FREQUENTLY ASKED QUESTIONS ABOUT PG&E'S BACKGROUND CHROMIUM STUDY IN HINKLEY

1. Why was a Background Chromium Study conducted?

The purpose of the background chromium study was to determine what concentrations of chromium naturally occur in groundwater in the Hinkley area. The Lahontan Water Board will consider amending PG&E's Cleanup and Abatement Order to include these background concentrations. The Cleanup and Abatement Order requires PG&E to contain the chromium plume from expanding and to clean up the plume. Cleanup to background concentrations will be the baseline in the required cleanup analysis that PG&E must perform.

2. How was the Background Chromium Study conducted?

PG&E proposed a plan for sampling wells in the Hinkley area outside of PG&E's chromium plume. The Water Board had independent experts review and comment on the plan, and the plan was modified based on the experts' comments. A total of 48 wells in the Hinkley area were each sampled up to four times during 2006. PG&E prepared a report that presented the sampling data and the results of statistical analysis of the data.

3. What forms of chromium are naturally in groundwater and in PG&E's plume?

Chromium occurs naturally (and in PG&E's plume) in either trivalent ("chromium three," Cr3, or Cr(III)) or hexavalent ("chromium six," Cr6, or Cr(VI)) forms. Laboratory analyses typically report "Total Chromium" (Cr(T)) or "Hexavalent Chromium." Total Chromium includes both trivalent and hexavalent chromium.

4. What were the background concentrations of chromium detected in Hinkley's groundwater?

Background concentrations of chromium in were as follows:

Background Concentrations, micrograms per liter (µg/L or ppb)

	Range	Average	Laboratory Method Detection Limit
Cr(VI)	Less than 0.2 to 2.69	1.19	0.2
Cr(T)	Less than 1 to 3.15	1.52	1

5. Could higher concentrations of naturally-occurring chromium be found in Hinkley's groundwater?

Yes. There may be areas of groundwater with higher chromium concentrations that were not sampled. A statistical analysis was conducted to estimate the highest likely

concentrations based on the concentrations that were measured in the background wells. This type of analysis is a standard procedure and is described in the 2002 USEPA document, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, EPA 540-R-01-003.

6. What are the expected maximum background concentrations of chromium in the groundwater?

The expected highest background concentrations of chromium in groundwater have been calculated as 95% upper tolerance limits (UTLs). Although it is possible that naturally-occurring chromium could be found at concentrations above the UTLs, there is a low probability of that. The maximum expected background concentrations are:

UTL for hexavalent chromium = 3.09 ppb
UTL for total chromium = 3.23 ppb

7. Why are the background concentrations for total and hexavalent chromium represented by a range of numbers (for example, non-detect to 3.09 ppb for hexavalent chromium)?

The background study included samples collected from 48 different wells, during four different sampling events in 2006. The range of numbers comes from the different values of total and hexavalent chromium found in the wells during the four different sampling events, and factors in the statistical calculation of the expected highest values if additional data were collected. The range of values represents the variation in naturally-occurring chromium concentrations in groundwater near PG&E's chromium plume in the Hinkley Valley.

8. How does this background analysis compare to the state drinking water standard for hexavalent chromium?

The California drinking water standard ("Maximum Contaminant Level", or MCL) for total chromium is 50 ppb. There is currently no MCL for hexavalent chromium. California's MCL was established in 1977, when the State adopted what was then a "National Interim Drinking Water Standard" for chromium. The US Environmental Protection Agency (EPA) adopted the same standard, but in 1991 raised the federal MCL for total chromium to 100 ppb. California did not follow EPA's lead, and stayed with its 50 ppb MCL for total chromium. California's Department of Public Health may consider adoption of a drinking water standard for hexavalent chromium based on recommendations from the Office of Environmental Health Hazard Assessment, which is developing a Public Health Goal for hexavalent chromium.

9. How does the background levels compare to naturally-occurring levels of chromium in other areas?

The natural chromium in the Hinkley groundwater is low compared to other areas.

Summary Statistics for Cr(T) and Cr(VI) Using Well Averages of Other Studies (micrograms per liter)

Parameter	Hinkley Background Mean	Hinkley Background UTL	Topock Background Mean	Topock Background UTL	CDHS Mean	USGS Mojave UTL
Cr(T)	1.52	3.23	9.37	34.1	NA	Not calculated
Cr(VI)	1.19	3.09	7.8	31.8	5.8*	27

*San Bernardino County public water systems

10. Is a well that tests below 3.09 ppb for hexavalent chromium outside the plume?

It depends on the location of the well and the activities that could have affected local conditions. If a well tests below the maximum expected background concentration (below 3.09 parts per billion), it is consistent with the range of numbers found in the background study. However, an assessment of the well's location, depth and historical data is necessary to make any further assessment as to whether a well is inside or outside the plume boundary.

11. Is a well that tests above 3.09 ppb inside the hexavalent chromium plume?

Not necessarily. A well that tests above 3.09 ppb for hexavalent chromium could be affected by PG&E's chromium plume, or the well could be located in an area with higher natural chromium concentrations than those found during the background study, or it could be affected by chromium from a source unrelated to PG&E. For example, water tested directly from a metal holding tank could contain elevated chromium concentrations as a result of contact with the tank. Again, an assessment would be needed to determine if the well is within the plume.