

**Fort Ord HTW BCT Meeting – Operable Unit 1 (OU-1) On-Post
9:00 AM, 22 April 2009
Yosemite, California**

**MEETING MINUTES
(prepared by HydroGeoLogic, Inc.)**

Meeting minutes for the on-Post portion of the OU-1 groundwater remediation are presented below. Roy Evans of HGL participated in person. The list of attendees is included as Attachment A.

1. Groundwater Remediation System Update

The Northwest Treatment System (NWTS) has operated nearly continuously since 17 March 2009 (shut down less than 30 minutes on 21 March 2009 for minor repair to bag filter #3) through 19 April 2009. A brief power outage occurred on 19 April 2009 and immediately thereafter the flow controller on the injection pump failed. All treated water has been discharged to the NW infiltration trench since that time. On 20 April 2009, extraction wells EW-OU1-63-A (typically pumping <1 gpm) and MW-OU1-46-AD (typically pumping ~ 22 gpm) were shut down to reduce flow volume pending replacement of the flow controller for the injection pump.

Total volume pumped through 15 April 2009 is 91,472,960 gallons. The average weekly treatment rate of 82.1 gpm over the last four weeks has ranged between 80.8 gpm and 83.6 gpm. Through 15 April, 2009, the NWTS has removed approximately 3.4 pounds (0.28 gallons) of TCE and 0.3 pounds (0.03 gallons) of cis-1,2-DCE.

The routine bimonthly performance samples from the treatment system and extraction wells were collected on 09 March 2009. Preliminary results are summarized in Table 1. TCE concentrations exceeded the Aquifer Cleanup Level (ACL) only at wells MW-OU1-87-A and EW-OU1-71-A. With the exception of EW-OU1-60-A, TCE concentrations at the extraction wells were either unchanged from the January results or declined by 0.1 µg/L. This variation is well within the accuracy of the sampling and analytical methods. At EW-OU1-60-A, TCE increased to 0.95 µg/L from 0.48 µg/L, however, because of the low pumping rates at this well (typically around 1.25 gpm) the TCE mass removal rate is insignificant (approximately 0.005 pounds annually).

The cis-1,2-DCE concentrations in March were virtually identical to those measured in January (Table 1). The TCE concentration reported in the NWTS influent sample increased slightly (approximately 10%) but this is believed to be associated with normal variability and precision in the laboratory analytical methods. None of the contaminants of concern were detected in the NWTS effluent.

2. Long-term Monitoring Update

The First Quarter 2009 long-term monitoring (LTM) samples were collected during the week of 09 – 13 March 2009. The first quarter sampling includes those monitoring wells sampled on semi-annual and quarterly frequencies. Preliminary results show that peak TCE concentrations continued to decline. The maximum TCE concentration reported in the first quarter was 10 µg/L at well EW-OU1-53-A. Preliminary analytical results are shown in the attached Figure 1.

3. Report Submittals

The Draft 2008 Annual and Fourth Quarter Groundwater Monitoring Report will be submitted within the next few weeks and the 2008 First Quarter and 2007 Annual and Fourth Quarter Groundwater Monitoring Reports are in preparation. These reports are secondary deliverables.

DTSC comments on the Final Hydraulic Control Pilot Project Construction Report have been resolved. A letter indicating that that no further edits are needed and corrected cover pages will be submitted.

4. 2009 Long-term Monitoring Program

Based on the performance of the OU-1 remediation system, the reduction in plume extent, the TCE concentration trends evident in the data, and previously agreed protocols HGL developed the following sample frequency guidelines for 2009:

- A. Monitoring wells located along the main axis of plume migration will be sampled semi-annually.
- B. Extraction wells will be sampled semi-annually or quarterly rather than bimonthly.
- C. The NWTS will be sampled quarterly.
- D. Sampling is suspended at wells where TCE was non-detect during 2008 or longer periods or was detected only at concentrations approximately equal to or less than the method detection limit (0.5 µg/L).
- E. Sampling is suspended or reduced to annual at wells where TCE has shown long term declines and was less than 2.0 µg/L at the end of 2008 or for longer periods or was detected only at concentrations approximately equal to or less than the method detection limit (0.5 µg/L).

In some cases, wells within categories D and E are included in annual sampling to provide control points for estimating plume width.

The attached Table 2 lists the proposed changes to sampling frequencies. HGL requested approval to implement the changes shown in Table 2 immediately. After discussion, it was agreed that:

- Performance monitoring samples would be collected quarterly. The currently scheduled samples for May will be postponed to June to coincide with the quarterly schedule.
- It was agreed in principle that the groundwater LTM program for the on-Post portion of OU-1 would be conducted on a semi-annual basis. The currently scheduled June 2009 LTM sampling event is cancelled. LTM samples will be collected in March and September during 2009.
- The individual monitoring well sample frequencies proposed in Table 2 are generally acceptable but will be finalized in discussion with DTSC subsequent to this meeting (tentatively planned late next week).

It was agreed that these meeting minutes would serve as documentation of the agreement to immediately modify the performance monitoring and LTM sample schedules. The individual monitoring well sample frequencies to be determined in subsequent discussions will be incorporated into the Draft 2008 Annual and Fourth Quarter Groundwater Monitoring Report. Agency approval of the Final 2008 Annual and Fourth Quarter Groundwater Monitoring Report will provide documentation of those schedules.

5. Other Items

After the OU-1 portion of the meeting was concluded, there was a discussion of potential strategies for winding down remediation activities at any given site as the cleanup goals for the site were achieved. It was agreed that pumping rates and schedules would be dependent on a variety of factors, such as:

- Stability of plume boundaries over time
- Shrinkage of plume boundaries over the long term
- Decline in peak contaminant concentrations
- Degree of hydraulic control established
- Duration of pumping (for pump and treat systems) and continuity

The discussion did not finalize explicit guidelines but agreed that the factors above – and other factors, as appropriate – would be considered on a case-by-case basis for the moment. Decision rules were discussed to provide guidelines for adjusting the pumping or monitoring status of a given well. This approach may evolve as future discussions occur. To modify an existing remediation program, a request should first be submitted to the regulatory agencies that documents the rationale and proposed change(s).

HGL pointed out that the approved design for the OU-1 on-Post remediation included a pumping schedule where various extraction wells would be idled for extended periods to avoid creating groundwater stagnation zones (i.e., areas of very slow or negligible groundwater flow because of the overlapping hydraulic impact of multiple pumping wells). HGL requested clarification on whether or not changing operational parameters to optimize performance (such as shutting down a well or wells for extended periods) would require a submittal as described above. The regulators agreed that operational adjustments were not subject to another approval sequence and did not require a formal submittal – notification and discussion within the BCT meeting format is sufficient.

Table 1

TCE and Cis-1,2-DCE in OU-1 FONR Groundwater Remediation System - Performance Monitoring

BCT Meeting for Former Fort Ord, Marina CA - 22 April 2009

Sample Date	Extraction Well								NWTS		
	Began Operation October 2007				Began Operation July 2006				INFLUENT	MIDPOINT	EFFLUENT
	MW-87	EW-71	MW-85	MW-46AD	EW-60	EW-62	EW-63	EW-66			
TCE (µg/L)											
11/9/2007	16	13	19	14	ND	ND	ND	1.7	11	ND	ND
1/18/2008	11	11	8.9	8.2	ND	ND	ND	1.2	6.0	ND	ND
3/18/2008	11	14	6.7	5.8	0.29	ND	ND	1.5	5.6	ND	ND
5/27/2008	9.7	18	2.5	6.1	ND	ND	ND	1.8	3.9	ND	ND
7/21/2008	9.1	14	4.4	3.4	0.78	ND	ND	1.4	3.6	ND	ND
9/29/2008	9.3	15	4.3	2.9	0.90	ND	ND	1.7	3.8	0.19	ND
12/1/2008	5.8	11	2.6	1.6	0.82	ND	ND	0.91	2.7	0.35	ND
1/26/2009	5.9	10	2.2	1.2	0.48	ND	ND	0.78	2.4	ND	ND
3/9/2009	5.8	9.9	<i>2.1</i>	<i>1.2</i>	<i>0.95</i>	<i>ND</i>	<i>ND</i>	<i>0.86</i>	2.7	<i>ND</i>	<i>ND</i>
cis-1,2-DCE (µg/L)											
11/9/2007	1.9	1.6	2.3	1.70	ND	ND	ND	ND	1.3	ND	ND
1/18/2008	1.20	1.40	1.00	1.20	ND	ND	ND	0.11	0.66	ND	ND
3/18/2008	1.20	1.50	0.74	0.63	ND	ND	ND	ND	0.59	0.11	ND
5/27/2008	0.88	2.10	0.26	0.74	ND	ND	ND	ND	0.36	0.21	ND
7/21/2008	0.80	1.50	0.52	0.37	ND	ND	ND	ND	0.41	0.34	ND
9/29/2008	0.99	1.60	0.54	0.30	ND	ND	ND	0.13	0.42	0.42	0.12
12/1/2008	0.67	1.30	0.33	0.21	ND	ND	ND	ND	0.27	0.37	0.19
1/26/2009	0.63	1.20	0.29	0.12	ND	ND	ND	ND	0.26	0.24	ND
3/9/2009	<i>0.62</i>	<i>1.20</i>	<i>0.29</i>	<i>0.13</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>0.23</i>	<i>0.26</i>	<i>ND</i>
<div style="background-color: yellow; border: 1px solid black; padding: 2px; display: inline-block;"> italics indicate data not yet validated </div>											
Bold font indicates concentration > ACL											

Table 2
Proposed OU-1 FONR
2009 Groundwater LTM Program Modifications

Station Name (Well)	Previously Approved Sample Frequency ¹	Proposed 2009 Sample Frequency ²	Trend Plot Figure #	Rationale for Change	Sample Depth(s) ³		Remarks
					Approve	Proposed	
<i>Northwest and FONR Treatment Systems</i>							
MW-OU1-46-AD	Quarterly >> Bimonthly	2X (March & September)	6.2	Declining TCE concentration since startup and less than ACL since July 2008. TCE was 1.6 µg/L in December 2008.	121	Port	Located upgradient from NWTS and along main axis of plume.
EW-OU1-60-A	Bimonthly	Quarterly	6.1	Maximum TCE of 0.9 µg/L in September 2008. Startup was January 2007.	N/A	Port	TCE stable (0.8 µg/L to 0.9 µg/L) in latter half of 2008; all previous samples ND or less than 0.5 µg/L.
EW-OU1-62-A	Bimonthly	2X (March & September)	6.1	VOC ND since May 2007; proposed off-line in April 2009.	N/A	Port	Maximum TCE of 1.2 µg/L in September 2006. Startup was July 2006.
EW-OU1-63-A	Bimonthly	2X (March & September)	6.1	VOC ND since September 2007; proposed off-line in April 2009.	N/A	Port	Maximum TCE of 2.7 µg/L three weeks after startup in July 2006. TCE less than 1.0 µg/L since November 2006.
EW-OU1-66-A	Bimonthly	Quarterly	6.1	Declining TCE concentration since July 2006 and less than ACL since May 2007. TCE was 0.9 µg/L in December 2008.	N/A	Port	TCE decreasing but greater than ACL in nearest upgradient monitoring wells (MW-OU1-50 A and MW-OU1-61-A).
EW-OU1-71-A	Bimonthly	Quarterly	6.2	Relatively stable TCE concentration since startup in October 2007 (11µg/L to 18 µg/L).	N/A	Port	TCE was 11µg/L in December 2008.
MW-OU1-85A	Bimonthly	Quarterly	6.2	Declining TCE concentration trend since startup and less than ACL since May 2008. TCE was 2.6 µg/L in December 2008.	N/A	Port	Highest pumping rate of all OU-1 extraction wells (approximately 34 gallons per minute).
MW-OU1-87A	Bimonthly	Quarterly	6.2	Declining TCE concentration trend since startup in October 2007. TCE was 5.8 µg/L in December 2008.	N/A	Port	Data trend suggests TCE concentration will fall below ACL in 2009.
MW-OU1-05-A	Annual (September)	None	5.4	Decreasing trend continued in 2008; TCE was 1.2 µg/L in December 2008. Well located near original source area.	115	AA	Quarterly samples show TCE between 1.2 µg/L and 4.1 µg/L since March 2004.
MW-OU1-08-A	2X (March & September)	Annual (September)	5.4	TCE declining since September 2002 and ≤2.7 µg/L in 2005 through 2008. TCE was 1.1 µg/L in October 2008.	95	100	Well is located near original source area.
MW-OU1-09-A	Annual (September)	None	5.4	TCE trending lower since December 2004 and has never exceeded ACL. TCE was 1.4 µg/L in October 2008.	105	AA	
MW-OU1-10-A	Annual (September)	None	5.4	Quarterly samples show TCE less than 0.83 µg/L since December 2001. TCE was 0.7 µg/L in October 2008.	112	AA	Well is located in region where all wells less than ACL.
MW-OU1-22-A	2X (March & September)	Annual (September)	5.4	Stable TCE between 2.1 µg/L and 2.9 µg/L in 2006 through 2008.	111	AA	TCE less than ACL since September 1998. TCE≤3.0 ppb since December 2004
MW-OU1-28-A	Annual (September)	None	--	All TCE samples ND since June 2001; maximum value 1.8 µg/L in September 1999.	87	AA	
MW-OU1-29-A	Annual (September)	None	7.1	TCE less than ACL since September 2002; ≤0.59 ppb since March 2005; ND in 2008.	88	AA	
MW-OU1-32-A	Annual (September)	None	5.4	TCE less than 1.0 µg/L during 2006 - 2007; TCE was 0.48 µg/L in October 2008.	98	None	Installed 1998; maximum TCE 1.8 µg/L in December 2004.
MW-OU1-34-A	2X (March & September)	None	--	Well is downgradient of treated water infiltration. All TCE samples ND since September 2001.	87	None	
MW-OU1-40-A	2X (March & September)	None	5.4	All TCE samples ≤1.7 µg/L in 2006; ≤1.3 µg/L in 2007. Decreased to 1.0 µg/L in 2008.	102.3	AA	
MW-OU1-43-A	Annual (September)	None	7.1	TCE samples between 0.32 µg/L and 0.66 µg/L from September 2004 - September 2007. ND in 2008.	98	AA	Well is located generally downgradient from treated water infiltration trench.

Table 2
Proposed OU-1 FONR
2009 Groundwater LTM Program Modifications

Station Name (Well)	Previously Approved Sample Frequency ¹	Proposed 2009 Sample Frequency ²	Trend Plot Figure #	Rationale for Change	Sample Depth(s) ³		Remarks
					Approve	Proposed	
<i>Monitoring Wells</i>							
MW-OU1-50-A	Quarterly	2X (March & September)	5.5b	TCE stable between 10 µg/L and 11 µg/L in 2008.	103	103.5	Data trend shows gradually decreasing TCE concentration of 16 µg/L since September 2007.
EW-OU1-52-A	Annual (September)	2X (March & September)	5.5a	Located upgradient from FONR system and along main axis of plume.	N/A	123	TCE was 4.2 µg/L in October 2008.
MW-OU1-57-A	Quarterly	Annual (September)	5.6	All TCE samples ND in 2007 through 2008.	91	AA	
MW-OU1-58-A	Quarterly	Annual (September)	5.6	TCE trending lower through 2007 and less than 0.6 µg/L throughout 2008.	92.5	97	
MW-OU1-59-A	Annual (September)	None	--	TCE has been ND since inception (2004) and well is downgradient from injection of treated water.	100	106	
MW-OU1-61-A	Quarterly	2X (March & September)	5.6	Relatively stable concentrations of 5.0 µg/L - 13 µg/L since inception but decreasing through 2008.	N/A	94	TCE was 5.6 µg/L in December 2008.
MW-OU1-64-A1	Quarterly	None	--	TCE has been ND since inception (2006).	N/A	97	
MW-OU1-64-A2	Quarterly	None	--	TCE has been ND since inception (2006).	N/A	80.6	
MW-OU1-65-A	2X (March & September)	None	--	TCE has been ND since inception (2006).	N/A	91.5	
MW-OU1-67-A	Quarterly	Annual (September)	5.6	TCE trending lower; TCE was 1.4 µg/L in December 2008.	N/A	102	Maximum historic value was 3.7 µg/L.
MW-OU1-68-A	Quarterly	None	--	TCE has been ND since inception (2006) and well is downgradient from NWTS treated water infiltration trench.	N/A	98	
MW-OU1-69-A2	Quarterly	Annual (September)	5.6	TCE less than 1.0 µg/L since May 2007 and decreasing through 2008.	N/A	96	
MW-OU1-70-A	Quarterly	Annual (September)	5.6	All TCE samples ND in 2008	N/A	90	TCE less than 1.0 µg/L since May 2007.
MW-OU1-83A	2X (March & September)	Annual (September)	5.5b	TCE less than ACL since November 2006.	N/A	124.5	Maximum TCE was 1.1 µg/L in November 2006 (initial well sample).
MW-OU1-84A	2X (March & September)	Annual (September)	5.5b	TCE less than 1.0 µg/L through 2008. Well down-gradient from injection of treated water.	N/A	128	
MW-B-10-A	Quarterly	Annual (September)	5.6	TCE less than 1.0 µg/L since March 2008 and was ND since June 2008.	85	AA	
MW-OU1-ERD-08-A	2X (March & September)	None	7.1	All TCE samples ND in 2008 and well is in path of treated water from FONR infiltration trench.	94	AA	

Notes:

¹ Approved refers to sampling frequency approved in one of the following documents: Draft Rebound Evaluation Report (HGL, 2007e); Final 2006 Annual and Fourth Quarter Groundwater Monitoring Report (HGL, 2007f)

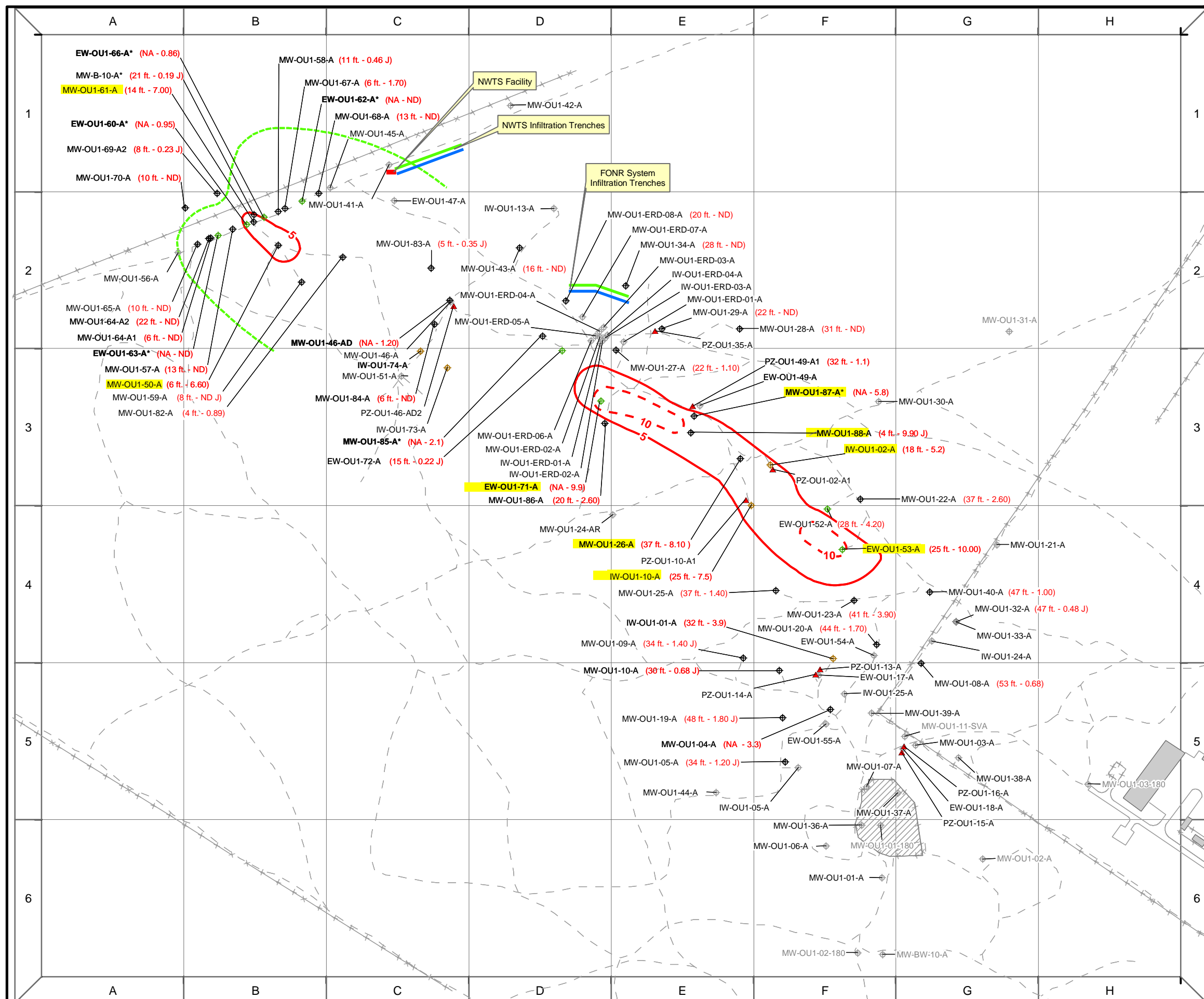
² Revisions take effect upon regulatory acceptance of 2008 Annual and Fourth Quarter Groundwater Monitoring Report except highlighted changes implemented in June 2009.

Depths is measured from top of well casing.

Bold font indicates changes between previously approved and revised sample frequency.

- AA - as approved
- ACL - aquifer cleanup level
- ERD - enhanced reductive chlorination
- EW - extraction well
- FONR - Fort Ord Natural Reserve
- IW - injection well
- LTM - long-term monitoring
- µg/L - micrograms per liter
- MW - monitoring well
- N/A - not applicable
- ND - non-detect
- NWTS - Northwest Treatment System
- OU1 - Operable Unit 1
- ppb - parts per billion
- PZ - piezometer
- SVA - Salinas Valley Aquitard
- 2X - semiannual
- TCE - trichloroethene
- VOC - volatile organic compound

Figure 1
OU-1 FONR
TCE Concentrations in Groundwater
First Quarter 2009



Legend

- ⊕ Monitoring Well
- ⊕ Extraction Well
- ⊕** Bold font indicates active well.
- ⊕ Injection Well
- ⊕** Bold font indicates active well.
- ⊕ Well Not Sampled
- ▲ Piezometer
- MW-OU1-87-A** Locations With March 2009 TCE Concentration At Or Above ACL (5 µg/L)
- 5-** TCE Contour (µg/L) Based on March 2009 Data
- - - Inferred Extent - See Notes Below
- MW-OU1-87-A Well ID
- (42 ft. - 9.30) March 2009 TCE Result (µg/L)
- Sample Elevation (feet above mean sea level)
- - - Trail/Unimproved Road
- ××× Fence
- - - Estimated Northwest Treatment System Capture Zone
- ▨ Former Fire Drill Area

Notes:
 Units of TCE concentrations are in ppb
 ND = Non-detect
 NA = Depth is not applicable - sample is from pumping well
 J = Estimated Value
 µg/L = Micrograms per liter
 Wells shown with an asterisk were not used to develop contour boundaries. Active extraction wells were typically not included because the data is not location-specific. Data from extraction well EW-OU1-71-A was used to infer the 10 µg/L TCE contour (shown as dashed line) because the results at that well (9.9 µg/L) and at MW-OU1-88-A (also 9.9 µg/L) suggest higher TCE concentrations in that vicinity. The TCE concentration at EW-OU1-53-A was 10 µg/L and nearby well data was less than 10 µg/L. Consequently, the 10 µg/L contour enclosing well EW-OU1-53-A was also dashed because the extent is inferred from recent results. Data from MW-B-10-A was excluded because the well does not fully penetrate the A-Aquifer. Well names appearing in gray were not included in OU1-Groundwater Monitoring Program. Wells for which no data are posted were not sampled.

0 200 400 800
 SCALE IN FEET

Y:/Ft_Ord/TO_201/OM9/GW_monitoring_Y6Q1/
 TCE_in_GW_Mar_2009.mxd
 Source: HGL
 04/17/09 CLimoges

**Fort Ord HTW BCT Meeting – Operable Unit 1 (OU-1) On-Post
9:00 AM, 22 April 2009
Yosemite, California**

MEETING MINUTES

ATTACHMENT A

ATTENDANCE LIST

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