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Dr. John Izbicki
U. S. Geological Survey
4165 Spruance Road
San Diego, CA 92106

Comments on Proposal to Study the Occurrence of Natural and Anthropogenic Cr(VI), Hinkley, California

Water Board staff is providing comments on your September 16, 2013 proposal to study hexavalent chromium near the mapped plume in Hinkley. Overall, we believe the proposed study to be thorough and comprehensive in tasks recommended for evaluating natural versus anthropogenic chromium in the Hinkley Valley and estimating background chromium concentrations in different locations. We also support tasks that will evaluate the potential for oxidizing Cr(III) to Cr(VI) in the unsaturated zone, as this is not only a community concern but also a Water Board concern due to potential future implications on water quality.

The comments that follow are divided into Contract, Comments/Questions, and Suggested Edits.

Contract

The contract scope of work, task 4, requires:

Preparation of background study proposal and workplan(s). The draft background study proposal and workplan(s) will include, but not be limited to:

i. A discussion of the scientific and management questions to be addressed by the proposal; specifically a discussion of whether or not the study will be able to determine the source(s) of hexavalent chromium in groundwater (i.e., from PG&E's waste discharge from the Compressor Station or from geologic materials in the Mojave Hydrologic Unit).
ii. An assessment of the confidence level of the proposal to successfully address the scientific and management questions.

Comment: Please add a section or appendix to specifically address tasks 4.i and ii. The Water Board has stated that it is important for the public and the Board to clearly see what questions will be addressed (and what won't) along with the confidence level (which could be as simple as a high-medium-low ranking).

Comments/Questions

1. The document focuses solely on Cr(VI). Consider adding total chromium to the study since the Water Board believes that PG&E's remedial actions (agricultural units and in-situ remediation) over time have added Cr(T) concentrations in groundwater above natural background by converting Cr(VI) to Cr(III), the latter which can be in found in the soluble form.
2. Pages 2 and 3: the document states that cooling tower water was treated with a compound containing chromium to inhibit corrosion. Recommend listing or citing the compound if known.
3. Pages 2, 3 and 9: the document states that the results of the study will be used to set cleanup goals for the Cr(VI) contamination plume in groundwater. The statement should be revised to state that the study results will evaluate the variations in background Cr(VI), which may be used by regulators in the future to determine cleanup goals.
4. On page 6, fourth paragraph: the second sentence states that water level declines in some areas were greater than 70 feet. In the section on historical groundwater pumping in the Hinkley Valley, the Water Board's July 2013 Final EIR discusses in Appendix A that water level declines were as much as 90 feet. Suggest comparing the references in the Final EIR to verify the amount of decline.
5. Page 7, first paragraph: not sure what is meant by the term "formerly saturated alluvium." Is this historically saturated alluvium prior to agricultural pumping in the 1950s and 1960s?
6. Page 7, second paragraph: recommend revising the first sentence and adding the following sentences:

   "Chromium-containing waste water was applied to unlined ponds on the compressor station property beginning in 1952 and continued until 1964. Impacts to groundwater likely began in 1959, based upon an estimate 7-year percolation rate. In 1965, the chromium waste water was treated prior to disposal to land. In 1966, phosphorus was substituted for chromium in cooling tower water. Disposal to the unlined ponds ceased in 1973 when eight lined ponds were constructed under a permit by the Lahontan Water Board. Downward percolation to groundwater may have continued to 1980.

   Water for the cooling towers comes from supply wells located on the southern portion of the compressor station property. The original supply wells were screened across the upper and lower aquifers until replaced in the mid-2000s with supply wells screened across just the lower aquifer. Originally, 50,000 gallons per day annual average (gpd) of groundwater was pumped for supplying water to the cooling towers. This amount was reduced to 30,000 gpd starting about 1997."

7. Page 8, third paragraph, last sentence, change to read: ...through the gap, and 4) what is the hydraulic connection between Hinkley Valley and Water Valley potentially affecting plume migration.

8. Page 12: Do the sequential extractions from cores and cuttings help understand the stability of Cr3 (operationally defined sorption sites on the surfaces of the mineral grains?) Or something else?
9. Suggest mentioning that the isolated chromium detections exceeding background levels in the west at Community Boulevard and Hinkley Road will be investigated to determine whether the source is natural or anthropogenic, such as from the waste pit on PG&E-owned land.

10. Page 19: Strontium (Sr) ratio of crustal abundance of 7.09939 doesn't seem right; should be less than 1?

Suggested Edits
Consider adding underlined text, and removing strikeout text where noted.

Throughout: Check usage of CAC - Community Advisory Committee – not Citizens Action Committee.

Pages 2 and 3: Average Cr6 background value is 1.2 ppb.

Page 3: The normal 95 percent upper tolerance level of 3.1 µg/L <u>was determined</u> from the 2007 background study and adopted by the Board as maximum background concentrations.~~ was adopted as the cleanup level for remediation activities at the site~~. (Note: the Water Board has not adopted cleanup levels yet for the site).

Page 6, third paragraph: suggest adding the word "artesian" when discussing flowing wells since that term is common to some people.

Page 7, third paragraph, third sentence: The chromium concentration high should be changed to 9,000 µg/L Cr(VI) (CH2MHill, August 2010).

Page 9, first paragraph: Recharge from irrigation return and dairy waste has contributed to increased dissolved solids and nitrates <u>at very high concentrations</u> in some areas.

Page 9, fourth paragraph: "These data will be used <u>by regulators</u> to establish cleanup goals…"

Page 23: ~~Installed~~ Installation of wells in ~~in~~ bedrock areas in the northern subarea is not recommended at this time.

Page 23: To address this concern, core material will be collected from two sites <u>in</u> the unsaturated zone underlying selected streams.

Page 25: To address the rate of groundwater movement from recharge areas along ~~paired~~ the river to the compressor station and the western subarea downgradient from the Lockhart Fault . . .

Page 25: Regional and local-scale water-level maps, and particle-~~tacking~~ tracking data

Page 26, fifth paragraph: To ~~analyses~~ analyze results from a Linkert opinion survey… Also, is it Likert Scale instead of Linkert Scale? Is this part of task 4?

We appreciate the opportunity to provide comments on your proposal and look forward to working with the U. S. Geological Survey in the future.

Should you have any questions, please contact Anne Holden at (530) 542-5450 or aholden@waterboards.ca.gov or Lisa Dernbach at (530) 542-5424 or ldernbach@waterboards.ca.gov.

Anne Holden

for Lisa Dernbach, PG, CHg, CEG
Senior Engineering Geologist (Specialist)

cc: Lauri Kemper, Lahontan Water Board Assistant Executive Officer
Ian Webster, IRP Manager
Kevin Sullivan, PG&E Remediation Project Manager

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