoring wells are affected by remedial actions that decrease chromium concentrations). Thus, it is not surprising that chromium is being detected in the northern end of the Hinkley Valley and in the southeast area of the Harper Dry Lake Valley.

As stated in past cleanup and abatement orders, there are no other anthropogenic sources of hexavalent chromium releases in the Hinkley area known to the Lahontan Water Board. In addition, PG&E has not provided any new data, evidence, or information to the Board to support the hypothesis that detected chromium is not from its historical releases. The Board, therefore, is within its authority to require PG&E to investigate areas affected or threatened by its discharges.

(3) The draft CAO exceeds the Water Board’s authority by ordering PG&E to investigate areas where chromium levels are below natural background conditions.

Response: Amended CAO R6V-2008-0002A1 adopted chromium background concentrations in groundwater in the Hinkley Valley. The adopted maximum background levels are 3.1 ppb Cr(VI) and 3.2 ppb Cr(VI). However, the adopted average background concentrations are 1.2 ppb Cr(VI) and 1.5 ppb Cr(T). At locations showing chromium concentrations exceeding the average background levels, PG&E’s discharge may account for some or all of chromium detections. Since average background levels for Cr(VI) and Cr(T) are less than 2.0 ppb, the Lahontan Water Board is justified and within its authority to require further investigation of discharges and threatened discharges in groundwater near domestic wells showing 2.0 ppb or higher chromium concentrations.

(4) The draft CAO exceeds the Water Board’s authority by setting very specific means to achieve plume definition.

Response: The draft CAO does not specify the design, location, and manner of monitoring, as forbidden in CWC section 13360. Rather, the draft CAO acknowledges that long-screen domestic wells have the potential to dilute chromium concentrations that would typically be detected at greater concentrations in monitoring wells. Because domestic wells having chromium concentrations of 2.0 ppb or greater are threatened by PG&E's discharge, the Lahontan Water Board is within its authority to require further investigations in the vicinity of such domestic wells so long as the exact monitoring location is not listed. It is PG&E's prerogative to install a monitoring well to the north, south, east, or west of such domestic wells, wherever access to private property can be obtained.

Attachment: Proposed CAO to PG&E for Additional Chromium Plume Investigation

cc: (w/attachment) PGE Technical Mailing List and Lyris list

LK/rp/PGE_Response_to_Comments_Memo10-25-12(LK)