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23 STATE OF CALIFORNIA

24 STATE WATER RESOURCES CONTROL BOARD

25 IN THE MATTER OF LAHONTAN
26 REGIONAL WATER QUALITY
27 CONTROL BOARD FAILURE TO
28 AMEND CLEANUP AND ABATEMENT
ORDER NO. R6V-2011-0005A2

PETITION FOR REVIEW AND
MEMORANDUM OF POINTS
AND AUTHORITIES IN
SUPPORT THEREOF; REQUEST
FOR ABEYANCE

1 This *Petition for Review and Memorandum of Points and Authorities in Support Thereof* is
2 respectfully submitted to the California Water Resources Control Board (“State Board”) on behalf
3 of Pacific Gas and Electric Company (“PG&E” or “Petitioner”) pursuant to Water Code Sections
4 13320 *et seq.* and California Code of Regulations (“CCR”) Title 23, Section 2050 *et seq.*, for
5 review of the Executive Officer of the Regional Water Quality Control Board-Lahontan Region’s
6 (“Regional Board”) failure to amend Cleanup and Abatement Order No. R6V-2011-0005A2
7 (WDID NO. 6B369107001) (“2012 CAO”) with respect to the Hinkley Compressor Station located
8 at 35863 Fairview Road (APN 048S-112-52) in Hinkley, California. A copy of the 2012 CAO is
9 attached hereto as Exhibit A. PG&E hereby requests that this petition be immediately placed into
10 abeyance so that further discussions may occur with the Regional Board regarding these issues.

11 Petitioner requests that the State Board direct the Regional Board to amend the 2012 CAO as
12 requested in PG&E’s September 3, 2013 formal request for modification. A copy of PG&E’s
13 September 3, 2013 request is attached hereto as Exhibit B. As more fully described below, the
14 2012 CAO contains multiple provisions that are not supported by existing facts, data, or California
15 law, and exceed the Regional Board’s authority under the Water Code and State Board Resolution
16 No. 92-49. Specifically, the 2012 CAO improperly requires PG&E to provide replacement water
17 for wells with chromium concentrations at or above the 0.06 µg/L detection limit, which is over 800
18 times lower than the 50 µg/L standard for total chromium currently applicable to all other water
19 purveyors in California, and over 160 times lower than the proposed 10 µg/L drinking water
20 standard for hexavalent chromium. The 2012 CAO also requires replacement water for wells below
21 natural background chromium levels set by the Regional Board and outside the conservatively
22 depicted chromium plume area. In doing so, the 2012 CAO creates unjustified public concern over
23 drinking water quality in wells that contain chromium concentrations less than the natural
24 background levels established by the Regional Board and existing and draft state drinking water
25 standards. As a result of this concern, many Hinkley residents elected to sell their property to
26 PG&E and leave the community. Finally, the 2012 CAO requires the unnecessary expenditure of
27 funds to install factually and legally unnecessary whole house water treatment systems.

1 As a result of these facts, PG&E submitted a formal request to the Regional Board Executive
2 Officer to amend the 2012 CAO in an effort to preserve the remaining community. (Exhibit C,
3 Declaration of Sheryl Bilbrey, at ¶6.) Unfortunately, PG&E's request was denied by the Executive
4 Officer and PG&E is forced to seek relief from the State Board. A copy of the Regional Board
5 Executive Officer's November 19, 2013 denial of PG&E's request to modify the 2012 CAO is
6 attached hereto as Exhibit D. In denying PG&E's request, the Executive Officer's stated reason
7 was the possibility of future changes to the WHW program as a result of the anticipated final
8 drinking water standard and the State Board's pending review of the Regional Board's plume
9 drawing CAO in another pending PG&E petition. (Exhibit D at 1-2.) PG&E contends that neither
10 of these future events justify ignoring the current problems with the CAO.

11 History of Petitioner's Replacement Water Program

12 The current California drinking water standard for total chromium (which includes
13 hexavalent chromium) is 50 µg/L. The draft California drinking water standard specifically for
14 hexavalent chromium is 10 µg/L. Over the last few years, PG&E has taken a total of approximately
15 2,500 samples from more than 400 domestic wells in Hinkley. Data from those samples show that:

16 • All of the domestic water supply wells in Hinkley are below the existing California
17 drinking water standard for total chromium of 50 µg/L, without any treatment.

18 • All of the domestic water wells in Hinkley are below the newly proposed drinking
19 water standard for hexavalent chromium of 10 µg/L, without any treatment.

20 • All of the wells in Hinkley contain lower hexavalent chromium levels than those
21 found in municipal water supplies in numerous communities across the state of California such as
22 Apple Valley, Davis, and others.

23 (Bilbrey Dec. at ¶8.)

24 Despite the fact that all domestic wells in Hinkley have chromium detections significantly
25 below the drinking water standards, in 2010, in an effort to remove the community's health
26 concerns so that remediation could move forward, PG&E voluntarily began providing bottled water
27 to all residents with wells located up to one mile outside of the plume of chromium-impacted
28

1 groundwater relating to PG&E’s past activities in Hinkley, California. (Bilbrey Dec. at ¶1.) Thus,
2 when the former Regional Board Executive Officer issued an order on January 7, 2011, requiring
3 bottled water for wells containing chromium levels above natural background, PG&E was already
4 providing bottled water to a much larger number of well owners in the area up to one mile beyond
5 the 3.1 µg/L plume boundary. (*Id.*)

6 However, on October 11, 2011, the former Regional Board Executive Officer dramatically
7 expanded the replacement water requirement by issuing Amended Cleanup and Abatement Order
8 No. R6V-2011-0005A1 (“2011 CAO”), attached hereto as Exhibit E. The 2011 CAO required that
9 PG&E provide interim bottled water *and* permanent whole house water to all well owners within
10 one mile of the plume, unless PG&E could demonstrate that any chromium in the wells (at any
11 detectable level) was not attributable to PG&E’s activities. On October 25, 2011, PG&E filed a
12 petition with the State Board challenging the 2011 CAO. (Bilbrey Dec. at ¶2.) PG&E’s petition
13 contended (in part) that the 2011 CAO was not supported by California law in that it required
14 replacement water for wells that contained hexavalent chromium concentrations that were below
15 naturally occurring background levels for the Hinkley area, as set by the Regional Board, and at
16 levels below the controlling total chromium drinking water standard.¹ (*Id.*)

17 While PG&E’s petition and request for a stay of the 2011 CAO were pending with the State
18 Board, PG&E was faced with the difficult choice of either attempting to comply with the 2011
19 CAO that PG&E believed was invalid, or refusing to comply at the risk of penalties for non-
20 compliance. (Bilbrey Dec. at ¶3.) Therefore, while the State Board was reviewing PG&E’s
21 petition and request for a stay of the 2011 CAO, PG&E prepared a voluntary Whole House Water
22 (“WHW”) replacement program and presented it to the Regional Board. (*Id.*) The Regional Board
23 agreed to allow PG&E to implement the voluntary replacement water program and agreed to
24 suspend the operation of some of the requirements of the 2011 CAO, as long as PG&E
25 implemented the voluntary WHW program. The Regional Board formalized the Board’s position
26 by issuing the 2012 CAO. (*Id.*) The 2012 CAO stated that the key provisions of the 2011 CAO

27
28 ¹ PG&E’s petition challenging the 2011 CAO contains additional legal challenges to the 2011 CAO that also apply to the Regional Board’s current refusal to modify the 2012 CAO. Those challenges are not repeated herein.

1 would be suspended as long as PG&E continued to implement the voluntary WHW program.
2 (Exhibit A at 4-5.) The 2012 CAO also contained an important clarification that PG&E's
3 obligation to provide replacement water under the 2011 and 2012 CAOs would end for any well
4 containing hexavalent chromium levels below the final hexavalent chromium drinking water
5 standard (MCL) once that standard is final in California. (*Id.* at 5.)²

6 PG&E implemented the WHW program immediately and has been operating the WHW
7 program since June 2012. (Bilbrey Dec. at ¶4.) PG&E's WHW program is an unprecedented
8 program that offers whole house replacement water to Hinkley residents living within one mile of
9 the hexavalent chromium plume boundary, if their domestic well has any detection of hexavalent
10 chromium, i.e., any amount above the 0.06 parts per billion (µg/L) detection limit. (*Id.*)
11 Unfortunately, despite the best efforts of PG&E, the 2011 and 2012 CAOs have created many
12 problems for Hinkley residents. For example, even though PG&E frequently communicates that
13 the replacement water program is not based on risk and is intended to eliminate public concerns
14 regarding water use in Hinkley, residents continue to make statements indicating that they are
15 concerned about their water, at least partially because replacement water is required and/or is being
16 provided. (*Id.* at ¶5.) A related problem is the large number of Hinkley residents electing to sell
17 their property to PG&E and move from the area. In response to repeated and widespread
18 community requests, PG&E offered to purchase at fair market value, at the election of the property
19 owner, any property within the replacement water program area in lieu of installing a water
20 treatment system. Surprisingly, a large percentage of the eligible property owners declined the
21 water treatment system option, and instead elected to sell their property to PG&E. (*Id.*)

22 PG&E's Proposed Revisions to the Replacement Water Program

23 On August 23, 2013, the State of California issued a proposed hexavalent chromium drinking
24 water standard of 10 µg/L (substantially higher than the 0.06 µg/L concentration that currently
25 triggers the WHW program under the 2011 and 2012 CAOs). (CDPH Chromium MCL Update,
26 available at <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/chromium6.aspx>.) A final

27 ² CDPH issued a draft MCL for hexavalent chromium in August 2013. The draft MCL is expected to be finalized in
28 August 2014. Until the draft MCL for hexavalent chromium is finalized, the existing total chromium MCL of 50 µg/L
governs all chromium in drinking water, including hexavalent chromium.

1 drinking water standard is expected by August 2014. After careful review of the existing WHW
2 program, significant experience implementing the program over the last year, and consideration of
3 the proposed hexavalent chromium drinking water standard, PG&E determined that eligibility for
4 additional residents to enter the WHW program should be modified pending the final drinking
5 water standard. (Bilbrey Dec. at ¶6.) Specifically, on September 3, 2013, PG&E formally
6 requested that the Regional Board amend the 2012 CAO to allow PG&E to modify the WHW
7 program's future eligibility provisions. (Exhibit B.) PG&E's requested modification to the WHW
8 program eligibility provisions would provide:

9 • Currently Eligible Residents: PG&E proposed no changes for currently
10 eligible residents residing within one mile of the Second Quarter 2013 plume boundary. Simply
11 put, residents who were currently eligible for the program would remain in the program with no
12 changes.

13 • Future Potentially Eligible Residents While the Drinking Water Standard is
14 Being Finalized: PG&E proposed that, should future depictions of the hexavalent chromium
15 plume boundary extend beyond the Second Quarter 2013 plume boundary and one-mile buffer
16 (the then current WHW program area), additional residents within the new hexavalent chromium
17 plume boundary with domestic well hexavalent chromium detections below the current
18 background level of 3.1 µg/L would still receive bottled water. Any additional residents within
19 the new hexavalent chromium plume boundary with hexavalent chromium detections above the
20 current background level of 3.1 would be eligible for a full whole house water treatment system.
21

22 • Future Potentially Eligible Residents After the Drinking Water Standard is
23 Finalized: As stated in the 2012 CAO, PG&E's obligation to provide replacement water under
24 the 2011 and 2012 CAOs will end for any wells with four consecutive quarters of hexavalent
25 chromium levels below the final hexavalent chromium drinking water standard (MCL).

26 (Exhibit B at 4-5.)
27
28

1 On November 19, 2013, the Regional Board Executive Officer denied PG&E's request to
2 modify the 2012 CAO. (Exhibit D at 1.) The Executive Officer stated that she preferred not to
3 make changes to the 2012 CAO because the hexavalent chromium MCL and PG&E's pending
4 petition regarding plume depiction requirements would likely be finalized and/or resolved in 2014.
5 (*Id.* at 1-2.) PG&E contends that the Executive Officer's failure to amend the 2012 CAO is not
6 supported by California law. PG&E files this petition asking the State Board to require the
7 Regional Board to modify the 2012 CAO to allow PG&E to implement the requested modifications
8 to the WHW program. Without the requested modifications, PG&E will continue to be required to
9 provide replacement water to wells with concentrations below existing and draft drinking water
10 standards, below natural background levels set by the Regional Board, and which are outside the
11 conservatively depicted plume area, contrary to California law. Moreover, without the requested
12 modifications, the many problems created by the 2011 and 2012 CAOs will continue and likely
13 multiply.

14 California law provides that any person aggrieved by a failure to act of a Regional Board
15 may petition the State Board within a thirty (30) day period in accordance with Water Code section
16 13320 *et seq.* and CCR tit. 23, section 2050 *et seq.* PG&E has filed this *Petition for Review* upon
17 the failure to act by the Regional Board, and within the 30-day deadline. As with the circumstances
18 surrounding the 2011 CAO, Petitioners are once again faced with the prospect of either complying
19 with the existing CAO that would require replacement water for wells that are below existing and
20 draft drinking water standards, are below natural background levels set by the Regional Board, and
21 are outside the conservatively depicted plume area, or refusing to comply with the CAO and risking
22 enforcement actions, including penalties. As such, Petitioner requests that the State Board direct
23 the Regional Board to amend the 2012 CAO as requested in PG&E's September 3, 2013 formal
24 request for modification.³

25
26
27
28 ³ Given the urgency of this response, Petitioner requests the right to supplement this petition further.

1. **NAME AND ADDRESS OF PETITIONER**

The contact information for Petitioners is as follows:

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2. **SPECIFIC ACTION OR INACTION FOR WHICH THIS PETITION FOR REVIEW IS SOUGHT**

Petitioner requests review of the Regional Board's failure to act to modify the 2012 CAO in response to PG&E's September 3, 2013 formal request for modification of Cleanup and Abatement Order No. R6V-2011-0005A2 (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, dated June 7, 2012.

1 3. **DATE THE REGIONAL BOARD ACTED OR FAILED TO ACT**

2 The date of the Lahontan Regional Board's failure to act is November 19, 2013, the date the
3 Regional Board Executive Officer informed PG&E that she would not modify the 2012 CAO.

4
5 4. **STATEMENT OF REASONS THE ACTION IS INAPPROPRIATE OR IMPROPER**

6 The failure to modify the 2012 CAO was inappropriate and improper for the following
7 reasons:

- 8
9 (a) Future compliance with the 2011 and 2012 CAOs would require Petitioner
10 to provide replacement water to wells that are below existing and draft
11 drinking water standards, are below natural background levels set by the
12 Regional Board, and are outside the conservatively depicted chromium
13 plume in Hinkley, and the CAOs are creating unnecessary concern and cost.
14 (b) Without modification, the 2012 CAO would require costly replacement
15 water systems with no public or private benefit.
16 (c) California law does not authorize the Regional Board to require replacement
17 water in these circumstances.

18 5. **THE MANNER IN WHICH PETITIONER IS AGGRIEVED**

19 Petitioner is aggrieved by the Regional Board's failure to amend the 2012 CAO, which
20 requires the installation of costly replacement water treatment systems for wells that have not been
21 affected by PG&E's activities. PG&E is being held to a different and unreasonable standard
22 compared to all other California water purveyors.

23 6. **PETITIONER'S REQUESTED ACTION BY THE STATE BOARD**

24 Petitioner respectfully requests that the State Board instruct the Regional Board to modify the
25 2012 CAO to incorporate PG&E's requested changes and any other changes the State Board deems
26 appropriate to the future eligibility provisions for replacement water.

27 7. **MEMORANDUM OF POINTS AND AUTHORITIES**

28 **I. Neither California Law Nor The Facts Support Requiring Petitioner To Provide
Replacement Water To Wells That Contain Hexavalent Chromium At Levels That Are
Below Existing And Draft Drinking Water Standards, Are Below Natural Background
Levels Set By The Regional Board, And Are Located Outside The Conservatively**

1 **Depicted Hexavalent Chromium Plume; And, Compliance With The CAOs Would**
2 **Create Unnecessary Public Concern, Community Impact, And Monetary Costs.**

3 The 2011 and 2012 CAOs are based on the Regional Board’s unsupported position that the
4 Public Health Goal “PHG” (of 0.02 µg/L for hexavalent chromium) should be used as the trigger
5 for requiring replacement water. The reliance on the PHG is improper for multiple reasons (as
6 outlined in PG&E’s petition challenging the 2011 CAO), including that there is an existing total
7 chromium MCL (50 µg/L) that applies to hexavalent chromium. The 2011 CAO’s reliance on the
8 PHG is even more improper now with the publication of a draft MCL for hexavalent chromium (10
9 µg/L). There is simply no basis in California law or the facts in Hinkley (including that the
10 Regional Board established the natural background level for hexavalent chromium in Hinkley at 3.1
11 µg/L) to rely on the 0.02 µg/L PHG as the trigger for requiring replacement water in Hinkley.⁴

12 Ongoing compliance with the CAOs would require Petitioner to provide replacement water
13 to wells with concentrations below existing and draft drinking water standards, below natural
14 background levels set by the Regional Board, and which are outside the conservatively depicted
15 plume area in Hinkley. In addition, the CAOs are creating significant harm in the form of
16 unnecessary public concern over water safety and unnecessary costs for treatment of water that is
17 outside the plume area at concentrations below the established natural background number. As a
18 result, the CAOs are not supported by California law or the facts pertaining to Hinkley.

19 **(A) Until The Draft Hexavalent Chromium Drinking Water Standard Is Final, The**
20 **50 µg/L State Standard For Chromium Is The Appropriate Standard For Triggering**
21 **Replacement Drinking Water, And All Wells In The “Affected Area” Meet This**
22 **Standard**

- 23 (i) The 50 µg/L Total Chromium MCL Currently Applies to Hexavalent
24 Chromium.

25 California law mandates that public water systems comply with primary MCLs. The
26 California Department of Public Health (“CDPH”), the entity that sets drinking water standards in
27 California, specifically states “Chromium-6 is currently regulated under the 50-micrograms per liter

28 ⁴ Current laboratory test methods cannot even reliably test for hexavalent chromium at the 0.02 µg/L level.

1 (µg/L) MCL for total chromium.” (CDPH Chromium MCL Update, *available at*
2 <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/chromium6.aspx>.) In fact, the CDPH notes
3 that, “[t]he total chromium MCL was established to address exposures to chromium-6, which is
4 considered to be the more toxic form of chromium.” (*Id.*)

5 In contrast to an MCL, which sets the standard for safe drinking water, a PHG is a non-
6 enforceable goal that CDPH later uses to then develop an enforceable regulatory standard. CDPH
7 can set the MCL above the level of the PHG. In almost all cases, the PHG associated with a
8 constituent is lower than the MCL.

9 The OEHHA announcement of the final PHG for hexavalent chromium, issued on July 27,
10 2011, reiterates these points in stating: “An MCL is an enforceable standard. This means that
11 when an MCL is established for a specific contaminant, the level of that contaminant in public
12 drinking water systems must not exceed the MCL. The PHG is not an enforceable standard.”
13 (OEHHA Fact Sheet - Final Public Health Goal for Hexavalent Chromium, 07/27/11, *available at*
14 http://oehha.ca.gov/public_info/facts/Cr6facts072711.html.)

15 In contrast to the MCL, an information sheet developed the same day that OEHHA issued its
16 final hexavalent chromium PHG stated:

17 A PHG is NOT a boundary line between a “safe” and “troubling”
18 level of a contaminant. Drinking water can still be acceptable for
19 public consumption if it contains contaminants at levels higher
20 than the PHG.

21 (*Id.*)

22 California law states that the applicable safe drinking water standard for hexavalent
23 chromium is the MCL of 50 µg/L. The CAOs requiring PG&E to supply replacement water for
24 wells in excess of the PHG (0.02 µg/L) are contrary to these drinking water regulations. The
25 existence of a draft MCL of 10 µg/L for hexavalent chromium makes it even more improper to rely
26 on the PHG as the trigger to require replacement water.

- 27 (ii) All Wells in the “Affected Area” Meet the Applicable Total Chromium
28 MCL and the Draft Hexavalent Chromium MCL.

1 There are no drinking water wells in use in Hinkley with hexavalent chromium levels above
2 the 50 µg/L total chromium California drinking water standard. (Bilbrey Dec. at ¶8.) In addition,
3 there are no drinking water wells in use in Hinkley with hexavalent chromium levels above the 10
4 µg/L draft hexavalent chromium drinking water standard. In addition, the highest current level of
5 hexavalent chromium at any drinking water well in Hinkley is 8.6 µg/L, which falls below both the
6 current statewide standards for safe drinking water (50 µg/L for total chromium) and the proposed
7 hexavalent chromium specific standard (10 µg/L for hexavalent chromium). (*Id.*) As such, all
8 wells in the “Affected Area” as defined by the CAOs meet the current and applicable MCL as well
9 as the draft MCL.

10 **(B) The Regional Board Misreads *In the Matter of the Petition of Olin Corporation***
11 ***and Standard Fusee, And Sets A Troubling Precedent With Statewide Implications***

12 The Regional Board attempted to rest the 2011 CAO on a prior State Board Order (Order
13 WQ 2005-0007). (2011 CAO at 5-7.) However, the State Board decision relied upon by the
14 Regional Board, *In the Matter of the Petition of Olin and Standard Fusee* (“*Olin*”) does not support
15 the 2011 CAO because:

16 • Here, there is an MCL covering hexavalent chromium (as a constituent of
17 total chromium) as well as a draft MCL for hexavalent chromium, but in *Olin* there was no MCL
18 nor draft MCL for the contaminant in question.

19 • Here, the 3.1 µg/L background concentration of hexavalent chromium is
20 higher than the PHG, but in *Olin* the background concentration of the contaminant in question was
21 below the PHG.

22 *Olin’s* importance must be considered in light of the relevant statutes. Water Code section
23 13304(a) permits a Regional Board to order a discharger to provide replacement water service. In
24 *Olin*, the State Board interpreted that provision in the context of a cleanup and abatement order
25 requiring Olin Corporation and Standard Fusee to provide replacement water service to owners of
26 private domestic wells affected by discharges of potassium perchlorate. At the time Olin
27 commenced the replacement water service in 2002, there was no enforceable State or federal
28 standard for potassium perchlorate in drinking water. Nonetheless, Olin provided replacement

1 water to owners of domestic wells in which perchlorate concentrations exceeded 4 µg/L, the then-
2 operative notification level set by the Department of Health Services (DHS—now CDPH). There
3 were no known sources of natural background perchlorate, but anthropogenic sources in the area
4 were responsible for background levels between 2 and 5 µg/L.

5 In April 2004, OEHHA issued a PHG of 6 µg/L for perchlorate. Following the publication
6 of the PHG, Olin sought approval from the Central Coast Regional Water Quality Control Board to
7 raise the level of contamination requiring replacement water service to 6.0 µg/L to match the PHG
8 and filed a petition with this Board objecting to the 4.0 µg/L trigger. The State Board concluded,
9 “where no federal, State or local standard yet exists, it is appropriate to use goals developed by
10 agencies with expertise for public health determinations in deciding whether replacement water
11 service is necessary.” Thus, in the absence of any standard and with a background level below the
12 PHG, the Regional Board embraced the perchlorate PHG as a replacement water standard and
13 ordered the regional board to increase the trigger for replacement water to the level of the new
14 PHG.

15 In contrast to *Olin*, an MCL exists for total chromium that specifically includes hexavalent
16 chromium. In addition, a draft MCL specifically for hexavalent chromium also now exists. As
17 such, the unique circumstances in *Olin* that required a Regional Board to stand in the shoes of
18 CDPH and improvise a drinking water standard are absent here. Furthermore, *Olin* involved a
19 scenario in which the background level of the contaminant in question was below an established
20 PHG. In the case of Hinkley, however, the background concentration of hexavalent chromium, 3.1
21 µg/L, vastly exceeds the PHG level of 0.02 µg/L. Thus, unlike *Olin*, enforcing the hexavalent
22 chromium PHG as a drinking water standard would require PG&E to provide replacement water for
23 wells containing less hexavalent chromium than what naturally exists in groundwater in the Hinkley
24 Valley.

25 The 2011 CAO also violates State Board Resolution No. 92-49, which provides:

26 [U]nder no circumstances shall [policies and procedures for
27 cleanup and abatement of discharges] be interpreted to require
28 cleanup and abatement which achieves water quality

1 conditions that are better than background conditions.

2 This experience of the WHW program at Hinkley underscores the statewide implications of
3 imposing a PHG as a drinking water standard. At the very least, the *Olin* decision should not be
4 used to supplant an enforceable MCL and a draft MCL.

5 **(C) California Law Does Not Allow The Regional Board To Require PG&E To Provide**
6 **Replacement Water To Wells That Have Not Been Affected By Petitioner's Actions**

7 Water Code Section 13304(a) states: “A cleanup and abatement order issued by the state
8 board or a regional board may require the provision of, or payment for, uninterrupted replacement
9 water service, which may include wellhead treatment, to each *affected* public water supplier or
10 private well owner.” (Emphasis added.) The limit of the Regional Board’s authority is the ability
11 to require replacement water to “affected” wells, not to unaffected wells.

12 The 2011 and 2012 CAOs currently require that PG&E provide replacement water to wells
13 that extend up to one mile outside the conservatively depicted plume boundary. For example, the
14 2011 CAO defines the “affected area” as “all domestic wells located laterally within one mile
15 downgradient or cross-gradient from the 3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium
16 plume boundaries” (Exhibit E at 8.) Similarly, the 2012 CAO states: “The affected area will
17 continue to be defined to include all domestic wells located laterally within one mile downgradient
18 or cross-gradient from the contiguous, including contiguous areas depicted with dashed lines, 3.1
19 µg/L hexavalent chromium or 3.2 µg/L total chromium plume boundaries” (Exhibit A at 2.)

20 In the face of a total chromium MCL of 50 µg/L that applies to hexavalent chromium, a draft
21 hexavalent chromium MCL of 10 µg/L, and a natural background value of 3.1 µg/L hexavalent
22 chromium or 3.2 µg/L total chromium, there is no support for including all wells at any chromium
23 concentration up to one mile outside the 3.1/3.2 µg/L plume boundary in the “affected” area. This
24 enormous geographic buffer zone is unprecedented. PG&E has not identified any other examples
25 of a regulatory order requiring bottled or replacement water one mile outside a plume boundary.

26 Ironically, the one mile buffer concept appears to have originated with PG&E’s initial offer
27 of bottled water to Hinkley residents that reside within one mile of the plume boundary. (Bilbrey
28

1 Dec. at ¶7.) PG&E's original bottled water offer was an effort to eliminate any health concerns
2 from drinking water, regardless of the lack of risk, in order for the remediation to proceed
3 unimpeded and to respond to community concerns. (*Id.*) Unfortunately, PG&E's original
4 voluntary offer of bottled water that included a one-mile buffer zone has now been incorporated
5 into CAO requirements issued by the Regional Board. However, there has never been any
6 scientific or regulatory basis for the one-mile buffer zone and there is certainly no scientific or
7 regulatory basis for the one-mile buffer zone included in either of the replacement water CAOs.
8 PG&E carefully monitors the plume and nearby domestic wells with quarterly sampling of
9 hundreds of monitoring and domestic wells. (*Id.*) With careful monitoring, there is no basis for a
10 one mile buffer zone around the plume. (*Id.*) As such, CAO provisions requiring a one mile buffer
11 zone for replacement water are not only unprecedented, but also without any support in California
12 law.

13 Not only does the 2011 CAO impose a one-mile buffer beyond the plume for requiring
14 replacement water, but it also places the burden on PG&E to demonstrate that any chromium found
15 above the PHG (i.e., at any detectable level) in any well within the one-mile buffer area is unrelated
16 to PG&E. (Exhibit E at 12-13.) This requirement turns due process on its head. The 2011 CAO
17 requires that PG&E provide replacement water to any well located within one-mile of the very
18 conservatively drawn plume boundary (as described below), unless PG&E can prove to the
19 Regional Board that any detectable chromium in any well inside the one-mile buffer is not from
20 PG&E's discharge. (*Id.*)

21 This requirement is inconsistent with the language of Water Code Section 13304(a) that only
22 provides the Regional Board with authority to require replacement water for "affected" wells.
23 Section 13304(a) does not provide the Regional Board with the power to draw a one-mile circle
24 around an area of contamination and simply assume that all wells in the circle are affected unless
25 proven otherwise by PG&E. This is particularly true in the context of a naturally occurring
26 background value of 3.1 µg/L formally adopted by the same Regional Board. On the one hand, the
27 Regional Board has stated that hexavalent chromium levels up to 3.1 µg/L are naturally present in
28 this area. On the other hand, the 2011 CAO requires that PG&E provide replacement water for

1 wells containing levels of chromium as low as 0.02 µg/L, unless PG&E is able to prove that part per
2 trillion levels of chromium outside the plume boundary are unrelated to PG&E. This is an unfair
3 burden and the Water Code does not include any language indicating a legislative authorization to
4 impose such a burden.

5 **(D) PG&E Would Incur Significant Costs To Provide Replacement Water To Meet The**
6 **Overreaching And Improper Standards Outlined In The 2011 And 2012 CAOs**

7 The significant cost of providing whole house replacement water must be considered,
8 particularly when compared to the lack of justification for the requirements. PG&E's whole house
9 replacement water individual well treatment units cost more than \$50,000 each, plus thousands of
10 dollars in operation and maintenance. (Bilbrey Dec. at ¶9.) Without modification of the 2012 CAO
11 as outlined in PG&E's request to the Regional Board, PG&E would incur significant costs to
12 install, operate, and maintain treatment units for wells that are not even within the extremely
13 conservatively drawn plume boundary, and that meet all current or draft drinking water standards,
14 and that are below natural background levels.

15 **(E) The Current, Unrevised CAOs Create Unnecessary and Unfounded Public Concern**
16 **Regarding The Safety Of Drinking Water**

17 Another consequence of the 2011 and 2012 CAOs and the resulting current replacement
18 water program is the public concern raised by the regulatory actions that result in the incorrect
19 public conclusion that the Regional Board would only require replacement water if there were
20 actual known risks to human health. Even though PG&E frequently communicates that the
21 replacement water program is not based on risk, residents continue to make statements, (not
22 corrected by Regional Board staff), indicating that they are concerned about their water at least
23 partially because replacement water is required and/or is being provided. (Bilbrey Dec. at ¶5.) It is
24 clear that ongoing replacement water requirements for wells outside the plume boundary will
25 continue to foster public concern without any factual basis.

1 **II. Reducing The Future Replacement Water Program Boundary Would Still Provide**
2 **Replacement Water For All Wells In A Conservatively Defined Plume Area.**

3 PG&E's proposed modifications to the replacement water program eligibility provisions in
4 the 2012 CAO would result in a program that still provides replacement water for all wells in a
5 conservatively defined plume area. There will be significant public and private costs if the 2012
6 CAO is not modified and there will be no public or private benefit. As a result, PG&E asks that the
7 2012 CAO be modified as described herein.

8 PG&E's requested modification to the WHW program would maintain the program for all
9 well owners within one mile of the Second Quarter 2013 plume boundary. (Exhibit B at 4.) The
10 proposed modification would only change the eligibility criteria for the program for future plume
11 depictions that are more than one mile larger than the plume boundary drawn at the time of PG&E's
12 proposal.⁵ (*Id.*) In that case, PG&E proposes to supply whole house replacement water treatment
13 systems for any well located within the new plume boundary containing hexavalent chromium
14 levels higher than the current natural background level of 3.1 µg/L set by the Regional Board. (*Id.*)
15 In addition, PG&E proposes to provide bottled water to any other well owner located within a new
16 plume boundary. (*Id.*) This proposed modification would provide replacement water for all
17 potentially affected wells within the conservatively drawn plume. In addition, all domestic wells in
18 Hinkley already meet the recently proposed drinking water standard of 10 µg/L for hexavalent
19 chromium, and the 2012 CAO ends PG&E's obligation to provide replacement water for all wells
20 that meet the final hexavalent chromium drinking water standard once the standard becomes final in
21 2014.

22 **(A) The Regional Board-Dictated Plume Boundary Ignores Data and Science, Resulting**
23 **In An Artificially Large Plume Boundary and PG&E's Proposed Modification To The**
24 **Replacement Water Program Boundary Would Cover All Potentially Affected Wells**
25 **Within That Conservative Plume Boundary**

26 _____
27 ⁵ PG&E is required to produce a new plume map every quarter. (Bilbrey Dec. at ¶12.) The 2011 and 2012 CAOs
28 require the replacement water program boundary to be expanded to cover a one-mile buffer outside the new plume
boundary each quarter. PG&E's proposed modification to the replacement water program would stop extending the
one-mile buffer after the second quarter 2013 plume boundary. (Exhibit B at 4.)

1 Because PG&E is not proposing any changes for currently eligible residents, the existing
2 one mile buffer from the 2013 second quarter plume boundary already provides a hefty margin of
3 conservatism to PG&E's WHW program. (Bilbrey Dec. at ¶7.) All residents within one mile of the
4 2013 second quarter plume map will continue to be eligible for the program while the hexavalent
5 chromium standard is being finalized. (Exhibit B at 4.) As noted above, PG&E is unaware of any
6 other program that provides such an extensive geographic buffer. (Bilbrey Dec. at ¶7.)

7 In the event that the contiguous plume boundary expands beyond the current one-mile
8 buffer, residents within the expanded plume boundary will be eligible for the program. (Exhibit B
9 at 4.) Modifying the eligibility trigger for treatment systems to well detections above 3.1 µg/L will
10 continue to provide a large margin of safety. This level is over 16 times lower than the standard
11 currently applied to all other California residents and over 3 times lower than the proposed
12 hexavalent chromium drinking water standard.

13 PG&E also notes that the Regional Board's current methodology for defining the hexavalent
14 chromium plume boundary provides an additional measure of conservatism to PG&E's program.
15 The Regional Board's plume delineation CAO considers only one line of data when defining the
16 plume--detections above 3.1 µg/L in monitoring wells that are located within 2,600 feet of one
17 another.⁶ (CAO No. R6V-2008-0002-A4 at 5-9 attached as Exhibit F.) This methodology is
18 inconsistent with standard industry practice by failing to consider all critical data such as
19 groundwater flow, elevation or chemistry. (Bilbrey Dec. at ¶10.) For example, strictly following
20 the Regional Board's methodology requires the plume to include wells on the other side of the
21 Lockhart fault and wells that contain dramatically higher water elevations than the plume areas.
22 (*Id.*) This Regional Board-mandated plume depiction methodology would result in inclusion within
23 the depicted plume of wells that clearly are not affected by PG&E's historic operations. (*Id.*)
24 Recently, the Regional Board agreed with evidence presented by PG&E demonstrating that the
25 eastern and southwestern areas of the Hinkley Valley were not impacted by PG&E's activities and

26
27 ⁶ PG&E previously petitioned the Regional Board's extremely conservative plume depiction directives. That petition,
28 including a request for an emergency stay, is pending with the State Board. The requirement to use the extremely
conservative plume depictions as the basis for the replacement water eligibility area is one of the reasons that PG&E
challenged the plume depiction directives.

1 the Regional Board issued a letter allowing PG&E to exclude these areas from future plume maps.
2 However, the Regional Board did not modify the requirements of the plume delineation CAO,
3 including the requirement to connect all chromium detections above 3.1 µg/L in monitoring wells
4 that are located within 2,600 feet of one another. As a result, the plume drawings will continue to
5 be artificially larger than science would dictate in many areas, particularly in the north. When all
6 relevant data is considered, the actual contiguous hexavalent chromium plume will remain much
7 smaller than the plume depicted under the Regional Board-mandated methodology. (*Id.*) Because
8 the current WHW program is directly tied to the Regional Board’s broad plume delineation criteria,
9 there is an extra level of conservatism built in. (*Id.*)

10 These plume depiction requirements, and the whole house replacement water provisions that
11 are based on the plume depictions, are arbitrary and capricious and the Regional Board has not
12 provided any scientific or factual basis for these provisions. As a result, the CAOs exceed the
13 Regional Board’s legal authority and are an abuse of discretion per Code of Civil Procedure section
14 1094.5(b), and Water Code sections 13320(a) and 1330. “Abuse of discretion is established if the
15 respondent has not proceeded in the manner required by law, the order or decision is not supported
16 by the findings, or the findings are not supported by the evidence.” (CCP § 1094.5(b).) A regional
17 board’s actions must have strong support in the evidence and be further supported by findings
18 which bridge the logical gap between the evidence and action. (*Topanga Ass’n for a Scenic*
19 *Community v. County of Los Angeles*, 11 Cal.3d 506, 514 (1974).)

20 **(B) All Hinkley Area Domestic Wells Meet The Current And Proposed Chromium**
21 **Drinking Water Standards**

22 On August 23, 2013, the CDPH proposed a hexavalent chromium drinking water standard
23 of 10 µg/L. (CDPH Chromium MCL Update.) CDPH recently advised a court overseeing the
24 process that it would finalize the drinking water standard within twelve months, i.e., by August
25 2014.⁷ All of the drinking water supply wells in Hinkley meet the proposed standard by a large
26 margin. (Bilbrey Dec. at ¶8.)

27 _____
28 ⁷ The Natural Resources Defense Council sued CDPH for delay in adopting the hexavalent chromium drinking water standard.

1 Over the last few years, PG&E has taken a total of approximately 2,500 samples from more
2 than 400 domestic wells. Data from those samples show that:

3 • All of the domestic water supply wells in Hinkley are below the existing
4 California drinking water standard for total chromium of 50 µg/L, without any treatment.

5 • All of the domestic water wells in Hinkley are below the newly proposed
6 drinking water standard for hexavalent chromium of 10 µg/L, without any treatment.

7 • All of the wells in Hinkley contain lower hexavalent chromium levels than those
8 found in municipal water supplies in numerous communities across the state of California
9 such as Apple Valley, Davis, and others.

10 (*Id.*)

11 More specifically, ninety percent of all currently eligible WHW program wells are below
12 3.1 µg/L, the current maximum hexavalent chromium background level established by the Regional
13 Board, over sixteen times lower than the drinking water standard for total chromium (50 µg/L), and
14 three times lower than the proposed hexavalent chromium standard (10 µg/L). The highest
15 domestic well detection is 8.6 µg/L, six times lower than the drinking water standard for total
16 chromium, and lower than the proposed hexavalent chromium drinking water standard. (Bilbrey
17 Dec. at ¶8.)

18
19 **(C) The 2012 CAO Ends The Whole House Water Replacement Program For All Wells**
20 **Containing Hexavalent Chromium At Levels Below The Final Drinking Water**
21 **Standard**

22 The 2012 CAO states that the final hexavalent chromium drinking water standard will
23 define continued eligibility in PG&E's WHW program:

24 When a final MCL (or drinking water standard) for hexavalent chromium
25 is adopted by CDPH, the requirements of [the 2011 CAO] and this Order
26 [the 2012 CAO] pertaining to providing either interim or whole house
27 replacement water for impacted wells only applies to locations with wells
28 containing hexavalent chromium at levels above the MCL level
established by CDPH. Following the adoption of an MCL for hexavalent

1 chromium, PG&E's obligation to provide interim or whole house
2 replacement water ceases for locations with four consecutive quarters of
3 hexavalent chromium detections which do not exceed the MCL.

4 (Exhibit A at 5.)

5 As a result of this provision ending the replacement water obligation for all wells that
6 comply with the final MCL, and the fact that all Hinkley domestic wells currently comply with the
7 draft MCL, the expected timing of the final drinking water standard further supports PG&E's
8 proposed CAO modifications. When the Regional Board first considered replacement water in its
9 2011 CAO, it concluded that bottled water was an adequate and protective short-term solution but
10 that whole house replacement water should be provided as a more "permanent" solution. (Exhibit E
11 at 8.) At that time, the State of California had just issued the hexavalent chromium PHG and the
12 final drinking water standard was not expected in the near future. CDPH has now issued its
13 proposed drinking water standard and is under court supervision to issue the final MCL, expected
14 by August 2014.

15 On average, it takes approximately nine months between the time a resident is identified as
16 eligible for the WHW program and the time the treatment unit is turned over to the resident for use.
17 (Bilbrey Dec. at ¶11.) PG&E identifies newly eligible residents in conjunction with each new
18 quarterly plume map. (*Id.* at ¶12.) Taking into account the nine-month lead time, any newly
19 eligible residents identified as a result of the most recent quarterly plume map (submitted in
20 October 2013) would not have their systems in place until July or August 2014, only one month (or
21 less) before the drinking water standard is expected to be finalized. (*Id.*) Newly identified residents
22 eligible after the fourth quarter of 2013 likely would not receive systems before the drinking water
23 standard is finalized. Regardless, PG&E's requested modification to the 2012 CAO would provide
24 bottled water to all residents within any newly expanded plume boundary (which the 2011 CAO
25 indicated would be adequate and protective) and would go even further by also providing treatment
26 systems for wells above 3.1 µg/L within any newly expanded plume boundary. In short, PG&E's
27 proposed modifications to the replacement water program eligibility provisions in the 2012 CAO
28

1 would result in a program that still provides replacement water for all wells in a conservatively
2 defined plume area.

3 **III. California Law Does Not Support The Provisions In The 2012 CAO Requiring That**
4 **PG&E Provide Whole House Replacement Water To Wells One Mile Outside The**
5 **Plume Boundary.**

6 California law does not provide the Regional Board with authority to require replacement
7 water for wells that are not impacted by PG&E's activities. Water Code Section 13304(a) states:
8 "A cleanup and abatement order issued by the state board or a regional board may require the
9 provision of, or payment for, uninterrupted replacement water service, which may include wellhead
10 treatment, to each *affected* public water supplier or private well owner." (Emphasis added.) As
11 described above, the Regional Board already requires PG&E to draw an extremely conservative
12 plume boundary. Yet, the Regional Board also requires that PG&E provide replacement water to
13 an area one mile larger than the extremely conservatively drawn plume boundary. There is no
14 support for this requirement in California law. The Water Code states that replacement water may
15 be required for "affected" wells. A well is not "affected" if it is located one mile outside the
16 boundaries of an extremely conservatively drawn plume boundary, particularly when its chromium
17 concentration is below natural background levels.

18 In addition, the 2011 CAO specifically stated that providing bottled water to residences
19 would satisfy the requirement for replacement water because the only beneficial use at issue is
20 consumptive use.⁸ (Exhibit E at 8.) "The Water Board acknowledges that providing bottled water
21 to residences or businesses currently served by affected wells would, on its face, satisfy the
22 requirement for uninterrupted replacement water service, specifically since the beneficial use
23 affected is water for consumptive purposes and bottled water could meet this need." (*Id.* at 8.) The
24 only reason the Regional Board required water treatment systems in addition to bottled water was
25 the assertion that a more permanent replacement water solution was required. (*Id.*)

27 ⁸ OEHHA confirmed that over 99 percent of the risk from hexavalent chromium in domestic wells in California is due
28 to ingestion. (August 17, 2011 OEHHA Memorandum to Regional Board Executive Officer at 5, attached hereto as
Exhibit G.) Bottled water eliminates any risk from ingestion.

1 As outlined above, based on the fact that all domestic wells in Hinkley already contain
2 levels of hexavalent chromium below the draft hexavalent chromium drinking water standard and
3 based on the expectation that the hexavalent chromium drinking water standard will be finalized in
4 August 2014, any water treatment systems installed from now until August 2014 would not be “the
5 permanent solution for this community.” These costly treatment systems would be installed for a
6 few months’ use at maximum. Using the logic and language from the 2011 CAO, it makes little
7 sense to install costly treatment systems that will not be the permanent solution for the community
8 when bottled water alone would satisfy the replacement water requirement for any affected wells.
9

10 8. **A COPY OF THIS PETITION HAS BEEN SENT TO THE LAHONTAN REGIONAL BOARD**

11 In accordance with title 23, section 2050(a)(8) of the CCR, the Petitioner mailed a true and
12 correct copy of this petition by First Class mail on December 19, 2013, to the Lahontan Regional
13 Board at the following address:

14 Patty Kouyoumdjian, Executive Officer
15 Regional Water Quality Control Board – Lahontan Region
16 2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150-7704

17 9. **ISSUES RAISED IN THE PETITION WERE PRESENTED TO THE LAHONTAN REGIONAL**
18 **BOARD BEFORE IT ACTED**

19 Petitioner specifically raised the issues discussed within this Petition with the Regional
20 Board in a September 3, 2013 letter formally requesting modifications to the 2012 CAO.
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DATED: December 19, 2013

TRACY J. EGOSCUE

By: 
TRACY J. EGOSCUE

Attorneys for Petitioner
Pacific Gas & Electric Company

DATED: December 19, 2013

LAW OFFICES OF J. DREW PAGE
J. DREW PAGE

By: 
J. DREW PAGE

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Pacific Gas & Electric Company

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Exhibit A

Cleanup and Abatement Order No. R6V-2011-0005A2 (WDID NO. 6B369107001) (“2012
CAO”)

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**AMENDED CLEANUP AND ABATEMENT ORDER NO. R6V-2011-0005A2
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:

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.
2. On October 11, 2011, the Water Board issued Cleanup and Abatement Order R6V-2011-0005A1 (Order) to PG&E. The Order required, in part, that PG&E provide interim and whole house replacement water service to those served by domestic or community wells that are within the affected area and determined to be impacted by its discharge. The Order defined impacted wells as all domestic or community wells in the affected area that are above 3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium. The affected area was 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 PG&E.
3. The Order also defined impacted wells as those domestic or community wells in the affected area containing hexavalent chromium in concentrations greater than 0.02 µg/L that were the result of PG&E's discharge at the Facility. PG&E was required to develop a method to determine if a well within the affected area that contained detectable levels of hexavalent chromium below 3.1 µg/L or total chromium below 3.2 µg/L was impacted by its discharge. PG&E, in letters dated November 23, 2011 and December 22, 2011, provided its position that there is currently no credible method to determine the source of hexavalent chromium in domestic wells with detections below the current background values (3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium).
4. PG&E, by letter dated April 16, 2012, has indicated its intent to implement a Voluntary Whole House Replacement Water Program (Program). On June 6, 2012, PG&E submitted a letter ([Appendix D](#)) with its "Revised Replacement Water Supply Feasibility Report," (Feasibility Study) supplementing information regarding the Program. The Program will provide interim (until the whole house replacement water is implemented) or whole house replacement water service for drinking water purposes that meets all California primary and secondary drinking water standards

and hexavalent chromium levels of less than 0.02 ug/L¹ or the final MCL, once that standard is adopted by CDPH, to all those served by domestic or community wells in the affected area when analytical monitoring results from those wells indicate detectable levels of hexavalent chromium at any time during the most recent four consecutive quarters (eligible property owners). The affected area will continue to be defined to include all domestic wells located laterally within one mile downgradient or cross-gradient from the contiguous, including contiguous areas depicted with dashed lines, 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 PG&E.² Wells of new eligible property owners that choose to participate will be added to the Program based on data collected and evaluated each quarter.

5. PG&E will provide a schedule for the voluntary program that provides for full implementation of the Program by August 31, 2013. Full implementation is defined as the installation of replacement water systems to all eligible property owners as identified in the Fourth Quarter 2012 Groundwater Monitoring Report submitted in January 2013 that chose to participate in the Program. For any eligible property owners identified after the Fourth Quarter 2012 Groundwater Monitoring Report, PG&E will notify the Regional Board of the additional eligible property owner(s) and will contact the eligible property owner(s) within 5 days of verified sampling results and offer to supply interim bottled water and will provide the eligible property owner(s) with information regarding the Program. Once the eligible property owner has elected to participate in the Program, PG&E will install the replacement water system within six months. For eligible property owners, PG&E has committed to full installation, operation, maintenance and monitoring for one of two options: 1) drilling a deeper well (in areas where hydrogeological conditions make it feasible) on residential property to draw water from the lower aquifer; or 2) installing individual whole house systems that treat water at the well head (supplemented by small under-sink treatment systems).
6. In support of this Program, PG&E submitted a Feasibility Study, dated April 9, 2012 (with a revised version on June 6, 2012) that analyzed several replacement water options and recommended two options, installation of deep wells or installation of ion exchange units for the treatment of all water plus an undersink reverse osmosis (RO) unit for additional treatment of all water used for drinking water purposes for residents within the affected area with domestic wells that have detections of hexavalent chromium above 3.1 µg/L. PG&E will offer the same two options to eligible property owners as part of the Program.

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

² PG&E's quarterly site-wide groundwater monitoring report identifies all detections of hexavalent chromium above 3.1 µg/L in monitoring wells that are not contiguous to the main portion of the plume and either proposes additional data collection to determine its source or presents data to support a conclusion regarding potential impact from PG&E's discharge.

7. Order No. R6V-2011-0005A1, section 2.d. states that PG&E is required to present the Feasibility Study to the community to determine the acceptability of each method. In compliance with this requirement and as part of the Program, PG&E has and will continue to conduct community outreach. PG&E has committed to provide opportunities for the community to learn more about the options examined in the Feasibility Study via public and one-on-one meetings. A key component of this effort is to provide a comprehensive outreach plan to engage eligible property owners, describe the pros and cons of the methods considered and offer the more feasible of the two recommended whole house replacement water options.
8. The Water Board cannot specify the manner in which PG&E provides whole house replacement water to eligible property owners. If PG&E implements its Program and includes all wells within the affected area that have detectable levels of hexavalent chromium at any time during the most recent four consecutive quarters, it would negate the need to develop a methodology, as required by section 3.a. of Order No. R6V-2011-0005A1, to determine if the hexavalent chromium at levels above non-detect, but below 3.1 µg/L hexavalent chromium or 3.2 µg/L total chromium in the well was due to PG&E's discharge. Moreover, the Program meets the requirements of Water Code section 13304 and Order No. R6V-2011-0005A1 and responds to community concerns regarding quality of water in domestic wells in the affected area and meets the requirements of environmental justice.
9. 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. It can be seen with substantial certainty that the issuance of this order, which amends Order R6V-2011-0005A1, would not have a significant effect on the environment.
10. In consideration of PG&E's voluntary implementation of the whole house replacement water Program, the Water Board will modify Order No. R6V-2011-0005A1 as indicated below.

IT IS HEREBY ORDERED, pursuant to Water Code section 13304 that Order No. R6V-2011-0005A1 is amended as follows:

1. Feasibility Study Community Involvement Process

PG&E proposes to implement a voluntary whole house replacement water Program as defined in Findings 4 - 6 and PG&E's letter and revised Feasibility Study dated June 6, 2012 and will present the Feasibility Study Report to those eligible under the Program. The Feasibility Study community involvement process shall be deemed complete on July 31, 2012 and prior to that date PG&E shall provide the

independent consultant described in Paragraph 4 of Order No. R6V-2011-0005A1 at least two opportunities to discuss the revised Feasibility Study dated June 6, 2012 with the community at regularly scheduled Community Advisory Committee meetings or similar meetings or open houses open to the community.

2. Paragraph 2 Suspension:

Based on the memorandum provided by PG&E on June 6, 2012, the Feasibility Study meets the requirements of Order No. R6V-2011-0005A1 and is accepted pending completion of The Feasibility Study community involvement process as outlined in Ordering paragraph 1. Except for Paragraphs 2(c)(8)³, 2(f) and 2(g), the requirements in paragraph 2 of Order No. R6V-2011-0005A1 are suspended as long as PG&E implements a voluntary Program as described in Findings 4 - 6 and PG&E's June 6, 2012 revised Feasibility Study and letter including:

a) replacement water service to eligible property owners that have wells that contain levels of hexavalent chromium greater than 3.1 µg/L or total chromium greater than 3.2 µg/L and are willing to receive replacement water. This will be done within 120 days of acceptance of the Feasibility Study by the Water Board,⁴ and

b) full implementation of the Program, as defined in Finding 5, by August 31, 2013. Within 14 days of acceptance of the Feasibility Study by the Water Board,⁵ PG&E must submit to the Water Board a detailed schedule for full implementation of the Program (as defined in Finding 5) by August 31, 2013. This schedule may be extended by the Executive Officer if PG&E demonstrates that additional time is necessary.

c) for any eligible property owners identified after the Fourth Quarter 2012 Groundwater Monitoring Report, PG&E will notify the Regional Board of the additional eligible property owner(s) and will contact the eligible property owner(s) within 5 days of verified sampling results and offer to supply interim bottled water and will provide the eligible property owner(s) with information regarding the Program. Once the eligible property owner has elected to participate in the Program, PG&E will install the replacement water system within six months.

If the Executive Officer determines that PG&E is failing to implement the Program as outlined in Findings 4 - 6 and as described in PG&E's June 6, 2012 revised Feasibility Study and letter, he/she will notify PG&E of the failure and provide 30 days for PG&E to cure the failure. If the failure is not cured, PG&E must achieve compliance with Paragraph 2 of the Order within 90 days of notification of its failure to implement the Program. This requirement for notice of failure to comply and

³ The monitoring program submitted by PG&E on May 11, 2012 satisfies Paragraph 2(c)(8).

⁴ Acceptance of the Feasibility Study means that the Water Board has reviewed the Feasibility Study for technical completeness, particularly as to whether it meets the minimum requirements of Order No. R6V-2011-0005A1, Ordering Paragraph 2.c, and does not mean that the Water Board identifies a preferred option for replacement water.

⁵ See footnote 3, above.

opportunity to cure does not, however, apply to meeting the final compliance dates in paragraphs (a)-(c), above.

3. A new section, Paragraph 3.f., is added to the Order as follows:

3.f. When a final MCL (or drinking water standard) for hexavalent chromium is adopted by CDPH, the requirements of Order No. R6V-2011-0005A1 and this Order (CAO NO. R6V-2011-0005A2) pertaining to providing either interim or whole house replacement water for impacted wells only applies to locations with wells containing hexavalent chromium at levels above the MCL level established by CDPH. Following the adoption of an MCL for hexavalent chromium, PG&E's obligation to provide interim or whole house replacement water ceases for those locations with four consecutive quarters of hexavalent chromium detections which do not exceed the MCL.

4. Paragraphs 3.a. through 3.e. Suspension

The requirements of Paragraph 3.a through 3.e. in Order No. R6V-2011-0005A1 are suspended as long as PG&E implements the Program as described in Findings 4 - 6 and PG&E's June 6, 2012 revised Feasibility Study and letter.. PG&E may implement this Program to provide interim, and, pursuant to the schedules of this Order, whole house replacement water without identifying, pursuant to Paragraph 3a of Order No. R6V-2011-0005A1, which wells with hexavalent chromium levels less than 3.1 µg/L its discharge has impacted,. If the Executive Officer determines that PG&E is failing to implement the Program as outlined in Findings 4 - 6 and as described in PG&E's June 6, 2012 revised Feasibility Study and letter, he/she will notify PG&E of the failure and provide 30 days for PG&E to cure the failure. If the failure is not cured, PG&E must achieve compliance with Paragraph 3.a. of the Order within 45 days of notification of its failure to implement the Program. This requirement for notice of failure to comply and opportunity to cure does not, however, apply to meeting the final compliance dates in paragraphs 2(a)-(c), above.

Order No. R6V-2011-0005 and Order No. R6V-2011-0005A1

Order No. R6V-2011-2005A1 amended 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 and CAO R6V-2011-0005A1 remain in effect unless later modified by the Water Board, the Water Board's Executive Officer, or his/her designated representative.

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: Patty Z. Kouyoumdjian Dated: June 7, 2012

PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

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Exhibit B

PG&E's September 3, 2013 Formal Request for Modification of the 2012 CAO



**Pacific Gas and
Electric Company**

111 Almaden Road
San Jose Ca 95113

Sheryl Bilbrey
Director
Chromium Remediation

Phone: (408) 621-7135
Mobile: (925) 551-1182
Fax: (415) 973-9052
S4BD@pge.com

September 3, 2013

Patty Kouyoumdjian
Executive Officer
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, California 96150

Subject: Whole House Replacement Water Program Modification

Dear Ms. Kouyoumdjian:

Pacific Gas and Electric Company (PG&E) is committed to remediating the groundwater in the Hinkley community, and has made substantial progress towards that goal. We also are committed to working closely with the California Regional Water Quality Control Board, Lahontan Region (Regional Board) and the Hinkley community to address concerns about drinking water supplies.

Last year, PG&E voluntarily introduced an unprecedented program that offers whole house replacement water to Hinkley residents living within one mile of the hexavalent chromium plume boundary if their domestic well has *any* detection of hexavalent chromium, i.e., any amount above the 0.06 parts per billion (ppb) detection limit. PG&E's program guarantees that the level of hexavalent chromium in replacement water is more than *800 times lower than* the standards currently applied to other California residents.

On August 23rd, the State of California issued a proposed hexavalent chromium drinking water standard of 10 ppb. A final drinking water standard is expected next year.

After careful review of the existing whole house replacement water program, significant experience implementing the program over the last year, and consideration of the proposed hexavalent chromium drinking water standard, PG&E believes future eligibility for the program should be modified pending the final drinking water standard. Specifically, PG&E's proposal is as follows:

- Currently Eligible Residents: PG&E is proposing no changes. Simply put, residents who currently are eligible for the program will remain in the program with no changes.
- Future Potentially Eligible Residents: While the drinking water standard is being finalized, PG&E proposes that any newly eligible residents would meet the following criteria: (1) the residence is within the contiguous hexavalent chromium plume boundary, and (2) the domestic well has a detection of hexavalent chromium above the current

background level of 3.1 ppb. Bottled water would continue to be offered to residents with domestic well detections below 3.1 ppb within future depictions of the contiguous plume boundary.

As described more fully below, PG&E believes these proposed modifications continue to provide an unprecedented level of protection to Hinkley residents while the hexavalent chromium drinking water standard is being finalized. Consistent with PG&E's original program design and the Regional Board's order, the final drinking water standard will set the standard for continued program eligibility once it is established.

1. Background

PG&E is committed to cleaning up the hexavalent chromium plume caused by its historical operations and to working with the Regional Board and the community to restore the water quality in Hinkley. Our interim remedial actions have made significant progress, reducing the highest concentrations of hexavalent chromium in the plume core by over 50%, increasing remedial pumping to over 1,000 gallons per minute, and demonstrating plume capture at Thompson Road. Working cooperatively with the Regional Board, the Independent Review Panel Manager, the United States Geological Survey and the community of Hinkley, PG&E is committed to implementing the final approved remedy and updating the study to determine the naturally occurring levels of hexavalent chromium in the groundwater.

In addition to focusing on the clean-up, PG&E has responded to residents' concerns regarding drinking water. Since 2010, a program of replacement water has been in place and has evolved over time. Because the main route of chromium exposure is through ingestion, the program began with the provision of bottled water for cooking and drinking, to anyone over the current background level of 3.1 ppb. This program was gradually expanded to include residents within ½ mile of the plume, and eventually to residents within one mile of the plume.¹

Last year, in response to a desire for a more "permanent" solution PG&E expanded the program beyond bottled water to include whole house replacement water. Because the State had not yet adopted a drinking water standard for hexavalent chromium, the eligibility criteria for the replacement water program was set at the hexavalent chromium detection limit of 0.06 ppb. This resulted in Hinkley residents being guaranteed a drinking water supply with no detectable levels of hexavalent chromium, more than 800 times lower than the standard applied to other California residents.

¹ This geographic buffer zone is unprecedented; PG&E has not identified any other examples of a party voluntarily offering bottled water one mile outside the boundary of the impacted groundwater, nor has PG&E identified any example of a regulatory order requiring bottled or replacement water one mile outside a plume boundary.

2. Current Information Regarding Hexavalent Chromium levels in Domestic Wells

PG&E understands that Hinkley residents are concerned about the quality of the water in their homes, and believes that the facts can help to allay these fears. Over the last few years we have taken a total of approximately 2,500 samples from more than 400 domestic wells. Data from those samples show that:

- All of the domestic water supply wells in Hinkley are well below the existing state drinking water standard for total chromium of 50 ppb, without any treatment.
- All of the domestic water wells in Hinkley also below the newly proposed drinking water standard for hexavalent chromium of 10 ppb, again, without any treatment.
- In fact, all of the wells in Hinkley contain lower hexavalent chromium levels than those found in municipal water supplies in numerous communities across the state of California such as Apple Valley, Davis, and others.

More specifically, nearly half of all eligible residents' domestic wells are below 1.2 ppb, the average background level for hexavalent chromium currently established by the Regional Board. This is over 40 times lower than drinking water standard for total chromium and 8 times lower than the proposed hexavalent chromium standard. Ninety percent of all eligible residents' wells are below 3.1 ppb, the current maximum background level, over 16 times lower than the drinking water standard for total chromium and 3 times lower than the proposed hexavalent chromium standard. The highest domestic well detection is 8.6 ppb, 6 times lower than the standard for total chromium and lower than the proposed hexavalent chromium standard.

3. Hexavalent Chromium Drinking Water Standard

On August 23rd, the California Department of Public Health (CDPH) proposed a hexavalent chromium drinking water standard of 10 ppb. CDPH recently advised a court overseeing the process that it would finalize the drinking water standard within twelve months, i.e., by August 2014.² As described above, all of the drinking water supply wells in Hinkley meet the proposed standard by a large margin.

In 2012, the Regional Board issued an order stating that the final hexavalent chromium drinking water standard will define continued eligibility in PG&E's whole house replacement water program.³

² The Natural Resources Defense Council has sued CDPH for its delay in adopting the hexavalent chromium drinking water standard. In July, the court overseeing the matter issued an order that, among other things, set a hearing in late October to determine when CDPH will finalize the drinking water standard.

³ Residents who are no longer eligible for the program after the drinking water standard is finalized can elect to have PG&E either remove or transfer ownership of the whole house water replacement units.

4. New Program Specifics

Based on all of the information available at this time, including sampling data from domestic water supplies, experience implementing the whole house replacement water program, and issuance of the proposed hexavalent chromium drinking water standard, PG&E believes it is appropriate to reevaluate future eligibility for the program while the drinking water standard is being finalized. Even with the proposed modifications, PG&E's program provides an extremely conservative level of protection not seen anywhere else in California or the rest of the country. PG&E's specific proposal is described below.

a. Currently Eligible Residents

PG&E is not proposing any changes to the program for currently eligible residents. PG&E is committed to installing all of the replacement water systems for the households within the current boundary of the replacement water program, i.e., households located within one mile of the 2013 second quarter plume boundary. In addition, PG&E will finalize negotiations with all eligible residents who have elected the property purchase option. Although all of these residents' wells contain hexavalent chromium levels well below the proposed drinking water standard, PG&E will honor its original commitments.

b. Future Potentially Eligible Residents

While the hexavalent chromium drinking water standard is being finalized, PG&E proposes to modify the whole house water program eligibility criteria for any *new* residents as follows: (1) the residence is within the contiguous hexavalent chromium plume boundary; and (2) the resident's domestic well contains hexavalent chromium above the currently adopted background level of 3.1 ppb. For residents within future depictions of the contiguous plume boundary with domestic well detections below 3.1 ppb, PG&E will continue to offer bottled water. PG&E believes these modifications are justified given the extremely conservative and unprecedented nature of the current program, coupled with the fact that any future expansion of the program likely will be short-term given the long lead times for the whole house replacement water units and the expected timing of the final drinking water standard.

Because PG&E is not proposing any changes for currently eligible residents, the existing one-mile buffer already provides a hefty margin of conservatism to PG&E's program. All residents within one mile of the 2013 second quarter plume map will continue to be eligible for the program while the hexavalent chromium standard is being finalized. As noted above, PG&E is unaware of any other program that provides such an extensive geographic buffer. In the unlikely event the contiguous plume boundary expands beyond the current one-mile buffer, residents within the expanded plume will be eligible for the program.

Similarly, modifying the eligibility trigger to well detections above 3.1 ppb will continue to provide a large margin of safety. This level is over 16 times lower than the standard currently applied to all other California residents and over 3 times lower than the proposed hexavalent chromium drinking water standard.

PG&E also notes that the Regional Board's current methodology for defining the hexavalent chromium plume boundary provides an additional measure of conservatism to PG&E's program. As discussed in detail in PG&E's 2013 second quarter plume map submission, the Regional Board considers only one line of data when defining the plume – detections above 3.1 ppb in wells that are located within 2,000 feet⁴ of one another. This methodology is inconsistent with standard industry practice by failing to consider all critical data such as groundwater flow, elevation or chemistry. For example, the Regional Board's methodology requires the plume to include wells on the other side of the Lockhart fault and wells that contain dramatically higher water elevations than the plume—areas that clearly are not attributable to PG&E's historic operations. When all relevant data is considered, the contiguous hexavalent chromium plume is much smaller. Because the whole house replacement water program is directly tied to the Regional Board's narrow plume delineation criteria, there is an extra level of conservatism built in.

The expected timing of the final drinking water standard further supports PG&E's proposed modifications. When the Regional Board first considered replacement water in its 2011 Clean-up and Abatement Order, it concluded that bottled water was an adequate and protective short-term solution but that whole house replacement water should be provided as a more "permanent" solution.⁵ At that time, the State of California had just issued the hexavalent chromium public health goal and the final drinking water standard was expected to take years to develop.

CDPH has now issued its proposed drinking water standard and is under court supervision to issue the final, which is expected by August 2014. On average, it takes approximately 9 months between the time a resident is identified as eligible for the whole house water program and the time the unit is turned over to the resident for use.⁶ The next opportunity to identify newly eligible residents is after the 2013 third quarter plume map is submitted at the end of October. Taking into account the 9-month lead time, any newly eligible residents identified in October would not have their systems in place until July 2014, only 1 month before the drinking water standard is finalized. Newly identified residents after the fourth quarter of 2013 likely would not receive systems before the drinking water standard is finalized.

Given the multiple layers of conservatism built into PG&E's whole house water replacement program and the fact that all domestic wells in Hinkley are well below the proposed drinking water standard, it makes sense to modify the program until the standard is finalized. Eligibility

⁴ Beginning in the third quarter, the Regional Board has ordered PG&E to modify the plume delineation criteria and connect all detections above 3.1 ppb in wells that are located 2,600 feet of one another. PG&E has petitioned this modification to the State Water Resources Control Board, on the grounds that it is arbitrary and unsupported. Nevertheless, absent a change to the new 2,600-foot criteria prior to submission of the third quarter plume map, PG&E expects the plume will artificially expand as compared to the 2,000-foot criteria.

⁵ Order R6V-2011-0005A1, para. 32.

⁶ Many factors contribute to this time period including: testing the resident's well to confirm eligibility; the resident's consideration of whether to elect the whole house replacement water option or the property purchase option; ordering the systems once the election has been made; construction of the necessary collateral infrastructure (e.g., electrical, plumbing, etc.); and start-up testing. Once a resident signs the access agreement, PG&E installs and hands over the system within five months.

Ms. Patty Z. Kouyoumdjian
September 3, 2013
Page 6

for the program likely will change once the standard is finalized. In the meantime, in the unlikely event the plume expands beyond the current one-mile buffer, PG&E will offer whole house replacement water systems to any resident within the expanded plume boundary with a domestic well detection above 3.1 ppb, and bottled water to residents with domestic well detections below 3.1 ppb.

5. Requested Action

PG&E asks that Regional Board Order R6V-2011-0005A2 be amended to provide for the updated replacement water program described in this letter. Specifically, we ask that the order be amended to state that the provisions of Order R6V-2-11-0005A1 will continue to be suspended so long as PG&E provides replacement water as described in this letter.

Thank you for your consideration of this request. I would be happy to discuss this proposal with you or to provide you with any additional information that you might require.

Sincerely,



Sheryl Bilbrey
Director, Chromium Remediation

Cc: Lauri Kemper
Kim Niemeyer

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Exhibit C

Declaration of Sheryl Bilbrey

1 Exhibit C

2 Declaration of Sheryl Bilbrey

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4 I, Sheryl Bilbrey, declare:

5 I am employed by Pacific Gas & Electric Company as the Director of Chromium
6 Remediation. I have worked on issues related to the Hinkley chromium plume cleanup
7 and related issues since September 2011. The facts stated in this declaration are within
8 my personal knowledge or information and belief and if called to testify I could testify
9 competently to them.
10

- 11 1. In 2010, in an effort to remove the community's health concerns so that remediation
12 could move forward, PG&E voluntarily began providing bottled water to all residents
13 with wells located up to one mile outside of the plume of chromium-impacted
14 groundwater relating to PG&E's past activities in Hinkley, California. Thus, when the
15 former Regional Board Executive Officer issued an order on January 7, 2011,
16 requiring bottled water for wells containing chromium levels above natural
17 background, PG&E was already providing bottled water to a much larger number of
18 well owners in the area up to one mile beyond the 3.1 µg/L plume boundary.
- 19 2. However, on October 11, 2011, the former Regional Board Executive Officer
20 dramatically expanded the replacement water requirement by issuing Amended
21 Cleanup and Abatement Order No. R6V-2011-0005A1 ("2011 CAO"). The 2011
22 CAO required that PG&E provide interim bottled water and permanent whole house
23 water to all well owners within one mile of the plume, unless PG&E could
24 demonstrate that any chromium in the wells (at any detectable level) was not
25 attributable to PG&E's activities. On October 25, 2011, PG&E filed a petition with
26 the State Board challenging the 2011 CAO. PG&E's petition contended (in part) that
27 the 2011 CAO was not supported by California law in that it required replacement
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1 water for wells that contained hexavalent chromium concentrations that were below
2 naturally occurring background levels for the Hinkley area, as set by the Regional
3 Board, and at levels below the controlling total chromium drinking water standard.

4 3. While PG&E's petition and request for a stay of the 2011 CAO were pending with the
5 State Board, PG&E was faced with the difficult choice of either attempting to comply
6 with the 2011 CAO that PG&E believed was invalid, or refusing to comply at the risk
7 of penalties for non-compliance. While the State Board was reviewing PG&E's
8 petition and request for a stay of the 2011 CAO, PG&E prepared a voluntary Whole
9 House Water ("WHW") replacement program and presented it to the Regional Board.
10 The Regional Board agreed to allow PG&E to implement the voluntary replacement
11 water program and agreed to suspend the operation of some of the requirements of the
12 2011 CAO, as long as PG&E implemented the voluntary WHW program. The
13 Regional Board formalized the Board's position by issuing the 2012 CAO.

14 4. PG&E implemented the WHW program immediately and has been operating the
15 WHW program since June 2012. PG&E's WHW program is an unprecedented
16 program that offers whole house replacement water to Hinkley residents living within
17 one mile of the hexavalent chromium plume boundary, if their domestic well has any
18 detection of hexavalent chromium, i.e., any amount above the 0.06 parts per billion
19 ($\mu\text{g/L}$) detection limit.

20 5. Unfortunately, despite the best efforts of PG&E, the 2011 and 2012 CAOs have
21 created many problems for Hinkley residents. For example, even though PG&E
22 frequently communicates that the replacement water program is not based on risk and
23 is intended to eliminate public concerns regarding water use in Hinkley, residents
24 continue to make statements indicating that they are concerned about their water, at
25 least partially because replacement water is required and/or is being provided. A
26 related problem caused by the 2011 and 2012 CAOs is the large number of Hinkley
27 residents electing to sell their property to PG&E and move from the area. In response
28 to repeated and widespread community requests, PG&E offered to purchase at fair

1 market value, at the election of the property owner, any property within the
2 replacement water program area in lieu of installing a water treatment system.
3 Surprisingly, over 70% of the eligible property owners declined the water treatment
4 system option, and instead elected to sell their property to PG&E.

5 6. After careful review of the existing WHW program, significant experience
6 implementing the program over the last year, and consideration of the proposed
7 hexavalent chromium drinking water standard, PG&E determined that eligibility for
8 additional residents to enter the WHW program should be modified pending the final
9 drinking water standard. Specifically, on September 3, 2013, PG&E formally
10 requested that the Regional Board amend the 2012 CAO to allow PG&E to modify the
11 WHW program's future eligibility provisions. Without the requested modifications,
12 PG&E will continue to be required to provide replacement water to wells with
13 concentrations below existing and draft drinking water standards, below natural
14 background levels set by the Regional Board, and which are outside the conservatively
15 depicted plume area.

16 7. The one mile buffer concept found in the CAOs appears to have originated with
17 PG&E's initial offer of bottled water to Hinkley residents that reside within one mile
18 of the plume boundary. PG&E's original bottled water offer was an effort to eliminate
19 any health concerns from drinking water, regardless of the lack of risk, in order for the
20 remediation to proceed unimpeded and to respond to community concerns. PG&E
21 carefully monitors the plume and nearby domestic wells with quarterly sampling of
22 hundreds of monitoring and domestic wells. With careful monitoring, there is no basis
23 for a one mile buffer zone around the plume. PG&E is not aware of any other
24 circumstance where a regulatory agency has imposed a one mile buffer for
25 replacement water.

26 8. Over the last few years, PG&E has taken a total of approximately 2,500 samples from
27 more than 400 domestic wells in Hinkley. Data from those samples show that:
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1 • All of the domestic water wells in Hinkley are below the newly proposed
2 drinking water standard for hexavalent chromium of 10 µg/L, without any treatment.

3 • All of the domestic water supply wells in Hinkley are below the existing
4 California drinking water standard for total chromium of 50 µg/L, without any treatment.

5 • All of the wells in Hinkley contain lower hexavalent chromium levels than those
6 found in municipal water supplies in numerous communities across the state of California
7 such as Apple Valley, Davis, and others.

8 • More specifically, ninety percent of all currently eligible WHW program wells
9 are below 3.1 µg/L , the current maximum background level established by the Regional
10 Board, over sixteen times lower than the drinking water standard for total chromium (50
11 µg/L), and three times lower than the proposed hexavalent chromium standard (10 µg/L).
12 The highest domestic well detection is 8.6 µg/L, below both the current statewide
13 standards for safe drinking water (50 ppb for total chromium) and the proposed
14 hexavalent chromium specific standard (10 ppb for hexavalent chromium).

15 • As such, all wells in the “Affected Area” as defined by the CAOs meet the
16 current and applicable MCL as well as the draft MCL.

17 9. PG&E’s whole house replacement water individual well treatment units cost more
18 than \$50,000 each, plus thousands of dollars in operation and maintenance.

19 10. The Regional Board’s plume delineation CAO (CAO No. R6V-2008-0002-A4 at 5-9)
20 considers only one line of data when defining the plume--detections above 3.1 µg/L in
21 wells that are located within 2,600 feet of one another. This methodology is
22 inconsistent with standard industry practice by failing to consider all critical data such
23 as groundwater flow, elevation or chemistry. For example, strictly following the
24 Regional Board’s methodology requires the plume to include wells on the other side of
25 the Lockhart fault and wells that contain dramatically higher water elevations than the
26 plume areas. This Regional Board-mandated plume depiction methodology would
27 result in inclusion within the depicted plume of wells that clearly are not affected by
28 PG&E’s historic operations. Recently, the Regional Board agreed with evidence

1 presented by PG&E demonstrating that the eastern and southwestern areas of the
2 Hinkley Valley were not impacted by PG&E's activities and the Regional Board
3 issued a letter allowing PG&E to exclude these areas from future plume maps.
4 However, the Regional Board did not modify the requirements of the plume
5 delineation CAO, including the requirement to connect all plume detections above 3.1
6 µg/L in wells that are located within 2,600 feet of one another. As a result, the plume
7 drawings will continue to be artificially larger than science would dictate. When all
8 relevant data is considered, the contiguous hexavalent chromium plume will remain
9 much smaller than the plume depicted under the Regional Board-mandated
10 methodology. Because the current WHW program is directly tied to the Regional
11 Board's broad plume delineation criteria, there is an extra level of conservatism built
12 in.

13 11. On average, it takes approximately nine months between the time a resident is
14 identified as eligible for the whole house water program and the time the treatment
15 unit is turned over to the resident for use.

16 12. PG&E is required to produce a new plume map every quarter. PG&E identifies newly
17 eligible residents in conjunction with each new quarterly plume map. Taking into
18 account the nine-month lead time, any newly eligible residents identified as a result of
19 the most recent quarterly plume map (submitted in October 2013) would not have their
20 systems in place until July or August 2014, only one month (or less) before the
21 drinking water standard is expected to be finalized. Newly identified residents eligible
22 after the fourth quarter of 2013 likely would not receive systems before the drinking
23 water standard is finalized.

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25 13. I declare under penalty of perjury under the laws of the State of California that the
26 foregoing is true and correct.
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Sheryl Bilbrey

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Exhibit D

Regional Board Executive Officer's November 19, 2013 Denial of PG&E's
Request to Modify the 2012 CAO

Lahontan Regional Water Quality Control Board

November 19, 2013

Daron Banks
via private e-mail

Sheryl Billbrey
Director, Remediation Program Office
Pacific Gas and Electric Company
77 Beale Street, B28A
San Francisco, CA 94105
e-mail: S4BD@pge.com

Theresa Schoffstall
via private e-mail

Re: Decision on Requests by PG&E and the Members of the Hinkley Community to Change Whole House Replacement Water Program and Plume Delineation Requirements

After careful consideration of the requests submitted by the Pacific Gas and Electric Company (PG&E) and members of the public to change the requirements of the Whole House Replacement Water Program (“WHRW Program”), and after review of the comments received in response to those requests, I have decided not to make changes to the existing requirements at this time.

There are several actions by other entities within the next year that have the potential to affect the WHRW Program, including the issuance of the maximum contaminant level (MCL) for hexavalent chromium by the California Department of Public Health (DPH), also referred to as the “drinking water standard”, and a review by the State Water Resources Control Board (State Board) of PG&E’s petition of Cleanup and Abatement Order (CAO) 2008-0002-A4. This CAO required PG&E to conform to specific mapping protocols to delineate the boundary of its plume of hexavalent chromium in Hinkley. This means that actions outside of our control have the potential to change the existing requirements within the next nine to twelve months. With impending potential changes to the existing requirements, I have determined that modifications to the WHRW Program and the plume delineations requirements at this time would introduce additional confusion and uncertainty. If I were to make changes today, by the time that modifications to the existing requirements are implemented, those changes would undoubtedly be revised again based upon the State Board and the DPH actions.

For example, on November 4, 2013, the State Board notified the Lahontan Regional Water Quality Control Board (Water Board) that it will be taking up the petition filed by PG&E on the CAO. The petition challenges the way that PG&E is required to draw the plume and the requirement to continue to install monitoring wells to delineate the plume boundary. The State Board could modify the Water Board's Order or require the Water Board to reconsider the requirements for how the plume is delineated based upon criteria it sets forth, which could affect how the plume is drawn and, therefore, who would be eligible for the WHRW Program.

Similarly, a final decision by the DPH that sets the drinking water standard for hexavalent chromium at a level above what is in people's wells in Hinkley would limit the requirements of the WHRW Order. The current WHRW Order recognizes the legal limits on the Water Board to require replacement water, and states that PG&E is only required to provide WHRW to those wells containing hexavalent chromium at levels above the MCL levels established by DPH. Therefore, once the DPH sets the final drinking water standard, the Water Board could not require replacement water for those wells whose levels of hexavalent chromium does not exceed drinking water standard.

In leaving the current requirements in place, I recognize that there will continue to be a lot of concern in how the plume is drawn and how the WHRW Program is implemented. Because PG&E has offered WHRW systems and property buyout opportunities to some Hinkley residents, the location of the plume has had financial and social repercussions for PG&E and the community. Changing the requirements today, only to have those requirements changed shortly thereafter, will introduce a level of confusion and uncertainty that I am not comfortable with.

In my October 31, 2013 letter to Ms. Sheryl Bilbrey with PG&E, I provided a temporary recusal to notify residents that would be potentially eligible for the WHRW Program due to expansion of the 3rd quarter buffer. Since my decision is now final, I expect full compliance with the requirements of any existing order. This would mean that PG&E would have to provide interim bottled water and information regarding the WHRW Program to any newly eligible property owner within the five (5) days set forth in the existing Order.

I believe there is an opportunity for PG&E and the community of Hinkley to work together to come up with solutions that satisfy most of the needs of all of the parties, and provide that certainty for themselves, especially in light of the fact that decisions by the State Board and DPH could impose requirements that are less satisfactory to all. The Water Board has facilitated those discussions in the past and I would like to offer our assistance again. We should not wait until the DPH drinking water standard is adopted to begin our discussions about how the new standard will affect the community, PG&E and Water Board requirements.

The Water Board has recently received three complex and technically related evaluation and interpretive reports that should be discussed in an open forum¹. The new information in these three reports answers some old questions, but raises many new ones. Everyone working together is a more effective use of expertise and resources. Cooperation between PG&E and the community can produce viable solutions that are more satisfying to everyone and more directly address concerns than decisions that are made for the parties by the Water Board. In the future, I request PG&E and the community make a good faith effort to work together and find consensus before coming to the Water Board with requests for changes. As always, we are here to provide guidance and technical assistance.

If you have any questions please contact me at pzkouyoumdjian@waterboards.ca.gov (530) 542-5412 or Doug Smith at dfsmith@waterboards.ca.gov (530) 542-5453.



PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

cc: PG&E Hinkley Lyris List (and web posting)

¹ Third Quarter 2013 Groundwater Monitoring Report and Domestic Well Sampling Results, Site-wide Groundwater Monitoring Program, October 30, 2013, by CH2M Hill; Compliance with Provision 1.C. of Cleanup and Abatement Order R6V-2008-0002-A4 and Requirements of Investigation Order R6V-2013-0029, October 29, 2013, by Stantec; and Project Proposal for Occurrence of natural and anthropogenic Cr VI near a mapped plume, Hinkley, CA, September 2013, by Dr. John Izbicki with the US Geological Survey.

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Exhibit E

Amended Cleanup and Abatement Order No. R6V-2011-0005A1
("2011 CAO")

**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 ($\mu\text{g/L}$) at monitoring well SA-MW-05D. A hazardous waste is defined as any waste that contains hexavalent chromium at concentrations that exceed 5,000 $\mu\text{g/L}$. The plume contains total chromium greater than the state Maximum Contaminant Levels (MCL), or drinking water standard of 50 $\mu\text{g/L}$ 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 $\mu\text{g/L}$ for hexavalent chromium and 1.52 $\mu\text{g/L}$ 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 $\mu\text{g/L}$ for hexavalent chromium and 3.23 $\mu\text{g/L}$ 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 $\mu\text{g/L}$ 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 $\mu\text{g/L}$ to 5.5 $\mu\text{g/L}$.
8. Testing results from the Second Quarter 2011 provided an approximate concentration contour, or outline of hexavalent chromium levels above 3.1 $\mu\text{g/L}$ and total chromium above 3.2 $\mu\text{g/L}$ 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 $\mu\text{g/L}$.

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...

...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 Env’t. 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/L¹ 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 $0.02 \mu\text{g}/\text{L}^2$ 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 $0.02 \mu\text{g}/\text{L}$. 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 $0.02 \mu\text{g}/\text{L}^3$.
 - 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

² For purposes of this standard, drinking water must test below the reporting limit of $0.06 \mu\text{g}/\text{L}$ 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 $0.06 \mu\text{g}/\text{L}$ 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/L⁴ 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.

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

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Exhibit F

CAO No. R6V-2008-0002-A4

Lahontan Regional Water Quality Control Board

January 8, 2013

Kirk Howard, Vice President
Gas Transmissions and Distribution
Pacific Gas and Electric Company
77 Beale Street, Mailcode B275
San Francisco, CA 94105

CLEANUP AND ABATEMENT ORDER NO. R6V-2008-0002-A4

I am issuing this Cleanup and Abatement Order (CAO) to require Pacific Gas and Electric Company (PG&E) to fully define the chromium plume in the Hinkley area, especially the targeted northern-most area at the Hinkley Gap and the Eastern area at Dixie Road. It is important that we have a clear and up-to-date understanding of the chromium plume boundaries. This critical information will guide us as we clean up groundwater pollution from the PG&E compressor station and will ensure protection of public health in the community.

Some key milestones in the CAO include:

- February 22, 2013 – Sampling and Analysis Workplan
- March 15, 2013 - Domestic well sampling begins
- October 30, 2013 - Report on domestic well sampling and plume definition efforts

This CAO requires PG&E to monitor and statistically evaluate hexavalent chromium concentrations in domestic water supply wells in areas outside the southern contiguous plume boundary. This CAO orders monthly domestic well sampling to determine if there is an increasing trend of chromium in groundwater before the concentrations have risen above background levels. Where an increasing trend is identified, additional monitoring wells are required to be installed. Further, this CAO requires PG&E to install additional monitoring wells in order to delineate the full lateral and vertical extent of chromium in groundwater, including locations where chromium has been detected in domestic wells above the maximum background levels. This CAO is based on sound scientific principles and is protective of public health.

Upon completion of the February 22, 2013 workplan, I would like to hold a public meeting in March to discuss the actions proposed in the draft workplan and to answer questions from the Hinkley community.

In this CAO I have not allowed for eastward plume expansion as was originally proposed in the draft CAO released for public comment. I believe it is not necessary at this time because cleanup activities can continue without it. Until we have had an opportunity to review additional information compiled on the fate and transport of remediation by-products, allowing for plume expansion would be premature.

Also, the draft CAO required PG&E to provide bottled water and include the owner of domestic well 34-65 in the Whole House Replacement Water Program. This provision is no longer needed since the property owner has reportedly opted into the property purchase program. Therefore, this requirement was removed.

This CAO does not rescind requirements in prior CAOs.

As always, I am available to answer any questions regarding this CAO and can be reached at (530) 542-5412; or you can also contact Lauri Kemper, Assistant Executive Officer, at (530) 542-5436.



Patty Z. Kouyoumdjian
Executive Officer

Enclosure: CAO R6V-2008-0002-A4

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**AMENDED CLEANUP AND ABATEMENT ORDER
NO. R6V-2008-0002-A4**

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 owns and operates the Hinkley Compressor Station (hereafter the "Facility"), located at 35863 Fairview Road, Hinkley in San Bernardino County. For the purposes of this Order, the Pacific Gas and Electric Company is referred to as the "Discharger."

Regulatory History

2. 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 total chromium (Cr[T]) and hexavalent chromium (Cr[VI]) to waters of the state. The CAO required the Discharger to take additional corrective actions to contain chromium migrating with groundwater, to continue to implement groundwater remediation in the source area and central plume area, and to develop and implement a final cleanup strategy. The CAO also modified the monitoring and reporting program for permitted projects.
3. Paragraph 3 of the Order provisions of the CAO required the Discharger to contain the total and hexavalent chromium plumes to locations where hexavalent chromium was below the interim background level of 4 parts per billion (ppb) and the total chromium was below 50 ppb.
 - a. The Discharger was required to achieve containment of the hexavalent chromium plume in the groundwater by December 31, 2008, using the Discharger's *Boundary Control Monitoring Program and Updated Site-Wide Groundwater Monitoring Program* (submitted July 2, 2008 and prepared by Secor International) as described in Finding 16 in the CAO.

- b. The Discharger was required to achieve containment of the total chromium plume in the groundwater by December 31, 2008, also based on the *Boundary Control Monitoring Program and Updated Site-Wide Groundwater Monitoring Program* as described in Finding 16 in the CAO.
4. Paragraph 4 of the Order provisions of the CAO required the Discharger to continue implementing full-scale in-situ corrective actions in the source area and central area of the chromium plume, or an alternate but equally effective method, to remediate the elevated chromium concentrations in groundwater.
5. The CAO required the Discharger to clean up and abate the chromium plume to background levels and set an interim amount of 4 ppb. Amended Order No. R6V-2008-0002A1 (Amended Order No. 1), effective November 12, 2008, adopted average and maximum background levels for hexavalent chromium of 1.2 ppb and 3.1 ppb, respectively. The adopted average and maximum background levels in Amendment Order No. 1 for total chromium are 1.5 ppb and 3.2 ppb, respectively. These background levels were adopted for the purposes of establishing background water quality conditions to be used later to consider cleanup strategies and to support future decisions regarding cleanup levels. For plume containment, the level remained at 4 ppb for both total and hexavalent chromium.
6. Amended Order No. R6V-2008-0002A3 (Amended Order No. 3), effective March 14, 2012, revised Paragraph 3 described above in Finding No. 3 by requiring the Discharger to contain the total and hexavalent chromium plumes of 3.1 ppb and 3.2 ppb, respectively, to locations south of Thompson Road. In addition, it required that the Discharger take all practicable actions to extract the total and hexavalent chromium plumes north of Thompson Road where concentrations exceeded 10 ppb.
7. On April 9, 2008, the Water Board adopted General Waste Discharge Requirements (Board Order No. R6V-2008-0014) for the Hinkley chromium contamination to facilitate groundwater remediation. Board Order No. R6V-2008-0014 allows the discharge of various products to facilitate cleanup of groundwater contamination in the area from the Compressor Station in the south to almost Thompson Road in the north. To be authorized to initiate discharge, the Discharger must submit a Notice of Intent describing the proposed remedial project and discharges to land and/or groundwater. Following a public comment period, the Executive Officer was authorized to issue a Notice of Applicability (NOA) to allow the discharge or discharges and prescribed an appropriate monitoring and reporting program.

Undefined Chromium Plume in Upper Aquifer

8. Pursuant to Orders from the Water Board, the Discharger has undertaken multiple investigations for defining the chromium plume in the upper aquifer to background levels. The document *Third Quarter 2012 Groundwater Monitoring Report and Domestic Well Sampling Results* describes the results of groundwater and domestic

well sampling during July to September 2012. Figure 3-1 in the report shows the extent of chromium in groundwater at concentrations exceeding background levels as being greater than 5 miles in length and about 2 miles in width. The quarterly report also shows that the chromium plume continues to be undefined to the east and north of the core plume area. The report also shows an area to the west of the core plume area, near the intersection of Hinkley Road and Community Boulevard, with concentrations above background that is separate from the core plume area. Further investigations are needed to fully define the lateral and vertical extent of all portions of the chromium plume and assess groundwater flow in the upper aquifer to evaluate threats to beneficial uses and to plan future corrective actions.

9. On July 9, 2012, the Discharger submitted a workplan to install additional wells for chromium plume definition. The workplan, prepared by Stantec, proposed installing wells at eight locations in the northern plume area by the Hinkley Gap. Monitoring well pairs and triplets are being proposed to monitor for the evidence of chromium. The proposed well locations, however, are not adequate to fully define the chromium plume boundaries. While the workplan does not state reasoning for large gaps in sampling locations, the Discharger has stated in the past its inability to gain access to certain private property. A revised workplan is being requested by this Order.
10. An August 20, 2012 Technical Memorandum by the Discharger cites groundwater investigation activities during the first six months of 2012. The Memorandum contains a map showing that the Discharger was unable to gain access to private property for installing additional monitoring wells at five of the eight locations proposed in the July 9, 2012 workplan. Furthermore, the map shows that the Discharger was also not able to gain access to an additional six private properties, as proposed in the September 1, 2011 Groundwater Investigation Report. These latter well locations are needed to define the northern chromium plume along the western and eastern boundaries, while the former well locations were proposed to define the northern plume extent.
11. Subsequent data submitted by the Discharger on September 18, 2012 shows that chromium in domestic wells exceeds the maximum background levels along Hinkley Road, 1.6 miles north of monitoring well MW-130S1 in the Harper Dry Lake Valley (also called Water Valley). Groundwater samples contained 4.0 ppb Cr(VI) and 3.8 ppb Cr(T) in the domestic well at 41717 American Way. Additionally, water samples from the domestic well at 42584 Hinkley Road contained 4.6 ppb Cr(VI) and 4.3 ppb Cr(T). These detections confirmed chromium results taken by private owners and submitted to the Water Board. Monitoring wells are necessary along the distance from well MW-130S1 to the latter residence to define the chromium plume in the Harper Dry Lake Valley, which is hydraulically downgradient of groundwater in the Hinkley Valley.

12. The flow of groundwater through the Hinkley Valley and to Harper Dry Lake Valley is well documented in U.S. Geological Survey (USGS) and Mojave Water Agency reports. For instance, according to a 2001 USGS report by Stamos et al titled "Simulation of Ground-Water Flow in the Mojave River Basin, California," the Hinkley Valley consists of highly transmissive aquifer conditions for groundwater movement. A significant drop in groundwater elevation from 2,200 feet above mean sea level (MSL) at the Mojave River to approximately 2,050 feet above MSL at the Harper Dry Lake influences the groundwater movement through the Hinkley Valley. The direction of groundwater movement is from the Mojave River through the Hinkley Valley and to the Harper Dry Lake Valley. The Discharger's September 2012 Feasibility Study lists a groundwater flow velocity of 1-4 feet per day (ft/day). Using a conservative average of 2 ft/day, the length of the chromium plume can be calculated since the time of the initial 1952 discharge as (assuming time between current time and discharge is 60 years, minus 7 years for the waste to percolate to groundwater):

$(2 \text{ ft/day} \times 365 \text{ days/year} \times 53 \text{ years}) / 5280 \text{ ft/mile} = 7.32 \text{ miles}$ of potential plume migration of the leading edge of the plume.

When one considers the distance from the point of release (the Hinkley Compressor Station) to the Hinkley Gap is approximately 6 miles and the groundwater flow velocity, it is reasonable to assume that chromium concentrations detected near the Hinkley Gap may be related to the release from the Hinkley Compressor Station. Such plume migration threatens approximately 12 domestic wells along the flow path in the Harper Dry Lake Valley.

13. This Order amends CAO No. R6V-2008-0002 to require the Discharger to fully define the lateral and vertical extent of the chromium plume in the upper aquifer where it is still unknown. The Order includes requirements for chromium plume mapping and potentiometric maps showing groundwater flow direction, velocity, and gradient in monitoring reports.

14. To fully define the plume, especially in the targeted northern-most area at the Hinkley Gap and the eastern area at Dixie Road, this Order requires the Discharger to prepare a workplan to sample domestic wells in these areas once a month for a period of at least 6 months beginning in **March 2013** to determine the levels of total and hexavalent chromium. This monitoring must be conducted to determine if there is an increasing trend of chromium concentrations before concentrations have the potential to rise above background levels. The data from the domestic well sampling must then be evaluated using a statistical test, such as the Mann-Kendall test, to determine if there is an increasing trend in any of these domestic wells over this period. The statistical trends will be used to establish potential risk to public health of residents in the area, and determine where additional monitoring wells are needed to further define the plume. If a domestic well displays an increasing trend, then a monitoring well must be installed within a quarter mile from that domestic well. The

Discharger must submit a report summarizing these data and a workplan for subsequent monitoring well installation by **October 30, 2013**.

CEQA

15. This enforcement action is being taken by this regulatory agency to enforce the provisions of the Water Code and, as such, is exempt from the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, section 15321. The implementation of this CAO Amendment is an action to assure the restoration of the environment and meets the criteria set forth in section 15321. In addition, this action is exempt from the provisions of the CEQA, in accordance with the California Code of Regulations, title 14, section 15301 because there is negligible or no expansion of the existing monitor well pairs and triplets and infrastructure that will be used to implement this Order. In addition, the additional monitoring wells required to be installed by this Order are exempt from CEQA in accordance with the California Code of Regulations, title 14, section 15303, which allows the construction or conversion of small structures, such as monitoring wells. No exception to these exemptions apply, as this Order does not allow take of any endangered species without a permit from the applicable federal or state agency.

Effect of Prior Orders

16. This Order amends CAO No. R6V-2008-0002. All findings in prior Orders of the Water Board not directly superseded by findings in this Order remain in effect. This Order shall not be construed to preclude enforcement against the Discharger for failure to comply with any requirement in any other Order issued by the Water Board.

IT IS HEREBY ORDERED that, pursuant to the Water Code sections 13267 and 13304, the Discharger shall clean up and abate the effects of the discharge and threatened discharge of chromium to waters of the state, and shall comply with the provisions of this Order:

I. Chromium Plume Definition in the Upper Aquifer

The Discharger must define the extent of total and hexavalent chromium in the upper aquifer within the targeted areas of the Hinkley Valley shown on the chromium plume maps in the *Third Quarter 2012 Groundwater Monitoring Report and Domestic Well Sampling Results*, the figure showing proposed well locations in the July 9, 2012 Monitoring Well Installation Workplan, and to locations in the Harper Dry Lake Valley where chromium has been detected in domestic wells above the maximum background levels.

A. By February 22, 2013, the Discharger must submit a workplan proposing:

1. A sampling and analysis plan to immediately sample domestic wells in target areas of the northern-most plume area at the Hinkley Gap, the eastern boundary area near Dixie Road, and any other areas outside of the currently identified primary contiguous plume boundary that may show anomalous or otherwise unexplained concentrations of chromium in domestic wells. The workplan must include a statistically based trend analysis methodology to determine positive or negative changes in groundwater chromium concentrations over the six month period, beginning March 2013. The general vicinity of domestic wells exhibiting an increasing trend in chromium concentrations will be targeted for follow-up installation of a shallow groundwater monitoring well.
2. Groundwater monitoring well sampling locations in the upper aquifer in the following areas that will allow for the definition of the vertical and lateral extent of the chromium plume to at least maximum background concentrations of 3.1 ppb Cr(VI) and 3.2 ppb Cr(T) and to verify groundwater flow.
 - a. Proposed monitoring well locations shall not exceed one-quarter mile distance from other monitoring wells in accessible areas.
 - b. Eastern boundary: east of wells MW-115 and MW-145 on Dixie Road.
 - c. Northern boundary: north of wells MW-154 and MW-130 to at least domestic well 21N-04 on Hinkley Road in the Harper Dry Lake Valley; west of Mountain View Road (north of Salinas Road); and east of Fairview Road extension (north of Sonoma Road).

The proposed sampling locations must be previously scoped to assure a reasonable probability of success in gaining access and likelihood of well installation or temporary groundwater sampling, such as within previously disturbed areas, such as right of ways. The workplan shall identify all properties owned by the Discharger, and discuss and mark on the map areas where previous attempts to gain access to private properties and desert tortoise habitat have been unsuccessful. Nothing in this Order authorizes the take of a federal or state listed endangered species.

B. By March 15, 2013, the Discharger must begin sampling domestic wells in the northern-most plume area at the Hinkley Gap and the eastern boundary area near Dixie Road monthly for a period of not less than 6 months for total and hexavalent chromium concentrations. These data will be used to

establish potential risk to residents that rely on the domestic water supply. The Discharger must provide well owners with analytical data as soon as they are available following each sampling event.

- C. **By October 30, 2013**, the Discharger must submit a report of domestic well monitoring conducted in accordance with the sampling and analysis plan required in section I.A.1 of this Order. The report must include all analytical data, appropriate maps, statistical test results, and recommended locations for the installation of additional monitoring wells within a quarter mile of any domestic well(s).

The report must also define the full lateral and vertical extent of chromium in groundwater, based on the monitoring information gathered pursuant to section I.A.2 of this Order, for total and hexavalent chromium to at least the maximum background levels of 3.1 ppb and 3.2 ppb, respectively, and determines the direction of groundwater flow. The report must contain the following additional information:

1. **Maps:**

- a. Extent of total and hexavalent chromium in groundwater in the upper aquifer:
 - i. A map showing the maximum plume boundary throughout the uppermost saturated zone.
 - ii. A separate map showing the plume boundary in the lowermost saturated zone.
- b. Extent of total and hexavalent chromium in groundwater in the lower aquifer using a map showing the maximum plume boundary.
- c. Potentiometric map showing the groundwater flow directions, estimated flow velocity, and calculated gradients, along the length of the mapped chromium plume and beyond where water table data exist.

2. **Map Content:**

- a. Text font size on maps shall be 9 points or greater.
- b. Street names must be shown in black color to be easily legible.
- c. Location of all active supply wells used for remedial actions and the compressor station operations.
- d. Approximate location of the Lockhart Fault.
- e. Chromium boundary lines on plume maps must reflect the reported data for the maximum concentration in monitoring wells and extraction wells at all locations. Monitoring wells showing 3.1 ppb Cr(VI) or 3.2 ppb Cr(T) must have plume lines drawn through the monitoring well.
- f. Plume boundary lines must show monitoring and extraction well concentration contours representing the maximum extent of the

following: 1,000 ppb Cr(VI) or Cr(T), 50 ppb Cr(T), 10 ppb Cr(VI) or Cr(T), 3.1 ppb Cr(VI) or 3.2 ppb Cr(T). Plume boundary lines must be drawn to connect any monitoring well located within one-half mile (2,600 ft) of any other monitoring well having chromium concentrations of 3.1 ppb Cr(VI) or 3.2 ppb Cr(T) or greater. The dashed line representing the inferred chromium boundary of 3.1 ppb Cr(VI) or 3.2 ppb Cr(T) shall be a dark color so as to stand out.

- i. Where access to private property or endangered species habitat has not been granted for six months or more, the chromium plume boundary shall be drawn around any domestic well containing chromium concentrations exceeding 3.1 ppb Cr(VI) or 3.2 ppb Cr(T) for at least two consecutive quarters and within one-half mile distance of the prior quarter's plume boundary. The map shall denote concentration isocontour lines with a hash mark to indicate uncertainty in these areas.
- g. Domestic wells having chromium concentrations exceeding maximum background levels and which recently become inactive can be removed from maps only if a monitoring well exists and is monitored within one-quarter mile distance of that domestic well.
- h. If PG&E believes that chromium data in groundwater is not related to its historic chromium discharges and should not be drawn in the plume boundary, it must use data collected within the past three years to make its argument.

3. Report Content:

- a. Description of methods and actions for installing wells.
- b. Laboratory results:
 - i. Sample results showing a difference of 25% or greater between Cr(VI) and Cr(T) concentrations shall be re-tested and the ensuing results described.
- c. Interpretation of chromium plume boundary.
- d. If the chromium plume boundary is undefined in certain areas (sampling locations are more than one-quarter mile distance), propose additional sampling locations and implementation schedule.
- e. Include boring logs and well designs.
- f. Geologic cross sections across the northern plume extent (from Salinas Road and north).
- g. Discussion of calculated groundwater flow direction and velocity.

4. Plume Map Submittals:

- a. Chromium plume maps must be submitted to the Water Board in digitized form (such as a pdf document) within one working day of the report due date. At least one of the submitted maps shall be printable on 8 1/2 in by 11 inch paper.

5. Geotracker Submittals:

- a. Report must be uploaded to the State Water Resources Control Board's Geotracker database, within one working day of the report due date.

II. Groundwater Monitoring Reports

Beginning with the third quarter 2013 quarterly groundwater monitoring report for site-wide and domestic well monitoring, due by **October 30, 2013**, and every quarter (three months) thereafter, the Discharger must include applicable information for maps and reports as described above in Paragraphs C.1., C.2., and C.3. Chromium plume maps and Geotracker submittals shall be implemented according to the due dates described in Paragraphs C.4. and C.5.

III. Laboratory Analysis

Testing for total chromium analyses must be done using US EPA Methods 6010B or 6020A to a reporting limit of 1 ppb. Testing for hexavalent chromium must be conducted in accordance with US EPA Method SW 218.6 with a reporting limit of 0.1 ppb. All future analyses of water samples must utilize the most recent testing methods with the lowest available reporting limits. The laboratory used must be certified by the California Environmental Laboratory Accreditation Program (ELAP).

IV. Liability for Oversight Costs Incurred by the 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 cleanup 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 to include the cost of split sample collection and analyses. 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.

V. 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 Civil Engineer registered in California. It is expected that all interpretations and conclusions of data in these documents be truthful, supported with evidence, with no attempts to mislead by false statements, exaggerations, deceptive presentation, or failure to include essential information.

VIII. 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 or Water Board representative as additional information becomes available.

IX. Enforcement Options

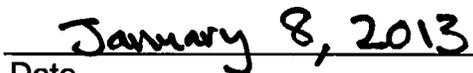
Failure to comply with the terms or conditions of this Order will result in additional enforcement action that may include the imposition of administrative civil liability pursuant to Water Code sections 13268 and 13350 or referral to the Attorney General of the State of California for such legal action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

X. Right to Petition

Any person aggrieved by this action of the Lahontan Water Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 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, or 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.


Patty Z. Kouyoumdjian
Executive Officer


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Exhibit G

August 17, 2011 OEHHA Memorandum to Regional Board Executive Officer

Office of Environmental Health Hazard Assessment



Matthew Rodriguez
Secretary for
Environmental Protection

George V. Alexeeff, Ph.D., D.A.B.T., Acting Director
Headquarters • 1001 I Street • Sacramento, California 95814
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Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: Harold J. Singer, Executive Officer
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, California 96150

FROM: George V. Alexeeff, Ph.D., D.A.B.T.
Acting Director

DATE: August 17, 2011

SUBJECT: PROPOSED PUBLIC HEALTH GOAL FOR HEXAVALENT CHROMIUM

Thank you for your inquiry of July 19, 2011 requesting guidance on the use of the new Public Health Goal (PHG) for hexavalent chromium (Cr VI) as a possible replacement standard for drinking water in Hinkley, California. On July 27, 2011, the Office of Environmental Health Hazard Assessment (OEHHA) published its PHG for Cr VI. Consequently, this PHG is no longer proposed but has been officially established by OEHHA at 0.02 parts per billion (ppb). This puts California in the position of having in place a non-mandatory goal for Cr VI without a corresponding state or federal regulatory standard. We appreciate that this may create challenges for regional water boards. The current situation in Hinkley described in your letter is one such example.

You have posed five specific questions to OEHHA covering three different aspects of the newly finalized PHG for Cr VI:

1. Whether the PHG is appropriate for use as a drinking water replacement standard?
2. Whether the PHG is scientifically justified given the comments of Dr. Joshua W. Hamilton, Ph.D.?
3. Whether evaporative coolers (a.k.a., swamp coolers) pose an inhalation risk by increasing the concentration of airborne Cr VI?

Responses to these questions have been prepared by OEHHA staff and are attached. Feel free to contact me at (916) 322-6235 if you require further information on how California's PHG for Cr VI was developed.

California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.

Attachment

Question 1. When is OEHHA scheduled to adopt the proposed PHG for hexavalent chromium?

Answer 1. The PHG for hexavalent chromium is now final and was posted on our Web site on July 27, 2011. It can be accessed at <http://oehha.ca.gov/water/phg/072911Cr6PHG.html>.

Question 2. What is OEHHA's position on the applicability of the proposed PHG as a value that would be protective of public health related to potential exposure of residents in Hinkley? If OEHHA's response is that use of the PHG is not applicable, please indicate if the current CA MCL is protective of public health and should be the standard that is used as the basis for providing replacement water. If neither the proposed PHG nor the CA MCL are the appropriate values to use, what would be an appropriate value that would be protective of public health?

Answer 2. By law, PHGs are determined by OEHHA's scientific assessments of the health risks posed by drinking water contaminants. In the case of hexavalent chromium, the PHG identifies a level of the metal in drinking water (0.02 ppb) that would pose no more than a one-in-one million cancer risk to individuals consuming water with that level of the contaminant daily over a 70-year lifetime. The PHG is a non-regulatory guideline that does not define an acceptable level of a contaminant in drinking water. State law requires the California Department of Public Health (CDPH) to set state Maximum Contaminant Levels for contaminants as close to the corresponding PHGs as is economically and technically feasible. In setting MCLs, CDPH considers important information (i.e., economic costs, technical feasibility, detection limits and water-supply issues) that by law OEHHA cannot consider when it develops PHGs.

Question 3. What is OEHHA's position on the comments by Dr. Joshua W. Hamilton Ph.D. (Attachment 3) on the scientific basis for the development of the PHG by OEHHA, specifically points 8-10 and 12?

Answer 3.

Comment 8-1: "For example, the lowest Cr(VI) concentration that caused tumors in animals in the National Toxicology Program study [4] which was the foundation for the draft PHG, was 20,000 µg/L. Notwithstanding, OEHHA proposed a PHG of 0.02 µg/L, *one million times lower* than the concentration that caused cancer in mice from a lifetime of drinking water exposure."

Response 8-1. The lowest Cr VI concentration causing a statistically significant increase in tumors compared to controls was 30,000 µg/L for adenomas and carcinomas of the small intestines of male mice (NTP, 2008). While the second sentence of this comment is literally true, it misses a critical point. Due to the limited number of mice used in the two-year bioassay (NTP, 2008), the absence of tumors at the lower Cr VI drinking water concentrations should not be interpreted as a threshold for tumor induction. Indeed, the genotoxic mechanism of action of Cr VI discussed in

the PHG document suggests that tumors would have been increased at dose levels well below those tested in the bioassay if more animals had been used in the experiment.

Comment 8-2: "The calculations embodied in the draft PHG do not represent 'established science.'"

Response 8-2. This statement is contradicted by the following:

1. Standard methodology was followed to model the rodent tumor data (U.S. EPA, 2005; OEHHA, 2009).
2. Professors from both the University of California and other universities reviewed the draft PHG documents. While there was not unanimity regarding the choice of method for modeling the rodent tumor data, the consensus opinion was that OEHHA had modeled the data according to the best current practices (see Responses to Comments document, available at <http://oehha.ca.gov/water/phg/072911Cr6PHG.html>).
3. Both the U.S. EPA (2010) and the New Jersey Department of Environmental Protection (2009) chose the same methodology as OEHHA for calculating the cancer potency of Cr VI. All three organizations derived the identical cancer potency value, suggesting that "established science" had been followed.

Comment 8-3: "And even if the draft PHG is adopted, regulators should not assume that exposures of the type and duration that would be experienced by Hinkley residents will result in any adverse health impacts. In fact, there is no way to confirm any of the risk assessors' assumptions in constructing the models that ostensibly support the draft PHG, or to determine whether there are any measurable health effects as a result of exposures at 0.02 µg/L. They reflect a highly conservative, overly-protective regulatory limit that assumes a lifetime of exposure, but they do not represent levels that suggest a significant or immediate health threat."

Response 8-3. It is not possible to measure tumor incidence in rodents at low Cr VI concentrations in drinking water because too many animals would be needed (U.S. EPA, 2005). Thus, the commenter is correct in suggesting that tumor induction cannot be measured in rodents exposed to Cr VI in the parts per billion (ppb) and parts per trillion (ppt) ranges. However, the best carcinogenicity data we have for exposures at low dose levels come from the human A-bomb survivors. Those data indicate a linear relationship between dose and cancer incidence that extends to the lowest dose levels analyzed for any carcinogen (Brenner *et al.*, 2003). Therefore, linear extrapolation is indicated for genotoxic carcinogens (U.S. EPA, 2005; OEHHA, 2009). This methodology was used in the PHG document to quantify the cancer risks posed by concentrations of Cr VI in the ppb and ppt ranges.

Comment 9-1: "Similarly, OEHHA is explicit that the draft Cr(VI) PHG is not and should not be used as a regulatory or cleanup standard: 'PHGs are not regulatory requirements, but instead represent non-mandatory goals....PHGs are not developed as target levels for cleanup of ground or ambient surface water contamination, and may

not be applicable for such purposes, given the regulatory mandates of other environmental programs.' ([3] p. iii.)"

Response 9-1. The commenter is correct in stating that PHGs are not developed as groundwater cleanup standards. Rather, PHGs are used by the California Department of Public Health (DPH) in establishing primary drinking water standards (State Maximum Contaminant Levels or MCLs).

Comment 9-2: "In sum, the draft Cr(VI) PHG as its name implies, is at most a goal, not a regulatory level, and in no way should exposures to concentrations above 0.02 µg/L be interpreted as an immediate health risk to Hinkley residents nor should this proposed goal be used to set action or cleanup levels."

Response 9-2. The value 0.02 µg/L is the 70-year exposure level estimated to be associated with a one in one million increased risk of cancer. In other words, one extra case of cancer would be expected in a population of one million persons consuming drinking water for seventy years at this concentration. A drinking water concentration ten times higher would yield a ten-fold higher risk (for example).

Comment 10-1: "The initial draft Cr(VI) PHG drew on two principal studies: The 1968 Borneff, et al., animal study [6], and the 1987 Zhang and Li epidemiology study. [7] Both are outdated and flawed, and they have been rejected by EPA and mainstream toxicology experts as a foundation for toxicology risk assessment."

Response 10-1. U.S. EPA's current Draft Toxicological Review of Hexavalent Chromium (2010) contains an extensive discussion of the epidemiology study by Zhang and Li (1987). This study is an important part of that document's discussion of the human relevance of the rodent tumor data. The final PHG document does the same. It should be noted that the U.S. EPA document specifically supports the re-analysis of the original Zhang and Li (1987) study conducted by Beaumont *et al.* (2008). Dr. Beaumont is one of the authors of the final PHG document. With regard to Borneff *et al.* (1968), discussion of this study was moved to the Appendix of the PHG document on the advice of peer reviewers. The study was included in the Appendix so as to generate a PHG document that cites all significant studies that tested Cr VI carcinogenicity via the oral route. Neither Borneff *et al.* (1968) nor Zhang and Li (1987) is used to calculate the PHG of 0.02 µg/L. That calculation is based on rodent tumor data from NTP (2008).

Comment 10-2: "EPA's draft Profile appropriately omits any reference to the Borneff study in its review of key animal studies. While the draft profile discusses the Zhang study and three follow-up analyses, it correctly states that it should not be used for risk assessment purposes. The panel agreed with these assessments. Thus, there is already significant disagreement between the draft PHG and EPA's draft Cr(VI) Toxicology Profile."

Response 10-2. Borneff *et al.* (1968) is reviewed in the Draft U.S. EPA Toxicology Review of Hexavalent Chromium (2010). As mentioned above in Response 10-1, Zhang and Li (1987) is thoroughly evaluated in the U.S. EPA document, where it is an important part of the discussion concerning the human relevance of the rodent data.

Also as noted above, U.S. EPA selected the re-analysis of Zhang and Li (1987) by Beaumont *et al.* (2008) over Kerger *et al.* (2009) as representing the most useful re-analysis of the original data. Dr. Beaumont is one of the authors of the PHG document. Lastly, the OEHHA PHG document and the U.S. EPA document develop identical cancer potencies for Cr VI via the oral route. This does not support the claim in Comment 10-2 that "there is already significant disagreement between the draft PHG and EPA's draft Cr(VI) Toxicology Profile."

Comment 10-3: "The panel's consensus was that the pending studies provided important new information that was critical to an overall understanding of Cr(VI), and should be incorporated into the EPA's Profile. Thus, the panel urged EPA to wait for these studies to be published so that they may be taken into account in their assessment."

Response 10-3. OEHHA will review papers and materials relating to the American Chemistry Council study of Cr VI toxicology when they are published. If the study produces compelling information that should be reflected in the PHG document, OEHHA will take appropriate action.

Comment 12-1: "In addition, OEHHA concluded that exposure by inhalation during showering did not contribute significantly to the overall risk. And even with conservative assumptions regarding exposure during showering, the contribution to risk from inhalation was 180 times lower than that from drinking water exposure."

Response 12-1. This is correct. Less than one percent of the cancer risk due to Cr VI in drinking water was due to inhalation during showering compared to over 99 percent due to ingestion.

Question 4. What is OEHHA's position on the validity of footnote No. 5 in Attachment 3?

Answer 4.

Footnote 5: "The PHG associated with inhalation exposure may be readily calculated from the information in the draft PHG assessment by removing the contribution from oral exposures. The PHG associated with inhalation exposure is 3.6 µg/L."

Response to Footnote 5. It is not clear what Dr. Hamilton was trying to say in footnote 5. A PHG for a carcinogen is determined to be the drinking water concentration associated with a 10^{-6} cancer risk due to all applicable routes of exposure. The PHG for Cr VI in drinking water is 0.02 µg/L. This is based on exposure via ingestion and via inhalation during showering. Since so little Cr VI is inhaled during showering, a PHG based only on ingestion is identical (after rounding) to that based on ingestion plus inhalation during showering: 0.02 µg/L. The correct and useful interpretation is that the fractional cancer risk due to inhalation of Cr VI is very small, and that inhalation exposure cannot be used as a basis for establishing the PHG.

Question 5. What is OEHHA's position on Dr. Hamilton's conclusion that swamp coolers do not pose an inhalation risk? If OEHHA believes that Dr. Hamilton's

conclusions are not supported by the available information (including but not necessarily limited to the references cited), does OEHHA believe that swamp coolers could pose a risk, and if so, at what hexavalent level? If OEHHA believes that the available information is insufficient to reach a conclusion, would OEHHA be willing to perform an evaluation of a typical residence in Hinkley to determine if the use of swamp coolers with water which contains low levels of hexavalent chromium poses a health risk to the residents? This evaluation could be in collaboration with the Agency for Toxic Substances Disease Registry which has done similar studies on other constituents.

Answer 5. We agree with Dr. Hamilton's conclusion that swamp coolers do not increase the concentration of airborne Cr VI. Thus, with regards to Cr VI, swamp coolers do not constitute an inhalation health risk. This is based on the following studies located in the scientific literature:

1. Finley *et al.* (1996) demonstrated that swamp coolers operating with water containing concentrations of Cr VI up to 20 mg/L did not increase the concentration of Cr VI in indoor air. The American Society for Testing and Materials (ASTM) Method D5281 was used. This allowed measurement of total Cr VI in the air, whether in the form of fumes, aerosols or particulates.
2. Paschold *et al.* (2003a) determined that indoor swamp coolers lowered rather than raised the levels of airborne particulate matter (PM_{2.5} and PM₁₀) potentially harboring Cr VI.
3. Paschold *et al.* (2003b) extended their previous study (Paschold *et al.*, 2003a) by analyzing the elements comprising airborne particulate matter (PM_{2.5} and PM₁₀) collected in the presence of swamp coolers. They found no evidence that swamp coolers introduced metals from the cooling water into the indoor air, whether in the form of particulates or aerosols.

These studies appear to have been well-conducted and the conclusions are warranted by the data. Therefore, the data on hand support Dr. Hamilton's conclusion that swamp coolers do not increase the concentration of airborne chromium.

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