CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

AMENDED CLEANUP AND ABATEMENT ORDER NO. R6V-2011-0005A1
WDID NO. 6B369107001
REQUIRING PACIFIC GAS AND ELECTRIC COMPANY
TO CLEAN UP AND ABATE WASTE DISCHARGES OF
TOTAL AND HEXAVALENT CHROMIUM TO THE
GROUNDWATERS OF THE MOJAVE HYDROLOGIC UNIT

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Water Board), finds:

Discharger

1. The Pacific Gas and Electric Company (PG&E) owns and operates the Hinkley Compressor Station (hereafter the "Facility") located southeast of the community of Hinkley in San Bernardino County. For the purposes of this Order, PG&E is referred to as the "Discharger."

Site History and Hydrogeology

2. The Facility is located at 35863 Fairview Road (APN 048S-112-52), one-half mile east of the community of Hinkley in San Bernardino County, in the Harper Valley Subarea of the Mojave Hydrologic Unit. The Facility began operating in 1952 and discharged untreated cooling tower water containing hexavalent chromium to unlined ponds until 1964. Wastewater then percolated through soil to the water table, approximately 80 feet below, creating a chromium plume. In general, the chromium plume extends north from the compressor station to at least Sonoma Road and from east of Summerset Road to west of Mountain View Road. This release of hexavalent chromium is the only known source of anthropogenic or human introduced chromium in the localized area.

3. The hydrogeology in the southern 75 percent and in the northeastern portion of the project area consists of an upper, unconfined aquifer and a lower, confined aquifer separated by a lacustrine clay that forms a regional aquitard. The hydrogeology in the northwestern portion of the project area consists of just the upper, unconfined aquifer, as the lower aquifer and clay aquitard pinch out (terminate against the upward sloping bedrock). In general, groundwater flow is primarily to the north-northwest towards the Harper Dry Lake, with an average gradient of 0.004 feet per foot. The Mojave River contributes more than 80 percent of the natural groundwater recharge to the Hinkley Valley.

4. The soils underlying the Facility are comprised of interbedded sands, gravels, silts, and clays. The depth to bedrock ranges from about 300 feet below ground surface in the southern project area to cropping out (bedrock comes to the ground surface) in the northern portion of the project area. The closest surface water is an unnamed

ephemeral stream, located about 4,000 feet northwest of the plume's northern boundary. In addition, the Mojave River is located less than one mile to the southeast of the Facility.

Chromium Plume

5. The groundwater in the upper aquifer below the Facility contains hexavalent chromium that was discharged from the PG&E compressor station and naturally occurring constituents. The plume is considered to be that portion of the aquifer affected by the discharge. Chromium concentrations in groundwater are highest at the compressor station and become less concentrated towards the north. According to the *Second Quarter 2011 Groundwater Monitoring Report*, the highest level of hexavalent chromium detected in groundwater was 7,800 micrograms per liter (µg/L) at monitoring well SA-MW-05D. A hazardous waste is defined as any waste that contains hexavalent chromium at concentrations that exceed 5,000 µg/L. The plume contains total chromium greater than the state Maximum Contaminant Levels (MCL), or drinking water standard of 50 µg/L in the area from the Facility to Santa Fe Avenue, almost two miles north. Concentrations of hexavalent chromium are present above background levels for at least the next mile north. The chromium plume resides primarily in floodplain sediments originating from the Mojave River and alluvial sediments eroded from local mountains.

6. Hexavalent and total chromium occur naturally in groundwater at variable concentrations, according to the February 27, 2007, document, *Groundwater Background Chromium Study Report, Hinkley Compressor Station*. The mean (or average) background concentrations detected in groundwater are 1.19 µg/L for hexavalent chromium and 1.52 µg/L for total chromium. The work plan for the Study recommended that maximum background concentrations should be expressed as the 95% upper tolerance limits. The 95% upper tolerance limit is the value that is estimated to include 95 percent of the possible detections of natural occurring chromium with a 95 percent confidence level. The 95% upper tolerance limits are 3.09 µg/L for hexavalent chromium and 3.23 µg/L for total chromium.

7. On July 28, 2010, Water Board staff received information from PG&E that hexavalent and total chromium concentrations exceeded 3.1 µg/L at three residential wells and four shallow monitoring wells along Summerset Road, and to the east of Summerset Road, north of Santa Fe Avenue. Three of these wells contained hexavalent chromium ranging from 4 µg/L to 5.5 µg/L.

8. Testing results from the Second Quarter 2011 provided an approximate concentration contour, or outline of hexavalent chromium levels above 3.1 µg/L and total chromium above 3.2 µg/L based on chromium results from the upper aquifer groundwater monitoring wells and short-screen extraction wells. These data indicate that the chromium plume had migrated to locations where the hexavalent chromium levels had previously been detected at levels below 3.1 µg/L.

Regulatory History

9. On August 6, 2008, the Water Board issued Cleanup and Abatement Order (CAO) No. R6V-2008-0002 to the Discharger to clean up and abate the effects of waste discharges and threatened discharges containing hexavalent chromium and total chromium to waters of the State. The CAO, in part, required the Discharger to prevent the chromium plume from migrating to locations where hexavalent chromium is below the background levels.

10. At the November 12-13, 2008 Water Board meeting, the Water Board considered the 2007 *Background Chromium Study*, along with comments and recommendations by interested persons and staff.

11. Following the meeting, the Water Board Executive Officer issued Amended CAO No. R6V-2008-0002A1 (2008 Amended CAO) to establish background concentrations for chromium in Hinkley Valley groundwater as follows:

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

12. The 2007 *Background Chromium Study* results described in Finding No. 6 have not been subject to an independent third-party review to comment on its accuracy. The study is currently undergoing peer-review through Cal/EPA's scientific peer review program. These background concentrations were set for the purposes of evaluating and eventually setting clean up requirements.

13. On January 7, 2011, the Water Board issued Cleanup and Abatement Order R6V-2011-0005 to PG&E in response to detections of hexavalent chromium above background levels in Hinkley domestic wells. This order required that PG&E provide interim uninterrupted replacement water, such as bottled water, to residences and businesses whose private or community wells were found to contain hexavalent chromium at concentrations exceeding 3.1 µg/L, or total chromium had been detected at 3.2 µg/L. This decision was based on 1) the 2010 testing results that showed concentrations of hexavalent chromium exceeded background levels, and 2) the background levels of chromium memorialized in the 2008 Amended Cleanup and Abatement Order (R6V-20008-0002A1).

Regulation of Hexavalent Chromium

14. On July 27, 2011, the California Office of Environmental Health Hazard Assessment (OEHHA) established a Public Health Goal (PHG) for hexavalent chromium at 0.02 µg/L. This is the first PHG specific to hexavalent chromium. PHGs are based on a risk assessment that identifies a level of exposure at which no known or anticipated adverse effects on health will occur, with an adequate margin of safety (Cal. Health & Safety Code §116365). The PHG is used by the California Department of Public Health (CDPH) to develop the MCL (California Health & Safety Code §116365(a)).

15. Currently, the MCL for total chromium in drinking water is 50 µg/L , which includes all forms of chromium. This MCL was established in 1977. There is no MCL specific to hexavalent chromium.

Authority – Legal Requirements

16. California Water Code section 13304, subdivision (a) states in part:

> *Any person . . . who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged to waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board clean up or abate the effects of the waste...*
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> *...in the case of threatened pollution or nuisance, take other necessary remedial action, including but not limited to, overseeing cleanup and abatement efforts. A cleanup and abatement order issued by the state board or a regional board may require the provision of, or payment for, uninterrupted replacement water service, which may include wellhead treatment, to each owner.*

17. Pursuant to Water Code section 13304, subdivision (f):

> *Replacement water provided pursuant to subdivision (a) shall meet all applicable federal, state, and local drinking water standards, and shall have comparable quality to that pumped by the public water system or private well owner prior to the discharge of waste.*

18. Water Code section 13307.6, subdivisions (a) (4) and (7) state in part:

> *(a) In addition to the requirements of Section 13307.5, the regional board may develop and use any of the following procedures ...if the regional board determines there is expressed community interest in the site...*
>
> *(4) Formation and facilitation of an advisory group.*
>
> *(7) Preparation of a public participation plan.*

19. Water Code section 13267, subdivision (b) states in part:

> *In conducting an investigation [of the quality of any waters of the state within its region] the regional board may require any person who has discharged waste within its region...[to] furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires.*

This Order requires the submittal of workplans, monitoring data, and reports, mainly to document that the replacement water service meets all regulatory requirements. Workplans and technical reports have been required by previous Water Board Orders and are necessary to develop an accurate assessment of the plume of anthropogenic hexavalent chromium in the Hinkley upper aquifer.

20. Section 13304 of the Water Code allows a regional board to hold persons accountable who "cause or permit" any waste discharged in a water of the State. The burden to remediate the impacts of waste falls on the party who is responsible for the discharge, even if their actions alone are not the only source of pollution (*City of Modesto Redevelopment Agency v. Superior Court*, 19 Cal.App.4th 28 (2004)). Likewise, in cases of hazardous waste discharges, the burden to remediate impacts of waste falls on the discharger even if they are not the sole cause of the costs (Browning-Ferris Industries of Illinois, Inc. v. Ter Maat, 195 F.3d 953, 49 Env't. Rep. Cas. (BNA) 1449, 30 Envtl. L. Rep. 20135 (7th Cir. 1999). The Discharger is currently the only known source of anthropogenic chromium in the Hinkley upper aquifer. It is the Discharger's responsibility to remediate the affects of its discharge or to demonstrate that it is not responsible for the contamination or only a legally divisible portion of the contamination.

Replacement Water Service

21. The State Water Resources Control Board (State Water Board) issued precedential Order WQ 2005-0007, In the Matter of the Petition of Olin Corporation and Standard Fusee, Incorporated (referred to as the "Olin Order"). The Olin Order was issued in response to a petition brought by the Olin Corporation and Standard Fusee to provide replacement water service to owners of private domestic wells affected by the discharge of potassium perchlorate from a facility. Because there was no enforceable state or federal standard for perchlorate in drinking water for use in determining when a well is affected such that the user should be entitled to replacement water, the regional board had relied on the notification level for perchlorate of 4 µg/L. After the issuance of a final public health goal issued by the OEHHA of 6 µg/L several years later, The Olin Corporation sought approval to raise the level of contamination requiring replacement water service to 6 µg/L to match the PHG, and the regional board denied the request. The State Water Board determined that *"where no federal, state or local standard yet exists, it is appropriate to use goals developed by agencies with expertise for public health determinations in deciding whether replacement water service is necessary,"* and concluded that the regional board should defer to OEHHA and DHS (now CDPH) in determining the appropriate level of contamination requiring replacement drinking water service. (Olin Order at p. 6-7.) The State Water Board recognized that although the PHG is not a legally enforceable standard, it is appropriate to use the public health goal as the applicable level for determining wells requiring replacement drinking water. (Olin Order at p. 8).

22. The situation facing the Water Board is analogous to that described in the Olin Order in that a drinking water standard specific to hexavalent chromium does not exist but an established PHG exists. Therefore, consistent with the State Water Board's

direction in the Olin Order, it is appropriate for the Water Board to rely on the PHG of 0.02 µg/L for hexavalent chromium as the appropriate level for determining wells requiring replacement water service. This is also consistent with a comment from the CDPH advising the Water Board not to rely on a *draft* PHG. This comment was received during the comment period on this draft Order at which time the OEHHA had not yet established the final PHG for hexavalent chromium. However, since the end of the comment period, the OEHHA has established a final PHG for hexavalent chromium. Once CDPH establishes an MCL for hexavalent chromium, the Water Board may amend this Order to use the MCL as the appropriate level for determining wells requiring replacement water service.

23. In setting the PHG, OEHHA evaluated health risks from hexavalent chromium in domestic water based on a variety of typical household uses of tap water, including drinking, preparing foods and beverages, bathing or showering, flushing toilets, and other household uses resulting in potential dermal and inhalation exposures. Toxicity studies from routes of exposure were categorized according to ingestion, inhalation and dermal contact. Inhalation risks were determined based on studies of the impacts of inhaling hexavalent chromium-contaminated water vaporized in the shower ("shower studies") and were found to be very low.

Many homes in the Hinkley area rely on swamp coolers to provide cooling. These swamp coolers typically use domestic water. The exposure risk associated with the use of water containing hexavalent chromium in swamp coolers was not evaluated as part of the development of the PHG for hexavalent chromium. As such, the Water Board needed independent input on this concern. In a memorandum dated August 17, 2011, the OEHHA advised the Water Board that swamp coolers do not pose any additional exposure risk due to the fact that chromium in water is not converted to the vapor phase in these units.

24. As defined in the Olin Order, wells are "affected" by a discharge of waste when they do not meet federal, state, or local drinking water standards; or where no standards exist, when the discharge does not meet goals developed by agencies with expertise for public health determinations. However, where the naturally occurring background levels of the constituent may exceed the PHG, the Water Board must also consider naturally occurring background levels when considering whether a well is affected. The Water Board can only require replacement water service if the presence and level of the constituent is due to the discharge of waste.

25. The Water Board has established maximum and average background levels of total and hexavalent chromium for the Hinkley area (see Finding Nos. 6, 10, 11 and 12). These levels were established to provide a basis for evaluating cleanup alternatives and were set at levels which had a high probability that any values in excess of these levels were likely caused by the discharge (see Finding No. 6). This criterion, while instructive, is not necessarily appropriate for establishing levels above which replacement water service should be provided. Because these background levels are 50 to 150 times greater than the PHG for hexavalent chromium, it is more appropriate to provide criteria for determining when replacement water service is necessary that is more conservative and protective of public health. Because the 3.1

µg/L hexavalent chromium and 3.2 µg/L total chromium values represent ***maximum*** background levels, hexavalent chromium levels in domestic wells that are below the maximum background levels may have been caused by PG&E's discharge. It is therefore necessary to establish a process to evaluate and determine if hexavalent chromium levels in domestic wells above the PHG, but below the established maximum background level are due to the discharge.

26. Background levels of hexavalent chromium in the Hinkley are variable given the geochemical processes that contribute to the formation of hexavalent chromium in groundwater. Additionally, hexavalent chromium concentrations that are considered background levels in any one well may vary over time. Therefore, because it will be necessary to evaluate each well separately, it is not practicable in this Order to set the hexavalent chromium background values for each domestic well that has been or could be affected by the plume. Rather, to determine whether hexavalent chromium levels in domestic or community wells are due to naturally occurring background or PG&E's discharge, PG&E must evaluate the hexavalent chromium values in each domestic well in the affected area (see Finding No. 30) separately, considering a number of factors, including, but not limited to: changes in hexavalent chromium levels over time, location of well in relationship to the plume and groundwater flow direction, isotopic analysis of hexavalent chromium, and statistical analysis described in Title 27, section 20415(e)(8).

27. The release from the Discharger's facility is the only known source of anthropogenic chromium in the groundwater of the upper Hinkley aquifer. All anthropogenic chromium in this area is considered to be the result of the Discharger's activities.

28. The Discharger is required to abate the effects of its discharge in accordance with Water Code 13304. This includes providing uninterrupted replacement water service to all impacted domestic or community wells. Replacement water service shall have comparable quality to the water pumped prior to the well being affected by the discharge of the waste. There are various methods to provide this replacement water service. Bottled water is not guaranteed to contain hexavalent chromium at levels needed to comply with the Water Code requirement that the replacement water service be comparable to that pumped by the well owner prior to it being affected by the discharge. Similarly, certified treatment systems are also not guaranteed to reduce hexavalent chromium to levels needed to meet the Water Code requirement cited above. Therefore, this Order requires the Discharger to demonstrate that bottled water or the water provided by treatment systems designed to provide replacement water service are of a quality comparable to that which was pumped prior to being affected by the discharge.

29. **Impacted wells** are defined as domestic or community wells in the affected area (see next finding) containing chromium in concentrations (measured at any time) that are above 3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium. Additionally, impacted wells also include those domestic or community wells in the affected area containing hexavalent chromium in concentrations greater than 0.02 µg/L when the analysis performed by the Discharger, in compliance with the approved methods as specified in Paragraph 3.a. of this Order, determines that the

hexavalent chromium is more likely than not, partially or completely, due to the discharge of waste by the Discharger. The Water Board believes this should be a well-by-well comparison and does not intend for any individual hexavalent chromium values to be compared to the average background level.

30. The **affected area** is defined as all domestic wells located laterally within one mile downgradient or cross-gradient from the 3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium plume boundaries based upon monitoring well data drawn in the most current quarterly site-wide groundwater monitoring report submitted by the Discharger. The affected area may change based on new data collected and evaluated each quarter.

Other Findings

31. The Water Board recognizes the significant community interest in this site. It further acknowledges the recent formation of a Community Advisory Group and the challenges that this Group and members of the community may have in evaluating the technical aspects of this site. The Hinkley community is a rural community that includes many different income levels and ethnicities. Therefore, it is important that environmental justice is promoted by ensuring that the cleanup and abatement of the contamination of this area promotes equity and affords fair treatment, accessibility and protection for all members of the community, regardless of their race, age, culture, income or geographic location. In order to effectively participate in these matters, the Water Board believes it is essential that the community have access to independent technical consultants. The cost of this effort should be borne by the Discharger pursuant to Water Code sections 13304 and 13307.6.

32. The Water Board acknowledges that providing bottled water to residences or businesses currently served by affected wells would, on its face, satisfy the requirement for uninterrupted replacement water service, specifically since the beneficial use affected is water for consumptive purpose and bottled water could meet this need. However, environmental justice requires that bottled water not be the permanent solution for this community. In more urban communities, long-term replacement water service would likely consist of replacing the source water, thereby allowing community members total and unrestricted use of all household taps for consumptive use. Relying on long-term use of bottled water for all consumptive uses for residences that previously had the ability to consume water from any household tap interferes with the free use of their property and deprives those persons of prior quality of life expectations. In those situations where the Discharger's actions require replacement water service, it is appropriate to require that not only the quality, but also the long-term replacement water service, be comparable to that which it was prior to the adverse effect to the water supply, even if bottled water must be the source of replacement water service on an interim basis. The fact that replacement water service will likely be in place for many years increases the necessity that there be a requirement in this Order for long-term replacement water service that enables the residents of the community to use their household taps.

33. Pursuant to Water Code section 13304, the Water Board is entitled to, and may seek, reimbursement for all reasonable costs actually incurred by the Water Board to investigate unauthorized discharges of wastes or to oversee cleanup of such waste, abatement of the effect thereof, or other remedial action pursuant to this Order.

34. This Order requires workplans, monitoring, and reports pursuant to Water Code section 13267, subdivision (b). Workplans and technical reports required are essential to design a long-term water replacement plan and implementation schedule to verify compliance with this Order. Monitoring is required to verify that the interim and long-term replacement water service option(s) implemented provides water that meets the quality requirements of the Water Code and this Order.

35. The issuance of this Order is an enforcement action taken by a regulatory agency and is exempt from the provision of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.), pursuant to California Code of Regulations (CCR), title 14, section 15321, subdivision (a)(2). In addition, CEQA includes a "common sense exemption" in CCR title 14, section 15061, subdivision (b)(3), which states that where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

36. In this case, the Discharger may comply with the requirement to provide replacement water service by providing interim bottled water service and developing a permanent replacement water supply by installing wellhead treatment, establishing deeper domestic wells, or installing above-ground tanks (to store hauled water). There is no possibility that these activities would have a significant effect on the environment. Should a community water system be selected as a means of providing long-term replacement water service, the Water Board, if it is the lead agency under CEQA, will address CEQA requirements.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13267 and 13304, the Discharger must:

1. Interim replacement water supply

a. **Within five (5) days from the date of this issuance of this Order, and within five (5) days of the submittal of each quarterly report delineating a revised affected area,** supply interim uninterrupted replacement water service (i.e., bottled water or equivalent), to all those served by domestic and community wells in the affected area where those wells are determined to be "impacted" as defined in Finding No. 30 of this Order and as determined pursuant to Paragraphs 3.a. and 3.b. below. This requirement is suspended once the Discharger provides a permanent replacement water supply or the well meets the conditions specified in Paragraphs 3c or 3.d. below.

b. **Within 14 days from the date of issuance of this Order, and within 14 days of the submittal of each quarterly report delineating a revised affected area** provide a report to the Water Board listing all properties that

have been provided interim uninterrupted water service. The report must include addresses and well numbers. The report must list the bottled water service being used and the water volume being provided. The report must include documentation to show that interim water supply meets state primary and secondary drinking water standards and hexavalent chromium levels of less than 0.02 µg/L[1] or the final MCL, once that standard is adopted by CDPH. The Discharger may propose a higher standard if it can demonstrate that the hexavalent chromium levels in the affected well prior to being impacted by the discharge was higher than 0.02 µg/L. If interim water supply is denied by a property owner or occupant, provide proof or evidence of such refusal.

c. **Within 30 days of the issuance of this Order**, provide a report to the Water Board that is acceptable to the Executive Officer describing how the Discharger intends to provide interim replacement water that achieves the quality limits described in 1.b. above. This report must address the following: source(s) of the replacement water, available information on the variability of the quality of the supply water, supply chain management considerations, proposed testing frequency based on any variability information and supply chain management plans, and a contingency plan. Additionally, the Discharger must provide a report to the Water Board at least 15 days prior to changing any aspect of the method for providing interim replacement water service. However, in the case where the Discharger must change its method due to unplanned or unanticipated quality issues or availability, the Discharger may change its method without first notifying the Water Board if needed to maintain compliance with this Order. In this situation, the Discharger must submit a report to the Water Board within five (5) days of making the change that describes the changes and addresses each of the topics required in the original report.

d. **Quarterly** (as part of its quarterly reports), provide monitoring information on the quality of the replacement water service consistent with the monitoring plan submitted in 1c above or as modified by the Water Board.

2. Permanent replacement water supply

a. **By no later than 30 days from the date of this signed Order**, submit a work plan to prepare the feasibility study required in Paragraph 2.c. below. The Workplan must include a conceptual outline of the analysis of each alternative and a project management schedule for completing each major task in the feasibility study.

b. **By not later than 110 days from the date of this signed Order,** submit a status report on the progress to prepare the feasibility study which should include a

[1] For purposes of this standard, drinking water must test below the reporting limit of 0.06 µg/L due to the limitation of laboratory analysis of low levels of chromium.

summary of results through the first three months and any indications that alternatives may or may not be viable.

c. **By no later than 180 days from the date of this signed Order**, submit to the Water Board a feasibility study on method(s) to provide permanent replacement water supply for all indoor domestic uses for all impacted wells in the affected area. Permanent replacement water must meet all California primary and secondary drinking water standards and hexavalent chromium levels of less than 0.02 µg/L[2] or the final MCL, once that standard is adopted by CDPH. The Discharger may propose a higher standard if it can demonstrate that the hexavalent chromium levels in the affected well prior to being impacted by the discharge was higher than 0.02 µg/L. The feasibility study must include the following:

1) evaluate various methods to provide replacement water supply including, but not limited to: replacing individual wells with deeper individual wells, storage tanks and hauling water, providing point of entry treatment systems (evaluate at least three systems that use at least two different technologies), and an area wide or community water system by either consolidation with an existing public or private water purveyor, forming a new system (either public or private) or developing a system for two or more residences that may not involve a regulated water purveyor.
2) Discussion of the feasibility and timing to implement each method including the need and timing for permits, approvals and environmental analysis.
3) Results of pilot studies of each treatment method that is not certified to reduce hexavalent chromium to levels needed to achieve compliance with this Order.
4) An evaluation of the quantity of water (gallons per minute) that can be provided by each method and a comparison with typical household supply needs.
5) An evaluation of the quality of water that can be provided by each method in comparison with California primary and secondary drinking water standards and with levels of hexavalent chromium of less than 0.02 µg/L[3].
6) An analysis of by-products or wastes that may be generated by each method and disposal options and costs.
7) An operations, maintenance and, if appropriate, replacement plan.
8) A water quality monitoring and reporting plan to verify quality and performance of each method.
9) A complete cost analysis including construction, operations, maintenance and replacement.
10) A contingency plan to ensure uninterrupted replacement water service.

d. The Discharger must present this feasibility study to the community and determine the acceptability of each method on a community-wide and specifically

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[2] For purposes of this standard, drinking water must test below the reporting limit of 0.06 µg/L due to the limitation of laboratory analysis of low levels of chromium.

[3] For purposes of this standard, drinking water must test below the reporting limit of 0.06 µg/L due to the limitation of laboratory analysis of low levels of chromium.

from those currently being provided interim replacement water service and, if different, the owners of the impacted wells.

e. **Within 90 days of acceptance of the plan by the Water Board**, the Discharger must implement permanent replacement water service for all impacted wells. This schedule may be extended by the Water Board if it accepts a plan that requires more time to implement as demonstrated by the feasibility study.

f. **Within 120 days from the date the Water Board accepts the plan to provide permanent replacement water service**, provide a report to the Water Board listing all properties that have been provided permanent uninterrupted replacement water service. The report must include addresses and well numbers. State the method used to provide permanent uninterrupted replacement water service and provide evidence to prove that provided water meets state primary and secondary drinking water standards and contains hexavalent chromium in concentrations no greater than 0.02 µg/L[4] or the final MCL, once that standard is adopted by CDPH. The Discharger may propose a higher standard if it can demonstrate that the hexavalent chromium levels in the affected well prior to being impacted by the discharge was higher than 0.02 µg/L. If storage tanks or transportation vehicles are used to store or transport water, provide evidence of state or local government certification. If permanent replacement water supply is denied by a resident or business, provide proof or evidence of such refusal.

g. **Quarterly** (as part of its quarterly reports), provide monitoring information on the quality of the replacement water service consistent with the monitoring plan submitted in Paragraph 2.c.8 above or as modified by the Water Board.

3. Determination of impacted wells

a. **Within 45 days of issuance of this Order**, the Discharger shall propose a method or methods to perform an initial and quarterly evaluation of every domestic or community well in the affected area to determine if detectable levels of hexavalent chromium between the maximum background level and the PHG represent background conditions, or are more likely than not, partially or completely, caused by the discharge of waste by the Discharger. The proposed method or methods should take into consideration the factors listed in Finding No. 26 of this Order.

b. **Within 10 days of acceptance** by the Water Board Executive Officer of the proposal in 3.a. above and as part of all quarterly submittals providing new groundwater and domestic well sampling results, the Discharger shall submit an evaluation of domestic and community wells in the affected area and the results of its determination of whether or not the well is impacted.

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[4] For purposes of this standard, drinking water must test below the reporting limit of 0.06 µg/L due to the limitation of laboratory analysis of low levels of chromium.

c. The Discharger may remove a well that was determined to be impacted due to total chromium levels above 3.2 µg/L or hexavalent chromium levels above 3.1 µg/L from impacted status if analytical results from four (4) consecutive quarters are below the above levels and the well does not meet the criteria for being designated as impacted by the accepted methods in 3.a. above.

d. The Discharger may remove a well that was determined to be impacted due to an evaluation using the accepted methods in 3.a. above from impacted status if the results of hexavalent chromium from four (4) consecutive quarters demonstrate that the well is no longer impacted based on the approved methods described in 3.a. above.

e. The Discharger may also provide evidence that the concentration of hexavalent chromium that is above 3.1 µg/L in a domestic or community well within the affected area is not due to its discharge and therefore be relieved of the requirement to provide replacement water service.

4. Independent Consultants

a. The Discharger must develop a process to fund an independent consultant(s) that can advise the community on matters subject to regulation by the Water Board. The independent consultant(s) selected by the community must not be involved in any aspect of this site (consulting for PG&E or involved in any litigation) and be acceptable to PG&E and the Water Board.

b. **Within 60 days of issuance of this Order**, the Discharger must develop a formal agreement with the community to implement this requirement. The Community Advisory Committee is the only existing group that may currently be viewed as representing the community. This Committee, a subset of the Committee or a totally different group would be acceptable as representing the community. It is also acknowledged that there are likely many divergent views in the community and that one group may not fully represent the spectrum of these views. The Water Board will monitor the Discharger's progress to implement this requirement and will modify this schedule if it determines that additional time is needed to develop an agreement acceptable to the community and will eliminate this requirement if the community rejects the need for independent consultants.

Order No. R6V-2011-0005

This Order amends Orders 1 and 2 in CAO R6V-2011-0005 for providing replacement water supply and submitting reports to the Water Board. All other Orders in CAO R6V-2011-0005 remain in effect unless later modified by the Water Board, the Water Board's Executive Officer, or his/her designated representative.

Laboratory Analysis

All future analysis of water samples must utilize the most recent testing methods. Testing for Total Chromium analysis must be done using US EPA Methods SW 6010B or 6020A to a reporting limit of 1 ppb. Testing for Hexavalent Chromium must be conducted in accordance with a modified version of EPA Method SW 218.6 with a reporting limit of 0.06 ppb.

The EPA has recently determined that detection limits of 0.02 ppb for hexavalent chromium are possible using a modified version of Method SW 218.6. These modifications allow for improved low concentration measurement and are outlined in Dionex Corp. Application Update 144 "Determination of Hexavalent Chromium in Drinking Water by Ion Chromatography" found at www.dionex.com/en-us/webdocs/4242-AU144_V18.pdf. The EPA determined that these modifications allow laboratories to attain a detection limit as low as 0.02 µg/L and can support a reporting limit of 0.06 µg/L (ppb). Information about the modified version of Method SW 218.6 is available at: http://water.epa.gov/drink/info/chromium/guidance.cfm.

The laboratory used must be certified by the California Environmental Laboratory Accreditation Program (ELAP) for hexavalent chromium analysis in drinking water. A list of certified labs is maintained by ELAP and is available at: (http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Chromium6.aspx)

Liability for Oversight Costs Incurred by Water Board

The Discharger shall be liable, pursuant to Water Code section 13304, to the Water Board for all reasonable costs incurred by the Water Board to investigate unauthorized discharges of waste, or to oversee clean up of such waste, abatement of the effects thereof, or other remedial action, pursuant to this Order. The Discharger shall reimburse the Water Board for all reasonable costs associated with site investigation, oversight, and cleanup. Failure to pay any invoice for the Water Board's investigation and oversight costs within the time stated in the invoice (or within thirty days after the date of invoice, if the invoice does not set forth a due date) shall be considered a violation of this Order. If the Property is enrolled in a State Water Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program.

Certifications for All Plans and Reports

All technical and monitoring plans and reports required in conjunction with this Order are required pursuant to Water Code section 13267 and shall include a statement by the Discharger, or an authorized representative of the Discharger, certifying (under penalty of perjury in conformance with the laws of the State of California) that the workplan and/or report is true, complete, and accurate. Hydrogeologic reports and plans shall be prepared or directly supervised by, and signed and stamped by a Professional Geologist or Professional Civil Engineer registered in California.

No Limitation of Water Board Authority

This Order in no way limits the authority of this Water Board to institute additional enforcement actions or to require additional investigation and cleanup of the site consistent with the Water Code. This Order may be revised by the Executive Officer as additional information becomes available.

Enforcement Options for Noncompliance with the Order

Failure to comply with the terms or conditions of this Cleanup and Abatement Order may result in additional enforcement action, which may include the imposition of administrative civil liability pursuant to Water Code sections 13350 and 13268 or referral to the Attorney General of the State of California for such legal action as he or she may deem appropriate.

Right to Petition: Any person aggrieved by this action of the Lahontan Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must *receive* the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, of state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

Ordered by: Harold J. Singer Dated: Oct 11, 2011

HAROLD J. SINGER
EXECUTIVE OFFICER