

March 28, 2013

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

Re: Comments on PG&E's Work Plan on the Response to Investigative Order No. R6V-2012-0060: Byproducts Plume Monitoring in IRZ Areas, Pacific Gas and Electric Company (PG&E), Hinkley Compressor Station, San Bernardino County dated February 15, 2013.

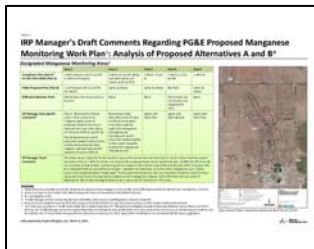
The image shows a screenshot of a document titled "IRP Manager's Draft Comments Regarding PG&E Proposed Manganese Monitoring Work Plan: Analysis of Proposed Alternatives A and B". The document contains a table with columns for "Alternative", "Description", and "Comments". The table is partially visible, showing several rows of data. To the right of the table is a small map showing a geographical area with various markers and labels.

Table 1

Key Points: IRP Manager is proposing (see attached comments summary Table 1¹) that some of the Work Plan's manganese monitoring well locations be slightly relocated based on the anticipated direction of groundwater flow, and the need to definitively verify, (and thereby eliminate CAC and Community's concerns) that there is no lateral (pure east to west) migration of groundwater

from the IRZ. Recommendations also include the need for a second tracer test² to be conducted associated with the IRZ-manganese impacts which are observed north of Frontier Rd. and south of Highway 58.

Dear Executive Officer Kouyoumdjian:

The Independent Review Panel (IRP) Manager is submitting comments regarding Pacific Gas and Electric Company (PG&E) proposed "Work Plan" on *the Response to Investigative Order No. R6V-2012-0060: Byproducts Plume Monitoring in IRZ Areas* prepared by Arcadis. Investigation Order No. R6V-2012-0060³ "the IO" required PG&E to conduct the following work:

- Submit a Work Plan by February 15, 2013 to better delineate the Manganese in the following areas:
 - North: in the 1,000 ft gap between wells Ex-21 and EX-22 (PG&E Area 1)

¹ A draft version of Table 1 was provided to the Water Board at the Water Board's Manganese Community Meeting held in Hinkley, CA on March 14, 2013.

² The IRP Manager was commenting on PG&E's February 15, 2013 work plan, which we now understand (per the above Community Meeting) has been modified to include a second tracer study, similar to what is being recommended herein by the IRP Manager.

³ IO No. R6V-2012-0060 was released by the Water Board on December 22, 2012

- West: in the 1,300 ft gap between wells CA-MW-108 and SC-MW-13 (PG&E Area 2)
- Southwest: in the 1,900 ft gap between SA-MW-16 and MW-78 (PG&E Area 3)
- South: in the 1,000 ft gap between wells MW-78 and MW-39 (PG&E Area 4)
- East: in the 1,000 ft gap between wells SA-MW-25 and SC-MW-01 (PG&E Area 5)
- Propose a tracer test along the western IRZ in the Work Plan
- Beginning 1st Quarter 2013 Manganese has to be monitored in the following wells MW-17, MW-36, MW-37, MW-38, MW-46, MW-61, MW-67, MW-73, MW-78, MW-155 and SA-MW-27

PG&E proposed two alternatives for monitoring well and tracer study locations in the Work Plan. Figure 1 shows Alternative A representing PG&E's interpretation of the IO. Alternative A includes a total of 14 new monitoring wells and injection of tracer at 6 monitoring wells at the Source IRZ. Figure 2 shows Alternative B representing PG&E's recommended plan, in part, derived from the Manganese Technical Exchange Meeting (TEM) on February 13, 2013. CAC Members participated in this meeting, and had the opportunity to present their opinions and provide input.

In summary, the IRP Manager is in technical agreement with Alternative B but recommends that the following comments (duplicated in summary **Table 1**) are addressed in the final Work Plan.

Area 1

In Alternative B, PG&E is proposing to install Well D approximately 100 ft north of extraction well EX-22. Given known groundwater flow directions, well D may not be in the Manganese groundwater flow pathway, since it is located, and possibly "protected" from measuring any upgradient Manganese groundwater impacts, since it is located downgradient of EX-22. (i.e. there is a possibility that well D could be within the radius of influence of EX-22, and thereby generate Manganese false negatives readings in Area 1. The IRP Manger is recommending that Well D is installed further to the west (or southwest) of EX-22. A discussion on the radius of influence of EX-21 and EX-22 should be included in the Work Plan.

Area 2

The IRP Manger recommends that Wells E2 and F2 are eliminated from both Alternative A and B since both wells may be within the 390 ppb and above, contoured Manganese plume area. Wells E1 and F1 appear to be better candidate

locations, and the IRP would recommend their locations be moved further west, if possible.

Area 3

The IRP Manager is in agreement with the proposed locations for Well G and Well H.

Area 4

Groundwater flow is generally in the northerly direction so the IRP Manager is in agreement that the well configuration sampling layout proposed for Alternative B for Area 4 is appropriate. However, if sampling results at wells MW-17, MW-39, MW-78 and SA-MW-27 are above the threshold of Manganese then the IRP Manager would recommend the installation of Wells I, J, K, L and M.

Area 5

The IRP Manager is in agreement with the proposed location of Well N.

Tracer Study Work Plan

The IO states the following regarding the tracer test in the IRZ Area:

In addition, the workplan shall propose a tracer test along the western IRZ boundaries.

PG&E proposes to inject tracer at six existing wells (SA-RW-11, SA-RW-12, SA-RW-13, SA-RW-14, SA-RW-15 and SA-RW-16). All wells are located within the Source Area IRZ. If we assume a (maximum) groundwater flow rate of 4 feet per day, the furthest that the tracer might travel is ~3,600 ft in the two and half years proposed in the Work Plan; that is, the tracer might reach the Central IRZ Area. The IRP Manager therefore recommends expediting the study by injecting another tracer simultaneously at another location; namely northwest injection well (CA-RW-01) or near Highway 58.

The IRP Manager would also recommend that PG&E calculate the maximum possible distance Manganese would have traveled since the start of any IRZ operations. The calculations should be computed in accordance with Appendix G of Addendum 3 of the Feasibility Study⁴.

Final Remarks

In conclusion, and equally importantly as the above technical comments, the CAC, the Community and the IRP Manager appreciate the transparency with which the Water Board and PG&E have managed a **technical discussion process** to first

⁴ PG&E, Prepared by Haley and Aldrich, San Diego, *Addendum #3 To The Feasibility Study Pacific Gas and Electric Company, Hinkley Compressor Station, Hinkley, California. Appendix G: Development of a Groundwater Flow and Solute Transport Model*, September 15, 2011.

quantify the extent of manganese impacts, second understand how they could be occurring and third formulate a plan for further assessment work. The *process* has allowed the CAC and Community to participate, understand technical opinions, voice their opinions and influence the *process*. Once the process has been completed (work plan is approved, work plan executed and final report is approved) and all data gaps have been addressed in the IRZ area then only should the findings be presented to the Community⁵. The CAC and the IRP Manager hope this *process*, as exemplified via the manganese work, can be carried over to other parallel programs such as the Background Study and Cr6 Plume Assessment.

Should you have any questions or comments please feel free to contact me at 714-388-1800 / iwebster@projectnavigator.com, or Dr. Raudel Sanchez at 714-388-1821 / rsanchez@projectnavigator.com.

Respectfully Submitted,



Ian A. Webster, Sc.D.
IRP Manager



Raudel Sanchez, Ph.D.
Project Engineer

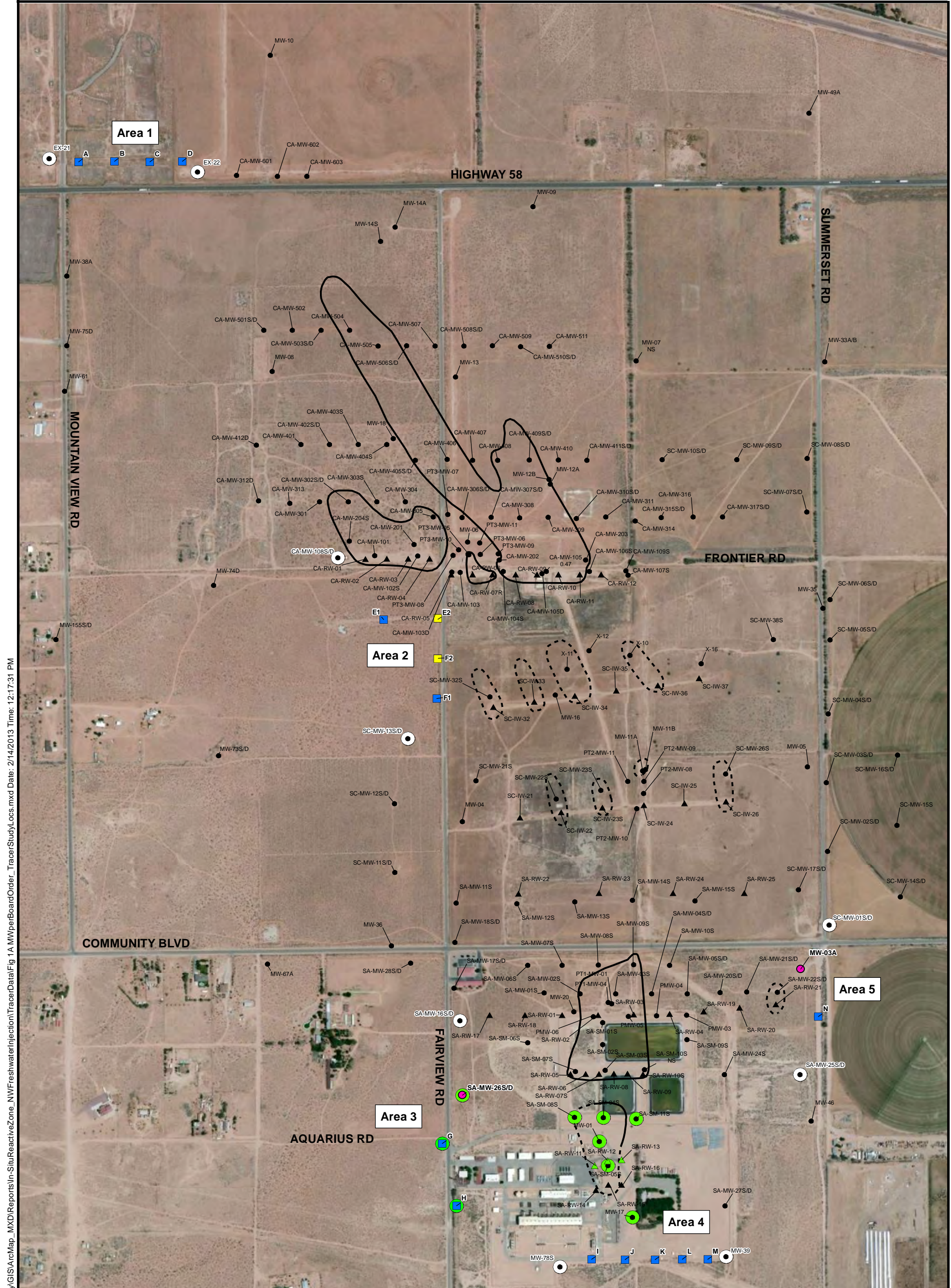
Cc: Hinkley Community Advisory Committee (CAC)
PG&E Contacts

- Devin Hassett, Keadjian & Associates
- Kevin Sullivan, PG&E

Attachments

- Figure 1: Monitoring Well Locations per Board Order No. R6V-2012-0060 and Tracer Study Locations (Alternative A)
- Figure 2: PG&E Proposed Monitoring Well and Tracer Study Locations (Alternative B)
- Table 1: IRP Manager's Draft Comments Regarding PG&E's Proposed Manganese Monitoring Work Plan: Analysis of Proposed Alternatives A and B

⁵ The CAC was concerned that the Lahontan Water Board presented their preliminary findings regarding 'Black Water' without the process being completed during their March 13, 2013 Manganese Community Meeting held at Hinkley Elementary School.

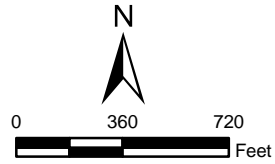


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Legend

- Monitoring Wells
- ▲ IRZ Recirculation Wells
- Proposed Monitoring Well
- Alternative Monitoring Well Location
- Existing Monitoring Well to be Used for Manganese Delineation Program
- ▲ Injection Well to be used for Tracer Study
- Monitoring Well to be used for Tracer Study Monitoring
- Wells referred to in Board Order No. R6V-2012-0060 to define areas requiring new monitoring wells
- Dissolved manganese concentrations exceeding threshold concentration of 0.39 mg/L Fourth Quarter 2012

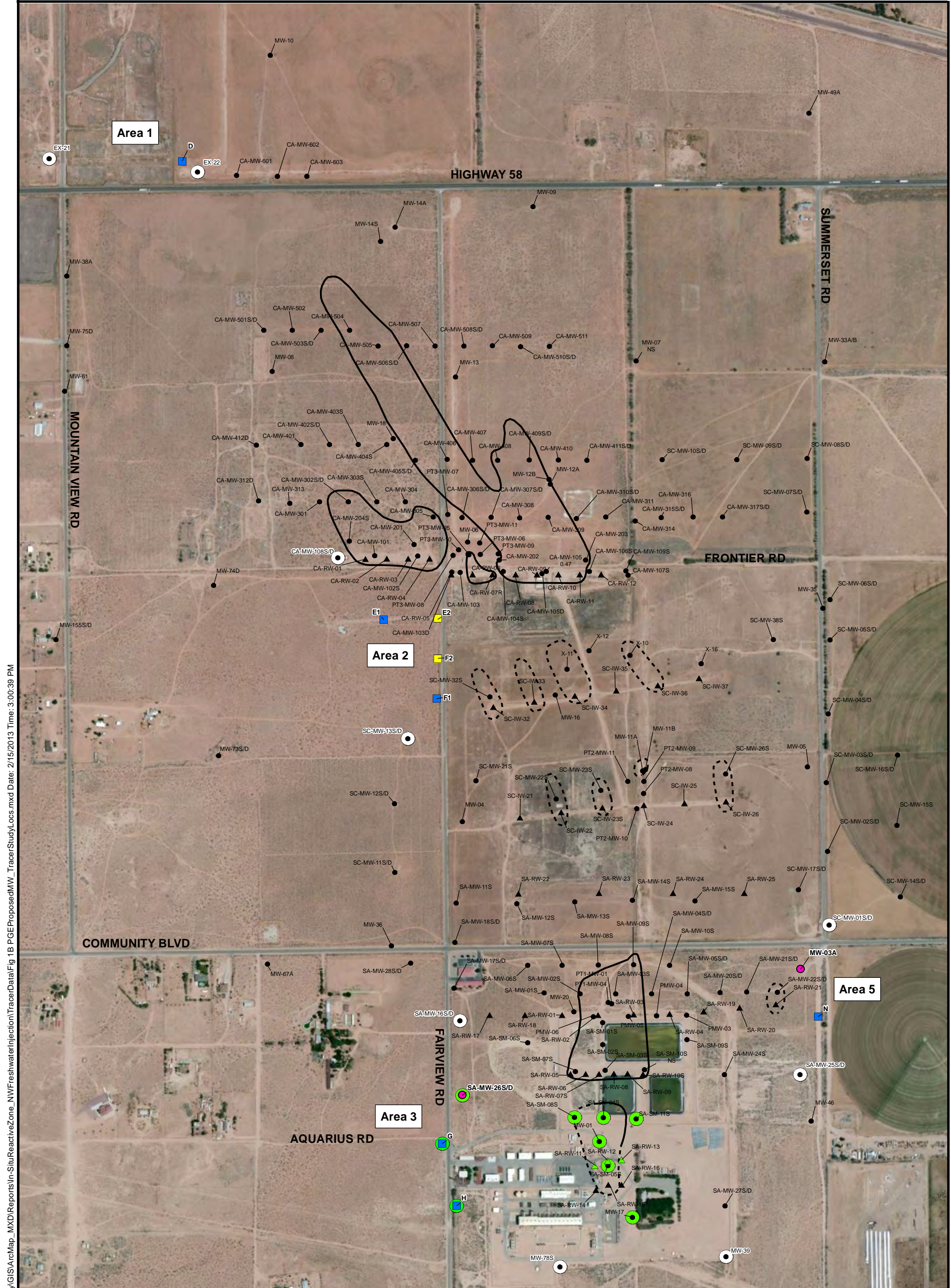
Note:
 Imagery accessed through BING Maps Aerial via ArcGIS Online Layer Packages by ESRI (12/1/2010) (c) 2010 Microsoft Corporation and its data suppliers accessed on 02/04/2013 through ArcGIS 10.
 mg/L- milligrams per liter



**FIGURE 1A
MONITORING WELL LOCATIONS PER
BOARD ORDER NO. R6V-2012-0060
AND TRACER STUDY LOCATIONS**

PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY, CALIFORNIA



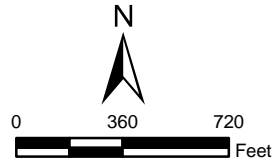


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Legend

- Monitoring Wells
- ▲ IRZ Recirculation Wells
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- Existing Monitoring Well to be Used for Manganese Delineation Program
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**FIGURE 1B
PG&E PROPOSED MONITORING WELL
AND TRACER STUDY LOCATIONS**

PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY, CALIFORNIA



TABLE 1

IRP Manager's Draft Comments Regarding PG&E'S Proposed Manganese Monitoring Work Plan¹: Analysis of Proposed Alternatives A and B*

Designated Manganese Monitoring Areas²

	Area 1	Area 2	Area 3	Area 4	Area 5
Compliance Plan with IO³ No.R6V-2012-0060 (Plan A)	4 Wells between EX-21 and EX-22: Wells A through D	2 Wells: E1 and F1 (Note: Two alternatives are shown as E2 and F2)	2 Wells : G and H	5 Wells: I, J, K, L and M	1 Well: N
PG&E Proposed Plan (Plan B)	1 well between EX-21 and EX-22: Well D	Same as Above	Same As Above	No Wells	Same As Above
Difference Between Plans	Plan B does not include wells A, B, and C	None	None	Plan B does not include any new (upgradient) wells	None
IRP Manager Area Specific Comments⁴	Plan A: Recommend that all wells in Plan A should be installed slightly south of proposed locations to ensure that wells are not in the radius of influence of EX-21 and EX-22. Plan B: Recommend well D should be located further to this southwest to avoid any false negative readings because the possible influence of EX-22.	Recommend that alternative wells E2 and F2 be eliminated since they might be within the manganese 390 ppb plume boundary. E1 and F1 should be located slightly further west if possible to avoid the manganese 390 ppb plume ⁵ .	Agree with Work Plan.	Agree with Alternative B	Agree with Work Plan
IRP Manager Tracer Comments	The tracer study is planned for the southern area of the plume bounded by Areas 3, 4 and 5. Given that the western boundary of the 3.1 ppb Cr6 plume runs close to the proposed tracer study monitoring well, SA-MW-26 S/D, G and H, we recommend that another monitoring well be located further to the west of Fairview Rd and north of Aquarius Rd. It is important that any possibilities of western migration be examined, since the entire manganese issue initially arose from complaints about "black water" to the west defined plume. Also we recommend that the need for tracer study work should be discussed at the locations of the manganese impacts north of Frontier Rd. and south of Highway 58. We do acknowledge that there are, now, a lack of residences in this area.				

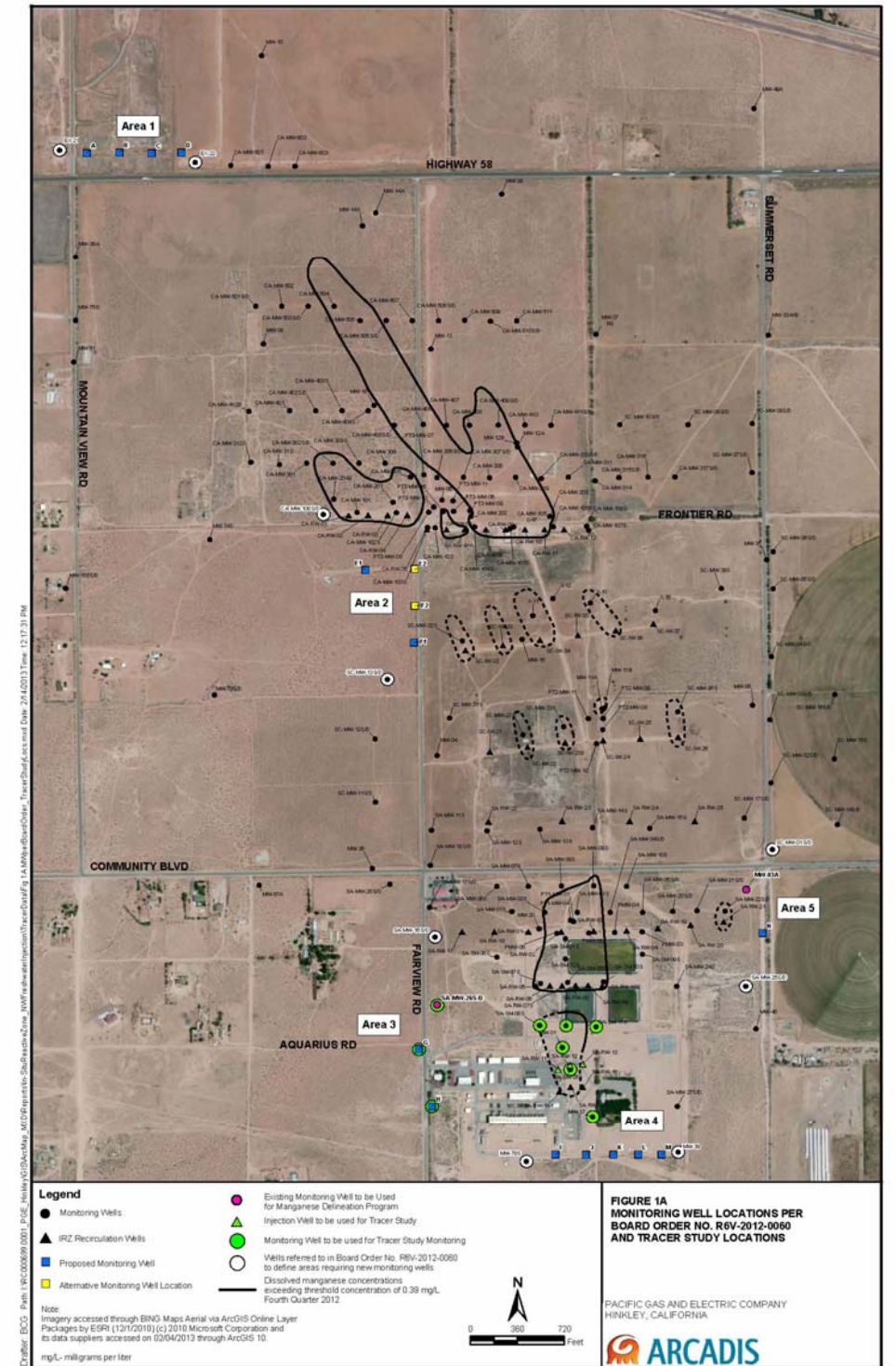


Figure 1A from PG&E's Manganese Monitoring Work Plan of 2/15/13

Footnotes

- PG&E Work Plan Submittal to Lahontan Water Board, Response to Investigative Order No.6RV-2012-0060: Byproduct Plume Monitoring in the IRZ Area, 2/15/13.
 - Areas are shown in more detail in the attached Figure for Plans A (Compliant) and B (PG&E Proposed).
 - IO = Investigative Order.
 - The IRP Manager and the Community Advisory Committee (CAC) may be submitting future detailed comments.
 - It would also be helpful to have the Work Plan's Figures 1A & 1B show the 3.1 ppb Cr6 plume boundary, and the location of the Lockhart Fault.
- * This Table was provided as a "Draft" to the Water Board at the Water Board's "Manganese Investigation Update Community Meeting" held on March 14, 2013 in Hinkley, CA. The IRP Manager learned during the Water Board briefing that some modifications have been made to the work plan (e.g. monitoring well locations and the addition of a 2nd tracer test) subsequent to its submission on February 15, 2013. Many of the modifications are consistent with the above suggestions.