

**Fort Ord Operable Unit 1 Meeting Minutes**  
**Groundwater Remediation, Well Destruction, and Treatment Plant Decommissioning**  
**Marina, California**  
**Base Closure Team Meeting**  
**1:30 p.m., 23 September 2014**  
**Prepared by HydroGeoLogic, Inc.**

**Attendees: (to be revised after meeting)**

<b>Individual</b>	<b>Attended?</b>	<b>Individual</b>	<b>Attended?</b>
James Specht, USACE	X	Grant Himebaugh, RWQCB	X
Teresa Rodgers, USACE	X	Edward Ticken, AMEC	X
Alex Kan, USACE	X	Jeff Fenton, AMEC	X
Bonnie McNeil, USACE	X	Derek Lieberman, Ahtna	X
Cory Koger, USACE		Brad Clark, Ahtna	
William Collins, BRAC	X	Holly Dillon, Ahtna	X
Tom Ghigliotto, Chenega <sup>1</sup>	X	Kevin Ghalambor, Burleson	
Melissa Broadston, Chenega <sup>1</sup>		Peter Kelsall, CB&I	X
Bart Kowalski, Chenega <sup>1</sup>	X	Steve Crane, Gilbane	X
Cary Stiebel, Chenega <sup>1</sup>		Erin Caruso, Gilbane	X
Lewis Mitani, EPA	X	Lindsay Alexander, Gilbane	X
Martin Hausladen, EPA	X	Larry Friend, Gilbane	
Kimberly Gettman, DTSC		Roy Evans, HGL	X
Franklin Mark, DTSC	X	Kevin Wierengo, HGL	X
Min Wu, Ph.D., DTSC	X	Sean McStay, UCSC	X
Edward Walker, DTSC	X	Kevin Siemann, Gilbane	X
Steve Sterling, DTSC	X		
X = attended in person or by telephone; blank indicates absent from the meeting			

<sup>1</sup>Chenega staff supporting the BRAC  
Ahtna = Ahtna Engineering Services  
BRAC = Base Realignment and Closure Fort Ord Office  
CB&I = Chicago Bridge & Iron, Inc.  
DTSC = California Department of Toxic Substances Control

EPA = U.S. Environmental Protection Agency  
HGL = HydroGeoLogic, Inc.  
RWQCB = Regional Water Quality Control Board  
UCSC = University of California, Santa Cruz  
USACE = U.S. Army Corps of Engineers

**OU-1 Treatment Plant Operations**

HGL reported the Northwest Treatment System (NWTS) operated continuously from 4 August 2014 through 18 September 2014. Extraction wells EW-OU1-60-A and EW-OU1-66-A are operating and total pumping from those wells is approximately 12.1 gallons per minute. EW-OU1-71-A, MW-OU1-87-A, and IW-OU1-10-A were temporarily restarted on 1 September 2014 to collect performance monitoring samples on 2 September 2014. Once samples were collected, EW-OU1-71-A, MW-OU1-87-A, and IW-OU1-10-A were shutdown.

Since system startup in 2006, the NWTS has pumped approximately 212 million gallons of groundwater and removed approximately 6.0 pounds of total volatile organic compounds,

primarily trichloroethene (TCE). An estimated 0.2 pound of TCE has been removed since the NWTS 18 September 2013 sampling event.

### **OU-1 Groundwater Quality Data**

In accordance with the Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP), HGL collected the following samples from monitoring wells and the NWTS on 2 September 2014:

EW-OU1-60-A	MW-OU1-58-A	PZ-OU1-49-A1	EW-OU1-53-A
EW-OU1-66-A	MW-OU1-57-A	MW-OU1-88-A	NWTS-Influent
EW-OU1-71-A	MW-OU1-61-A	MW-OU1-26-A	NWTS Midpoint
MW-OU1-87-A	EW-OU1-72-A	PZ-OU1-10-A1	NWTS Effluent
IW-OU1-10-A	MW-OU1-86-A	EW-OU1-52-A	

HGL received laboratory analytical results for the September samples and submitted them for validation. The unvalidated results showed that TCE concentrations did not exceed the Aquifer Cleanup Level (ACL) of 5.0  $\mu\text{g/L}$  in any of the samples collected. The highest TCE concentration, 4.7  $\mu\text{g/L}$ , was detected in the samples collected from MW-OU1-61-A and MW-OU1-88-A. It should be noted that this sampling event marks the first time all TCE concentrations in the OU-1 groundwater monitoring network were below the ACL. Tables 1A and 1B show the TCE and cis-1,2-dichloroethene concentrations, respectively, found in the extraction wells and treatment system. All unvalidated TCE results from the September 2014 sampling event are presented on Table 2. A Figure showing the September 2014 TCE concentrations is included for reference in Attachment 1. The next planned sampling event is in December 2014.

### **Reporting/Federal Facility Agreement Schedule**

All scheduled submittals have been made for primary and secondary deliverables. The status of submitted and anticipated reports for 2014 is summarized in Table 3. The Draft Well Destruction and Treatment Plant Demolition Completion Report was submitted on 11 August 2014 for regulatory agency and public review. The regulatory agencies indicated that the draft was accepted as written and there were no public comments by the response deadline. Therefore the Draft is accepted as Final. Replacement pages will be distributed to indicate this change and to include copies of approved well destruction permits that were omitted from the Appendix.

### **OU-1 Weed Control and Rare Plant Monitoring**

The U.S. Fish and Wildlife Service required that the third year of rare plant monitoring be completed at the former well destruction sites and this survey was completed between 25 April 2014 and 02 May 2014. Additional monitoring was performed in May and June during the well destruction effort at well sites destroyed within the Fort Ord Natural Reserve. The Draft 2014 FONR Impact Assessment and Habitat and Rare Plant Species Survey Results Report was submitted for Army review on 11 September 2014.

## **Site Exit/Closure Strategy**

Based on preliminary data from the September sampling event, TCE concentrations have met the aquifer cleanup level at all OU-1 monitoring wells. The exit/closure strategy is based on demonstrating that the cleanup objectives of the Record of Decision (ROD) regarding human health protectiveness have been met and, therefore, the ROD cleanup goals have been attained. A technical memorandum will be prepared to present the case for OU-1 closure based on cleanup progress to date. The human health risk corresponding to Chemical of Concern concentrations observed at the site have met the human health protectiveness objectives for several years. The technical memorandum will include recommendations for performing attainment monitoring that incorporate existing data to the maximum extent. The memorandum will be presented to the regulators for review and comment.

## **Well Destruction and Treatment Plant Demolition**

As of 17 July 2014, all wells for which right of entry (ROE) was obtained have been destroyed (81 wells in total) and the two inactive OU-1 groundwater treatment plants have been demolished. As discussed at previous meetings, the ROE for the Armstrong Ranch property has not yet been obtained—consequently the timetable for destroying these 14 wells and removing approximately 1,500 feet of associated pipeline remains uncertain. Figure 1.2 in Attachment 1 shows the locations of the destroyed wells within OU-1. The Draft Well Destruction and Treatment Plant Demolition Completion Report was submitted on 11 August 2014 for regulatory agency and public review. No comments were received, therefore, the Draft is accepted as Final.

### **Action Items:**

- The Army will obtain ROE agreements for Armstrong Ranch
- HGL will prepare a technical memorandum (TM) to present the case for OU-1 closure in accordance with the strategy described above. The deliverables schedule has been updated to include this TM.
- In addition to the standard distribution list, HGL will send hard copies of Final Well Destruction and Treatment Plant Demolition Completion Report to the following entities:
  - City of Marina
  - Monterey County
  - Marina Coast Water District
  - U.S. Fish and Wildlife

### **Ongoing:**

- Submit draft minutes for previous BCT meeting(s)—complete through August 2014.
- Submit approved final minutes for previous BCT meeting(s) — complete through August 2014.

**Other:**

- Regulatory agency representatives in attendance concurred that four rounds of verification sampling (sampling every other month) will be required following the termination of the NWTs.

**Fort Ord HTW BCT Meeting  
23 September 2014**

**Fort Ord Operable Unit 1  
Groundwater Remediation, Well Destruction, and Treatment Plant Decommissioning**

**ATTACHMENT 1**

Table 1A

TCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring

BCT Meeting for Former Fort Ord – 23 September 2014

Began: Date	FONR Extraction Well (listed from south to north)					Boundary Extraction Well (from west to east)				NWTS								
	Nov-10 IW-10	Oct-07 MW-87    EW-71    MW-85    MW-46AD				Jul-06 EW-63    EW-60    EW-66    EW-62				INFLUENT	MIDPOINT	EFFLUENT						
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			
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	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	not sampled		discontinued	inactive	0.27	J	inactive	1.8	2.1	0.13	J				
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	1.5	--	ND					
3/27/13	--	4.8	--	--	--	discontinued	ND	0.23	J	inactive	1.5	--	ND					
6/26/13	--	4.4	--	--	--	discontinued	--	--	inactive	1.7	--	ND						
9/18/13	--	4.7	1.9	--	--	discontinued	0.17	J	0.31	J	inactive	2.0	--	ND				
12/17/13	2.8	4.2	--	--	--	discontinued	--	--	inactive	2.1	--	--						
3/27/14	--	3.4	A	0.89	A	--	--	discontinued	0.22	J/A	0.29	J/A	inactive	1.7	0.92	J/A	ND	A
6/27/14	--	3.7	--	--	--	discontinued	--	--	inactive	0.28	0.39	J	ND					
9/2/14	2.2	4.2	0.88	--	--	discontinued	0.25	J	0.26	J	inactive	1.0	0.41	J	ND			
Notes:	<b>Italics (if used) indicate data not yet validated</b>					<b>Bold font indicates concentration &gt; ACL</b>												
ACL - aquifer cleanup level	-- - Not sampled					µg/L - micrograms per liter				J - Data qualified as estimated								
ND - nondetect	TCE - trichloroethene					NWTS - Northwest Treatment System				FONR - Fort Ord Natural Reserve								
Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.																		

**Table 1B**  
**cis-1,2-DCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring**  
**BCT Meeting for Former Fort Ord – 23 September 2014**

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									
<b>cis-1,2-DCE (µg/L)</b>																		
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	--	0.39	J	0.23	J	--	--	discontinued	inactive	ND	inactive	ND	0.24	J	ND	ND		
1/8/13	--	0.35	J	--	--	--	--	discontinued	ND	ND	inactive	0.12	--	--	--	--		
3/27/13	--	0.34	J	--	--	--	--	discontinued	ND	ND	inactive	0.12	--	--	--	--		
6/26/13	--	0.31	J	--	--	--	--	discontinued	--	--	inactive	0.27	--	--	--	--		
9/18/13	--	ND	ND	--	--	--	--	discontinued	ND	ND	inactive	ND	--	--	ND	ND		
12/17/13	ND	0.19	J	--	--	--	--	discontinued	--	--	inactive	0.23	--	--	--	--		
3/27/14	--	0.16	J/A	--	--	--	--	discontinued	ND	A	ND	A	inactive	0.21	ND	A	ND	A
6/27/14	--	ND	--	--	--	--	--	discontinued	--	--	inactive	ND	0.43	J	0.17	J		
9/2/14	ND	0.21	J	ND	--	--	--	discontinued	ND	ND	inactive	ND	0.48	J	ND	ND		
Notes:	<b>Italics (if used) indicate data not yet validated</b>					<b>Bold font indicates concentration &gt; ACL</b>												
ACL - aquifer cleanup level	-- - Not sampled					µg/L - micrograms per liter				J - Data qualified as estimated								
ND - nondetect	TCE - trichloroethene					NWTS - Northwest Treatment System				FONR - Fort Ord Natural Reserve								
NA - Not Available	Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.																	

**Table 2**  
**Unvalidated OU-1 Sampling Results for September 2014**

Sample Point	Location	TCE	
		$\mu\text{g/L}$	Qualifier
<b>Treatment plant</b>			
NWTS-Influent	Treatment Plant	1.0	
NWTS-Midpoint	Treatment Plant	0.41	J
NWTS-Effluent	Treatment Plant	ND	
<b>Extraction wells</b>			
EW-OU1-60-A*	NW Boundary	0.25	J
EW-OU1-66-A*	NW Boundary	0.26	J
EW-OU1-71-A*	Central FONR	0.88	
MW-OU1-87-A*	Central FONR	4.2	
IW-OU1-10-A*	Central FONR	2.2	
<b>Monitoring wells</b>			
MW-OU1-58-A	NW Boundary	ND	
MW-OU1-57-A	NW Boundary	ND	
MW-OU1-61-A	NW Boundary	4.7	
MW-OU1-61-A	Duplicate	4.0	
EW-OU1-72-A	Central FONR	0.78	
MW-OU1-86-A	Central FONR	0.42	J
PZ-OU1-49-A1	Central FONR	1.2	
MW-OU1-88-A	Central FONR	4.7	
MW-OU1-26-A	Central FONR	2.7	
PZ-OU1-10-A1	Central FONR	2.4	
EW-OU1-52-A	Central FONR	2.9	
EW-OU1-53-A	Central FONR	1.9	

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

$\mu\text{g/L}$  = micrograms per liter

FONR = Fort Ord Natural Reserve

ND = nondetect

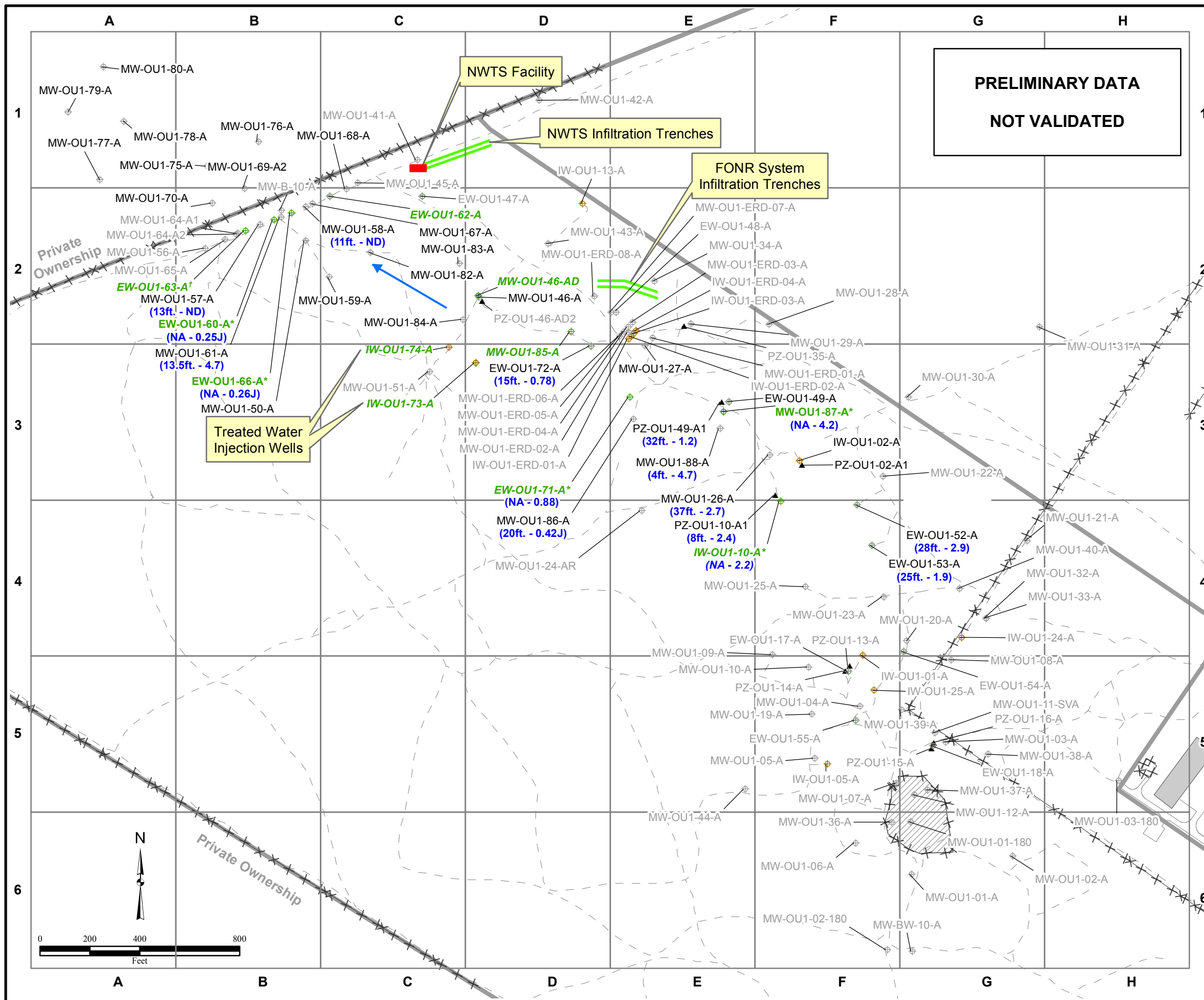
TCE = trichloroethene



**Table 3**  
**Current Deliverable Schedule**  
**Former Fort Ord, Marina, California – 23 September 2014**

<b>Deliverable Title</b>	<b>Submittal</b>	<b>Review Comments Due</b>	<b>Status/Remarks</b>
<i><b>Primary Deliverables</b></i>			
Final UFP-QAPP	May 2014	Received	Submitted 29 May 2014
UFP-QAPP 2014 Update	TBD		
<i><b>Secondary Deliverables</b></i>			
Final 2014 Semiannual Groundwater Monitoring Report	June 2014	August 2014	Submitted 25 June 2014
Draft 2014 Annual Groundwater Monitoring Report	November 2014	December 2014	In progress.
Draft Exit / Closure Strategy Technical Memorandum	October 2014	December 2014	In progress
Draft Well Destruction and Treatment Plant Demolition Completion Report	August 2014	September 2014	Draft accepted as Final.
Draft Health & Safety Plan – OU-1 O&M/LTM	May 2014	Received	Draft accepted as Final.
<i><b>Completed Recent Submittals</b></i>			
Final Memorandum for Record for Optimizing Remediation Pumping	March 2012	February 2012	Accepted as final during July 2012 BCT meeting.
Final 2012 Annual and 3 <sup>rd</sup> 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.
Preliminary Draft Work Plan for Well Destruction and Treatment Plant Demolition	5 November 2013	19 November 2013	Army comments addressed.
Preliminary Draft Health & Safety Plan – Well Destruction and Treatment Plant Demolition	5 November 2013	19 November 2013	Army comments addressed.
Preliminary Draft Health & Safety Plan – OU-1 O&M / LTM	5 November 2013	19 November 2013	Army comments addressed
Draft 2013 Annual and 3 <sup>rd</sup> Quarter Groundwater Monitoring Report	January 2014	March 2014	Submitted 17 January 2014.
Preliminary Draft UFP-QAPP	26 November 2013	10 December 2013	Army comments addressed.
Draft UFP-QAPP	March 2014	May 2014	Submitted 04 March 2014
Final 2013 Annual and 3 <sup>rd</sup> Quarter Groundwater Monitoring Report	April 2014	NA	Submitted 04 April 2014
Final Work Plan for Well Destruction and Treatment Plant Demolition	April 2014	NA	Submitted 04 April 2014

**OU-1 FONR A-Aquifer  
TCE Concentration in Groundwater  
September 2014  
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-OU1-61-A Location with September 2014 TCE Concentrations at or above ACL (5 µg/L)
- (13.5ft. - 13) September 2014 TCE Result (µg/L)
- Sample Elevation (feet above mean sea level)
- TCE contour based on September 2014 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.

\\Gst-srv-01\hglgis\F1\_Ord\Miscellaneous\_Figures\  
 (x)TCE\_2014-09.mxd  
 9/19/2014 PD  
 Source: HGL