

HGL Update
Fort Ord Operable Unit (OU) – 1 On-Post Groundwater Remediation
Marina, California
10:00 a.m., 16 October 2013

Treatment Plant Operations

The Northwest Treatment System (NWTS) operated continuously from 16 September 2013 through 14 October 2013. Extraction wells EW-OU1-60-A, EW-OU1-66-A, and MW-OU1-87-A are operating and total pumping averaged 18.5 gallons per minute. Since system startup in 2006, the NWTS has pumped approximately 203 million gallons of groundwater and removed approximately 6.0 pounds of total volatile organic compounds, primarily trichloroethene (TCE).

An estimated 0.05 pound of TCE has been removed since the NWTS 27 March 2013 sampling event. The most recent system performance monitoring samples were collected on 18 September 2013 from the following extraction wells:

EW-OU1-71-A MW-OU1-87-A EW-OU1-66-A EW-OU1-61-A

Sample results from these wells and the monitoring wells sampled on 18 – 19 September 2013 are discussed in the following section.

Groundwater Quality Data

Preliminary, unvalidated sampling results from the September 2013 sampling event are presented in attached Tables 1A and 1B for the extraction wells listed previously. The observed TCE concentration trend in extraction well EW-OU1-71-A decreased to 1.9 micrograms per liter ($\mu\text{g/L}$) from 4.4 $\mu\text{g/L}$ in the previous sample collected a year ago. As shown in Table 1A, the TCE concentration in the other extraction wells sampled increased by 0.1 $\mu\text{g/L}$ to 0.3 $\mu\text{g/L}$ since the previous sample. These minimal increases indicate essentially stable conditions since the last sampling events in March and June of 2013.

The unvalidated analytical results from the monitoring well samples showed that only TCE, cis-1,2-dichloroethene and chloroform were detected in any sample. TCE was the only chemical with a concentration that exceeded the laboratory reporting limit of 0.5 $\mu\text{g/L}$. Concentrations were very similar to the previous result at each well and varied within $\pm 1 \mu\text{g/L}$. Table 2 shows the current and previous TCE concentrations for each well.

MW-OU1-61-A and MW-OU1-88-A remained the only two wells where the TCE concentration exceeded the Aquifer Cleanup Level (ACL) of 5 $\mu\text{g/L}$. In September, the TCE concentration at MW-OU1-61-A declined to 6.7 $\mu\text{g/L}$ while MW-OU1-88-A rose slightly to 6.4 $\mu\text{g/L}$. Other observations include:

- TCE increased slightly at the most upgradient well (EW-OU1-52-A) but remained below the ACL (4.9 $\mu\text{g/L}$ versus 5 $\mu\text{g/L}$).
- The estimated extent of the central zone groundwater TCE exceedance area shrank because TCE concentrations decreased in the upgradient and downgradient wells.

- At the off-Post sentry wells MW-OU1-69-A2 and MW-OU1-70-A, TCE remained at nondetect and demonstrates the effectiveness of the extraction well plume capture.
- TCE was not detected at well MW-OU1-50-A. This well is upgradient from MW-OU1-61-A.

Figure 1 shows the TCE concentration contours based on the unvalidated September 2013 data. This Figure will be updated as needed after the data is validated.

Based on these sampling results, HGL recommends performing the following sampling in December 2013:

- Monitoring wells MW-OU1-88-A and MW-OU1-61-A
- Extraction wells MW-OU1-87-A and IW-OU1-10-A (restarted on 14 October 2013)

Reporting/Federal Facility Agreement Schedule

All scheduled submittals have been made for primary and secondary deliverables. The status of submitted and anticipated reports for 2012 and 2013 is summarized in Table 3. HGL began preparing the 2013 Annual and Third Quarter Groundwater Monitoring Report. No comments were received on the 2013 First Quarter Groundwater Monitoring Report and the relevant discussions therein will be incorporated into the annual report without change.

Weed Control and Rare Plant Monitoring

University of California Santa Cruz staff completed the weed control activities scheduled for 2013.

Action Items:

Ongoing:

- Submit draft minutes for previous BCT meeting(s) — complete.
- Submit final minutes for previous BCT meeting(s) — Draft September minutes are in review.
- Prepare update for the next BCT meeting — to be done.

**Fort Ord HTW BCT Meeting
Marina, California
16 October 2013**

**HGL Update
OU-1 On-Post Groundwater Remediation**

ATTACHMENT 1

Reference Table(s) and Figure(s)

Table 1A
TCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring
BCT Meeting for Former Fort Ord – 16 October 2013

Began: Date	FONR Extraction Well (listed from south to north)					Boundary Extraction Well (from west to east)					NWTS		
	Nov-10	Oct-07				Jul-06				INFLUENT	MIDPOINT	EFFLUENT	
	IW-10	MW-87	EW-71	MW-85	MW-46AD	EW-63	EW-60	EW-66	EW-62				
TCE (µg/L)													
11/9/07	Used as monitoring well until pump installed in October 2010. Pumping began 03 November 2010.	16	13	19	14	ND	ND	1.7	ND	11	ND	ND	
1/18/08		11	11	8.9	8.2	ND	ND	1.2	ND	6.0	ND	ND	
3/18/08		11	14	6.7	5.8	ND	0.29	1.5	ND	5.6	ND	ND	
5/27/08		9.7	18	2.5	6.1	ND	ND	1.8	ND	3.9	ND	ND	
7/21/08		9.1	14	4.4	3.4	ND	0.78	1.4	ND	3.6	ND	ND	
9/29/08		9.3	J 15	J 4.3	J 2.9	J ND	0.90	J 1.7	J ND	3.8	J 0.19	J ND	
12/1/08		5.8	11	2.6	1.6	ND	0.82	0.91	ND	2.7	0.35	J ND	
1/26/09		5.9	10	2.2	1.2	ND	0.48	J 0.78	ND	2.4	ND	ND	
3/9/09		5.8	9.9	2.1	1.2	ND	0.95	0.86	ND	2.7	ND	ND	
6/11/09		6.9	11	2.4	1.5	ND	0.88	1.7	ND	2.6	0.14	J ND	
9/15/09		6.8	9.4	1.7	0.78	ND	inactive	1.1	0.036	J 2.3	0.35	J ND	
12/14/09		6.9	7.5	0.84	not sampled	not sampled	inactive	0.94	not sampled	2.3	0.65	J ND	
3/22/10		7.2	8.5	0.62	0.55	inactive	ND	0.90	inactive	2.3	ND	ND	
6/21/10		7.4	6.5	0.90	0.40	J inactive	0.86	0.58	inactive	2.1	ND	ND	
9/20/10		7.7	6.6	0.83	0.35	J discontinued	0.63	0.49	J inactive	2.3	not sampled	ND	
12/16/10		5.2	6.9	5.2	0.58	0.28	J discontinued	0.72	0.42	J inactive	2.6	0.18	J ND
3/7/11		5.1	6.0	4.6	0.55	0.60	discontinued	0.87	0.42	J inactive	2.5	0.59	ND
6/7/11		4.2	6.1	4.0	0.78	0.63	discontinued	0.76	0.36	J inactive	2.6	1.0	ND
9/20/11		4.5	6.2	4.2	1.10	0.38	J discontinued	0.57	0.36	J inactive	2.5	1.7	ND
12/7/11		3.8	5.1	3.7	--	--	discontinued	inactive	0.27	J inactive	1.8	2.1	0.13
3/15/12	3.7	5.5	3.8	0.70	0.23	J discontinued	inactive	0.38	J inactive	0.81	0.32	J ND	
9/25/12	--	5.3	4.4	--	--	discontinued	inactive	0.19	J inactive	1.8	0.72	J ND	
1/8/13	--	5.4	--	--	--	discontinued	ND	0.19	J inactive	1.54	--	ND	
3/27/13	--	4.8	--	--	--	discontinued	ND	0.23	J inactive	1.48	--	ND	
6/26/13	--	4.4	--	--	--	discontinued	--	--	J inactive	1.90	--	ND	
9/18/13	--	<i>4.7</i>	<i>1.9</i>	--	--	discontinued	<i>0.17</i>	J <i>0.31</i>	J inactive	2.00	--	ND	
		Italics (if used) indicate data not yet validated					Bold font indicates concentration > ACL						
Notes:													
ACL - aquifer cleanup level	-- - Not sampled												
µg/L - micrograms per liter													
J - Data qualified as estimated	Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.												
ND - nondetect													
TCE - trichloroethene													
FONR - Fort Ord Natural Reserve													
NWTS - Northwest Treatment System													

Table 1B
cis-1,2-DCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring
BCT Meeting for Former Fort Ord – 16 October 2013

Began:	FONR Extraction Well (listed from south to north)					Boundary Extraction Well (from west to east)				NWTS								
	Nov-10	Oct-07				Jul-06				INFLUENT	MIDPOINT	EFFLUENT						
	Date	IW-10	MW-87	EW-71	MW-85	MW-46AD	EW-63	EW-60	EW-66				EW-62					
cis-1,2-DCE (µg/L)																		
11/09/07	Used as monitoring well until pump installed in October 2010. Pumping began 03 November 2010.	1.9	1.6	2.3	1.70	ND	ND	ND	ND	1.3	ND	ND						
01/18/08		1.20	1.40	1.00	1.20	ND	ND	0.11	ND	0.66	ND	ND						
03/18/08		1.20	1.50	0.74	0.63	ND	ND	ND	ND	0.59	0.11	ND						
05/27/08		0.88	2.10	0.26	0.74	ND	ND	ND	ND	0.36	0.21	ND						
07/21/08		0.80	1.50	0.52	0.37	ND	ND	ND	ND	0.41	0.34	ND						
09/29/08		0.99	1.60	0.54	0.30	ND	ND	0.13	ND	0.42	0.42	0.12						
12/01/08		0.67	1.30	0.33	0.21	J	ND	ND	ND	ND	0.27	J	0.37	J	0.19	J		
01/26/09		0.63	1.20	0.29	J	0.12	J	ND	ND	ND	ND	0.26	J	0.24	J	ND		
03/09/09		0.62	1.20	0.29	J	0.13	J	ND	ND	ND	ND	0.23	J	0.26	J	ND		
06/11/09		0.71	1.10	0.30	J	0.13	J	ND	ND	0.14	J	ND	0.24	J	0.28	J	ND	
09/15/09		0.80	1.00	0.22	J	0.08	J	ND	inactive	0.03	J	ND	0.22	J	0.37	J	0.03	J
12/14/09		0.67	0.65	0.10	J	not sampled	not sampled	inactive	ND	J	not sampled	0.21	J	0.30	J	0.11	J	
03/22/10		0.67	0.79	ND	ND	inactive	ND	ND	inactive	0.20	J	0.11	J	0.13	J	0.13	J	
06/21/10		0.67	0.53	0.14	J	ND	inactive	ND	ND	inactive	0.20	J	0.23	J	ND	ND		
9/20/10		0.66	0.46	J	ND	ND	discontinued	ND	ND	inactive	0.23	J	not sampled	ND	ND			
12/16/10		0.55	0.66	0.35	J	ND	J	ND	discontinued	ND	ND	inactive	0.27	J	0.28	J	ND	
3/7/11	0.37	J	0.52	0.28	J	0.11	J	ND	discontinued	ND	ND	inactive	0.23	J	0.30	J	ND	
6/7/11	0.35	J	0.55	0.29	J	ND	ND	discontinued	ND	ND	inactive	0.18	J	0.31	J	0.15	J	
9/20/11	0.25	J	0.46	J	0.21	J	ND	ND	discontinued	ND	ND	inactive	0.17	J	0.19	J	0.30	J
12/7/11	0.27	J	0.48	J	0.19	J	not sampled	discontinued	inactive	ND	inactive	0.16	J	0.17	J	0.23	J	
3/15/12	0.15	J	0.40	J	0.22	J	0.15	J	ND	discontinued	inactive	ND	inactive	ND	0.24	J	ND	
9/25/12	--	J	0.39	J	0.23	J	--	--	discontinued	inactive	ND	inactive	ND	0.24	J	ND		
1/8/13	--	J	0.35	J	--	--	--	--	discontinued	ND	ND	inactive	0.12	--	--	--		
3/27/13	--	J	0.34	J	--	--	--	--	discontinued	ND	ND	inactive	0.12	--	--	--		
6/26/13	--	J	0.31	J	--	--	--	--	discontinued	--	--	inactive	0.27	--	--	--		
9/18/13	--	J	0.32	J	ND	--	--	--	discontinued	ND	ND	inactive	0.01	--	0.14	J		
Italics (if used) indicate data not yet validated					Bold font indicates concentration > ACL													
Notes:																		
ACL - aquifer cleanup level	--- Not sampled																	
µg/L - micrograms per liter																		
J - Data qualified as estimated	Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.																	
ND - nondetect																		
DCE - dichloroethene																		
FONR - Fort Ord Natural Reserve																		
NWTS - Northwest Treatment System																		

Table 2
OU-1 LTM Sampling Results for September 2013
PRELIMINARY / UNVALIDATED

Sample Point	Location	September 18 - 19, 2013			Previous TCE
		Results in micrograms/liter			
		TCE	cis-1,2-DCE	chloroform	
NWTS-Influent	Treatment Plant	2.0*	0.07*	---	1.8
NWTS-Midpoint	Treatment Plant	---	---	---	.72 J
NWTS-Effluent	Treatment Plant	ND	.12 J	0.14 J	ND
EW-OU1-60-A*	NW Boundary	.17 J	ND	ND	ND
EW-OU1-66-A*	NW Boundary	.31 J	ND	ND	ND
MW-OU1-87-A*	Central FONR	4.7	.32 J	ND	4.4
EW-OU1-71-A*	Central FONR	1.9	ND	ND	4.4
MW-OU1-70-A	NW Boundary	ND	ND	.15 J	ND
MW-OU1-69-A2	NW Boundary	ND	ND	ND	ND
MW-OU1-61-A	NW Boundary	6.7	.25 J	ND	7.4
MW-OU1-50-A	Central FONR	ND	ND	ND	.21 J
EW-OU1-72-A	Central FONR	.36 J	ND	ND	.15 J
MW-OU1-50-A	Central FONR	---	---	---	.21 J
PZ-OU1-49-A1	Central FONR	0.77	ND	ND	.21 J
MW-OU1-88-A	Central FONR	6.4	.46 J	.19 J	5.6
MW-OU1-26-A	Central FONR	3.6	.13 J	ND	4.6
MW-OU1-26-A Duplicate	Central FONR	---	---	---	---
PZ-OU1-10-A1	Central FONR	.17 J	ND	ND	.4 J
EW-OU1-52-A	Central FONR	4.9	.35 J	.16 J	4.2

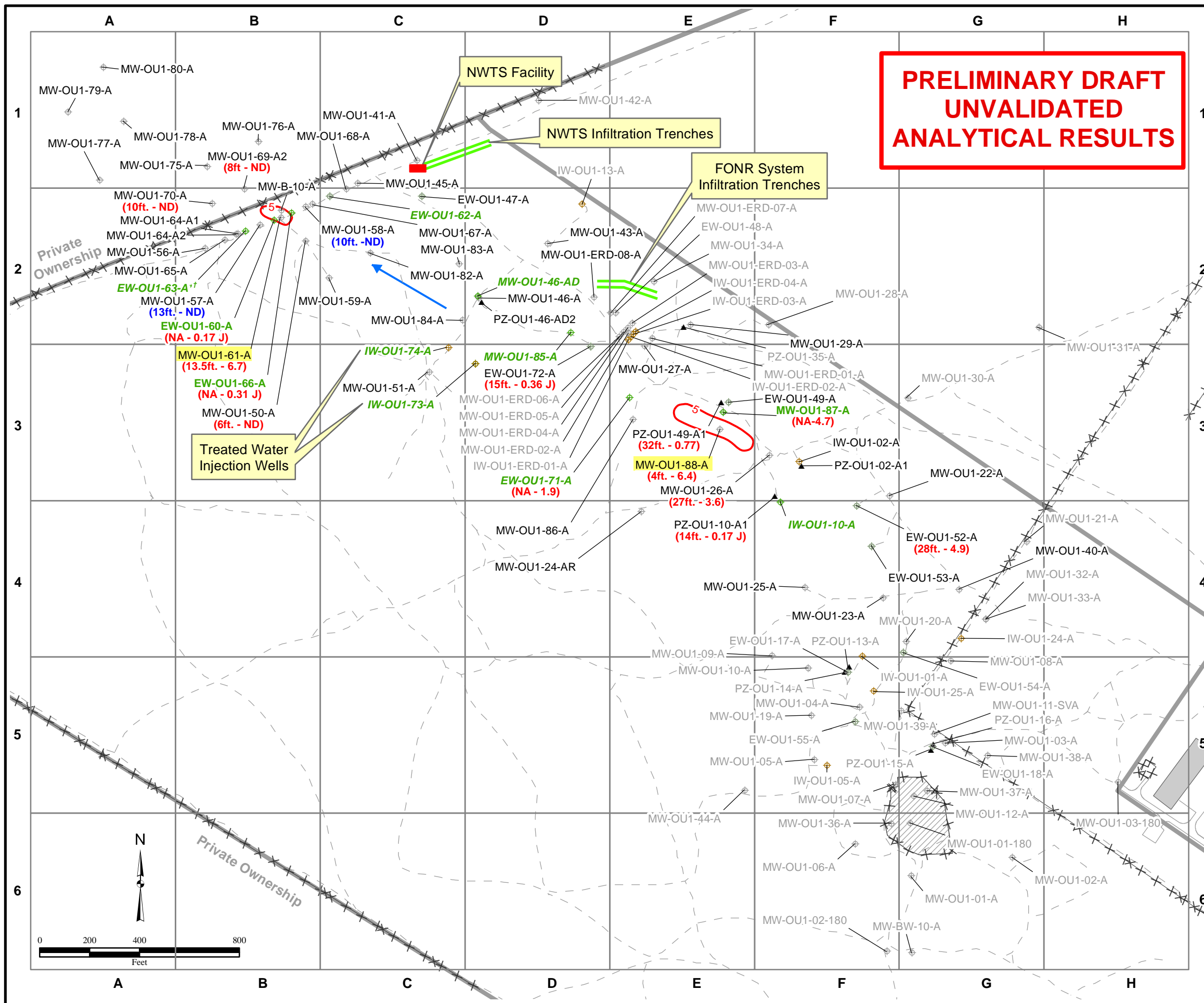
*Operating extraction well - samples collected from port on discharge pipe.

- Not sampled
- J Concentration is estimated value below the reporting limit
- ND Not detected
- TCE Trichloroethene
- TBD cis-1,2-dichloroethene
- FONR Fort Ord Natural Reserve
- NW Northwest
- * Calculated value based on individual wells and flow rates

Table 3
Current Deliverable Schedule
BCT Meeting for Former Fort Ord, Marina, CA – 20 September 2013

Deliverable Title	Submittal Due	Review Comments Due	Status/Remarks
<i>Primary Deliverables</i>			
Draft 2013 Annual and 3rd Quarter Groundwater Monitoring Report	January 2014	March 2014	In progress. Data not yet validated.
<i>Secondary Deliverables</i>			
None scheduled			
<i>Completed Recent Submittals</i>			
Final Memorandum for Record for Optimizing Remediation Pumping	March 2012	February 2012	Accepted as final during July 2012 BCT meeting.
Final IW-OU1-10-A Construction Report	March 2012	NA	Submitted 30 March 2012.
Final Operable Unit 1 Well Destruction Report	March 2012	NA	Submitted 30 March 2012.
Draft Five Year Review Report	March 2012	May 2012	Army submitted 30 March 2012.
Draft 2011 Annual and 3rd Quarter Groundwater Monitoring Report	May 2012	July 2012	Submitted 17 May 2012.
2012 First Quarter Groundwater Monitoring Report	May 2012	August 2012	Submitted 29 May 2012.
Draft 2007 Annual and 4th Quarter Groundwater Monitoring Report	June 2012	August 2012	Submitted 13 June 2012. No comments.
Draft Final Five Year Review Report	July 2012	September 2012	Submitted to Army 26 June 2012.
Final 2011 Annual and 3rd Quarter Groundwater Monitoring Report	July 2012	NA	Submitted 25 July 2012. No comments.
IW-OU1-74-A Vandalism Report	July 2012	NA	Submitted 25 July 2012.
Final 2007 Annual and 4th Quarter Groundwater Monitoring Report	September 2012	NA	Submitted 26 September 2012. No comments.
Final Five Year Review Report	September 2012	NA	Text for final version sent to Army on 08 August 2012
Draft 2012 Annual and 3rd Quarter Groundwater Monitoring Report	December 2012	NA	Submitted 31 December 2012. Waiting for agency comments.
2012 FONR Impact Report	February 2012	NA	Submitted 05 February 2012.
Final 2012 Annual and 3rd Quarter Groundwater Monitoring Report	March 2013	NA	Submitted 21 March 2013.
2013 First Quarter Groundwater Monitoring Report	June 2013	August 2013	Submitted 1 July 2013.

Figure 1
OU-1 FONR A-Aquifer
TCE Concentration in Groundwater
September 2013
Former Fort Ord, CA



Legend

- ⊕ Well
- ⊕ Extraction Well
- ⊕ Injection Well
- ▲ Piezometer or 2-Inch Well
- Groundwater Flow Direction
- ⊕ MW-OU1-21-A Well Destroyed
- ⊕ MW-OU1-88-A Location with March 2013 TCE Concentrations at or above ACL (5 µg/L)
- MW-OU1-57-A Well ID
- (13.5ft. - 6.7) September 2013 TCE Result (µg/L)
- Sample Elevation (feet above mean sea level)
- (13ft. - ND) Jan/Feb/March 2013 Latest TCE Result (µg/L)
- Sample Elevation (feet above mean sea level)
- 5— TCE contour based on September 2013 Data
- - - Trail/Unimproved Road
- × Fence
- Treated Water Infiltration Trench
- Property Boundary
- ▭ Building
- ▨ Former Fire Drill Area

Notes:
Units of TCE concentration are in micrograms per liter.
FONR = Fort Ord Natural Reserve
NWTS = Northwest Treatment System
ACL = Aquifer Cleanup Level
ND = nondetect
NA = Depth is not applicable - sample is from pumping well
µg/L = micrograms per liter
Wells shown with an asterisk were not used to develop contour boundaries.
Wells for which no data are posted were not sampled.
J = Estimated value
Green font indicates extraction or injection well.
Italicized font shows pumping suspended.
† = Disconnected extraction well. No longer operable.

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(1)TCE_2013-09.mxd
10/14/2013 CNL
Source: HGL

