

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

**MEETING OF OCTOBER 9 - 10, 2013
BARSTOW**

ITEM: 7

**SUBJECT: WASTE DISCHARGE REQUIREMENTS DISCUSSION,
PACIFIC GAS & ELECTRIC COMPANY'S (PG&E)
HINKLEY COMPRESSOR STATION, SAN BERNARDINO
COUNTY**

CHRONOLOGY: On July 17, 2013 at its regular meeting in Barstow, the Water Board adopted a resolution to certify a Final Environmental Impact Report (EIR) for comprehensive cleanup of chromium in groundwater at Hinkley, and discussed options for developing comprehensive cleanup requirements.

BACKGROUND: An EIR was prepared to support the Water Board's issuance of Waste Discharge Requirements (WDRs) and a Cleanup and Abatement Order to expand remediation of chromium in groundwater in the Hinkley Valley. The EIR analyzed five action alternatives involving different combinations and intensities of four remediation technologies: 1) groundwater extraction combined with agricultural treatment units, 2) in-situ (in-aquifer) remediation using carbon-source injections, 3) groundwater extraction combined with ex-situ (above-ground) treatment, and 4) freshwater injections into the aquifer. No "preferred alternative" was identified in the EIR. This allows the Water Board maximum flexibility to direct PG&E to implement the full range of remediation methods analyzed in the EIR over the entire project area, without being constrained by choosing one alternative.

Public comments received during EIR development indicated that dissolved metals byproducts such as manganese generated by in-situ treatment injections are of considerable concern. In response, Water Board staff required, in a December 21, 2012 Order, that PG&E conduct additional investigations to verify that in-situ remediation byproducts are confined to the remediation area, and also enhanced an EIR mitigation measure to prohibit the expansion of existing in-situ remediation until those investigations are complete. The first byproduct investigation report is due November 20, 2013.

In order to move forward with certain components of an expanded remediation project while the required in-situ byproduct investigations are being completed, PG&E has proposed an initial expansion of agricultural treatment units. Water Board staff proposes to develop WDRs specifically addressing the discharges associated with agricultural treatment units only. Several options are proposed for structuring the WDRs to authorize expansion, as shown in Enclosure 1, and discussed below.

DISCUSSION:

Public Outreach: In August 2013, the Water Board and PG&E staff met with a subgroup of the Hinkley Community Advisory Committee (CAC) and its technical consultant to discuss options for expanded agricultural treatment unit. In general, support was expressed for additional agricultural treatment units to treat chromium in the extracted groundwater and provide hydraulic containment of the chromium plume.

However, there were concerns related to the potential for increased agricultural extraction to result in decreased water well yields due to more extensive groundwater drawdown, and to affect water quality in wells near the new agricultural treatment units. Stakeholders also requested additional information on the effectiveness of the current agricultural treatment units. A gradual expansion approach was preferred, so that the nature and magnitude of any impacts and the effectiveness of mitigation measures can be assessed at a smaller scale in the near-term.

Agricultural Treatment Unit Water Quality Impacts and Mitigation: The EIR identifies impacts to domestic wells from increased byproducts such as total dissolved solids, nitrate, and uranium due to agricultural irrigation, and potential increases in chromium due to plume bulging. The EIR requires that PG&E provide replacement water supplies for water quality impacts related to remediation. Some of the domestic wells in areas that may be impacted in the future by existing and expanded agricultural treatment units have already opted for whole house water treatment units, property purchase, or the bottled water-only option. Recent experience demonstrates that the whole house units can typically be operational within four to six months, and an EIR mitigation measure requires that PG&E conduct extensive monitoring so that an alternate water supply can be installed prior to water quality being impacted in additional residential wells. Therefore, incorporating the water quality mitigation measures from the EIR into agricultural treatment unit WDRs will help address many concerns regarding water quality impacts.

Groundwater Drawdown Impacts and Mitigation:

Groundwater drawdown affecting water supply wells was identified as a significant impact in the EIR. For supply wells that are affected by drawdown ("affected" is defined as a decrease of 25% or more of the wetted screen depth of a supply well due to remedial extraction), PG&E is required to provide alternate water supply to the affected well user. The method for providing such alternate supply could be fairly straightforward, such as lowering the well pump or drilling a deeper well. However, in areas of the Hinkley Valley where the aquifer is shallow, these straightforward fixes may not be available, and a more intensive and time-consuming effort to replace the water supply would be needed, likely similar to the current effort of providing a new water supply to the Hinkley School.

Water Board staff have considered these concerns in proposing permit structure options. Enclosure 1 identifies three different permit structure options: one that proposes no limits, and would allow the maximum amount of acreage/pumping rates analyzed in the EIR; a second that would impose limits on the number of allowable acres for treatment or pumping rates; and a third that would allow expansion of new agricultural treatment units according to categories based on risk of water quality or groundwater drawdown impacts. Categories with greater potential to affect supply wells or threaten water quality would require more intensive monitoring and planning than lower threat categories.

Water Board staff will discuss Enclosure 1 at the September CAC meeting. At the October Board meeting, staff will share a summary of public comments received at the CAC meeting.

RECOMMENDATION:

This is an informational item only; however, the Water Board may provide direction to staff.

ENCLOSURE:

Enclosure	Item	Bates Number
1	Agricultural Treatment Unit WDRs permitting options table	7-7

This page is intentionally left blank.

ENCLOSURE 1

This page is intentionally left blank.

Enclosure 1. Options for Agricultural Treatment Unit (ATU) Waste Discharge Requirements Permitting

1. Write Waste Discharge Requirements (WDRs) to allow expansion to the maximum amount of acres and drawdown/pumping rates analyzed in the Environmental Impact Report (EIR).

Based on the amount of acres and extraction rate from EIR alternative 4C-4 (4,388 gallons per minute [gpm]/1,394 acres).

Monitoring: Consider more intensive monitoring where ATUs would be operated in certain areas, such as:

- Areas of higher chromium concentrations than historically applied (i.e., higher than applied at the East Land Treatment Unit, operated from 1992 to 2001 in Operable Unit [OU] 1; see attached map for OU locations);
- Areas where chromium concentrations in irrigation water is more than 20 times¹ greater than concentrations in receiving groundwaters, and a potential for downgradient migration to domestic wells exists.
- Areas of active in-situ remediation, where in-situ treatment byproducts may be present in irrigation waters such that soil levels may become elevated (over a threshold value) or mobilization to groundwaters may occur.

Advantages: WDRs would be applicable long-term, no need to write additional WDRs as agricultural remediation expands.

Challenges: Expansion of ATUs to maximum allowable amount, instead of a more limited amount, may not have public support based on initial feedback from stakeholders.

2. Write WDRs to allow limited amount of acres and drawdown/pumping rates.

Options:

- A. Limit allowable ATU acres/extraction rates to that of EIR alternative 4C-2 (about 575 acres).
- B. Put time steps on the expansion of acreages and pumping rates.

Example:

¹ The "20 times greater" criterion is based on the measured chromium removal efficiency from existing ATUs of 95%, so 5% (1/20) of chromium in the irrigation water could potentially percolate back to groundwater. Additional monitoring could be required to evaluate if the residual chromium might degrade water quality such that domestic wells would be impacted.

- 2014-2017: up to 3,167 annual average gallons per minute extraction rate/575 acres (based on EIR alternative 4C-2)
- 2018-2021: up to 3,750 gpm/800 acres (mid-range amount of acres and extraction rate)
- 2022 and beyond: up to maximum allowed by EIR of 4,388 gpm/1,394 acres (4C-4)

Monitoring: Same as for Option 1.

Advantages: Both options provide assurance that expansion of ATUs will be limited to start, so may have better public support using a limited or time step approach.

Challenges: Option A WDRs will only be good in the short-term (2 to 3 years or so). When additional ATUs are needed to provide hydraulic containment or treat more of the project area, a new or additional permit would be needed, which could slow remediation expansion. Option B WDRs may still limit remediation pace; however, they could include language to allow the Executive Officer to expedite the expansion schedule based on certain factors, such as needed hydraulic containment, low risk of impacts, etc. Developing meaningful and non-arbitrary time steps for expansion would be challenging, especially ahead of upcoming cleanup requirements that will be set in a Cleanup and Abatement Order. Time steps could limit the ability to adaptively manage remediation progress, or respond to impacts.

3. Write WDRs using a categorical approach that sets additional requirements based on water quality and drawdown risk. WDRs could authorize expansion to the maximum amount of EIR acres, or a limited amount.

Potential Categories:

A. Low threat ATUs

- All existing ATUs (Desert View Dairy, Gorman north/south, Cottrell, Yang). These would not require soil, plant or vadose (unsaturated) zone monitoring, due to existing information, but would require all investigations and monitoring required by the EIR.
- Any new ATU in OU2 or OU3 (generally areas with chromium concentrations below 50 ppb), and where irrigation water chromium concentrations are below a certain threshold. This category would not require soil, plant or vadose zone monitoring, but would require all pre-discharge investigations (for background water quality and groundwater levels) and monitoring required by EIR.

- This category does not include ATUs for which modeling analysis shows the need for alternate water supply mitigation due to projected groundwater drawdown which cannot be mitigated by a installing a deeper well or well pump.

B. ATUs within OU1 with high chromium concentrations in irrigation water, or near active in-situ treatment areas

- Additional monitoring of soil, plant tissue, irrigation water and vadose zone required due to potential for higher than historically applied concentrations of chromium and in-situ byproducts in irrigation water.
- This category does not include ATUs for which modeling analysis shows the need for alternate water supply mitigation due to projected groundwater drawdown which cannot be mitigated by a installing a deeper well or well pump.

C. ATUs requiring piped alternative water supply for mitigation

- Any new ATU where groundwater drawdown is predicted to occur **and** will require water supply mitigation other than a deeper well or lowering the well pump. In other words, if ATU extraction will draw down a supply well, and there isn't a deeper well or pump option available, then this will require additional planning. For example, an alternate water supply system (such as piped water from upgradient of the compressor station) must be in place before the ATU can begin operation.

Advantages: WDRs would be applicable long-term, no need to draft additional WDRs as agricultural remediation expands. Potential for greater stakeholder support for a categorical approach specifying additional monitoring and planning for higher risk ATUs. A categorical approach could allow stakeholders an opportunity to review Category C (and possibly Category B) ATUs, prior to Executive Officer authorization to PG&E to proceed.

Challenges: Specifying clear criteria for categories to adequately address stakeholder concerns. Developing a simple, timely review and approval process that provides for public review and comment on potentially controversial ATUs (this challenge applies to all options).

Location of Operable Units (OUs)

