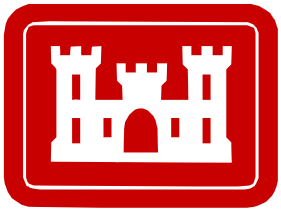
DRAFT
CLOSEOUT REPORT
OPERABLE UNIT 1 GROUNDWATER REMEDIATION
FRITZSCHE ARMY AIRFIELD FIRE DRILL AREA
FORMER FORT ORD, CALIFORNIA



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OPERABLE UNIT 1 GROUNDWATER REMEDIATION
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PROJECT:	Delivery Order for Operable Unit 1, Former Fort Ord, California (Delivery Order CM08)
CLIENT:	U.S. Army Corps of Engineers
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PROJECT MANAGER:	Roy Evans, P.E.
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LIST OF ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
ACL	Aquifer Cleanup Level
BCT	BRAC Cleanup Team
bgs	below ground surface
BRAC	Base Realignment and Closure (Fort Ord Office)
Cal/EPA	California Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
DCE	dicholorethene
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FAAF	Fritzsche Army Air Field
FDA	Fire Drill Area
FONR	Fort Ord Natural Reserve
GAC	granular activated carbon
GRO	gasoline range organics
GST	Groundwater Statistics Tool
GWETS	groundwater extraction and treatment system
GWSTS	groundwater and soil treatment system
HA	health advisory
HCPP	Hydraulic Control Pilot Project
HGL	HydroGeoLogic, Inc.
HMP	Habitat Management Plan
J	value is estimated
LTM	long-term monitoring
mg/kg	milligrams per kilogram
ng/L	nanograms per liter
NPL	National Priority List
NWTS	Northwest Treatment System
OU	Operable Unit
PFOA	perfluorooctanoic acid

PFOS	perfluorooctane sulfonate
PFOT	total PFOA and PFOS concentration
PHA	Preliminary Health Advisory
PLC	programmable logic control
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RACR	Remedial Action Completion Report
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SVA	Salinas Valley Aquiclude
TCE	trichloroethene
TPH	total petroleum hydrocarbons
U.S. Army	Department of the Army
USACE	U.S. Army Corps of Engineers, Sacramento District
UCL	upper confidence limit
UCNRS	University of California Natural Reserve System
UCSC	University of California at Santa Cruz
VOC	volatile organic compound

REGULATORY SUMMARY

The groundwater long-term monitoring (LTM) results showed and the attainment monitoring results confirmed that the aquifer cleanup levels (ACLs) specified in the Operable Unit 1 (OU-1) Record of Decision (ROD) for the chemicals of concern (COC) have been met. The emerging contaminants perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) were not addressed in the ROD but were included in the groundwater attainment monitoring program. PFOA and PFOS sample results were considered with the COC sample results in evaluating the case for OU-1 site closure. The detected PFOA and PFOS concentrations in two wells were greater than the U.S. Environmental Protection Agency (EPA) Health Advisory (HA) limits published in May 2016. These HA values were published five months after the attainment monitoring effort was completed. All PFOA and PFOS detections in OU-1 groundwater were much less than the Preliminary HA values in effect at the time the attainment monitoring was performed. The California Department of Toxic Substances Control (DTSC), Regional Water Quality Control Board (RWQCB), and EPA concluded that OU-1 groundwater monitoring and remediation are complete and that OU-1 can be closed. This closure report summarizes the site history, remediation and monitoring activities, and decommissioning of the remediation system.

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1.0 INTRODUCTION

HydroGeoLogic, Inc. (HGL) prepared this closeout report on behalf of the U.S. Army Corps of Engineers, Sacramento District (USACE) to document completion of soil and groundwater remediation at Operable Unit (OU)-1, Former Fort Ord, California. Training activities conducted at the former Fire Drill Area (FDA) at Fritzsche Army Airfield resulted in contaminants being released to the environment in the OU-1 area (Figure 1.1).

Contaminated soils were removed from the FDA source area in 1987. Cleanup objectives were specified in the OU-1 Record of Decision (ROD) (U.S. Army, 1995). The ROD established Aquifer Cleanup Levels (ACLs) for 10 chemicals of concern (COCs) in OU-1 groundwater. The 10 OU-1 COCs and the corresponding ACL (shown in parentheses after the chemical name) are:

- 1,1-Dichloroethane (5.0 micrograms per liter [µg/L])
- 1,2-Dichloroethane (0.5 µg/L)
- 1,1-Dichloroethene (DCE; 6.0 µg/L)
- Total 1,2-DCE (6.0 µg/L)
- 1,1,1-Trichloroethane (200 µg/L)
- Benzene (1.0 µg/L)
- Chloroform (2.0 µg/L)
- Methyl ethyl ketone (1,900 µg/L)
- Tetrachloroethene (5.0 µg/L)
- Trichloroethene (TCE; 5.0 µg/L)

Groundwater remediation using pump and treat systems and groundwater monitoring was conducted from 1988 through 2014 as part of the OU-1 cleanup and groundwater long-term monitoring (LTM) effort. The LTM results showed that the ACLs specified in the ROD were met at all wells in September 2014 and the remediation system was converted to standby operation in October 2014. Attainment monitoring to confirm that the ROD requirements had been met and would be maintained in the future was performed during 2015.

Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) have been used nationwide as part of film-forming foam applied to extinguish fires and have been identified by the U.S. Environmental Protection Agency (EPA) as emerging contaminants. Because of their potential use in fire training activities at OU-1, PFOA and PFOS were included in the attainment monitoring sampling program. These compounds were not considered during development of the ROD or included in the ACLs specified in the ROD. Neither Federal nor California drinking water

standards for these chemicals have been established; therefore the Preliminary Health Advisory (PHA) values for PFOA and PFOS concentrations in groundwater established by EPA prior to the start of the attainment monitoring effort (EPA, 2014) were used as screening criteria in evaluating the sampling results.

PFOA and PFOS were detected in groundwater at two locations during attainment monitoring. All PFOA and PFOS detections in OU-1 groundwater were much less than the PHA values in effect at the time the attainment monitoring was performed. However, the detected concentrations in two wells were greater than the EPA Health Advisory (HA) limits published in May 2016 (five months after the attainment monitoring effort was completed).

Although the HA values are non-enforceable and presented as advisory information, these more conservative values were considered in evaluating the case for OU-1 closure. The California Department of Toxic Substances Control (DTSC), Regional Water Quality Control Board (RWQCB), and EPA concluded that the cleanup objectives specified in the OU-1 ROD (U.S. Army, 1995) have been met and will continue to be met in the future. They also concurred with the Army recommendation to proceed with site closure activities. This closeout report summarizes the information developed and the actions taken throughout the OU-1 investigation and remediation process.

2.0 SUMMARY OF SITE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

Former Fort Ord is located adjacent to Monterey Bay in Monterey County, CA (Figure 1.1). The Fritzsche Army Air Field (FAAF) FDA, located in the northernmost portion of the former Fort Ord (Figure 1.1), is the source area for OU-1 groundwater contaminants. The FDA was identified as the contaminant source area for the soil and groundwater cleanup designated as OU-1. The FDA was established in 1962 as a training area for the Fort Ord Fire Department. The FDA consisted of an unlined burn pit, a drum loading area, a storage tank, and underground piping that connected the storage tank to a discharge nozzle (U.S. Army, 1995). During training exercises, fuel was piped into the burn pit, ignited, and then extinguished. Training activities at the FDA ceased in 1985.

At its maximum extent, the OU-1 groundwater contamination plume (defined as the footprint of the area in which any COC concentration exceeded its associated ACL) extended beyond the former Fort Ord boundary and onto the Armstrong Ranch property as shown on Figure 2.1. The contaminant source area and the resulting OU-1 plume within the former Fort Ord boundary are located within a habitat reserve managed by the University of California at Santa Cruz (UCSC). This habitat reserve is part of the University of California Natural Reserve System (UCNRS) and is referred to as the Fort Ord Natural Reserve (FONR) (Figure 2.2).

2.1.1 Land Use

The dominant habitats within the OU-1 portion of the FONR are coast live oak woodland, coastal scrub, maritime chaparral, and annual grassland. The maritime chaparral is considered a rare habitat by the California Department of Fish and Game and is largely dependent on Former Fort Ord land for survival. Several federally protected rare, threatened, or endangered species are known or suspected to be present within the FONR and were identified in the Installation-Wide Multispecies Habitat Management Plan (HMP) (USACE, 1997). These species include the federally endangered and state threatened sand gilia, the federally threatened Monterey spineflower, and the federally and state threatened California tiger salamander. Several other plant and animal HMP species are or may also be present in the FONR, including the following:

- Coast wallflower (Erysimum ammophilum)
- Eastwood's ericameria (Ericameria fasciculata)
- Monterey ceanothus (Ceanothus cuneatus var. rigidus)
- Sandmat manzanita (Arctostaphylos pumila)
- Toro manzanita (Arctostaphylos montereyensis)
- Yadon's piperia (Piperia yadonii)
- California black legless lizard (Anniella pulchra nigra)
- Monterey ornate shrew (Sorex ornatus salarius)

The Armstrong Ranch property overlying the former OU-1 contaminant plume was used for cattle grazing or as idle pasture until the Off-Post monitoring and extraction wells were decommissioned and destroyed in October 2016 (HGL, 2016b).

2.1.2 Hydrogeologic Setting

The Former Fort Ord straddles two distinct groundwater basins: the southwestern edge of the Salinas Basin and the eastern portion of the smaller Seaside Basin. The Salinas Basin underlies the OU-1 area (Lawrence Berkeley National Laboratory/Lawrence Livermore National Laboratory, 2001). At the Former Fort Ord, the Salinas Basin is composed of relatively flat-lying to gently dipping, poorly consolidated sediments. Aquifers within the Salinas Basin at the Former Fort Ord, from top to bottom, are as follows:

- The unconfined A-Aquifer
- The confined Upper 180-foot Aquifer
- The confined and unconfined Lower 180-foot Aquifer
- The confined 400-foot and 900-foot Aquifers

These aquifer names reflect local historical water levels and are not directly correlated to present water levels at the Former Fort Ord. Contaminants at OU-1 were detected only in the A-Aquifer. Since at least 2003, the TCE plume footprint encompassed the maximum extent of the other nine COCs. Consequently, TCE concentrations are used to define the boundaries of OU-1 groundwater contamination.

Aquifer materials in the saturated zone of the A-Aquifer consist predominantly of permeable, slightly silty, fine- to medium-grained sands with some coarse-grained sands. Typically, this aquifer depth ranges from approximately 80 feet to 125 feet below ground surface (bgs) in the OU-1 area. The depth to water ranges from approximately 60 feet to 110 feet bgs. The A-Aquifer is underlain by a sequence of impermeable silts and clays that compose the Salinas Valley Aquiclude (SVA). The SVA is up to 100 feet thick beneath Former Fort Ord. In the OU-1 area, the SVA appears to be an effective barrier that prevents downward migration of contaminants from the A-Aquifer into the underlying Upper 180-foot Aquifer.

Additional information concerning the geology, climate, hydrology, and hydrogeology in OU-1 is presented in the Final 100% Engineering Design Report, Volume 1 of 3 (HGL, 2006a).

2.2 NPL LISTING

Environmental investigations began at Fort Ord in 1984 at FAAF under California Central Coast RWQCB cleanup/abatement orders 84-92, 86-86, and 86-135 (U.S. Army, 2010). Additional investigations at the Fort Ord Landfills began in 1986 and the preliminary site characterization was completed in 1988. In 1990, Fort Ord was placed on the EPA's National Priority List (NPL), primarily because of volatile organic compounds (VOCs) found in groundwater beneath the Fort Ord Landfills. Subsequent environmental investigations and remedial actions at the former Fort Ord have been conducted under the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The CERCLA regulation is more commonly referenced as Superfund. A Federal Facility Agreement was signed in 1990 by the U.S. Department of the Army (U.S. Army) as lead agency, the EPA, the DTSC and the RWQCB. DTSC and RWQCB are part of the California Environmental Protection Agency (Cal/EPA).

The OU-1 remediation effort is overseen by the Army, EPA, DTSC, and RWQCB. These entities signed the Federal Facilities Agreement to perform the Fort Ord environmental cleanup and are referred to as the Fort Ord Base Realignment and Closure (BRAC) Cleanup Team (BCT).

The OU-1 ROD was signed by the EPA in September 1995, the DTSC and the RWQCB in March 1996, and the U.S. Army in May 1996 (U.S. Army, 1995). Groundwater samples collected late in 2004 and in 2006 indicated that the OU-1 plume was larger than that estimated in the ROD. The sample results also indicated that the plume had migrated beyond the capture zone of the groundwater extraction and treatment system (GWETS) and across the boundary between the former Fort Ord and Armstrong Ranch. Consequently, an Explanation of Significant Differences (ESD) was prepared and was signed by the U.S. Army, EPA, and the Cal/EPA in June 2010 (U.S. Army, 2010). The ESD addressed three items:

- The change in the physical area of the remediation response.
- Significant changes in remediation cost from the estimates in the OU-1 ROD due to the expanded remedial area.
- After the OU-1 ROD was signed, institutional controls regarding contaminated groundwater at the former Fort Ord were developed and implemented.

The ESD described the expansion of the extraction and treatment remedy and noted that institutional controls are in place. The two additional extraction and treatment systems that were constructed and operated are described in Section 2.4. The institutional controls (groundwater protection zones shown on Figure 2.5) prevent access or use of the groundwater within the OU-1 area for any purpose until the ACLs are met. The boundaries of the groundwater protection zones are updated as determined by the BCT.

2.3 REMOVAL ACTIONS

In 1986, approximately 4,000 cubic yards of total petroleum hydrocarbon- (TPH) contaminated soil were excavated from the FDA and temporarily stockpiled. The maximum depth of the excavation was 31 feet bgs and lateral excavation continued until soil samples collected from the excavation side walls were less than 200 milligrams per kilogram (mg/kg). The completed excavation was backfilled to the original ground surface with clean soil. The excavated soil removed from the FDA was stockpiled and placed in an aboveground biotreatment area.

Biotreatment of the contaminated soil progressed incrementally in l-foot layers of soil and was completed by August 1991. Nutrients were added to treated groundwater from the GWETS and the treated water was then sprayed on the soil in the biotreatment area to optimize growth of microbes that consume hydrocarbons. As each contaminated soil layer was remediated, it was removed and transported to a soil borrow area for use as fill in construction projects at Fort Ord.

The ROD states that the contaminated soil at the FDA has been remediated and no further soil remediation action was selected (U.S. Army, 1995).

2.4 REMEDY SUMMARY / HISTORY

The ROD names extraction and treatment as the selected remedy for groundwater at OU-1. In total, four separate extraction and/or treatment systems were constructed and operated to achieve the OU-1 groundwater remediation goal. These separate systems are shown on Figure 2.3 and were operated as follows:

- Original GWETS / 1988 – 2006. This system included two extraction wells connected to a treatment plant using carbon adsorption to remove COCs.
- Northwest Treatment System (NWTS) / 2006 – 2014. This system included four extraction wells connected to a treatment plant using carbon adsorption to remove COCs.
- FONR System / 2007 – 2014. This system included four extraction wells connected to the NWTS treatment plant.
- Off-Site GWETS / 2008 – 2009. This system included two extraction wells connected to a treatment plant using carbon adsorption to remove COCs.

Treatment facilities using granular activated carbon (GAC) to remove the COCs from groundwater were constructed at the original GWETS, the NWTS, and the Off-Site GWETS. Groundwater from the FONR system extraction wells was conveyed to and treated at the NWTS facility. The individual remediation systems are described in the following sections.

Figure 2.4 shows the locations of the monitoring and extraction wells constructed as part of the overall remediation effort. The grid pattern overlain on the background maps enable easier location of the wells discussed within this document. To help locate any well, Table 2.1 provides a cross reference to this and other map grids shown in some figures. Well names throughout the document are followed by the column letter and row number in which the well can be found on the figure grid. Well MW-OU1-26-A (F3), for example, would be found in Column F, Row 3 of the grid on Figure 2.4.

Note that typical well identification formats—"MW-" prefix for monitoring wells, "EW-" prefix for extraction wells, and "IW-" prefix for injection wells—do not correspond to well function in all cases.

The current use of each well is shown in Table 2.2. The boundaries of the contaminated groundwater zone in OU-1 were refined as the remedial design progressed after the wells were permitted and constructed. The initial stage of remedy implementation provided additional plume definition and estimated potential pumping rates at several monitoring wells. The evaluation of design alternatives showed that the most effective OU-1 remedy required that some wells be used for different purposes than originally intended. Consequently, some wells that were intended and named as monitoring wells when constructed became extraction wells during remedy implementation; those wells were MW-OU1-46-AD (D2), MW-OU1-85-A (D2), and MW-OU1-87-A (E3). Conversely, well EW-OU1-72-A (D3) is used only for monitoring groundwater quality. Several wells were named as potential injection well sites, but only two such wells were incorporated into the remedy for this purpose; those wells were IW-OU1-73-A (D3) and IW-OU1-74-A (C3). The remaining "IW-" prefix wells are used only for monitoring groundwater quality.

The only exception to this statement is well IW-OU1-10-A (F3), which was converted from a monitoring well to an extraction well in October 2010.

2.4.1 Original GWETS

The original GWETS began operating in 1988 and was located in the immediate vicinity of the contaminant source area. The GWETS extracted groundwater through extraction wells EW-OU1-17-A (F5) and EW-OU1-18-A (G5) (HGL, 2006a). The system treated VOCs using GAC vessels connected in series. The treated groundwater was discharged through a spray irrigation system located in the former FDA to recharge the underlying groundwater.

All monitoring wells within the original GWETS capture zone met the aquifer cleanup targets in 2005 and the original GWETS was shut down on 22 February 2006 to conduct a rebound evaluation. The regulatory agencies concurred with the Army that significant rebound did not occur and the original GWETS should remain shut down. A detailed discussion of the rebound evaluation study and evaluation of the data collected therein are presented in the Final Rebound Evaluation Report (HGL, 2011a). The original GWETS and associated equipment were decommissioned and removed from the site in 2014 (HGL, 2014).

2.4.2 NWTS and FONR Systems

The expanded remediation system designed to capture and treat the remainder of the OU-1 VOC plume within the former Fort Ord boundary became fully operational in October 2007 (Figure 2.3). The expanded system was constructed in two phases. The first component was installed as a pilot program (the Hydraulic Control Pilot Project [HCPP]) consisting of a groundwater treatment system using GAC and four extraction wells installed along the northwest boundary of the FONR.

The primary objective of the HCPP was to prevent plume migration across the former Fort Ord property boundary. The four HCPP extraction wells are EW-OU1-60-A (B2), EW-OU1-62-A (C2), EW-OU1-63-A (B2), and EW-OU1-66-A (B2). The HCPP began operating on 01 July 2006. After approximately nine months of successful operation, the "pilot project" label was dropped and the HCPP facilities were subsequently referred to as the NWTS. During the operation of the pilot phase, the treated groundwater was discharged through an infiltration trench to recharge the groundwater immediately east of the NWTS (Figure 2.4).

The second phase of the full remediation system was constructed in the summer of 2007 and became fully operational on 12 October 2007. The primary objective of this component of the remedy was to accelerate plume capture by placing extraction wells along the main path of plume migration. This component is referred to as the FONR System and consists of four additional extraction wells located along the main axis of plume migration in the central portion of the FONR. The additional extraction wells are MW-OU1-46-AD (D2), MW-OU1-85-A (D2), MW-OU1-87-A (E3), and EW-OU1-71-A (E3). After October 2007, treated groundwater from the NWTS was recharged to the A-Aquifer through one or more of the following options:

- Infiltration trenches constructed during the pilot project phase and located immediately to the east of the NWTS treatment facility
- New infiltration trenches constructed in the grassland area adjacent to the central portion of the OU-1 plume during the second phase

- One of two injection wells (IW-OU1-73-A [D3] or IW-OU1-74-A [C3]) constructed within the FONR habitat

In 2010, HGL converted monitoring well IW-OU1-10-A to an extraction well to accelerate the overall groundwater cleanup. The design parameters for this expansion are described in the Remediation System Expansion Design Technical Memorandum (HGL, 2010).

Significant progress was achieved during the 2007 to 2011 review period in terms of reducing the footprint of the TCE plume by over 60 percent and reducing the maximum detected TCE concentration by 67 percent (to 17 µg/L). In September 2011, the remaining TCE plume was composed of two discrete segments covering approximately 8 acres in total. The smaller segment was located along the northwest OU-1 boundary, in the immediate vicinity of MWOU1-61-A, with a footprint of approximately 0.5 acre. The 7.5 acres remaining in the second segment were at least 1,700 feet from the northwest boundary. The Army recommended that the remedy continue operating and be evaluated to optimize the overall effectiveness of natural attenuation with respect to the following:

- Time required to achieve the ACLs
- Impact on greenhouse gas emissions resulting from the current pump and treat system
- FONR habitat impact
- Groundwater mass balance
- Total cost to meet the ACLs

Optimization evaluations were conducted and recommendations were made to reduce pumping and modify the groundwater LTM program resulting in fewer wells to be sampled and conducting sampling semiannually. The recommended changes would reduce electric use and greenhouse gas emissions, reduce the potential impacts to the protected FONR habitat, extend the life of the carbon adsorption system, and reduce the estimated cost to reach the OU-1 cleanup goals. The recommendations were approved by the regulatory agencies and implemented in 2012 (HGL, 2012c).

Sample results from the groundwater LTM program in September 2014 showed that groundwater met the ACLs at all sampled wells in September 2014. The NWTS and FONR systems were taken offline in October 2014 as a prerequisite for initiating attainment monitoring. The NWTS remained offline but operable after October 2014, except for brief periods to test repairs of damage caused by an electric utility meter short circuit and a lightning strike. The NWTS was decommissioned and all remaining OU-1 wells were destroyed as part of site closure (see Section 5 and Appendix B).

2.4.3 Off-Site System

In August 2008, construction of the Off-Site GWETS was completed and operation was initiated. This Off-Site System was constructed in the Armstrong Ranch near the downgradient edge of the OU-1 TCE Plume. It consisted of groundwater extraction from the A-Aquifer by two extraction wells, aboveground treatment with GAC, and infiltration of the treated water (Figure 2.3). Treated water was discharged to an infiltration basin on the Marina Coast Water District property near the Off-Site GWETS. The Off-Site System operated full-time until February 2009, when analytical

data indicated remedial action objectives were achieved. A series of rebound tests starting in February 2009 indicated that COC concentrations in the off-site area remained below ACLs (Shaw, 2010). The Off-Site System treatment plant and the treated water discharge pipeline were decommissioned and removed in 2014 (HGL, 2014). The OU-1 monitoring wells, extraction wells, and associated pipeline on Armstrong Ranch were destroyed in 2016 (HGL, 2016b).

2.5 INSTITUTIONAL CONTROLS

OU-1 groundwater contamination is limited to the A-Aquifer. Although this aquifer is not used for drinking water purposes, the OU-1 area is located within the Special Groundwater Protection Zones established by Monterey County. These special protection zones, which include all the OU-1 area, are designated as the Prohibition Zone and the Consultation Zone and are illustrated on Figure 2.5.

The boundaries of the groundwater protection zones shown on Figure 2.5 are updated as determined by the Fort Ord BCT. The BCT consists of representatives of the U. S. Army, EPA, California DTSC, and the California RWQCB, Central Coast Region. Construction of any proposed well in the OU-1 area falls within the boundaries shown on Figure 2.5 and must be approved by the Monterey County Health Office in consultation with the BCT (Monterey County, 2016).

2.6 FINAL INSPECTION ACTIVITIES

Final inspections performed by the BCT consisted of the following activities:

- Review, comment, and acceptance of the Final Well Destruction Report for OU-1 (HGL, 2012b). This report described the decommissioning and removal of 55 wells within OU-1, including grout quantities and well destruction completion reports submitted to Monterey County. The destroyed wells were located within the original GWETS capture zone and elsewhere within OU-1 where the groundwater ACLs specified in the ROD had been achieved.
- Review, comment, and acceptance of the Final Well Destruction and Former OU-1 Treatment Plant Decommissioning Completion Report (HGL, 2014). This report described the decommissioning and removal of the original GWETS, the off-site GWETS, and the destruction of the extraction wells associated with the original GWETS. This report also presented information, including grout quantities and well destruction completion reports submitted to Monterey County. The destroyed wells were located in areas where the groundwater ACLs specified in the ROD had been achieved.
- Review, comment, and acceptance of the Final Remedial Action Completion Report (RACR) (HGL, 2016a). This report presented the results of the attainment monitoring program that was performed in accordance with the Exit Strategy Technical Memorandum (HGL, 2015a) approved by the BCT.
- Review, comment, and acceptance of the Final Armstrong Ranch Well Destruction and Pipeline Decommissioning Completion Report (HGL, 2016b). This report described the decommissioning and removal of the extraction wells and pipeline associated with the off-site GWETS, and the destruction of the monitoring wells located on the Armstrong Ranch

property. This report also presented information, including grout quantities and well destruction completion reports submitted to Monterey County. The destroyed wells were located in areas where the groundwater ACLs specified in the ROD had been achieved.

- Review, comment, and acceptance of the Technical Memorandum: Final Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminants in Operable Unit 1 Groundwater (U.S. Army, 2016). This memorandum described the results of the attainment monitoring for PFOA and PFOS in comparison to the corresponding HA values published by EPA in May 2016.
- Review, comment and acceptance of the Final OU-1 Well Destruction and NWTS Plant Decommissioning Completion Report (Appendix B). This report describes the decommissioning of the NWTS and removal of all OU-1 extraction wells and monitoring wells that remained when the regulatory agencies concurred that remediation and monitoring were complete and OU-1 could be closed. This work was completed in July 2017.
- Review, comment, and acceptance of this OU-1 Closeout Report.

3.0 MONITORING RESULTS

Groundwater monitoring was conducted from 1985 through 2015. The number of wells included in the groundwater LTM network varied over time, as did the sampling frequency. As the aquifer cleanup progressed, the frequency of LTM sample collection went from quarterly to semiannually. The sampling frequency at individual wells varied from quarterly to annually. The remediation phase of the LTM program ended in September 2014 when groundwater sampling showed that the cleanup objectives for the COCs identified in the ROD had been achieved at all monitoring locations. These sampling results are described in Section 3.2. Groundwater sampling for attainment monitoring was performed in 2015 and is described in Section 4.

3.1 SOURCE ACTION SOIL REMOVAL CONFIRMATION

A groundwater and soil treatment system (GWSTS) was constructed at the former fire drill training source area and operation began in August 1988. Details of the construction of the GWSTS are presented in the Construction Report (HLA, 1989a) and summarized as follows:

- Approximately 4,000 cubic yards of TPH-contaminated soil was excavated and temporarily stockpiled. The maximum depth of the excavation was 31 feet bgs.
- The excavated, stockpiled soil removed from the FDA was placed in an aboveground biotreatment area. Biotreatment of the contaminated soil progressed incrementally in l-foot layers of soil, or lifts, and was completed by August 1991. As each lift was remediated, it was removed and transported to the FAAF soil borrow area for use as fill in construction projects at Fort Ord.
- Soil sampling during and after the excavation activities demonstrated that TPH was not detected in soil samples collected from the excavation side walls above 200 mg/kg. Two samples were analyzed specifically for gasoline range organics (GRO) during the excavation because of odors noticed by the field team. In the two samples, TPH-GRO was only detected in one, at a concentration of 190 parts per million.
- The excavation was backfilled to the original ground surface with clean soil.

In 1993, additional soil samples were collected as part of a remediation (cleanup) confirmation study (HLA, 1994). The confirmation sampling results indicated that low concentrations of several organic chemicals remained in soil at the site, but cleanup goals for soil were achieved. These remaining chemicals included: 1,3-dichlorobenzene; methylene chloride; toluene; xylenes; chlorinated dioxins and furans; and TPH as diesel and gasoline. Lead was also detected in soil samples just above natural background concentrations in several samples, but below the cleanup goals (HLA, 1994; Appendix A).

3.2 GROUNDWATER MONITORING DEMONSTRATING REMEDIATION PROGRESS

Groundwater monitoring wells at OU-1 were sampled as part of the groundwater LTM program from 1986 through 2015. The sampling frequency varied from quarterly to semiannually during that period. Extraction wells and treatment system inflow and discharge have also been sampled as part of the performance monitoring associated with the groundwater treatment systems (Figure

2.3). All sampling results were presented at least semiannually in reports presented to the public and BCT. These sampling reports are available in the Fort Ord Administrative Record located at:

4463 Gigling Road, Ord Military Community
Seaside, California 93955
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All groundwater sampling reports and other documents referenced in this Closeout Report can also be accessed online at http://fortordcleanup.com/documents/search/.

Except for TCE, remediation efforts successfully reduced all COC concentrations below their corresponding ACLs in 2008. Since 2004 or earlier, the footprint of the TCE concentration greater than the ACL encompassed all other COCs that exceeded their respective ACLs. Consequently, the TCE contamination boundary has been used to define cleanup progress.

The 2006 groundwater sampling events revealed TCE exceedances (at or above 5 µg/L) at nine well locations (Figure 3.1). Continual operation of the pump and treat remediation systems (Figure 2.3) steadily reduced the footprint of the TCE contamination boundary; however, the TCE concentration in some wells in the southern portion of the site and at one well on the northwest boundary of the former Fort Ord consistently exceeded the ACL from 2006 to 2013. By 2013, TCE exceeded the ACL only at monitoring wells MW-OU1-61-A (B2) in the northern portion and MW-OU1-88-A (E3) in the southern portion of the site. The September 2014 groundwater sampling results showed that the TCE concentration at all LTM wells met the ACL targets specified in the ROD. Follow-up samples from monitoring wells MW-OU1-61-A (B2) and MW-OU1-88-A (E3) in December 2014 confirmed the September results. Figure 3.1 shows the consistent shrinkage in the TCE contamination boundary from 2006 to 2014. Figure 3.2 illustrates the decline in TCE concentration observed at the wells located along the main axis of plume migration.

4.0 ATTAINMENT DEMONSTRATION FOR GROUNDWATER CLEANUP

Following the December 2014 sampling event, the BCT developed and approved an exit strategy and Attainment Monitoring program to confirm that OU-1 groundwater remediation is complete and the OU-1 site can be closed (HGL, 2015a). The sampling results from the Attainment Monitoring Program were evaluated to verify that the ROD cleanup goals were met and will continue to be met after termination of remedial activities.

The evaluation of OU-1 groundwater monitoring data collected from 2006 through 2014 and the 2015 attainment monitoring sampling indicates that all COC concentrations are below the ACLs identified in the ROD. Analytical data and statistical analysis of contaminant concentrations confirm that COCs will continue to meet the OU-1 ROD ACLs in the future (HGL, 2016a).

4.1 ATTAINMENT MONITORING SUMMARY - VOCS

All COCs at wells in the Attainment Monitoring well network, with the exception of TCE, have been less than the corresponding ACL since 2008. TCE concentrations in all Attainment Monitoring wells were less than the corresponding ACL for at least six consecutive sampling events, including the four attainment monitoring events. The dates for remediation period events during which TCE concentrations were less than the ACL vary by well and are presented in Table 4.1.

The EPA Groundwater Statistics Tool (GST) (EPA, 2015) was used to evaluate the TCE sample results from the attainment monitoring wells. The dataset at each well included all samples since the TCE ACL was reached at each well, except for well PZ-OU1-10-A1. At PZ-OU1-10-A1, the September 2012 and September 2013 TCE concentrations of 0.4 J µg/L and 0.2 J µg/L (the J qualifier indicates the value is estimated) were omitted from the GST input data to avoid potentially biasing the evaluation results to the low side. The results from these two dates were much less than the range of TCE concentration observed in the five subsequent samples collected between September 2014 and December 2015 (1.6 µg/L to 3.3 µg/L). The lower concentrations reported during September 2012 and 2013 may be a result of vertical mixing caused by changes in pumping at nearby extraction well IW-OU1-10-A.

The dataset evaluation for all wells in the attainment monitoring program showed that the 95 percent upper confidence limit (UCL) band value after the fourth attainment event was less than the ACL of 5.0 µg/L. The maximum 95 percent UCL band value after the fourth event was 4.2 µg/L at well MW-OU1-61-A (B2). More information regarding VOC results, trends, and statistical evaluation is presented in the Final RACR/Technical Memorandum (HGL, 2016a). The TCE results used in GST calculations are provided in Table 4.1 and the Attainment Monitoring Results (May 2015 to December 2015) are shown on Figure 4.1.

4.2 ATTAINMENT MONITORING SUMMARY – PFOA/PFOS

4.2.1 Comparison to Preliminary Health Advisory

PFOA was detected in all wells and PFOS was detected at two wells during the first attainment monitoring sampling event (May 2015). Consequently, sampling for PFOA and PFOS was included during all four attainment monitoring events. Sampling for PFOA and PFOS was discontinued at well PZ-OU1-10A after the first event because of concerns about the potential for suspended sediment in the Hydrasleeve™ collection device to impact sample results. The EPA, DTSC, and RWQCB concurred with the decision to discontinue sampling at this location. Total depth measurements at this well combined with visible aquifer material in the bottom of the Hydrasleeve™ sampler indicated that the well casing and/or screen has been damaged and Hydrasleeve™ samplers do not exclude suspended sediments. COC sampling for VOCs continued because the passive diffusion bags used to collect VOC samples exclude suspended sediments from the sample; this method has not been approved for PFOA or PFOS sample collection. The analytical results from the Attainment Monitoring program are presented in Table 4.2 and shown on Figure 4.2.

A field duplicate, trip blank, field blank, and equipment blank were collected during all sampling events. PFOA and PFOS were not detected in any trip, equipment, or field blank. The results for the blank samples clearly indicate that the sampling procedures did not affect the analytical results.

Although drinking water standards for PFOA and PFOS have not been established, EPA developed PHA standards in 2009 for concentrations in groundwater (EPA, 2014). The PHAs for groundwater for PFOA and PFOS are 400 nanograms per liter (ng/L) and 200 ng/L, respectively (EPA, 2014). Although these compounds were not identified in the OU-1 ROD, the regulatory agencies stated that the attainment monitoring sampling program must include these potential contaminants in order for the agencies to evaluate the case for OU-1 closure. The PHA values were used as a benchmark in evaluating PFOA and PFOS sampling results.

PFOS was detected in only two of the eight attainment network monitoring wells and was detected during each of the four sampling periods. The PFOS concentrations in all events were less than the corresponding PHA value for this analyte in all cases. The maximum concentration was detected in well MW-OU1-88-A (E3) at 72 ng/L; this is the same well that contained the highest PFOA concentration. The PFOS concentration ranged from 72 ng/L to 33 ng/L at MW-OU1-88-A (E3) with the minimum value observed in the fourth sampling round (December 2015).

PFOS was also detected in well MW-OU1-26-A (F3) with a maximum concentration of 15 ng/L. The PFOS concentration was essentially unchanged and varied only from 7 ng/L to 15 ng/L.

The extraction holding time was exceeded by four days for all samples in the first Attainment Monitoring Event. Consequently, the "J-" qualifier was assigned to all results to indicate the possibility that the analytical results may be biased low. The successive PFOS concentrations were either nearly identical or slightly decreasing within a minimal range. Based on the consistency between sampling events, it is unlikely that the initial results were biased low due to sample holding time exceedances. At both wells where PFOS was detected, the maximum concentration was far less than the 200 ng/L PHA screening value.

PFOA was detected in all samples collected during the Attainment Monitoring Program. The maximum concentration was observed at MW-OU1-88-A (E3) at 270 ng/L. PFOA ranged from 180 ng/L to 270 ng/L with close agreement between the duplicate samples. As with PFOS, the overall results suggest it is unlikely that the initial results were biased low. At the other wells in the attainment monitoring network (excluding PZ-OU1-10-A1 [F3], which was sampled only once), there was virtually no variation between measurements. The maximum range was 10 ng/L at MW-OU1-26-A (F3) and the maximum concentration was 44 ng/L at that same well. All PFOA concentrations were much less than the 400 ng/L PHA screening value.

Based on these results, the regulatory agencies concurred (see Appendix A, Attachment 1) in March 2016 with the Army's conclusion that remediation was complete and OU-1 should proceed to site closure. A Closure Plan was developed and included as Appendix D of the 2016 OU-1 Annual Groundwater Monitoring Report (HGL, 2016c).

4.2.2 Comparison to May 2016 PFOA/PFOS Health Advisory

In May 2016, the EPA published HA values for PFOA and PFOS (EPA, 2016); these values superseded the previous PHA values. The 2016 HA eliminated separate values for each compound and established 70 ng/L as the advisory limit for the sum of PFOA and PFOS concentrations in a sample. As illustrated in Table 4.2 and discussed below, PFOA and PFOS concentrations exceeded the HA values at two wells.

The maximum total PFOA and PFOS concentration in all sampling events was found at well MW-OU1-88-A (E3). A duplicate sample was collected from this well during attainment sampling events 2 through 4. Using the maximum value of the parent and duplicate sample as the sampling result for each event, the total PFOA and PFOS concentration (PFOT) was nearly identical in sampling events 1 and 2 (334 ng/L and 332 ng/L, respectively) and likewise, although decreasing by approximately 25 percent, in events 3 and 4 (244 ng/L and 243 ng/L, respectively). All results were greater than the revised advisory value of 70 ng/L.

As noted in the previous section, well PZ-OU1-10-A1 (F3) was sampled only during the first attainment event (in May 2015) because the sample showed considerable suspended sediment. PFOS was not detected in the sample; thus, the PFOT value was equal to the PFOA value of 120 ng/L and exceeded the revised advisory limit of 70 ng/L.

The Army submitted a Technical Memorandum to the regulatory agencies in August 2016 that discussed these results and sited characteristics in relation to the 2016 HA values (U.S. Army, 2016); this submittal is included for reference as Appendix A. The Army recommended that OU-1 be closed without further remediation or sampling.

After reviewing the OU-1 attainment monitoring results, the regulatory agencies concurred (Appendix A, Attachment 1) that all response actions have been successfully completed and that the cleanup objectives specified in the OU-1 ROD (U.S. Army, 1995) have been met and will continue to be met in the future. This closeout report summarizes the information developed and the actions taken throughout the OU-1 investigation and remediation process.

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5.0 SUMMARY OF OPERATION AND MAINTENANCE REQUIRED

Remediation has been completed and all requirements of the ROD have been met. All groundwater monitoring and extraction wells were destroyed in accordance with State of California and Monterey County requirements. The NWTS facility was decommissioned and the infrastructure disposed or recycled with the following exceptions:

- The buried water transmission pipelines connecting the NWTS and FONR extraction wells to the NWTS and connecting the NWTS to the infiltration trenches and injection wells in the FONR (Figure 2.3) were capped and left in place. Removal of these pipelines would potentially impact sensitive habitat within the FONR and the UCSC management staff preferred that the pipelines be left in place.
- The buried water transmission pipelines connecting the original extraction wells to the GWETS in the former source area (Figure 2.3) were also capped and left in place based on the same rationale described in the previous bullet point.
- The electric utility connection, lighting, fencing, and secondary containment basin at the NWTS were left in place to provide a storage and staging facility to support future field research activities to be conducted by UCSC.

Consequently, no further operation or maintenance of the former remediation system is needed or required. The Well Destruction and NWTS Decommissioning Completion Report describing these activities is included as Appendix B in this Closeout Report.

5.1 GROUNDWATER MONITORING

The regulatory agencies concurred that remediation is complete and no further groundwater monitoring is required (Appendix A, Attachment 1). All groundwater monitoring wells were destroyed (Appendix B) following approval of the Well Destruction and NWTS Decommissioning Work Plan (HGL, 2017).

5.2 INSTITUTIONAL CONTROLS

All property within the OU-1 boundary is located within the Special Groundwater Protection Zones (Figure 2.5) established by Monterey County (described in Section 2.5). Construction of any new well within the former OU-1 area must be approved by the Monterey County Health Office in consultation with the BCT (Monterey County, 2016). It is anticipated that these controls will remain in place until the groundwater cleanup goals established for other ongoing OUs are met—in particular, for the Carbon Tetrachloride OU that is underway immediately south of OU-1. The boundaries of the Special Groundwater Protection Zones may be modified only with approval from Monterey County and the BCT.

In addition, most of the OU-1 area lies within the FONR (Figure 2.2). The FONR property is owned by the University of California and managed by the UCSC as part of the UCNRS. The FONR is a protected habitat devoted to biological and environmental research; development is prohibited.

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6.0 DEMONSTRATION OF CLEANUP ACTIVITY QA/QC

The EPA, DTSC, and RWQCB have provided program review and oversight throughout the investigation, design, construction, and operational activities of the OU-1 effort. Reports and documents representing major milestones in the investigation and cleanup process were designated as Primary Documents and longer review time (compared to Secondary Documents) was allotted to facilitate thorough quality assurance (QA)/quality control (QC). The minimum 60-day review period for Primary Documents was extended upon request in some cases. Reports were submitted as draft, draft final, and final to ensure that all public and agency review comments and any QA/QC concerns were satisfactorily resolved. Key elements of the QA/QC effort are discussed in the following sections.

6.1 CONSTRUCTION QA/QC

Construction QC was implemented during the construction of the groundwater remediation system to ensure that the remedy would function as designed. Aquifer pumping tests were performed as part of the remedial design effort to ensure that plume control and capture would be consistent with the requirements of the OU-1 ROD. Leak detection was incorporated into the Off-Site treatment system and all water transmission pipelines for the GWETS, NWTS, and FONR systems were located within the capture zone of the associated extraction wells. Startup testing was performed as each treatment system was brought online to ensure proper operation. Construction reports were submitted upon completion and subsequent modification of each treatment system to document the as-built condition. USACE staff provided field QA/QC during the well destruction and treatment plant removals in 2014, 2016, and 2017.

A detailed description of the HCPP/FONR OU-1 groundwater remediation system components is provided in the following documents:

- Construction Report Ground-Water and Soil Treatment System (HLA, 1989a)
- Design Modifications Ground-Water Treatment System (HLA, 1989b)
- Final 100% Engineering Design Report, Volumes 1-3 (HGL, 2006a, 2006b, 2006c)
- Final HCPP Construction Report (HGL, 2007)
- Final FONR System Design Technical Memorandum (HGL, 2011b)
- Final FONR System Construction Report (HGL, 2009)
- Final IW-OU1-10-A System Expansion Construction Report (HGL, 2012a)
- Draft Final Operable Unit 1 Off-Site Groundwater Extraction Pilot Study Work Plan, Former Fort Ord, California. Revision 0 (Shaw, 2008)
- Report of Off-Site Groundwater Extraction Pilot Study and Quarterly Monitoring Operable Unit 1 July to September 2008 (Shaw, 2009)

6.2 OPERATIONS AND MAINTENANCE QA/QC

The four groundwater treatment systems operated independently (except that the FONR system extraction wells were connected to the NWTS treatment plant) as noted in Section 2.4 and shown on Figure 2.3. The periods of operation overlapped to some degree:

- Original GWETS from 1988 to 2006.
- NWTS from 2006 to 2014.
- FONR System from 2007 to 2014.
- Off-Site GWETS from 2008 to 2009.

All treatment systems were unmanned, automatic operation, and were inspected at regular intervals. The inspection schedules varied from at least weekly to monthly, depending upon cleanup progress and pumping volumes. The inspections included routine maintenance of pumps, controls, and equipment to ensure proper operation and repairs or replacement of system components as needed. Pumping and treatment rates and other operational parameters were gauged, recorded, and compared to expected rates to confirm performance was in accordance with design expectations.

The NWTS and Off-Site GWETS included automated monitoring, programmable logic controls (PLC), and alarm callouts to alert Operations and Maintenance personnel of unexpected conditions (such as low or high pressure, and low or high water volumes in holding tanks, for example). The PLC could automatically shut down system operation in response to pre-programmed conditions such as leaks or system water pressure outside a prescribed range.

The system performance data was compared to groundwater sampling results to identify opportunities to optimize system performance by adjusting pumping rates and/or eliminating pumping at individual wells. Groundwater modeling was used to evaluate alternative pumping strategies and optimization impacts. The NWTS total pumping rate declined over time as the groundwater cleanup targets were met within the capture zones of individual wells (Figure 3.1).

Effluent discharge requirements were set by RWQCB Order Number 85-20. Effluent sampling for the COCs identified in the ROD was performed at regular intervals to monitor compliance and the sampling frequency was adjusted with regulatory concurrence as the cleanup progressed, influent contaminant loading decreased, and discharge quality stabilized. The GAC treatment vessels at each system were connected in series and mid-point concentrations were monitored to identify potential or actual contaminant breakthrough. When breakthrough was identified, the treatment process order was reversed and the GAC in the breakthrough vessel was replaced. This approach minimized the potential for discharging treated water that did not meet the requirements of RWQCB Order 85-20.

6.3 SAMPLING AND ANALYIS PROTOCOLS

The sampling and monitoring activities followed the procedures, specifications, and requirements described in the Final Sampling and Analysis Plan, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California (HGL, 2004a) and the Final Quality Assurance Management Plan (HGL, 2004b). The Final Quality Assurance Management Plan was revised in

2015 in accordance with guidance for the Uniform Federal Policy Quality Assurance Project Plan (QAPP). The QAPP revisions in 2015 (HGL, 2015b) provided guidance for PFOA and PFOS sample collection and analysis and incorporated the requirements of the Attainment Monitoring Program.

Groundwater LTM analytical results have been validated since May 1992 or July 1993 (varies among the first 19 wells installed and their sampling frequency) to ensure compliance with the requirements of the QAPP. Since 2004, groundwater data was validated at a frequency of 100 percent for validation to Level III (EPA Stage 2) and a minimum of ten percent of the samples were validated to meet Level IV (EPA Stage 4) requirement. Data validation results are included with the groundwater monitoring reports submitted for regulatory review. The data validation effort ensured that all results used in evaluating OU-1 site closure were of sufficient quality for use in meeting the project objectives.

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7.0 FIVE-YEAR REVIEW

Five-year review reports are required by CERCLA §121 and the National Contingency Plan. The five-year review process consists of evaluating relevant documents including Operation and Maintenance records, groundwater evaluation records, groundwater VOC concentration monitoring data, and remediation system performance data. The data collected over each five-year term is evaluated for continual effectiveness as the chosen remedial action and overall protection of human health and the environment. The findings are evaluated to assess the capability of the remedy to reduce contamination and determine whether additional remedial action is necessary.

The initial five-year review report was submitted in 2002 (U.S. Army, 2002) with subsequent reviews submitted in 2007, 2012, and 2017 (U.S. Army, 2007; 2012; 2017). The preliminary draft of the fourth five-year review has been submitted for Army review. The following sections provide a brief overview of the most recent five-year review (concluded in 2012) and the anticipated key conclusions of the 2017 five-year review effort that is underway.

7.1 SUMMARY OF PREVIOUS AND CURRENT FIVE-YEAR REVIEWS

No issues were identified in the third five-year review (U.S. Army, 2012) that affected the protectiveness of the remedy at OU-1 or that would require follow-up action. The current remedy achieved the groundwater cleanup objectives during the period covered by this five-year review.

The current five-year review report (U.S. Army, 2017) noted that the maximum TCE concentration within the OU-1 monitoring well network first met the ROD cleanup target in the September 2014 sampling effort and this achievement was confirmed in samples collected in December 2014 and during attainment monitoring from May 2015 through December 2015. The report also concluded that there are no issues affecting the protectiveness of the remedy at OU-1. Consequently, the final recommendation regarding OU-1 is to initiate the Closure Plan as described in the Final 2016 Annual Groundwater Monitoring Report (HGL, 2016c) and the regulatory agencies concurred with that recommendation. All remaining infrastructure associated with the OU-1 remediation was destroyed or decommissioned as of August 2017.

7.2 FUTURE FIVE-YEAR REVIEWS

As of February 2017, the BCT concurred that OU-1 can be closed without additional groundwater monitoring or remediation. This site will be eliminated from future Five-Year Reviews. However, in response to EPA concerns about PFOA and PFOS, the Army has proposed the following:

> "*Given that the Army is planning to screen for the presence of PFOA and PFOS at OU 2 and conduct a site-wide PFOA/PFOS review (which includes OU 1) in 2018, the Army instead proposes to include a new section to discuss the emerging contaminant nature of PFOA/PFOS in the 5th Five Year Review. This section will include discussion regarding PFOA/PFOS issues at OU 1 and the results of the site-wide review of historical activities with the potential to cause PFOA/PFOS contamination in the soil and groundwater. Since PFOA/PFOS issues will be discussed under the new section, the Army recommends the elimination of OU 1 from future Five Year Reviews after acceptance of the final Close-out Report."*

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8.0 SITE COMPLETION CRITERIA

The remedy at OU-1 is protective of human health and the environment as the remedial action objectives stipulated in the 1995 ROD and 2010 ESD have been achieved. The Closure Plan presented in the 2016 OU-1 Annual Groundwater Report (HGL, 2016c; Appendix D) will be implemented to complete the site closeout activities. Primary components of the plan are as follows:

1. Prepare a Work Plan to remove the facilities and wells used in the remediation effort
2. Destroy wells used in OU-1 remediation effort, specifically:
    a) All OU-1 monitoring, extraction, and injection wells
    b) Associated pipelines and power conduits
3. Decommission and remove NWTS treatment plant
    a) Remove treatment equipment and off-post pipelines (Table D.2)
    b) Leave the Pacific Gas & Electric power transformer and meter, fence and containment basin in place
4. Perform site restoration if needed
5. Prepare reports to satisfy regulatory documentation of site closure:
    a) Draft and final reports describing the work activities performed in accordance with the Closure Plan
    b) OU-1 Closeout Report

All OU-1 groundwater monitoring wells, extraction wells, and associated pipelines located on the Armstrong Ranch (included in Items 1 and 2 of the Closure Plan summary above) were destroyed in October 2016 (HGL, 2016b; 2016d). No further field activities will occur on Armstrong Ranch.

The Final Work Plan described in Item 1 was submitted in July 2017 (HGL, 2017). All remaining OU-1 wells were destroyed (Item 2 and Item 4) and the NWTS was decommissioned (Item 3) in July 2017. This Closeout Report addresses Item 5.

Rare plant surveys at the OU-1 well sites within the FONR will be performed annually through 2020 in accordance with the 2015 Biological Opinion (U.S. Fish and Wildlife Service, 2015). The results of the 2017 Rare Plant Survey will be submitted separately. No restoration activities (Item 4) beyond those already completed as part of well destruction and treatment plant decommissioning have been identified at present. The final determination regarding site restoration will be made after completion of the OU-1 biological monitoring program in 2020 and evaluation of those results.

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9.0 REFERENCES

HydroGeoLogic, Inc. (HGL), 2004a. Final Sampling and Analysis Plan, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. July. Administrative Record Series Number OU1-501*.

HGL, 2004b. Final Quality Assurance Management Plan, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. July. Administrative Record Series Number OU1-505*.

HGL, 2006a. Final 100% Engineering Design Report, Volume 1 of 3, Geology and Conceptual Site Model, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. August. Administrative Record Series Number OU1-538*.

HGL, 2006b. Final 100% Engineering Design Report Volume 2 of 3, Groundwater Modeling and Design Analysis, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. June. Administrative Record Series Number OU1-535*.

HGL, 2006c. Final 100% Engineering Design Report Volume 3 of 3, Engineering Calculations Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. October. Administrative Record Series Number OU1-537*.

HGL, 2007. Final Hydraulic Control Pilot Project Construction Report, Operable Unit One, Former Fort Ord, California. January. Administrative Record Series Number OU1-541*.

HGL, 2009. Final FONR System Construction Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. August. Administrative Record Series Number OU1-561*.

HGL, 2010. Final Fort Ord Natural Reserve (FONR) Remediation System Expansion Design Technical Memorandum. October. Administrative Record Series Number OU1-583*.

HGL, 2011a. Final Rebound Evaluation Report Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. September. Administrative Record Series Number OU1-559*.

HGL, 2011b. Draft 2011 Fort Ord Natural Reserve (FONR) Remediation System Expansion Design Technical Memorandum Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. February. Administrative Record Series Number OU1-609*.

HGL, 2012a. Final IW-OU1-10-A System Expansion Construction Report Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. March. Administrative Record Series OU1-592*.

HGL, 2012b. Final Well Destruction Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. September. Administrative Record Series Number OU1-593*.

HGL, 2012c. Memorandum for Record: Record of Decision Remedy Optimization for Operable Unit 1, Former Fort Ord, California. March. Administrative Record Series Number OU1-594*.

HGL, 2014. Final Well Destruction and Former OU-1 Treatment Plant Decommissioning Completion Report, Former Fort Ord, California. September. Administrative Record Series Number OU1-611*.

HGL, 2015a. Final Technical Memorandum Operable Unit 1 Exit Strategy Former Ford Ord, California. April. Administrative Record Series Number OU1-614*.

HGL, 2015b. Final Uniform Federal Policy Quality Assurance Project Plan, Groundwater Monitoring and Operations and Maintenance of Treatment System at OU-1, Former Fort Ord, California. Revision 1. April. Administrative Record Series Number OU1-606*.

HGL, 2016a. Final Remedial Action Completion Report / Technical Memorandum Operable Unit 1 Attainment Monitoring Results Sampling Events #1 Through #4 Former Fort Ord, California. March. Administrative Record Series Number OU1-623*.

HGL, 2016b. Final Armstrong Ranch OU-1 Well Destruction and Pipeline Decommissioning Completion Report, Former Fort Ord, California. *Date to be determined*. Administrative Record Series Number OU1-*627C**. *The preliminary draft report is currently being prepared – this will be updated in the future*

HGL, 2016c. Final 2016 Annual Groundwater Monitoring Report, Operable Unit 1 Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. August. Administrative Record Series Number OU1-624*.

HGL, 2016d. Final Armstrong Ranch OU-1 Well Destruction and Pipeline Decommissioning Work Plan, Former Fort Ord, California. October. Administrative Record Series Number OU1-627*.

HGL, 2017. Final OU-1 Fort Ord Natural Reserve Well Destruction and Northwest Treatment System Decommissioning Work Plan, Former Fort Ord, California. October. Administrative Record Series Number OU1-629*.

HLA, 1989a. Construction Report, Ground-water and Soil Treatment System, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. Report prepared for Department of the Army, Corps of Engineers, Sacramento District. May. Administrative Record Series Number OU1-114*.

HLA, 1989b. Design Modification, Fritzsche Army Airfield Ground-Water Treatment System, Fort Ord, California. Report prepared for Department of the Army, Corps of Engineers, Sacramento District. October. Administrative Record Series Number OU1-136*.

HLA, 1994. OU 1 Remediation Confirmation Study, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. Report prepared for the Department of the Army, Corps of Engineers, Sacramento District. May. Administrative Record Series Number OU1-248*.

Lawrence Berkeley National Laboratory/Lawrence Livermore National Laboratory, 2001. Phase II Fort Ord Landfill Demonstration Task 7 – Three-dimensional Groundwater Flow Mapping, Aquifer Response and Treatment System Monitoring at Site OU-1. November. Administrative Record Series Number BW-2576*.

Monterey County, CA – Code of Ordinances, 2016. Chapter 15.08.140 – Special Groundwater Protection. https://www.municode.com/library/ca/monterey_county/codes/code_of_ordinances.

Shaw, 2008. Draft Final Operable Unit 1 Off-Site Groundwater Extraction Pilot Study Work Plan, Former Fort Ord, California. Revision 0. April. Administrative Record Series Number OU1-557*.

Shaw, 2009. Report of Off-Site Groundwater Extraction Pilot Study and Quarterly Monitoring Operable Unit 1 July to September 2008 Former Fort Ord, California. January. Administrative Record Series Number OU1-565*.

Shaw, 2010. Report of Off-Site Groundwater Extraction Pilot Study and Quarterly Monitoring, Operable Unit 1, July to September 2008, Former Fort Ord, California, Revision 0. January. Administrative Record Series Number OU1-565.

Department of the Army (U.S. Army), 1995. Record of Decision, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. July. Administrative Record Series Number OU1-362*.

U.S. Army, 2002. Draft Final Five-Year Review Report, First Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. May (reissued in August). Administrative Record Series Number BW-2167*.

U.S. Army, 2007. Final Second Five-Year Review Report, Fort Ord Superfund Site, Monterey, California. September. Administrative Record Series Number BW-2437*.

U.S. Army, 2010. Explanation of Significant Difference No. 1, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. August. Administrative Record Series Number OU1-581*.

U.S. Army, 2012. Final Third Five-Year Review Report, Fort Ord Superfund Site, Monterey, California. September. Administrative Record Series Number BW-2632*.

U.S. Army, 2016. Letter correspondence; William Collins (BRAC Environmental Coordinator) to Maeve Clancy (EPA). Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminants in Operable Unit 1 Groundwater, Fritzsche Army Airfield, Former Fort Ord, California. August. Administrative Record Series Number OU1-626*.

U.S. Army, 2017. Draft 4th Five-Year Review Report, Fort Ord Superfund Site, Monterey, California. March. Administrative Record Series Number not yet assigned – # will be added in final version of this Closeout Report*.

U.S. Army Corps of Engineers (USACE), 1997. Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California. April. Administrative Record Series Number BW-1787*.

U.S. Environmental Protection Agency (EPA), 2014. Emerging Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). EPA 505-F-14-001. March. https://nepis.epa.gov/Exe/ZyNET.exe/P100LTG6.txt?ZyActionD=ZyDocument&Client=EPA&Index=2011%20Thru%202015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTXT%5C00000014%5CP100LTG6.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1

EPA, 2015. Groundwater Statistics Tool http://www2.epa.gov/sites/production/files/2015-11/gw_stats_tool_08112014.final_.xlsm

EPA, 2016. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA). EPA 822-R-16-005. May. https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos

U.S. Fish and Wildlife Service, 2015. Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74). May 28. Administrative Record Series Number BW-2747*.

* When using the Fort Ord Data Integration System, to see a complete listing of all documents, grouped by a specific report, use an asterisk (*) as a wildcard search in the "Record Number" field on that particular number series. For example:

- Searching for: BW-1283* will show every item related to the main document of BW-1283.
- Searching for: BW-1283B* - will only show the items that came after "B" (BW-1283-C, BW-1283-D, etc.)

- Searching for: ESCA* will show all document numbers with prefix ‘ESCA.

The asterisk is also a useful feature for finding comment letters related to a report.

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TABLES

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Table 2.1
Well Location Map Index

Well or Piezometer Name	Map Cell	Cell Quadrant	Well or Piezometer Name	Map Cell	Cell Quadrant	Well or Piezometer Name	Map Cell	Cell Quadrant	Hydropunch Boring Name	Map Cell	Cell Quadrant
EW-OU1-17-A*	F5	NW	MW-OU1-19-A*	F5	NW	MW-OU1-68-A	C2	NW	FAA-HP-1	H5	NE
EW-OU1-18-A*	G5	SW	MW-OU1-20-A*	G4	SW	MW-OU1-69-A2	B1	NW	HP-OU1-15	E3	NE
EW-OU1-47-A	C2	NW	MW-OU1-21-A*	G4	NE	MW-OU1-70-A	B2	NW	HP-OU1-16	F2	SW
EW-OU1-49-A	E3	NE	MW-OU1-22-A*	F3	SE	MW-OU1-75-A	B1	SW	HP-OU1-17	G3	NW
EW-OU1-52-A	F4	NE	MW-OU1-23-A*	F4	SE	MW-OU1-76-A	B1	SE	HP-OU1-18	H2	SE
EW-OU1-53-A	F4	NE	MW-OU1-24-AR*	E4	NW	MW-OU1-77-A	A1	SE	HP-OU1-22	H5	NE
EW-OU1-54-A	G4	SE	MW-OU1-25-A*	F4	SW	MW-OU1-78-A	A1	SE	HP-OU1-23	D2	NW
EW-OU1-55-A	F5	NE	MW-OU1-26-A*	F3	SE	MW-OU1-79-A	A1	SW	HP-OU1-24	E2	NW
EW-OU1-60-A	B2	NW	MW-OU1-27-A*	E3	NW	MW-OU1-80-A	A1	NW	HP-OU1-25	C3	SE
EW-OU1-62-A	C2	NW	MW-OU1-28-A*	F2	SW	MW-OU1-82-A	C2	NW	HP-OU1-26	D4	NW
EW-OU1-63-A	B2	NW	MW-OU1-29-A*	E2	SW	MW-OU1-83-A	C2	NE	HP-OU1-27	E3	NW
EW-OU1-66-A	B2	NE	MW-OU1-30-A*	G3	NW	MW-OU1-84-A	C2	SE	HP-OU1-28	E5	SE
EW-OU1-71-A	E3	NW	MW-OU1-31-A*	G2	SE	MW-OU1-85-A	D2	SE			
EW-OU1-72-A	D3	NE	MW-OU1-32-A*	G4	SW	MW-OU1-86-A	E3	NW			
IW-OU1-01-A	F4	SE	MW-OU1-33-A*	G4	SW	MW-OU1-87-A	E3	NE			
IW-OU1-02-A	F3	SW	MW-OU1-34-A*	E2	SW	MW-OU1-88-A	E3	NE			
IW-OU1-05-A	F5	SW	MW-OU1-36-A*	F6	NE	MW-OU1-ERD-01-A*	E2	SW			
IW-OU1-10-A	F3	SW	MW-OU1-37-A*	G5	SW	MW-OU1-ERD-02-A*	E2	SW			
IW-OU1-13-A	D2	NE	MW-OU1-38-A*	G5	SW	MW-OU1-ERD-03-A*	E2	SW			
IW-OU1-24-A	G4	SW	MW-OU1-39-A*	G5	NW	MW-OU1-ERD-04-A*	E2	SW			
IW-OU1-25-A	F5	NE	MW-OU1-40-A*	G4	SW	MW-OU1-ERD-05-A*	E2	SW			
IW-OU1-73-A	D3	NE	MW-OU1-41-A*	C1	SW	MW-OU1-ERD-06-A*	E2	SE			
IW-OU1-74-A	C3	NE	MW-OU1-42-A*	D1	NW	MW-OU1-ERD-07-A*	D2	SE			
IW-OU1-ERD-01-A*	E2	SW	MW-OU1-43-A*	D2	NW	MW-OU1-ERD-08-A*	D2	SE			
IW-OU1-ERD-02-A*	E2	SW	MW-OU1-44-A*	E5	SE	MW-OU1-01-180*	G6	NW			
IW-OU1-ERD-03-A*	E2	SW	MW-OU1-45-A*	C1	SW	MW-OU1-02-180*	F6	SE			
IW-OU1-ERD-04-A*	E2	SW	MW-OU1-46-A*	D2	SW	MW-OU1-03-180*	H5	SW			
MW-B-10-A*	B2	NW	MW-OU1-46-AD	D2	SW	MW-BW-10-A*	G6	NW			
MW-OU1-01-A*	G6	NW	MW-OU1-50-A	B2	NE	PZ-OU1-02-A1	F3	SW			
MW-OU1-02-A*	G6	NE	MW-OU1-51-A	C3	NE	PZ-OU1-10-A1	F3	SW			
MW-OU1-03-A*	G5	SW	MW-OU1-56-A	B2	NW	PZ-OU1-13-A*	F5	NW			
MW-OU1-04-A*	F5	NE	MW-OU1-57-A	B2	NW	PZ-OU1-14-A*	F5	NW			
MW-OU1-05-A*	F5	SW	MW-OU1-58-A	B2	NE	PZ-OU1-15-A*	G5	SW			
MW-OU1-06-A*	F6	NE	MW-OU1-59-A	C2	SW	PZ-OU1-16-A*	G5	SW			
MW-OU1-07-A*	F5	SE	MW-OU1-61-A	B2	NW	PZ-OU1-35-A*	E2	SW			
MW-OU1-08-A*	G5	NW	MW-OU1-64-A1	B2	NW	PZ-OU1-46-AD2	D2	SE			
MW-OU1-09-A*	F4	SW	MW-OU1-64-A2	B2	NW	PZ-OU1-49-A1	E3	NE			
MW-OU1-10-A*	F5	NW	MW-OU1-65-A	B2	NW						
MW-OU1-11-SVA*	G5	NW	MW-OU1-67-A	B2	NE						

* Wells installed by others
C5 - Map cell identification number
Letter indicates column on well location index map
Number indicates row on well location map
NE - Northeast quadrant of map cell
NW - Northwest quadrant of map cell
SE - Southwest quadrant of map cell
SW - Southeast quadrant of map cell

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Table 2.2
Well Function

Existing Monitoring Well Identification	Northing Location Coordinate	Easting Location Coordinate	Well Function(s)
Remaining Wells on NW Boundary Road (5 Total)			
MW-OU1-67-A	2,145,146.910	5,746,128.750	Monitoring well
MW-OU1-57-A	2,145,064.165	5,745,918.771	Monitoring well
MW-OU1-58-A	2,145,135.397	5,746,101.889	Monitoring well
MW-OU1-61-A	2,145,093.660	5,746,002.560	Monitoring well
MW-OU1-68-A	2,145,206.490	5,746,264.480	Monitoring well
Marina Municipal Airport Well (1 Total)			
MW-B-02-A	2,146,530.206	5,749,507.454	Monitoring well
Extraction Wells (9 Total)			
EW-OU1-60-A	2,145,082.110	5,745,974.440	Extraction well
EW-OU1-62-A	2,145,176.620	5,746,197.950	Extraction well
EW-OU1-63-A	2,145,039.090	5,745,859.970	Extraction well
EW-OU1-66-A	2,145,111.140	5,746,043.900	Extraction well
MW-OU1-46-AD	2,144,778.116	5,746,791.994	Monitoring; converted to Extraction in 2006.
EW-OU1-71-A	2,144,372.988	5,747,400.254	Extraction well
IW-OU1-10-A	2,143,956.400	5,748,004.350	Monitoring; converted to Extraction in 2010.
MW-OU1-85-A	2,144,635.096	5,747,164.990	Extraction well
MW-OU1-87-A	2,144,314.009	5,747,774.400	Extraction well
Remaining FONR and Grassland Wells (20 Total)			
EW-OU1-53-A	2,143,778.418	5,748,369.881	Monitoring well
EW-OU1-52-A	2,143,941.682	5,748,310.174	Monitoring well
PZ-OU1-10-A1	2,143,978.280	5,747,981.540	Monitoring well
IW-OU1-02-A	2,144,117.040	5,748,079.410	Monitoring well
MW-OU1-26-A	2,144,141.800	5,747,960.000	Monitoring well
MW-OU1-88-A	2,144,246.831	5,747,761.098	Monitoring well
EW-OU1-49-A	2,144,355.179	5,747,796.775	Monitoring well
PZ-OU1-49-A1	2,144,353.560	5,747,766.780	Monitoring well
MW-OU1-86-A	2,144,285.082	5,747,414.248	Monitoring well
MW-OU1-27-A	2,144,578.100	5,747,460.400	Monitoring well
EW-OU1-72-A	2,144,576.724	5,747,243.822	Monitoring well
MW-OU1-84-A	2,144,683.376	5,746,730.867	Monitoring well
MW-OU1-83-A	2,144,908.009	5,746,717.940	Monitoring well
MW-OU1-82-A	2,144,952.025	5,746,360.764	Monitoring well
MW-OU1-50-A	2,144,999.072	5,746,101.724	Monitoring well
PZ-OU1-02-A1	2,144,099.970	5,748,088.780	Monitoring well
MW-OU1-46-A	2,144,773.124	5,746,795.274	Monitoring well
MW-OU1-59-A	2,144,852.762	5,746,195.379	Monitoring well
IW-OU1-73-A	2,144,508.890	5,746,782.737	Injection Well
IW-OU1-74-A	2,144,573.499	5,746,674.984	Injection Well

Notes:
FONR = Fort Ord Natural Reserve

Table 4.1
OU-1 Attainment Monitoring Summary of Analytical Results for TCE

Analyte		TCE (µg/L)	
Aquifer Cleanup Level or Screening Value		5 µg/L	
Well Identification	Sample Event	Sample Date	Result
		Groundwater Concentration	
EW-OU1-53-A	Remediation Period	9/21/2011	4.9 A
		9/2/2014	1.9 A
	Attainment Monitoring	5/7/2015	1.6 A
		7/17/2015	1.8 A
		10/2/2015	1.3 A
		12/11/2015	1.4 A
EW-OU1-52-A	Remediation Period	9/27/2012	4.2 A
		9/19/2013	4.9 A
		9/2/2014	2.9 A
	Attainment Monitoring	5/7/2015	3.8 A
		7/17/2015	3.7 A
		10/2/2015	3.0 A
		12/11/2015	2.9 A
PZ-OU1-10-A1	Remediation Period	9/15/2012[1]	0.4 J/A
		9/18/2013[1]	0.2 J/J
		9/2/2014	2.4 A
	Attainment Monitoring	5/7/2015	3.3 A
		7/17/2015	2.5 A
		10/2/2015	2.0 A
		12/11/2015	1.6 A
IW-OU1-02-A	Remediation Period	3/4/2010	4.1 A
		9/22/2010	3.5 J/A
		3/9/2011	4.0 A
		9/21/2011	3.8 A
	Attainment Monitoring	5/7/2015	1.8 A
		7/17/2015	1.8 A
		10/2/2015	1.8 A
		12/11/2015	1.9 A
MW-OU1-26-A	Remediation Period	1/8/2013	4.5 A
		2/19/2013	4.6 A
		9/18/2013	3.9 A
		3/27/2014	2.5 A
		9/2/2014	2.7 A
	Attainment Monitoring	5/7/2015	2.5 A
		7/17/2015	2.5 A
		10/2/2015	2.3 A
		12/11/2015	2.2 A

Table 4.1
OU-1 Attainment Monitoring Summary of Analytical Results for TCE

Analyte		TCE (µg/L)	
Aquifer Cleanup Level or Screening Value		5 µg/L	
Well Identification	Sample Event	Sample Date	Result
		Groundwater Concentration	
MW-OU1-88-A	Remediation Period	3/27/2014	4.6 A
		6/27/2014	4.5 A
		9/2/2014	4.7 A
		12/22/2014	4.1 A
	Attainment Monitoring	5/7/2015	4.0 A
		7/17/2015	3.2 J/J-
		10/2/2015	3.9 A
		12/11/2015	3.9 A
PZ-OU1-49-A1	Remediation Period	10/1/2008	2.7 A
		3/10/2009	1.1 A
		9/15/2009	0.71 A
		3/24/2010	0.61 A
		9/21/2010	0.79 A
		3/8/2011	0.64 A
		9/22/2011	0.29 J/A
		3/15/2012	0.27 J/A
		9/27/2012	0.21 J/A
		9/18/2013	0.77 A
		9/2/2014	1.2 A
	Attainment Monitoring	5/7/2015	1.8 A
		7/17/2015	2.0 A
		10/2/2015	2.2 A
		12/11/2015	1.9 A
MW-OU1-61-A	Remediation Period	9/2/2014	4.7 A
		12/22/2014	4.6 A
	Attainment Monitoring	5/7/2015	4.4 A
		7/17/2015	4.4 A
		10/2/2015	3.7 A
		12/11/2015	3.5 A

Notes:

[1] Result omitted from Environmental Protection Agency Groundwater Statistics Tool calculations in order to avoid a potentially low bias. These results were probably impacted by pumping cycle at nearby extraction well.

µg/L = micrograms per liter
A = The result has undergone routine data validation
J = Estimated concentration
J- = Data are qualified as estimated, with a low bias likely to occur. The associated value is the detected level. False negatives are unlekely to have been reported.
NS = Not Sampled
OU-1 = Operable Unit 1
TCE = trichloroethene

Table 4.2
OU-1 Attainment Monitoring Summary of Analytical Results for PFOA and PFOS

Analyte	PFOA				PFOS				Total PFOA and PFOS			
Preliminary Health Advisory January 2009 - May 2016	400 ng/L				200 ng/L				Not Applicable			
Health Advisory 16 May 2016	Not Applicable								70 ng/L			
Sample Event #	1	2	3	4	1	2	3	4	1	2	3	4
Sample Date(s)	5/11/2015	7/20/2015	10/5/2015	12/14/2015	5/11/2015	7/20/2015	10/5/2015	12/14/2015	5/11/2015	7/20/2015 & 7/24/2015	10/5/2015	12/14/2015
Well Identification	Groundwater Concentration in ng/L											
EW-OU1-53-A	14 J-	13.0	9	13	UJ-	U	U	U	14 J-	13.0	9	13
EW-OU1-52-A	3 J-	4.0	4	5	UJ-	U	U	U	3 J-	4.0	4	5
PZ-OU1-10-A1**	120 J-	Not sampled			UJ-	Not sampled			120 J-	Not sampled		
IW-OU1-02-A	9 J-	10.0	7	9	UJ-	U	U	U	9 J-	10.0	7	9
MW-OU1-26-A	34 J-	44.0	42	39	7 J	12.0	15	12	41 J-	56.0	57	51
MW-OU1-88-A	270 J-	230.0	180	210	64 J-	62.0	37	33	334 J-	292.0	217	243
		260.0	*200*	*200*		*72.0*	*44*	*36*		*332.0*	*244*	*236*
PZ-OU1-49-A1	7 J-	8.0	9	11	UJ-	U	U	U	7 J-	8.0	9	11
MW-OU1-61-A	3 J-	*3.0*	*2 J*	*2*	UJ-	U	U	U	3 J-	3.0	2 J	2
	4 J-				*UJ-*				*4 J-*			

Notes:

** PZ-OU1-10-A1 was deleted from the sampling network for PFOA and PFOS after Event #1 because suspended aquifer material from a damaged screen was present in the sample.

italics = Field duplicate
ng/L = nanograms per liter
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
TCE = trichloroethene
OU-1 = Operable Unit 1
U = Not detected
J- = Potential low bias in reported result
Red font indicates value exceeds May 2016 Health Advisory

FIGURES

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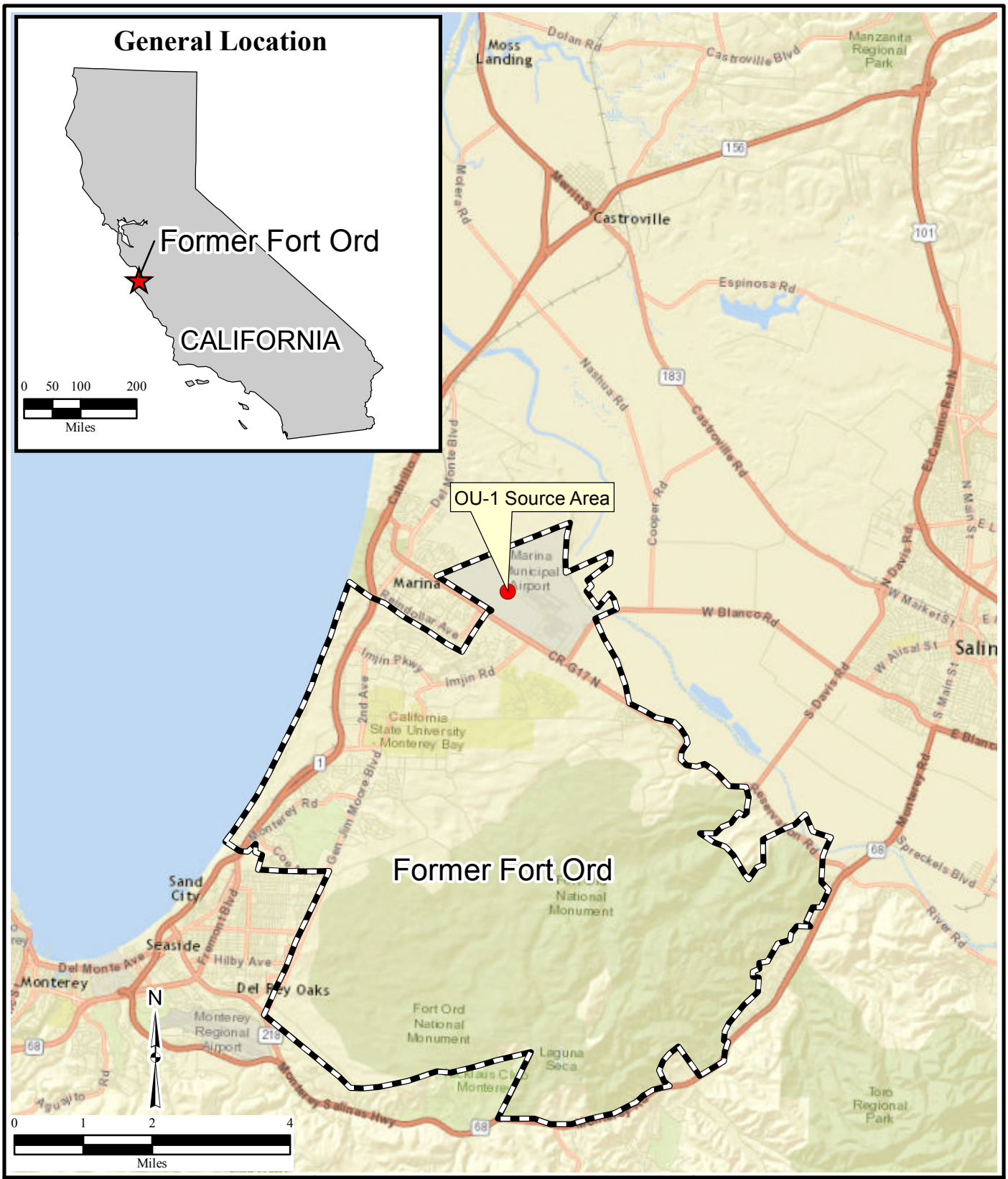

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11/11/2016 JG
Source: HGL
ESRI World Street Map

Legend

Site OU-1 Source Area

Former Fort Ord

Figure 1.1
Former Fort Ord
Location Map

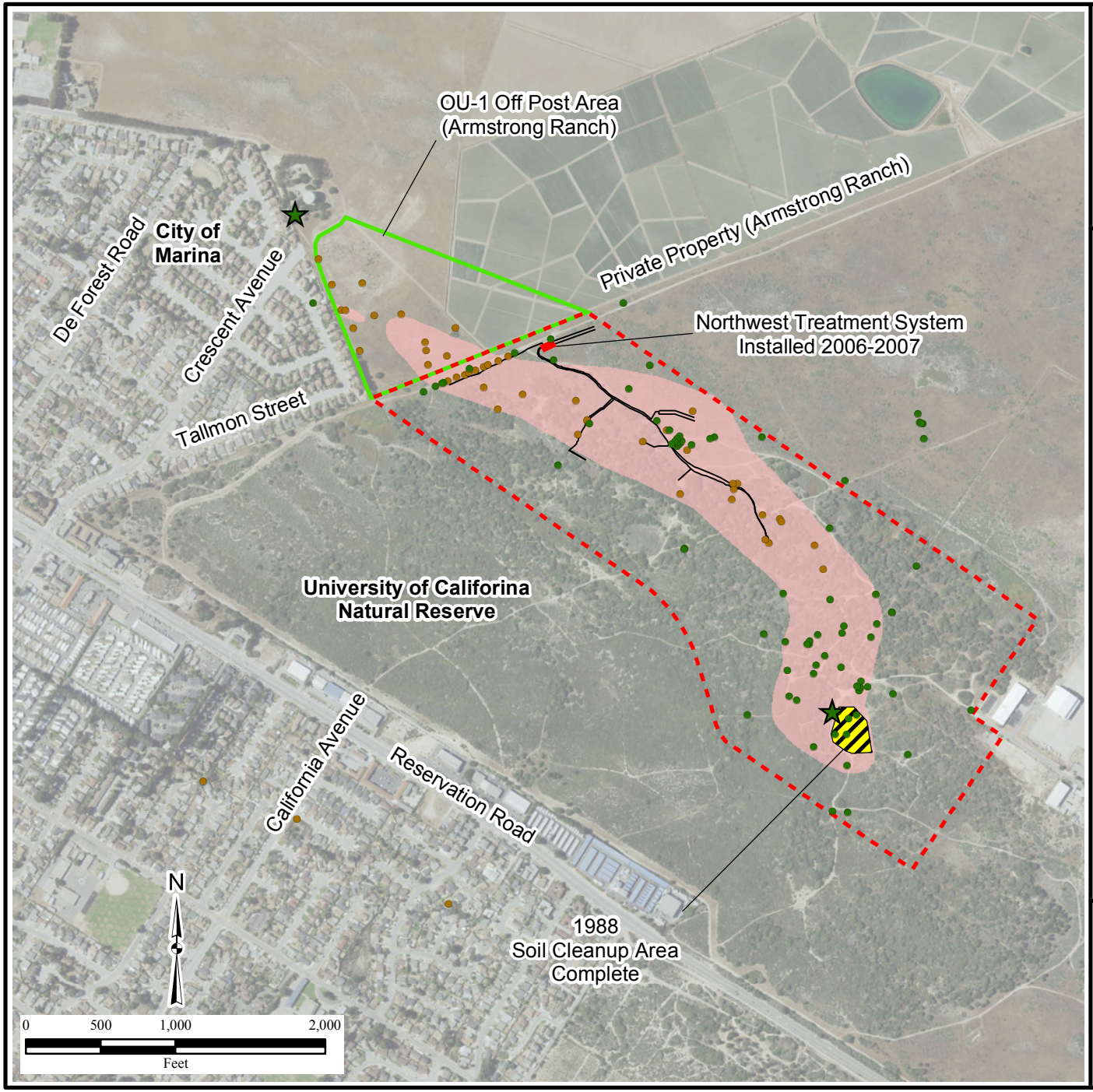

Figure 2.1
Maximum Extent of Trichloroethene (TCE) in OU-1 Groundwater

Legend

- Exisiting Monitoring Well
- Destroyed Monitoring Well
- Destroyed Treatment Plant
- Pipeline
- Maximum Historical Extent of OU1 Groundwater Contamination
- 1988 Soil Cleanup Area
- Northwest Treatment System
- OU-1 Area in FONR
- OU-1 Off Post Area (Armstrong Ranch)

Notes:
At OU1 there were no detections of TCE above its ACL in September 2014.
Adapted from Former Fort Ord Base Realignment and Closure Office, Community Involvement Workshop February 2016.

ACL=Aquifer Cleanup Level
FONR=Fort Ord Natural Reserve
OU=Operable Unit

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4/25/2017 CNL
Source: HGL, Monterey County Assessor's Office, USACE ArcGIS Online Imagery

HydroGeoLogic, Inc

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4/25/2017 CNL
Source: HGL
USGS aerial photo dated 9/7/1998

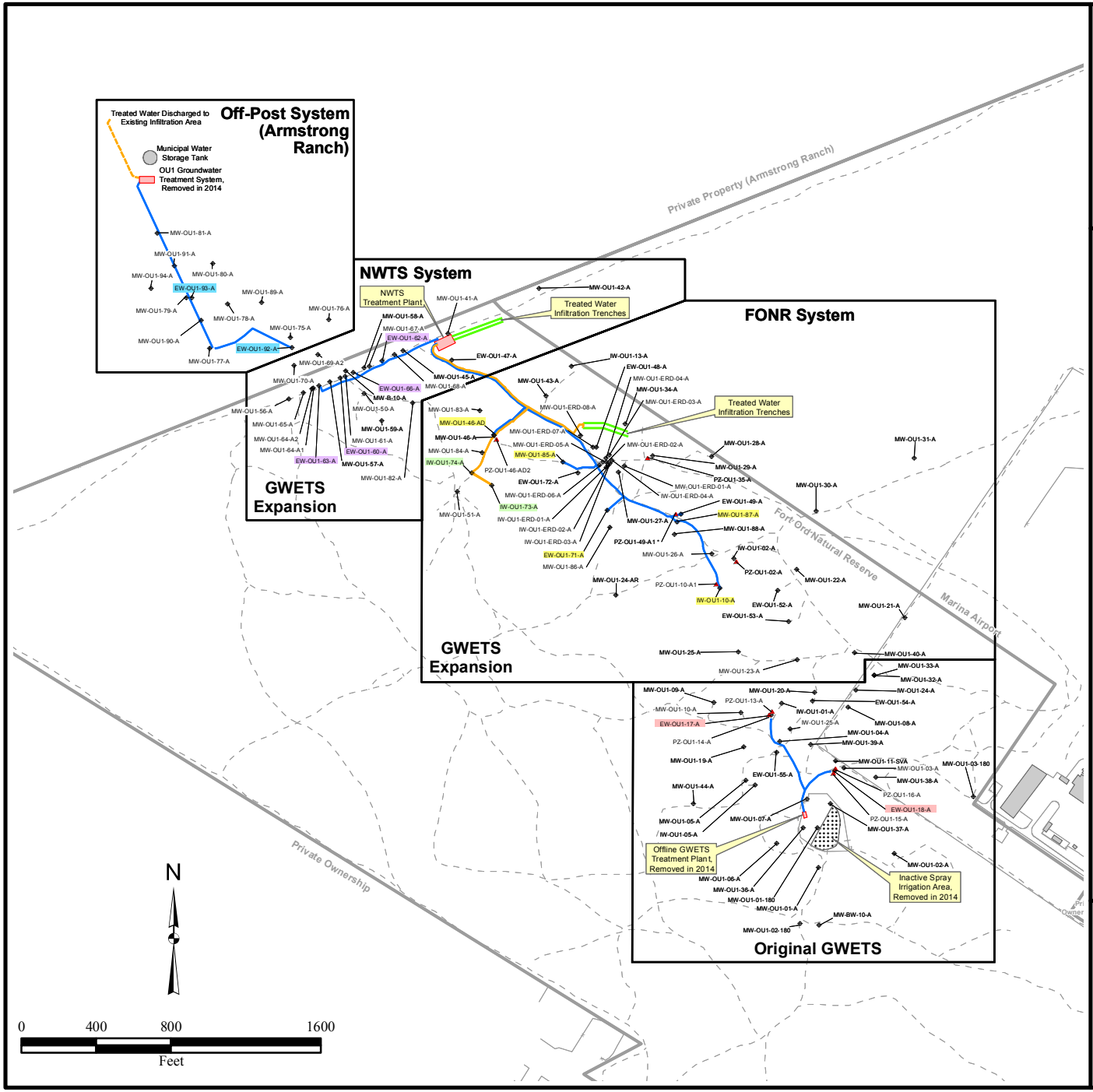
Legend

- OU-1 Area in FONR
- OU-1 Off Post Area (Armstrong Ranch)
- Land Parcel Boundary

Notes:
FONR=Fort Ord Natural Reserve
OU=Operable Unit
UCSC=University of California, Santa Cruz

Figure 2.2
OU-1
Remediation Area

Figure 2.3
Former Fort Ord
OU-1
Remediation System



Legend

- Monitoring Well
- Piezometer
- EW-OU1-18-A — Original GWETS Extraction Well
- IW-OU1-73-A — FONR Injection Well
- MW-OU1-46-AD — FONR Extraction Well
- EW-OU1-63-A — NWTS Extraction Well
- EW-OU1-92-A — Off-Post Extraction Well
- Trail/Unimproved Road
- Fence
- Discharge Pipe
- Extraction Pipeline
- Treated Water Pipeline
- Treated Water Infiltration Trench
- Treatment Plant

Notes:
The treated water and extraction water pipelines are located in separate trenches within or near the existing roadway. The separation shown in this figure is exaggerated for clarity.
Some wells shown were destroyed as cleanup progressed - see Figure 6 for exisitng wells.
NWTS=Northwest Treatment System
FONR=Fort Ord Natural Reserve
GWETS=Groundwater Extraction and Treatment System
OU=Operable Unit

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4/25/2017 CNL
Source: HGL

HydroGeoLogic, Inc

HGL—OU-1 Closeout Report Former Ord, CA

Figure 2.4
OU-1 Groundwater Remediation Well Locations Former Fort Ord, CA

NWTS Facility

NWTS Infiltration Trenches

FONR System Infiltration Trenches

Treated Water Injection Wells

Private Property (Armstrong Ranch)

Private Ownership

MW-OU1-81-A, MW-OU1-91-A, MW-OU1-80-A, MW-OU1-94-A, MW-OU1-79-A, MW-OU1-89-A, MW-OU1-78-A, EW-OU1-93-A, MW-OU1-90-A, MW-OU1-77-A, EW-OU1-92-A, MW-OU1-70-A, MW-OU1-56-A, MW-OU1-65-A, MW-OU1-64-A1, MW-OU1-64-A2, EW-OU1-60-A, MW-OU1-76-A, MW-B-10-A, EW-OU1-66-A, MW-OU1-75-A, MW-OU1-69-A2, MW-OU1-58-A, MW-OU1-45-A, MW-OU1-41-A, MW-OU1-42-A, EW-OU1-47-A, MW-OU1-68-A, EW-OU1-62-A, MW-OU1-61-A, MW-OU1-67-A, MW-OU1-50-A, MW-OU1-59-A, MW-OU1-57-A, EW-OU1-63-A*, MW-OU1-83-A, MW-OU1-82-A, MW-OU1-84-A, MW-OU1-46-A, MW-OU1-46-AD, PZ-OU1-46-AD2, MW-OU1-85-A, IW-OU1-74-A, MW-OU1-51-A, IW-OU1-73-A, MW-OU1-43-A, IW-OU1-13-A, MW-OU1-ERD-08-A, MW-OU1-ERD-07-A, MW-OU1-34-A, EW-OU1-48-A, MW-OU1-ERD-03-A, MW-OU1-ERD-02-A, MW-OU1-29-A, MW-OU1-28-A, MW-OU1-ERD-04-A, MW-OU1-ERD-05-A, MW-OU1-ERD-06-A, EW-OU1-72-A, IW-OU1-ERD-01-A, IW-OU1-ERD-02-A, IW-OU1-ERD-03-A, IW-OU1-ERD-04-A, EW-OU1-71-A, MW-OU1-86-A, MW-OU1-27-A, MW-OU1-88-A, PZ-OU1-35-A, MW-OU1-ERD-01-A, PZ-OU1-49-A1, EW-OU1-49-A, MW-OU1-87-A, MW-OU1-26-A, PZ-OU1-02-A1, IW-OU1-02-A, PZ-OU1-10-A1, IW-OU1-10-A, EW-OU1-52-A, MW-OU1-24-AR, EW-OU1-53-A, MW-OU1-25-A, MW-OU1-23-A, MW-OU1-40-A, MW-OU1-32-A, MW-OU1-33-A, IW-OU1-01-A, EW-OU1-54-A, MW-OU1-20-A, IW-OU1-24-A, MW-OU1-09-A, PZ-OU1-13-A, MW-OU1-10-A, EW-OU1-17-A, MW-OU1-08-A, PZ-OU1-14-A, IW-OU1-25-A, MW-OU1-39-A, MW-OU1-04-A, MW-OU1-11-SVA, MW-OU1-16-A, MW-OU1-19-A, EW-OU1-55-A, PZ-OU1-16-A, MW-OU1-03-A, MW-OU1-05-A, IW-OU1-05-A, MW-OU1-38-A, MW-OU1-07-A, MW-OU1-44-A, EW-OU1-18-A, PZ-OU1-15-A, MW-OU1-06-A, MW-OU1-37-A, MW-OU1-36-A, MW-OU1-12-A, MW-OU1-02-A, MW-OU1-01-180, MW-OU1-01-A, MW-OU1-02-180, MW-BW-10-A, MW-OU1-31-A, MW-OU1-30-A, MW-OU1-22-A, MW-OU1-21-A, MW-OU1-03-180

N

0 200 400 800
Feet

Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1-31-A — Well Destroyed
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- NWTS Facility

Notes:
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System
OU=Operable Unit
Well labels in green font indicate extraction or injection well.
Italicized font shows pumping suspended.

* Disconnected extraction well. No longer operable.

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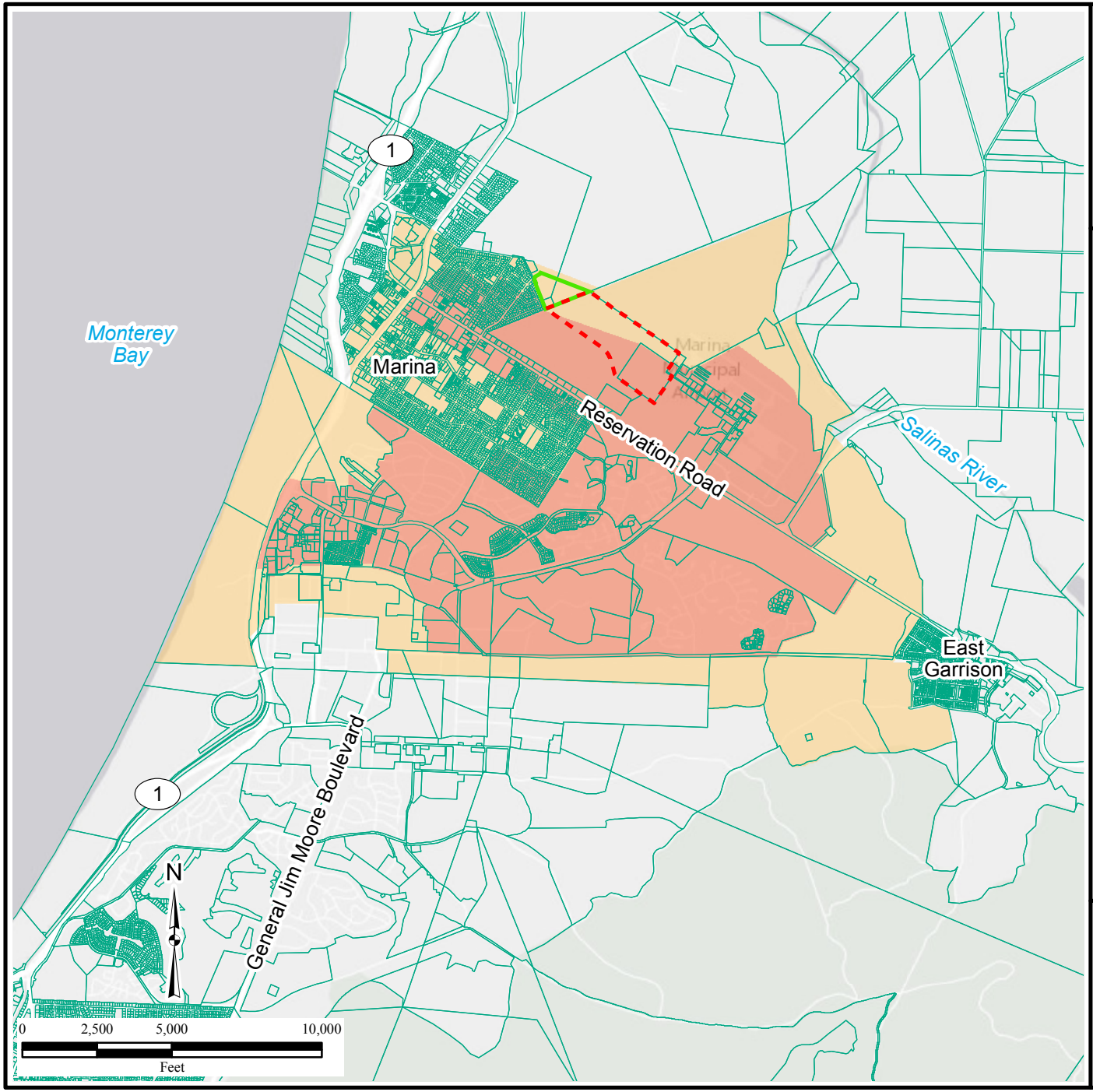
4/25/2017 CNL
Source: HGL

HGL HydroGeoLogic, Inc

Figure 2.5
Special Groundwater Protection Zones
June 2016



Legend

- Assessor's Parcel
- Prohibition Zone
- Consultation Zone
- OU-1 Area in FONR
- OU-1 Off Post Area (Armstrong Ranch)

Notes:
Prohibition Zone: Well construction is restricted due to the presence of organic contaminants at concentrations exceeding state and federal guidelines and to prevent interference with ongoing remedial activities.
Consultation Zone: Well construction is restricted due to the proximity to organic contamination and associated remedial activities.

FONR=Fort Ord Natural Reserve
OU=Operable Unit

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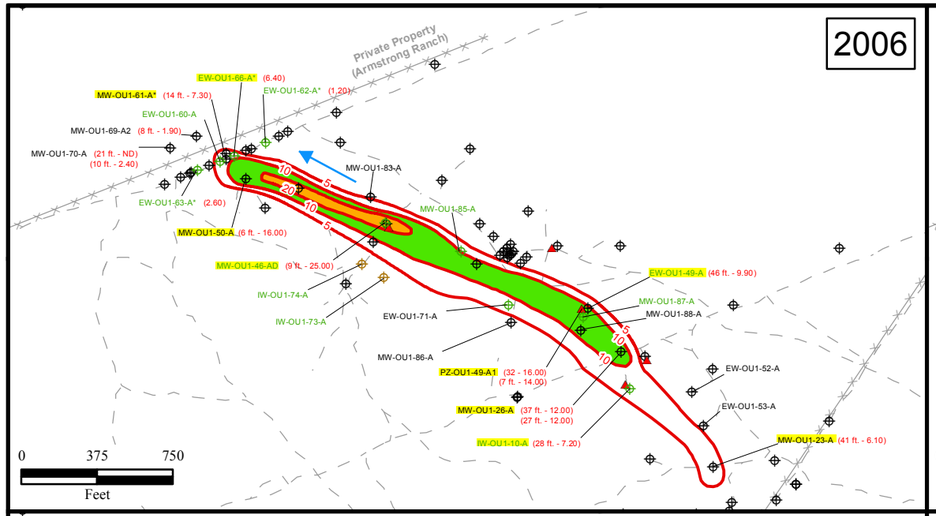
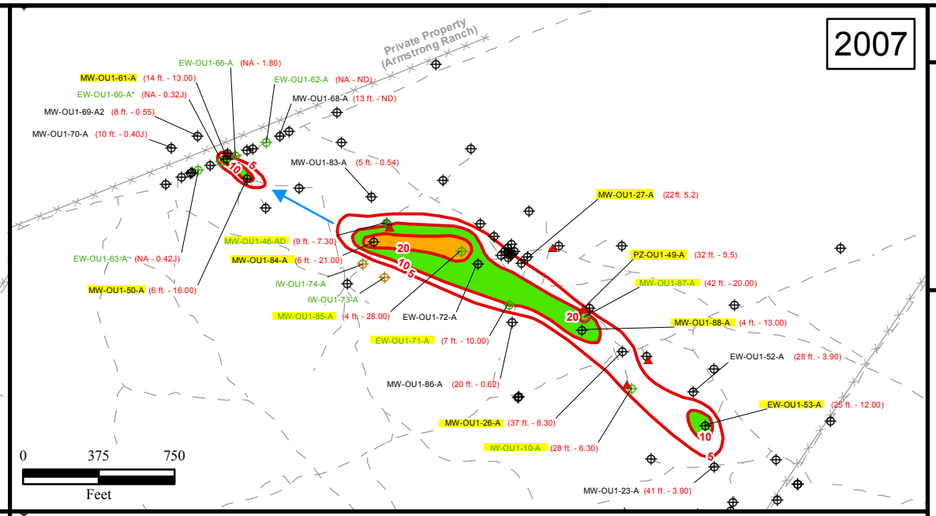
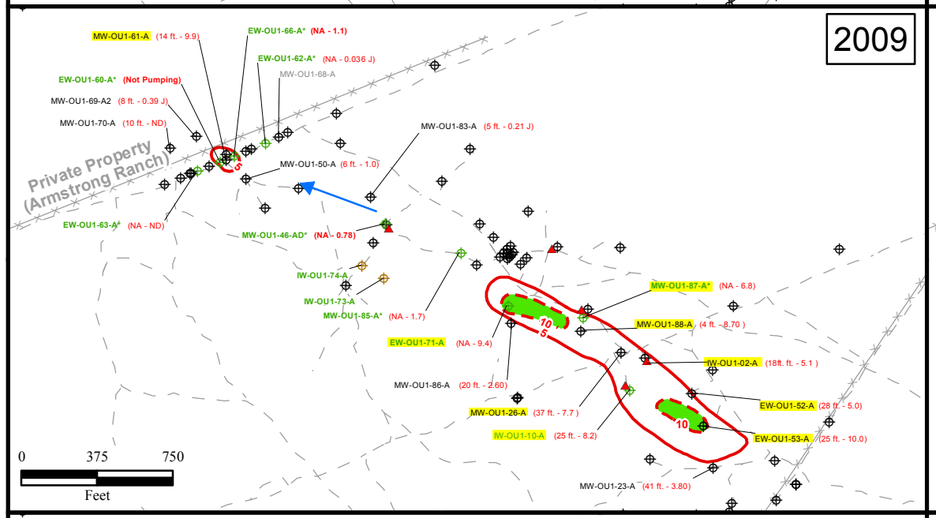
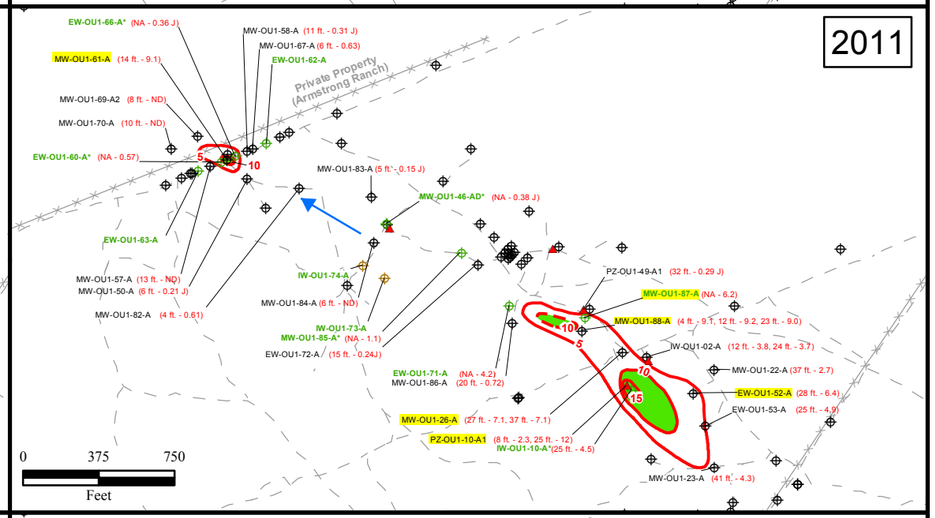
4/25/2017 JAR
Source: HGL, Monterey County Assessor's Office, USACE ArcGIS Online Light Gray Canvas Basemap

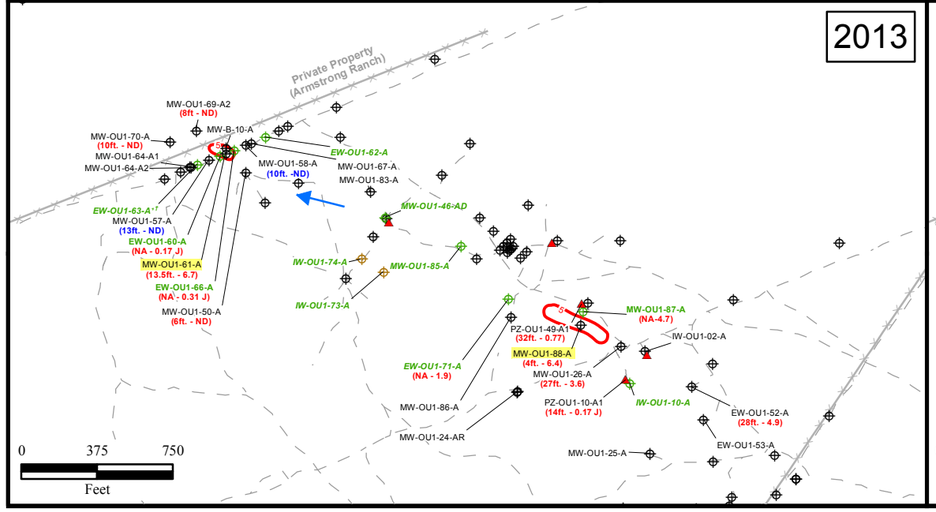
HydroGeoLogic, Inc











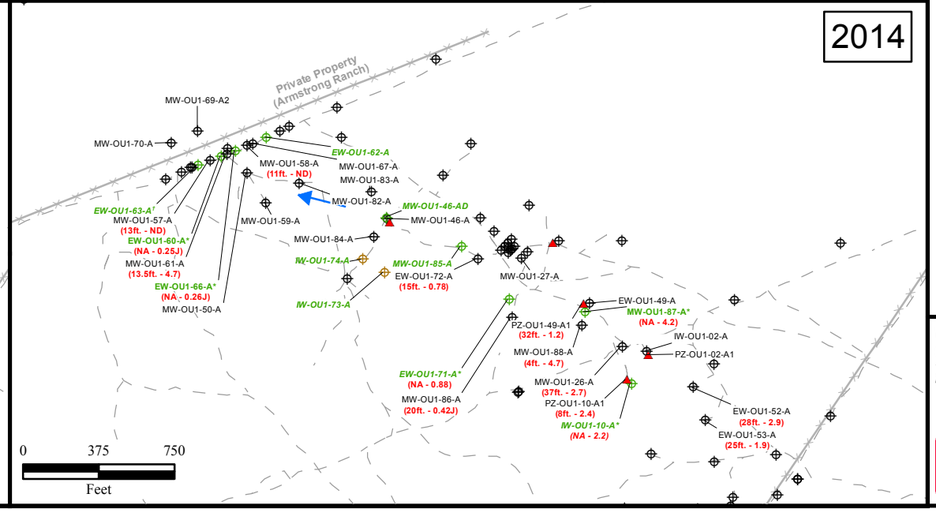


Figure 3.1
TCE Concentration in September Groundwater Monitoring 2006-2014

Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer
- MW-OU1-88-A — Location with TCE Concentration at or Above MCL (5 µg/L)
- — 5 — TCE Contour (µg/L) Based on September Data for Given Year (dashed where inferred)
- MW-OU1-88-A — Well ID
  (4 ft. - 6.4) — September TCE Result (µg/L)
  Sample Elevation (feet above mean sea level)
- 10 µg/L to 20 µg/L TCE
- 20 µg/L or Greater µg/L TCE
- Trail/Unimproved Road
- Fence
- General Direction of Groundwater Flow

Notes:
Green well label font indicates extraction or injection well.
Italicized font shows pumping suspended.
MCL=Maximum Contaminant Level (specified in OU-1 Record of Decision)
ND=Nondetect
NA=Depth is not applicable - sample is from pumping well
OU=Operable Unit
J=Estimated value
TCE=Trichlorethene
µg/L=Micrograms per liter
*=Indicates wells not used for contouring
+=Indicates disconnected extraction well. No longer operable.

N

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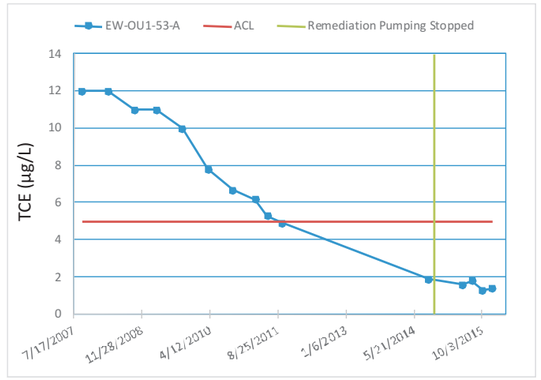
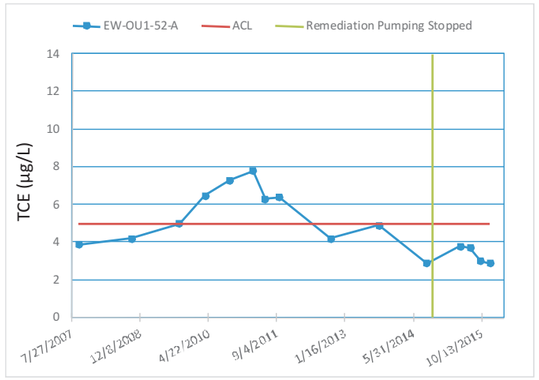
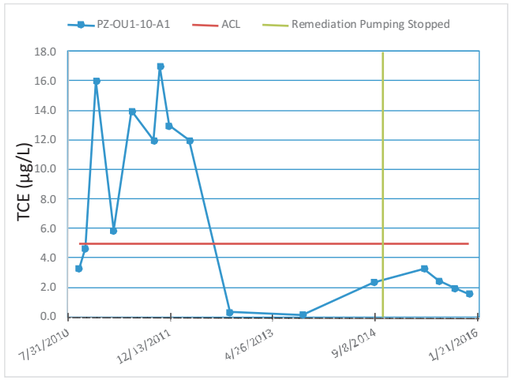
4/25/2017 CNL
Source: HGL

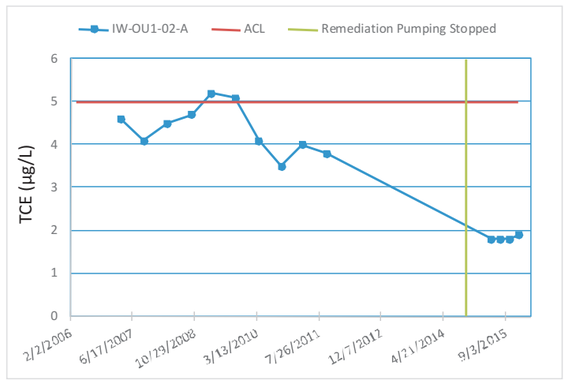
HGL HydroGeoLogic, Inc

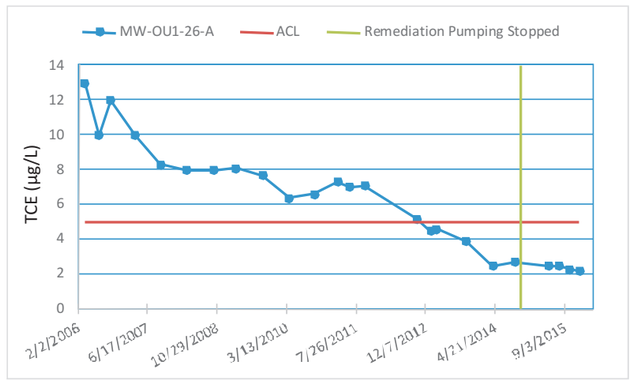
Wells Along Main Axis of Contaminant Migration (South to North):

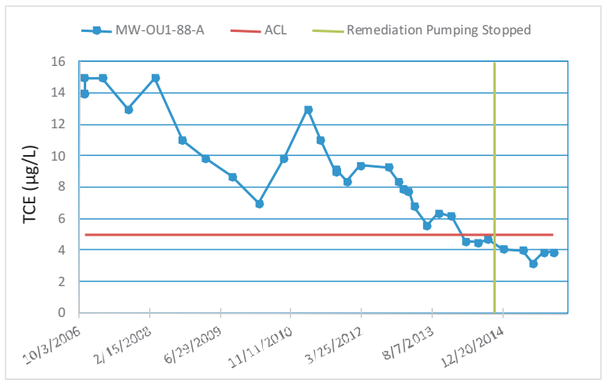


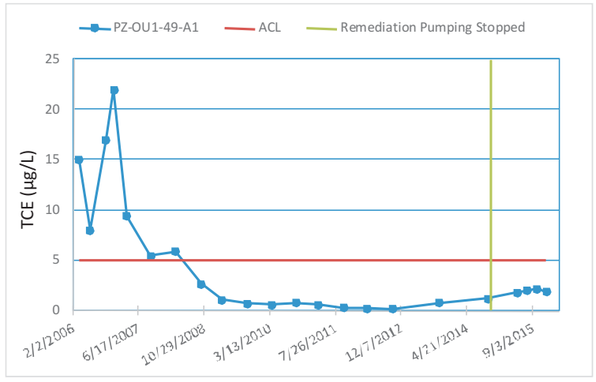


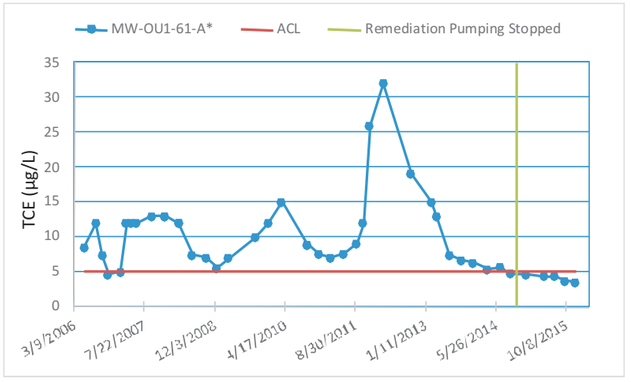












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11/11/2016 JAR
Source: HGL

Legend

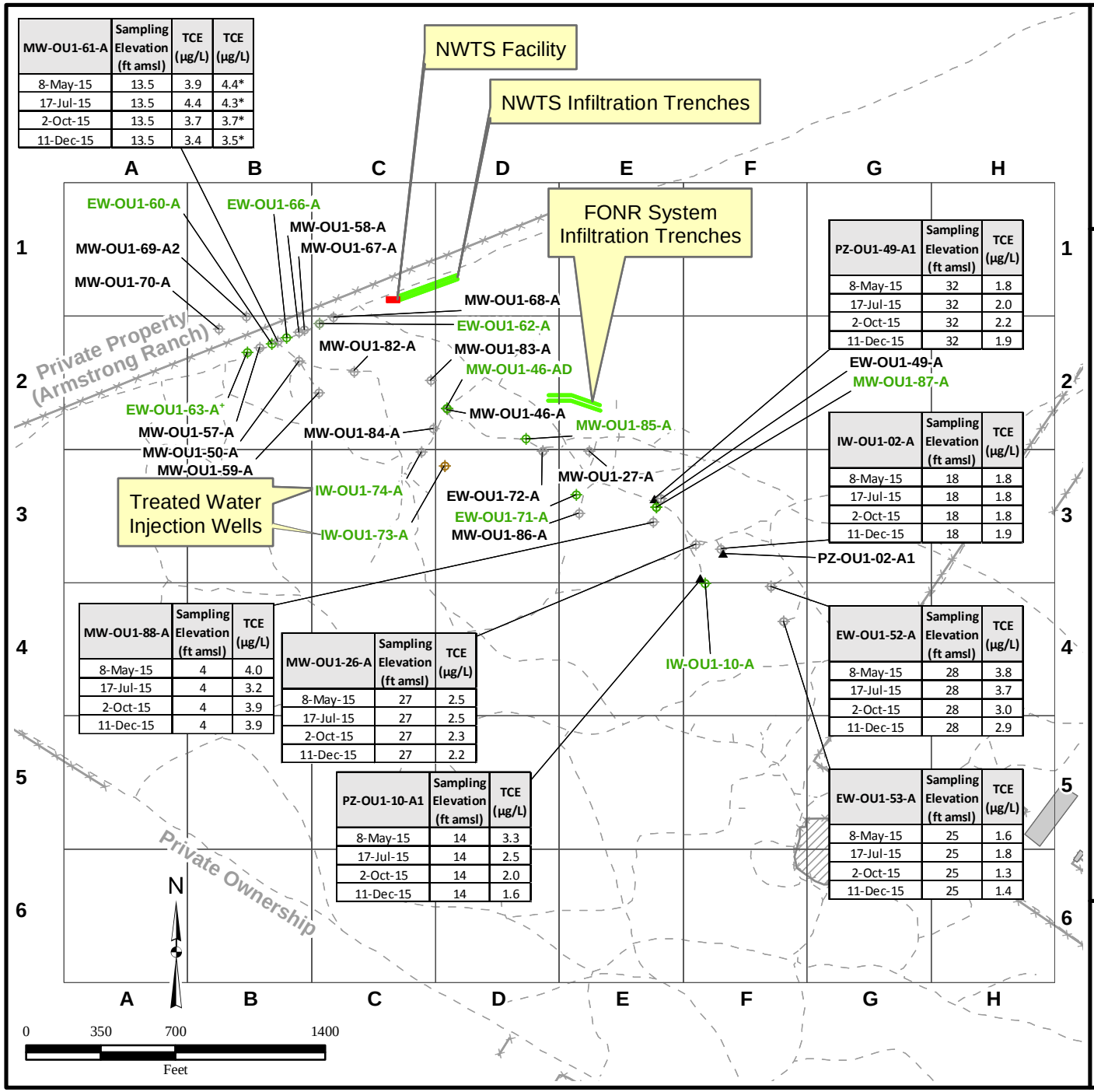
- TCE Concentration in Micrograms per Liter (µg/L)
- Aquifer Cleanup Level (µg/L)
- Remediation pumping ended in October 2014—data points before that date show remediation monitoring; data to the right show attainment monitoring

Notes:
The number(s) in parenthesis is the sample elevation (or range of elevation) in feet above mean sea level.

*=Well is screened only in Channel Fill Interval. January 2013 non-detect value is considered to be outlier based on previous and subsequent samples. This non-detect value is not shown.
ACL=aquifer cleanup level
FONR=Fort Ord Natural Reserve
TCE=trichloroethene

Figure 3.2
OU-1 FONR TCE Concentrations Over Time for Attainment Monitoring Well Network, Former Fort Ord, CA

Figure 4.1
Attainment Monitoring Summary TCE Concentrations in OU-1 A-Aquifer



MW-OU1-61-A	Sampling Elevation (ft amsl)	TCE (µg/L)	TCE (µg/L)
8-May-15	13.5	3.9	4.4*
17-Jul-15	13.5	4.4	4.3*
2-Oct-15	13.5	3.7	3.7*
11-Dec-15	13.5	3.4	3.5*

PZ-OU1-49-A1	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	32	1.8
17-Jul-15	32	2.0
2-Oct-15	32	2.2
11-Dec-15	32	1.9

IW-OU1-02-A	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	18	1.8
17-Jul-15	18	1.8
2-Oct-15	18	1.8
11-Dec-15	18	1.9

MW-OU1-88-A	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	4	4.0
17-Jul-15	4	3.2
2-Oct-15	4	3.9
11-Dec-15	4	3.9

MW-OU1-26-A	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	27	2.5
17-Jul-15	27	2.5
2-Oct-15	27	2.3
11-Dec-15	27	2.2

EW-OU1-52-A	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	28	3.8
17-Jul-15	28	3.7
2-Oct-15	28	3.0
11-Dec-15	28	2.9

PZ-OU1-10-A1	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	14	3.3
17-Jul-15	14	2.5
2-Oct-15	14	2.0
11-Dec-15	14	1.6

EW-OU1-53-A	Sampling Elevation (ft amsl)	TCE (µg/L)
8-May-15	25	1.6
17-Jul-15	25	1.8
2-Oct-15	25	1.3
11-Dec-15	25	1.4

Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1-70-A — Well Identification
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- Building
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Wells not sampled are not part of Attainment Monitoring Network.
∗=Duplicate Sample
+=Indicates disconnected extraction well. No longer operable.
ft amsl=feet above mean sea level
µg/L=micrograms per liter
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System
OU=Operable Unit
TCE=Trichloroethene

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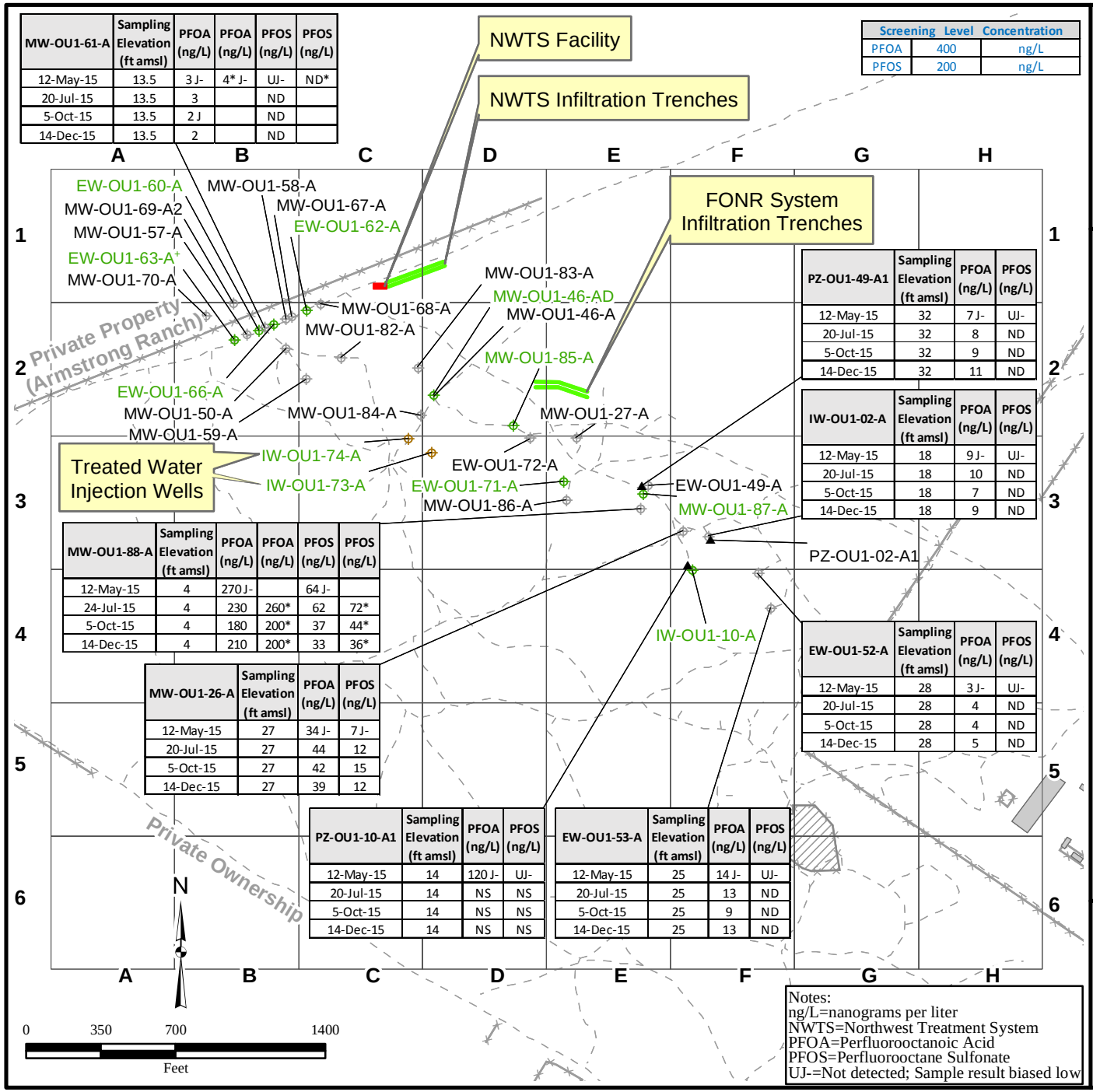
4/25/2017 CNL
Source: HGL

HydroGeoLogic, Inc

HGL—OU-1 Closeout Report Former Fort Ord, CA

Figure 4.2
Attainment Monitoring Summary PFOA and PFOS Concentrations in OU-1 A-Aquifer



MW-OU1-61-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOS (ng/L)
12-May-15	13.5	3 J-	4* J-	UJ-	ND*
20-Jul-15	13.5	3		ND	
5-Oct-15	13.5	2 J		ND	
14-Dec-15	13.5	2		ND	

Screening Level Concentration		
PFOA	400	ng/L
PFOS	200	ng/L

PZ-OU1-49-A1	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	32	7 J-	UJ-
20-Jul-15	32	8	ND
5-Oct-15	32	9	ND
14-Dec-15	32	11	ND

IW-OU1-02-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	18	9 J-	UJ-
20-Jul-15	18	10	ND
5-Oct-15	18	7	ND
14-Dec-15	18	9	ND

MW-OU1-88-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOS (ng/L)
12-May-15	4	270 J-		64 J-	
24-Jul-15	4	230	260*	62	72*
5-Oct-15	4	180	200*	37	44*
14-Dec-15	4	210	200*	33	36*

EW-OU1-52-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	28	3 J-	UJ-
20-Jul-15	28	4	ND
5-Oct-15	28	4	ND
14-Dec-15	28	5	ND

MW-OU1-26-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	27	34 J-	7 J-
20-Jul-15	27	44	12
5-Oct-15	27	42	15
14-Dec-15	27	39	12

PZ-OU1-10-A1	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	14	120 J-	UJ-
20-Jul-15	14	NS	NS
5-Oct-15	14	NS	NS
14-Dec-15	14	NS	NS

EW-OU1-53-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	25	14 J-	UJ-
20-Jul-15	25	13	ND
5-Oct-15	25	9	ND
14-Dec-15	25	13	ND

Notes:
ng/L=nanograms per liter
NWTS=Northwest Treatment System
PFOA=Perfluorooctanoic Acid
PFOS=Perfluorooctane Sulfonate
UJ-=Not detected; Sample result biased low

Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1 70-A — Well Identification
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- Building
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Wells not sampled are not part of Attainment Monitoring Network.
∗=Duplicate Sample
+=Indicates disconnected extraction well. No longer operable.
ft amsl=feet above mean sea level
FONR=Fort Ord Natural Reserve
J-=Sample result estimated value potentially biased low
J=Sample result estimated value
ND=Nondetect
NS=Not Sampled
OU=Operable Unit

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\CloseoutReport\OU1\(4-02)PFOA_PFOS_Concens_Mon_Summary_Prelim.mxd 4/25/2017 CNL
Source: HGL

HydroGeoLogic, Inc

HGL—OU-1 Closeout Report Former Fort Ord, CA

APPENDIX A

ATTAINMENT MONITORING EVALUATION AND SUMMARY FOR EPA DESIGNATED EMERGING CONTAMINANTS IN OPERABLE UNIT 1

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TECHNICAL MEMORANDUM

Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminants in Operable Unit 1 Groundwater, Fritzsche Army Airfield, Former Fort Ord, California

1.0 INTRODUCTION

After reaching the groundwater cleanup targets established in the Record of Decision (ROD), the Army, the U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board (RWQCB) approved an Exit Strategy and Attainment Monitoring program to confirm that Operable Unit (OU)-1 groundwater remediation is complete and the OU-1 site can be closed (HGL, 2015a).

During discussions with the regulatory agencies to develop the Exit Strategy, the agencies expressed concern that perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) may have been used during fire training activities at the OU-1 source area. These compounds have been used as part of film-forming foam applied to extinguish fires, and have been identified by the EPA as emerging contaminants. Federal and California drinking water standards for these chemicals have not been established but in January 2009 EPA's Office of Water established Preliminary Health Advisory (PHA) values for concentrations in groundwater (EPA, 2014). Although these compounds were not identified in the OU-1 ROD, the regulatory agencies stated that the attainment monitoring sampling program must include these potential contaminants to evaluate the case for OU-1 closure.

This Technical Memorandum presents the results from PFOA and PFOS sampling during the attainment monitoring period, describes the distribution of these compounds within OU-1 groundwater and factors affecting site closeout, and recommends that the OU-1 site proceed to closure without further sampling or remediation for PFOA and PFOS.

1.1 DECISION CRITERIA

The Exit Strategy specified that sample results for PFOA and PFOS be considered as described below:

During the initial sampling event, if either compound is detected in any well at a concentration greater than the method detection limit (MDL) but less than the PHA, then PFOA and PFOS sampling will be extended through four sampling periods during attainment monitoring.

If neither compound is detected above the MDL in any sample, then a second (confirmation) set of samples and analysis for PFOA and PFOS will be performed in the next scheduled sampling event.

If the confirmation samples also show that all PFOA and PFOS concentrations are less than the MDL, then collection and analysis for PFOA and PFOS will be terminated. If either compound is detected in any well at a concentration greater than the MDL but less than the PHA in the

confirmation sampling, then PFOA and PFOS sampling will be extended through a total of four sampling periods.

If either compound is detected in any well at a concentration greater than the corresponding PHA during any sampling event, then the OU-1 groundwater extraction and treatment system will resume operation. In that event, the implementation of this Exit Strategy will be suspended and discussions will be held with the regulatory agencies to define the subsequent OU-1 groundwater monitoring network and sampling frequency. The subsequent sample results will be evaluated to develop an acceptable path forward to complete the OU-1 remediation effort and attain site closure.

If the PFOA and PFOS concentrations in all samples are less than their corresponding PHA value, then site closure activities will be based on the results of the attainment monitoring for the contaminants of concern (COCs) specified in the ROD. If the PFOA or PFOS concentration in any sample exceeds the corresponding PHA, then the pump and treat system will resume operation and the attainment monitoring results will be evaluated to develop an acceptable path forward to complete the OU-1 remediation effort and attain site closure.

1.2 ATTAINMENT MONITORING ANALYTICAL RESULTS

Attainment monitoring sampling results were described in detail in the Final Remedial Action Completion Report (HGL, 2016). Table 1.1 and Figure 1.1 show the analytical results for PFOA and PFOS during the attainment monitoring period.

PFOA was detected in all wells and in all sampling events. The maximum concentration was observed at MW-OU1-88-A (E3) at 270 nanograms per liter (ng/L). PFOA ranged from 180 ng/L to 270 ng/L with close agreement between the duplicate samples (see Table 1.1). At the other wells in the attainment monitoring network (excluding PZ-OU1-10-A1 [F3], which was sampled only once), there was virtually no variation between measurements. The greatest range between the minimum and maximum values was 10 ng/L at MW-OU1-26-A (F3). The second highest PFOA concentration observed at any well was 44 ng/L, also at MW-OU1-26-A (F3). All PFOA concentrations were much less than the 400 ng/L PHA screening value established in 2009 and incorporated in the Exit Strategy decision criteria.

PFOS was detected in only two of the eight attainment network monitoring wells and was detected during each of the four sampling periods. The maximum concentration was detected in well MW-OU1-88-A (E3) at 72 ng/L; this is the same well that contained the highest PFOA concentration. The PFOS concentration ranged from 36 ng/L to 72 ng/L at MW-OU1-88-A (E3) with the minimum value observed in the fourth sampling round. PFOS was also detected in well MW-OU1-26-A (F3) with a maximum concentration of 15 ng/L. The PFOS concentration was essentially unchanged and varied only from 7 ng/L to 15 ng/L during the attainment monitoring effort. All PFOS concentrations were much less than the 200 ng/L PHA screening value established in 2009 and incorporated into the Exit Strategy decision criteria.

1.3 SAMPLING RESULTS RELATIVE TO THE MAY 2016 PHA REVISION FOR PFOA / PFOS

In May 2016, the EPA published revised PHA values for PFOA and PFOS (EPA, 2016b). The revision eliminated separate values for each compound and established 70 ng/L as the advisory limit for the sum of PFOA and PFOS concentrations in a given sample. As illustrated in Table 1.1 and discussed below, PFOA and PFOS concentrations exceeded the revised standard at two well locations.

The maximum total PFOA and PFOS concentration in all sampling events was found at well MW-OU1-88-A (E3). A duplicate sample was collected from this well during sampling events 2 through 4. If the maximum of the parent and duplicate sample is used as the sampling result for each event, the total PFOA and PFOS concentration (PFOT) was virtually identical in sampling events 1 and 2 (334 ng/L and 332 ng/L, respectively) and likewise essentially the same—although decreasing by approximately 25 percent—in events 3 and 4 (244 ng/L and 243 ng/L, respectively). All results were greater than the revised advisory value of 70 ng/L.

Well PZ-OU1-10-A1 (F3) was sampled only during the first attainment event (in May 2015) because the sample showed considerable suspended sediment. Comparison of total depth after construction to the total depth at the time of sampling indicated approximately 8.5 feet of accumulated sediment in the well. PFOS was not detected in the sample and PFOA was much less than the PHA value at the time of sampling (120 ng/L versus 400 ng/L). Consequently, the regulatory agencies concurred during the June 2015 Base Realignment and Closure Cleanup Team meeting that PFOA and PFOS sampling would be suspended at that well (HGL, 2015b). The PFOT value of 120 ng/L exceeded the revised advisory limit of 70 ng/L.

2.0 OU-1 CLOSEOUT CONSIDERATIONS

2.1 ROD REQUIREMENTS AND EXIT STRATEGY

PFOA and PFOS were not included in the ROD (U.S. Army, 1995) and these compounds were sampled only during the attainment monitoring period as specified in the approved Exit Strategy. The groundwater long-term monitoring (LTM) and attainment monitoring results demonstrated that the cleanup requirements specified in the ROD have been met. The PFOA and PFOS sampling results met the Exit Strategy criteria for site closure approved by the regulators based on the PHA values in effect before the May 2016 revision. After reviewing the attainment monitoring results, the regulatory agencies concurred that cleanup was complete and agreed that the Army could begin site closeout activities (DTSC, 2016; EPA, 2016a; RWQCB, 2016).

2.2 REGULATORY STANDARD VERSUS PHA

The role of the PHA is described in the publication that presented the revised values (EPA, 2016b):

"The U.S. Environmental Protection Agency (EPA) developed the nonregulatory Health Advisory (HA) Program in 1978 to provide information for public health officials or other interested groups on pollutants associated with short-term contamination incidents or spills that can affect drinking water quality, but are not regulated under the Safe Drinking Water Act (SDWA)…HAs serve as

informal technical guidance to assist federal, state, and local officials, and managers of public or community water systems in protecting public health when emergency spills or other contamination situations occur…The HA value is not a legally enforceable federal standard and is subject to change as new information becomes available."

PFOA and PFOS health risks are being evaluated by numerous entities in the United States, Europe, and elsewhere. Few regulatory entities have established regulatory standards but many have developed guidance values. Table 2.1 presents selected published values, including the EPA revision of May 2016, for various states and countries. The values presented in Table 2.1 illustrate the current range of promulgated and guidance levels and Table 2.1 is not intended as an exhaustive summary. California has not established any promulgated standards or guidance values for PFOA and PFOS concentrations in groundwater or drinking water, although the former PHA values were approved as site-specific closure criteria for OU-1 (HGL, 2015a).

2.3 PFOA / PFOS SOURCE AREA AND MIGRATION

The groundwater LTM program for OU-1 was conducted from 1987 through 2014. The volatile organic compound (VOC) contaminant concentrations obtained during that period demonstrated that the attainment well locations are on the main path of the VOC plume migration. Like trichloroethene (TCE), PFOA and PFOS are highly mobile in groundwater and would be expected to follow the same groundwater flow path (shown in Figure 2.1).

Fire training activities conducted at the former Fire Drill Area (FDA; Figure 1.1) are believed to be the source of PFOA and PFOS in OU-1 groundwater. Contaminated soils were removed from the FDA in 1987 and replaced with clean backfill (U.S. Army, 1995). Groundwater cleanup for those contaminants identified in the ROD was completed in the source area and vicinity in 2007 (HGL, 2011). The extraction and monitoring wells associated with the source area cleanup were destroyed in 2011 with regulatory concurrence (HGL, 2012).

As shown on Figure 1.1, the nearest existing wells that are downgradient from the former source area are wells EW-OU1-53-A (F4) and EW-OU1-52-A (F4). The PFOT concentrations varied by less than 4 ng/L during the attainment monitoring period with maximum values of 14 J- ng/L and 5 ng/L, respectively (Table 1.1). The PFOT concentrations at these wells support the conclusion that the source area is no longer contributing PFOA and PFOS at concentrations that would exceed the revised PHA values.

Likewise, the downgradient PFOT concentration at the former Fort Ord boundary, represented by well MW-O1-61-A (B2), decreased from 4 J- ng/L to 2 ng/L during the attainment monitoring period. Well PZ-OU1-49-A1 (E3) is also along the main path of the TCE plume migration and showed a maximum PFOT concentration of 11 ng/L during the attainment monitoring.

Assuming similar migration paths and concentration trends as observed for TCE and shown on Figure 2.2 and Figure 2.3, the area where PFOT exceeds the revised PHA value would be in the central part of the Fort Ord Natural Reserve (FONR); the attainment monitoring results for PFOT are consistent with this observation. Well MW-OU1-61-A (B2) is located at the former Fort Ord boundary and is downgradient from this area. The sample results from MW-OU1-61-A (B2)

showed a maximum PFOT concentration of 4 ng/L and demonstrate that the high PFOT concentration is not migrating off site.

2.4 HUMAN HEALTH PROTECTIVENESS

OU-1 groundwater contamination is limited to the A-Aquifer. This aquifer is not used for drinking water purposes. In addition, the OU-1 area is located within the Special Groundwater Protection Zones, either the Prohibition Zone or the Consultation Zone, as illustrated on Figure 2.4. Installation of wells and use of the A-Aquifer for drinking water is prohibited by Monterey County ordinance.

The Salinas Valley Aquiclude (SVA) underlies the A-Aquifer beneath former Fort Ord and continues in a downgradient direction more than 5,000 feet beyond the farthest historic extent of the OU-1 plume (Ahtna, 2016; Figure 5). The low permeability and thickness of the SVA prevents significant vertical migration of groundwater within the former OU-1 plume area from the A-Aquifer into the underlying Upper 180 Foot Aquifer. Consequently, there is no exposure pathway to human receptors for groundwater from the OU-1 area where the PFOT concentration exceeds the revised PHA.

The OU-1 area is also located within the FONR. The FONR is managed by the UCSC and access is prohibited / controlled by perimeter fencing and locked gates. As part of the California Natural Reserve System, development is prohibited within the FONR. The University of California, Santa Cruz (UCSC) uses the FONR as a "nature laboratory" for the study of rare plant species and associated habitat. Well installation is allowed only as part of the OU-1 remediation effort.

Based on the hydrologic and institutional factors described above, there is no exposure pathway for high PFOT concentration groundwater to reach human receptors and OU-1 closure will remain protective of human health.

3.0 CLOSEOUT RECOMMENDATION

The Army recommends that the OU-1 site proceed to closure without further sampling or remediation for PFOA and PFOS. This recommendation is based on the following considerations:

- The PFOT concentrations in the attainment network wells indicate that the potential source area no longer contributes these compounds to OU-1 groundwater in significant concentration.
- The maximum PFOT concentration at the former Fort Ord boundary is 4 J- ng/L in all samples and well below the revised PHA value of 70 ng/L. These results indicate that high PFOT concentration is not migrating off site.
- There is no exposure pathway for use of OU-1 groundwater where PFOT exceeds the revised PHA that would impact human health; thus the remedial action is protective of human health.
- OU-1 closeout was previously approved by the regulatory agencies (correspondence provided in Attachment 1) based on the attainment monitoring results presented in the Remedial Action Completion Report (HGL, 2016).

- The PHA concentration is an advisory value rather than a regulatory limit and may be considered in the overall context of site conditions rather than as numerical criteria.

4.0 BIBLIOGRAPHY

Ahtna, 2016. Draft Operable Unit Carbon Tetrachloride Plume Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring Report, Former Fort Ord, California. February. Administrative Record Series Number OUCTP-0071*.

DTSC (California Department of Toxic Substances Control), 2016. Letter to William Collins, BRAC Environmental Coordinator "*Review of Final Technical Memorandum Operable Unit 1, Attainment Monitoring Results, Sampling Events #1 Through #4, Former Fort Ord, California, March 16, 2016*" from Dr. Min Wu, Project Manager. April 4, 2016.

EPA, 2014. Emerging Contaminants – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). EPA 505-F-14-001. March. http://www2.epa.gov/fedfac/emerging-contaminants-perfluorooctane-sulfonate-pfos-and-perfluorooctanoic-acid-pfoa.

EPA, 2016a. Letter to William Collins, BRAC Environmental Coordinator "*Remedial Action Completion: Operable Unit 1, Former Fort Ord, California*" from Angeles Herrera, Assistant Director, Superfund Division. March 28, 2016.

EPA, 2016b. Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA). EPA 822-R-16-005. May. https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos.

HGL, 2011. Final Rebound Evaluation Report Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. September. Administrative Record Series Number OU1-559*.

HGL, 2012. Final Well Destruction Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California. March. Administrative Record Series Number OU1-593*.

HGL, 2015a. Final Technical Memorandum Operable Unit 1 Exit Strategy Former Ford Ord, California. April. Administrative Record Series Number OU1-614*.

HGL, 2015b. Final Technical Memorandum Operable Unit 1 Perfluorinated Chemicals Sampling Event #1 (May 2015) Fritzsche Army Airfield Fire Drill Area Former Ford Ord, California. October. Administrative Record Series Number OU1-620*.

HGL, 2016. Final Remedial Action Completion Report / Technical Memorandum Operable Unit 1 Attainment Monitoring Results Sampling Events #1 Through #4 Former Fort Ord, California. March. Administrative Record Series Number OU1-623*.

RWQCB (Regional Water Quality Control Board) 2016. Email correspondence to R. Evans, HGL Project Manager "Revisions to OU-1 Draft Attainment Technical Memorandum" from G. Himebaugh, Engineering Geologist. March 10, 2016.

U.S. Army, 1995. Record of Decision, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. July. Administrative Record Series Number OU1-362*.

The following tables, figures, and Attachment referenced above are included:

TABLES

Table 1.1	OU-1 Attainment Monitoring Summary of Analytical Results for PFOA and PFOS
Table 2.1	Selected PFOA and PFOS Promulgated and Guidance Concentrations Established by Others

FIGURES

Figure 1.1	Attainment Monitoring Summary PFOA and PFOS Concentrations in OU-1 A-Aquifer
Figure 2.1	OU-1 FONR A-Aquifer Groundwater Elevation Map May 2015 and December 2015
Figure 2.2	OU-1 FONR TCE Concentrations Over Time for Attainment Monitoring Well Network
Figure 2.3	TCE Concentration in September Groundwater Monitoring 2006-2014
Figure 2.4	Special Groundwater Protection Zones June 2016

ATTACHMENT

Attachment 1	Regulatory Closeout Approval Documentation Based on Attainment Monitoring Results

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TABLES

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Table 1.1
OU-1 Attainment Monitoring Summary of Analytical Results for PFOA and PFOS

Analyte	PFOA				PFOS				Total PFOA and PFOS			
Preliminary Health Advisory January 2009 - May 2016	400 ng/L				200 ng/L				Not Applicable			
Revised Preliminary Health Advisory 16 May 2016	Not Applicable								70 ng/L			
Sample Event #	1	2	3	4	1	2	3	4	1	2	3	4
Sample Date(s)	5/11/2015	7/20/2015	10/5/2015	12/14/2015	5/11/2015	7/20/2015	10/5/2015	12/14/2015	5/11/2015	7/20/2015 & 7/24/2015	10/5/2015	12/14/2015
Well Identification	Groundwater Concentration in ng/L											
EW-OU1-53-A	14 J-	13.0	9	13	UJ-	U	U	U	14 J-	13.0	9	13
EW-OU1-52-A	3 J-	4.0	4	5	UJ-	U	U	U	3 J-	4.0	4	5
PZ-OU1-10-A1**	120 J-	Not sampled			UJ-	Not sampled			120 J-	Not sampled		
IW-OU1-02-A	9 J-	10.0	7	9	UJ-	U	U	U	9 J-	10.0	7	9
MW-OU1-26-A	34 J-	44.0	42	39	7 J	12.0	15	12	41 J-	56.0	57	51
MW-OU1-88-A	270 J-	230.0	180	210	64 J-	62.0	37	33	334 J-	292.0	217	243
		260.0	*200*	*200*		*72.0*	*44*	*36*		*332.0*	*244*	*236*
PZ-OU1-49-A1	7 J-	8.0	9	11	UJ-	U	U	U	7 J-	8.0	9	11
MW-OU1-61-A	3 J-	*3.0*	*2 J*	*2*	UJ-	U	U	U	3 J-	3.0	2 J	2
	4 J-				*UJ-*				*4 J-*			

Notes:

italics = Field duplicate
ng/L = nanograms per liter
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
TCE = trichloroethene
OU1 = Operable Unit 1
U = Not detected
J- = Potential low bias in reported result
Red font indicates value exceeds PHA

** PZ-OU1-10-A1 was deleted from the sampling network for PFOA and PFOS after Event #1 because suspended aquifer material from a damaged screen was present in the sample.

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Table 2.1
Selected PFOA and PFOS Promulgated and Guidance Concentrations Established by Others

State or Country	Limit (nanograms/liter)			Year Established	Remarks	Reference
	PFOA	PFOS	Total PFOA & PFOS			
Vermont	**20**	**30**	-	2016	Drinking water criteria	9
New Jersey	40	-	-	2007	Preliminary health-based guideline for drinking water	1
Delaware	70	70	-	2016	Values "…are not to be construed as site specific cleanup levels…."	11
New Hampshire	**70**	**70**	**70**	2016	Ambient Groundwater Quality Standards	10
USEPA PHA	70	70	70	2016	Public Health Advisory value	2
Michigan	89	11	-	2016	Proposed values	4
Maine	100	-	-	2014	Maximum Exposure Guideline (MEG) in drinking water; MEG value for short term exposure is 400 ng/L	1
Texas	**290**	**560**	-	2016	Promulgated value for groundwater cleanup	4 and 14
Denmark	300	100	-	2015	Proposed values	3
Germany	**300**	**300**	100	2006	300 ng/L is strict, health-based level. 100 ng/L is precautionary guidance value	3
Minnesota	**300**	**300**	-	2008	Chronic non-cancer Health Risk limit for drinking water	1 and 5
United Kingdom Tier 1	**300**	**300**	-	2009	Minimum action is requirement to consult health professionals and	8
Alaska	400	160	-	2016	Proposed values	4
California	400	200	-	2015	Site-specific screening level specified in approved OU-1 Exit Strategy	12
Illinois	400	200	-	2013		4
West Virginia	500	-	-		Requirement to provide alternative drinking source if exceeded; considering change to 400 ng/L	5
North Carolina	2,000	-	-	2006	North Carolina Science Advisory Board recommended in 2012 reducing Interim Maximum Allowable Concentration in groundwater to 1,000 ng/L	6 and 7
United Kingdom Tier 2	**5,000**	**1,000**	-	2009	Minimum action is requirement to reduce concentration to less than limit as soon as practicable	8
Oregon	24,000	300,000	-	2009	Trigger level requiring measurement or development of pollutant reduction plan; not a water quality standard	4 and 13
United Kingdom Tier 3	**45,000**	**9000**	-	2009	Minimum action is requirement to reduce exposure from drinking water within 7 days	8
Netherlands	-	530	-	2011	Maximum tolerable concentration in drinking water	3
Sweden	-	-	90	2014	Sum of seven PFAS substances	3

Table 2.1
Selected PFOA and PFOS Promulgated and Guidance Concentrations Established by Others

Notes:

Bold font is promulgated value | ng/L = nanograms per liter | OU-1 = Operable Unit 1
PFOA = perfluorooctanoic acid | PFOS = perfluorooctane sulfonate

1 - Maximum Exposure Guideline for Perfluorooctanoic Acid in Drinking Water; Division of Environmental Health, Maine Department of Health and Human Services. March, 2014
2 - US EPA, Office of Water, EPA 822-R-16-005, Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA), May 2016
3 - Danish Ministry of the Environment, *Perfluoroalkylated substances: PFOA, PFOS, and PFOSA. Evaluation of health hazards and proposal of a health based quality criterion for drinking water, soil and ground water* . Environmental Project #1665, 2015
4 - USACE Omaha Presentation by OTIE & Amec Foster Wheeler, 2016
5 - State WRCB [CA], *Groundwater Information and Fact Sheet Perfluorooctanoic Acid (PFOA) & Related Compounds* . May, 2016
6 - North Carolina Interim Maximum Allowable Concentrations in groundwater https://deq.nc.gov/document/nc-stds-groundwater-imac-2013
7 - North Carolina Department of Environment and Natural Resources Memorandum *NCASB Recommendation for the Revision of the IMAC for PFOA* , August 10, 2012
8 - United Kingdom Drinking Water Inspectorate *Guidance on the Water Supply (Water Quality) Regulations 2000* [1] *specific to PFOS (perfluorooctane sulfonate) and PFOA (perfluorooctanoic acid) concentrations in drinking water. October 2009*
9 - Vermont Environmental Conservation Drinking Water and Groundwater Protection Division Guidance. Interim Groundwater Quality Standards. April, 2016.
10 - New Hampshire Department of Environmental Health. Ambient Groundwater Quality Standard for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) http://des.nh.gov/media/pr/2016/20160531-pfoa-standard.htm
11 - Delaware Department of Natural Resources and Environmental Control. Screening Level Table. July 2016
12 - HGL, 2015a. Final Technical Memorandum OU-1 Exit Strategy Former Ford Ord, California. April. Administrative Record Series Number OU1-614*.
13 - Oregon Department of Environmental Quality Rule 340-045-0100
14 - Texas Commission on Environmental Quality Texas Risk Reduction Program Protective Concentration Levels Tier 1 values

FIGURES

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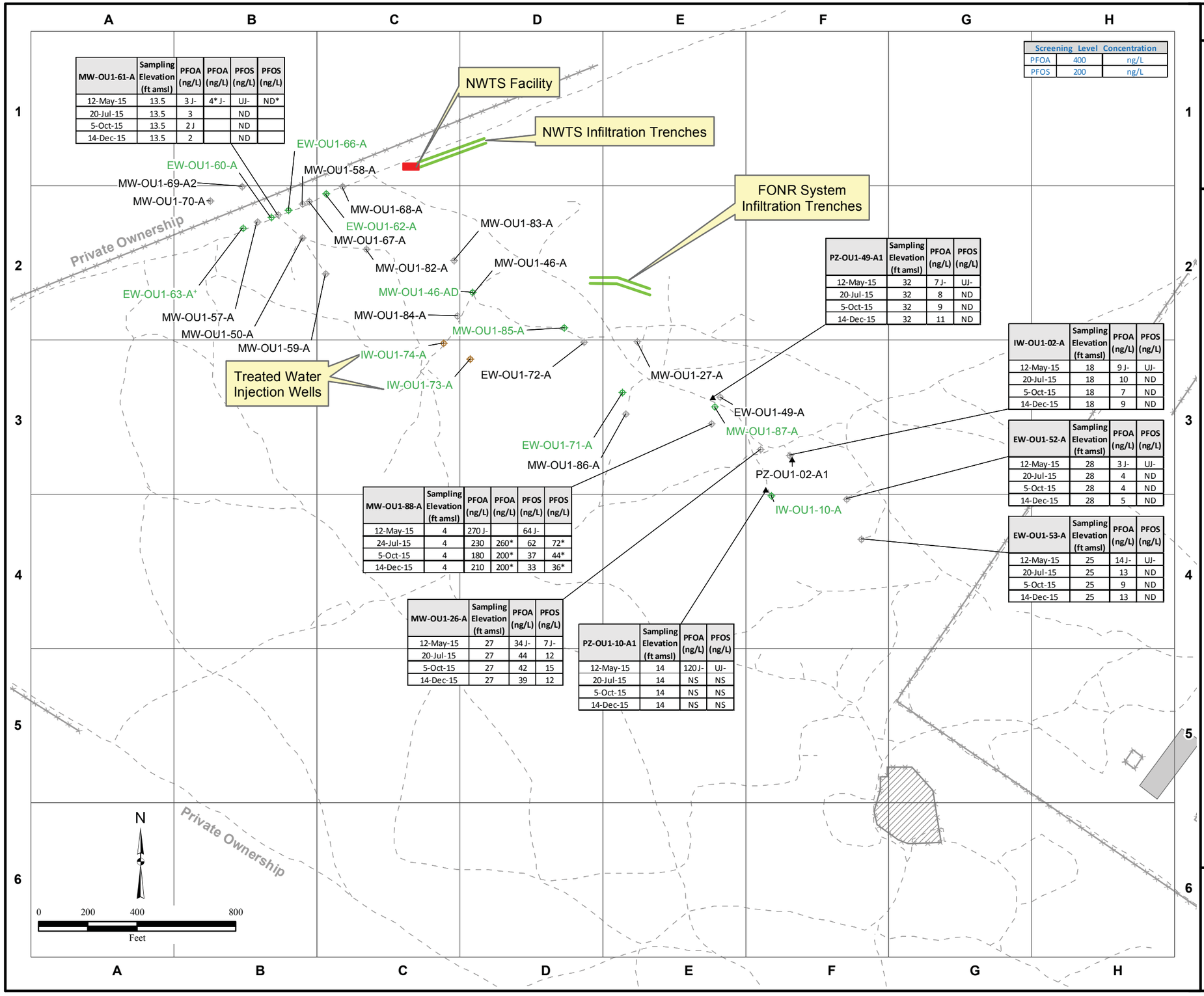
Figure 1.1
Attainment Monitoring Summary PFOA and PFOS Concentrations in OU-1 A-Aquifer Former Fort Ord, CA



MW-OU1-61-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOS (ng/L)
12-May-15	13.5	3 J-	4* J-	UJ-	ND*
20-Jul-15	13.5	3		ND	
5-Oct-15	13.5	2 J		ND	
14-Dec-15	13.5	2		ND	

Screening Level Concentration		
PFOA	400	ng/L
PFOS	200	ng/L

PZ-OU1-49-A1	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	32	7 J-	UJ-
20-Jul-15	32	8	ND
5-Oct-15	32	9	ND
14-Dec-15	32	11	ND

IW-OU1-02-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	18	9 J-	UJ-
20-Jul-15	18	10	ND
5-Oct-15	18	7	ND
14-Dec-15	18	9	ND

EW-OU1-52-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	28	3 J-	UJ-
20-Jul-15	28	4	ND
5-Oct-15	28	4	ND
14-Dec-15	28	5	ND

EW-OU1-53-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	25	14 J-	UJ-
20-Jul-15	25	13	ND
5-Oct-15	25	9	ND
14-Dec-15	25	13	ND

MW-OU1-88-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	PFOS (ng/L)
12-May-15	4	270 J-		64 J-	
24-Jul-15	4	230	260*	62	72*
5-Oct-15	4	180	200*	37	44*
14-Dec-15	4	210	200*	33	36*

MW-OU1-26-A	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	27	34 J-	7 J-
20-Jul-15	27	44	12
5-Oct-15	27	42	15
14-Dec-15	27	39	12

PZ-OU1-10-A1	Sampling Elevation (ft amsl)	PFOA (ng/L)	PFOS (ng/L)
12-May-15	14	120 J-	UJ-
20-Jul-15	14	NS	NS
5-Oct-15	14	NS	NS
14-Dec-15	14	NS	NS

Legend

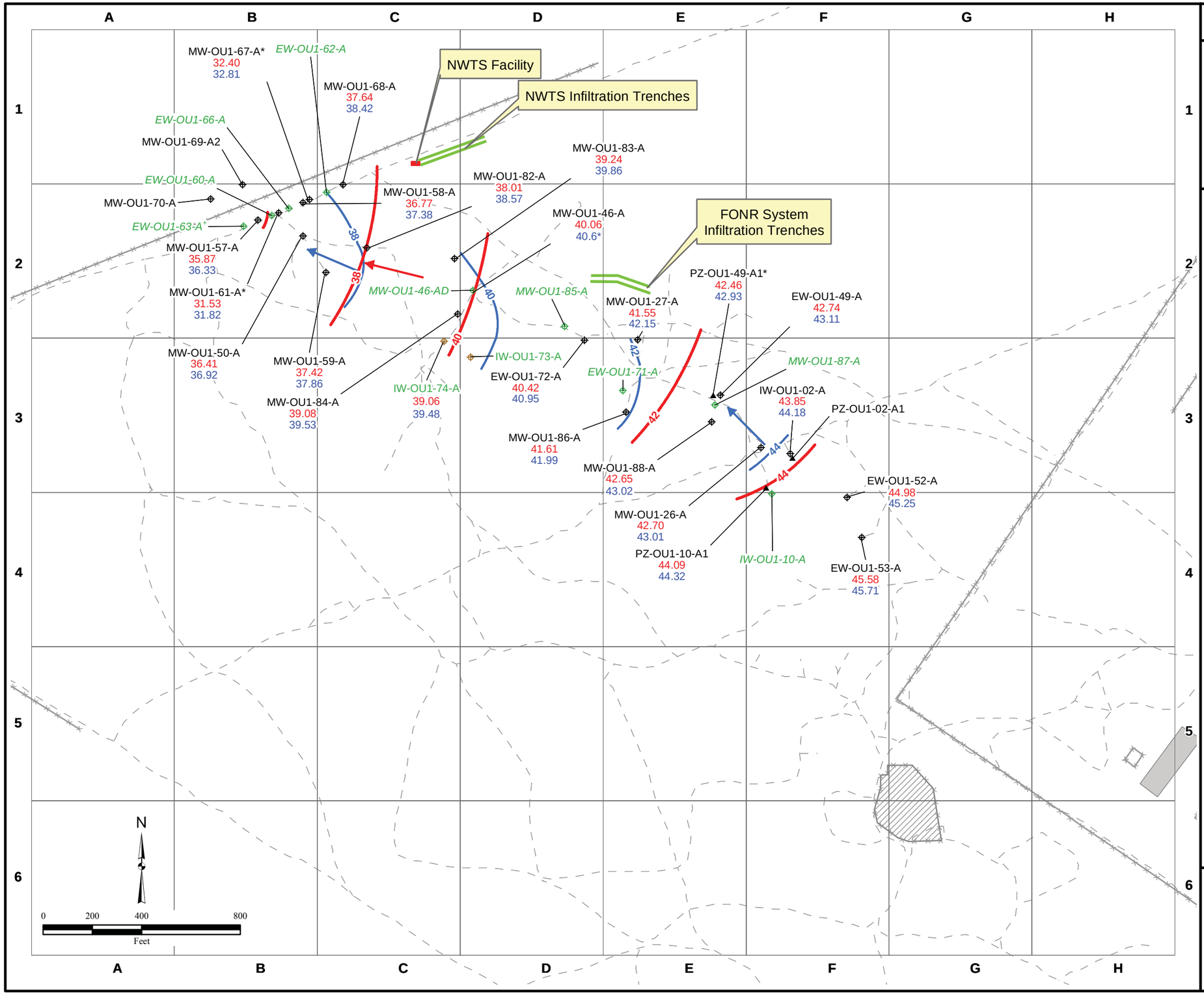
- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1-70-A — Well Identification
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- Building
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Wells not sampled are not part of Attainment Monitoring Network.
∗=Duplicate Sample

+=Indicates disconnected extraction well. No longer operable.
ft amsl=feet above mean sea level
FONR=Fort Ord Natural Reserve
J-=Sample result estimated value potentially biased low
J=Sample result estimated value
ND=Nondetect
NS=Not Sampled
ng/L=nanograms per liter
NWTS=Northwest Treatment System
PFOA=Perfluorooctanoic Acid
PFOS=Perfluorooctane Sulfonate
UJ-=Not detected; Sample result biased low

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU1_PFC_HA_Tech_Memo\(1-01)PFOA_PFOS_Concens_Mon_Summary_Prelim.mxd
8/22/2016 CNL
Source: HGL

Figure 2.1
OU-1 FONR A-Aquifer Groundwater Elevation Map May 2015 and December 2015 Former Fort Ord, CA



Legend

- OU-1 Existing Wells
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1-27-A / 41.55 / 42.15 — Well Identification; Groundwater Elevation (May 2015); Groundwater Elevation (December 2015)
- 38 — Groundwater Elevation Contour (December 2015) (dashed where inferred) (ft amsl)
- 38 — Groundwater Elevation Contour (May 2015) (dashed where inferred) (ft amsl)
- General Direction of Groundwater Flow (December 2015)
- General Direction of Groundwater Flow (May 2015)
- Trail/Unimproved Road
- Treated Water Infiltration Trench
- Fence
- Former Fire Drill Area
- Building
- NWTS Facility

Notes:
Locations where no groundwater elevation is reported were not measured.
Well labels in green font indicate extraction or injection well.
MW-OU1-61-A: Well completed in channel fill interval only.
MW-OU1-67-A: Well completed in channel fill interval only.
PZ-OU1-49-A1: Well is located 30 feet from EW-OU1-49-A and aquifer is approximately 11 feet deeper at PZ-OU1-49-A1.
ft amsl=feet above mean sea level
*=Indicates wells not used for contouring
+=Indicates disconnected extraction well. No longer operable.
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System

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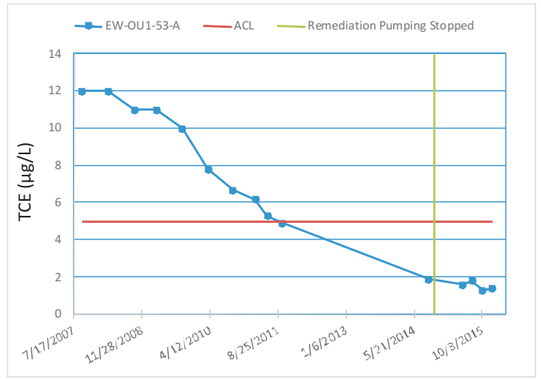
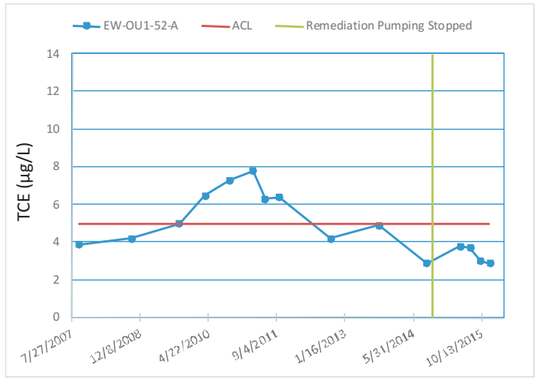
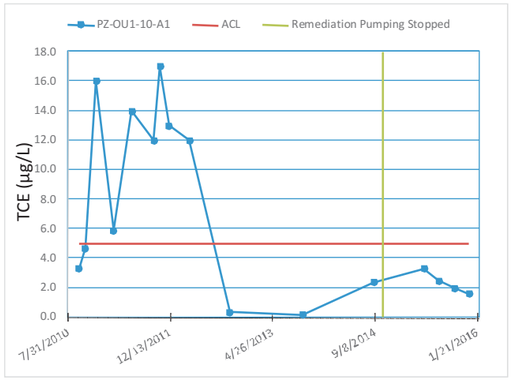
8/23/2016 CNL
Source: HGL

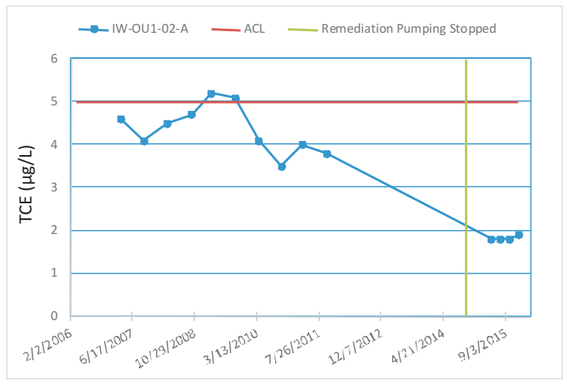
HGL HydroGeoLogic, Inc

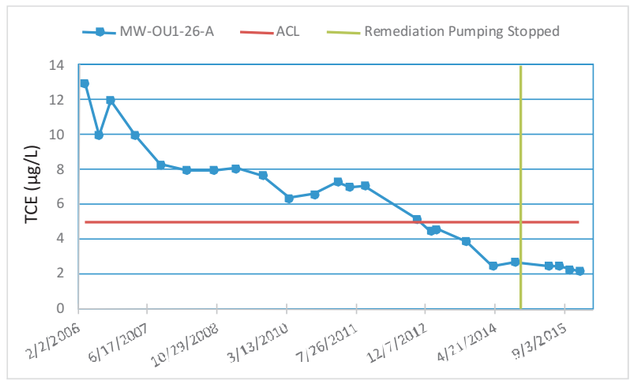
Wells Along Main Axis of Contaminant Migration (South to North):

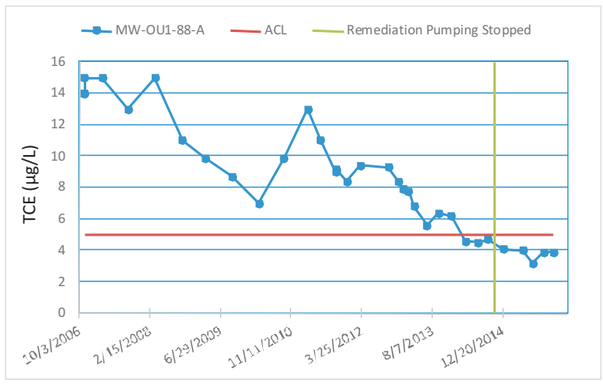


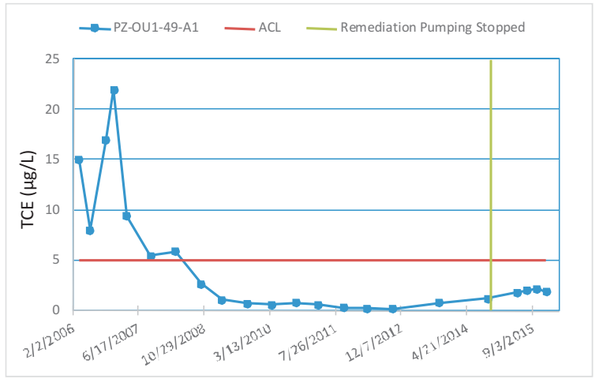


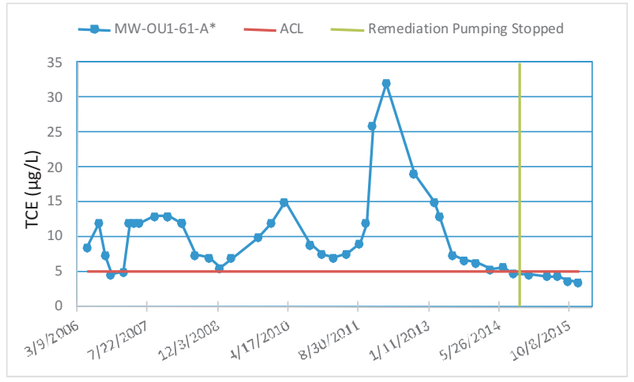












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8/23/2016 CNL
Source: HGL

HydroGeoLogic, Inc

Legend

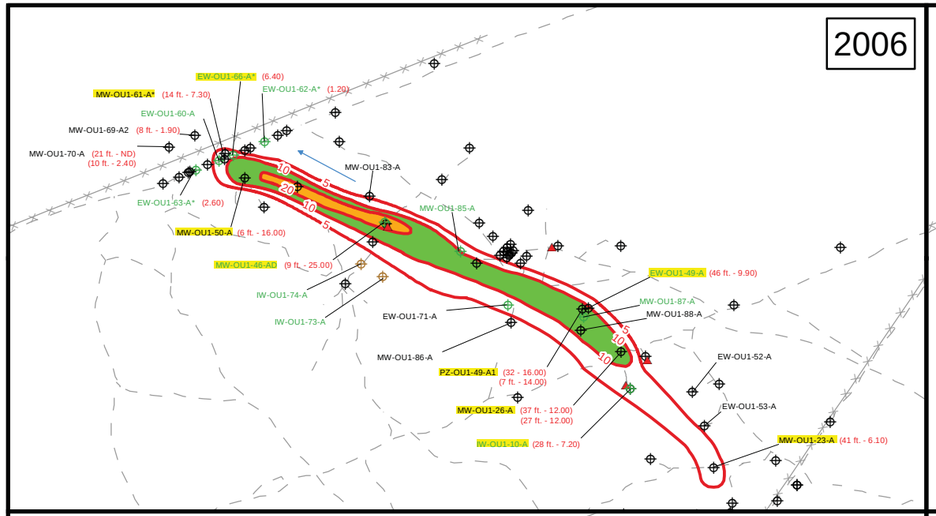
- TCE Concentration in Micrograms per Liter (µg/L)
- Aquifer Cleanup Level (µg/L)
- Remediation pumping ended in October 2014—data points before that date show remediation monitoring; data to the right show attainment monitoring

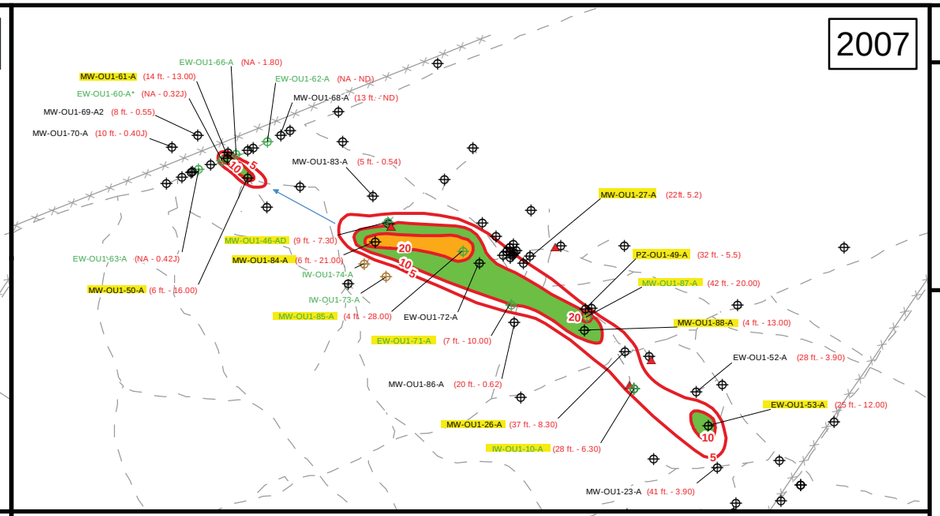
Notes:
The number(s) in parenthesis is the sample elevation (or range of elevation) in feet above mean sea level.

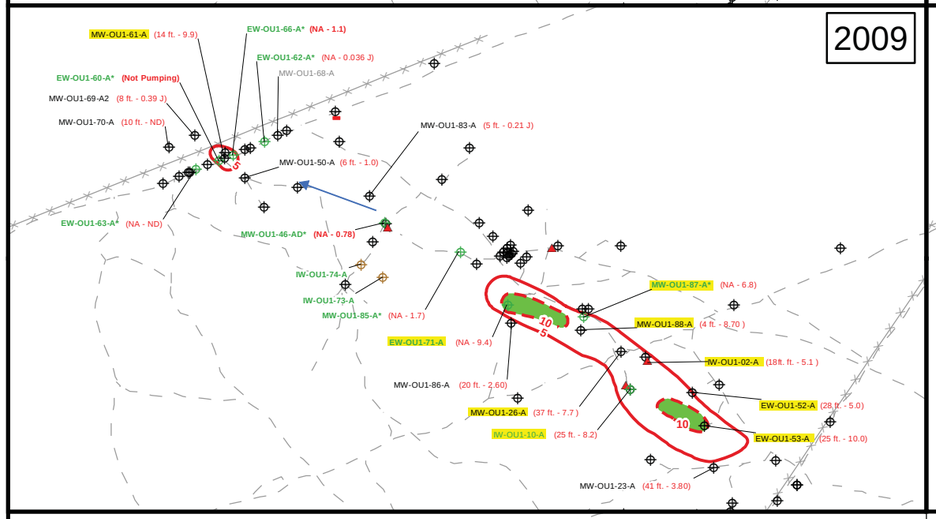
*=Well is screened only in Channel Fill Interval. January 2013 non-detect value is considered to be outlier based on previous and subsequent samples. This non-detect value is not shown.
ACL=aquifer cleanup level
FONR=Fort Ord Natural Reserve
TCE=trichloroethene

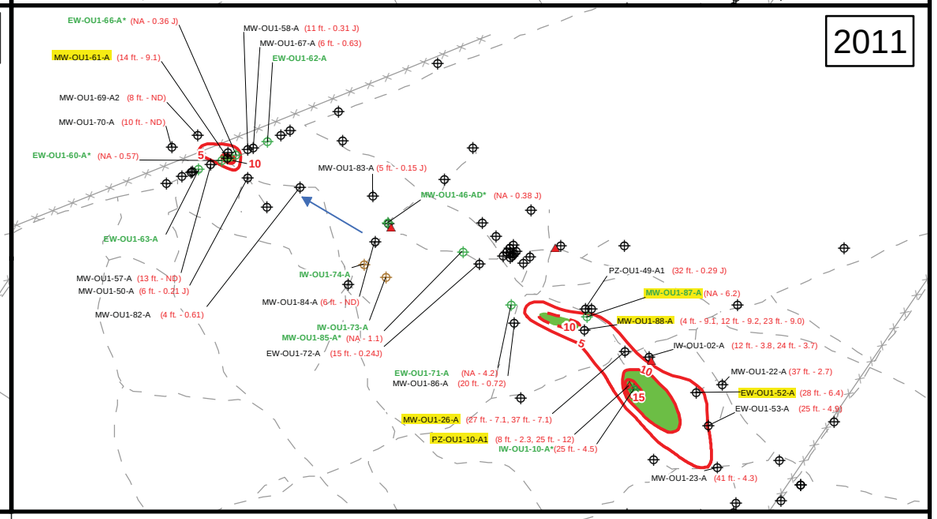
Figure 2.2
OU-1 FONR TCE Concentrations Over Time for Attainment Monitoring Well Network
Former Fort Ord, CA

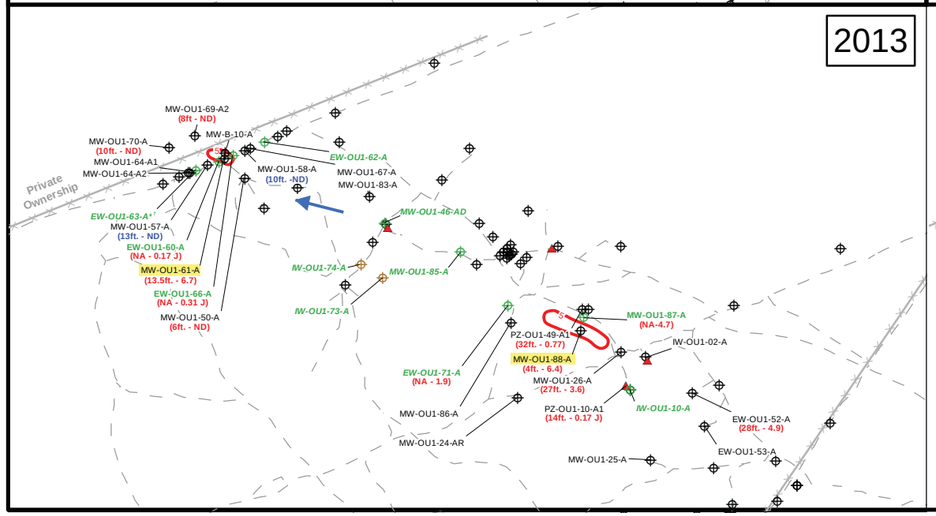
Figure 2.3
TCE Concentration in September Groundwater Monitoring 2006-2014

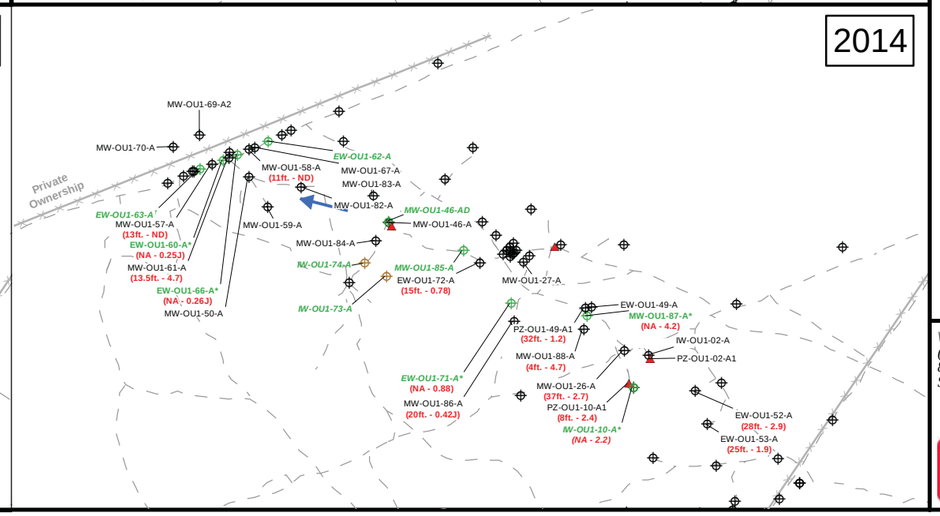












Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer
- MW-OU1-88-A — Locations with TCE Concentrations at or Above MCL (5 µg/L)
- 5 — TCE Contour (µg/L) Based on September Data for Given Year (dashed where inferred)
- MW-OU1-88-A — Well ID
- (4 ft. - 7.0) — September TCE Result (µg/L)
- Sample Elevation (feet above mean sea level)
- 10 µg/L to 20 µg/L TCE
- 20 µg/L or Greater µg/L TCE
- Trail/Unimproved Road
- Fence
- General Direction of Groundwater Flow

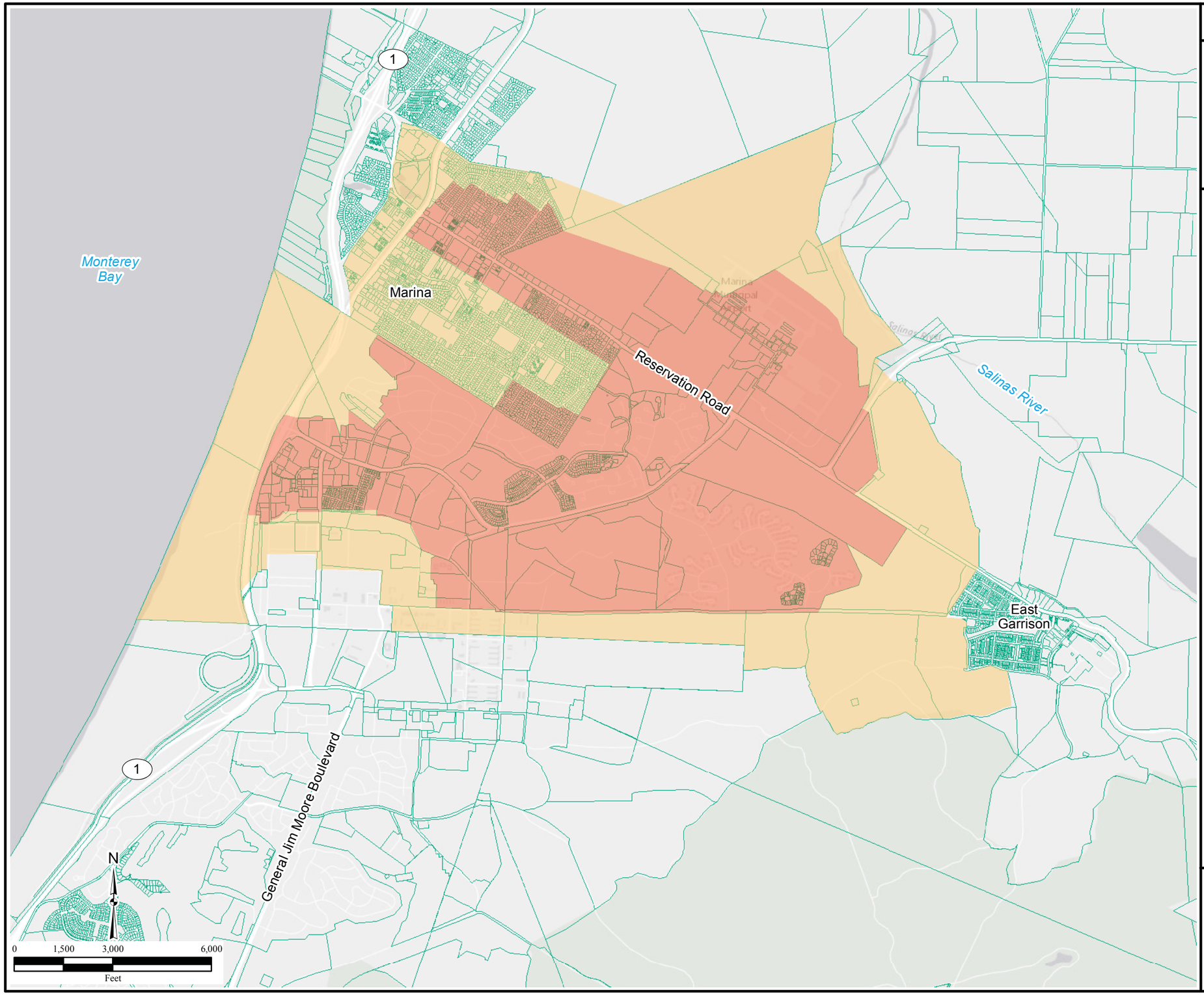
N

Notes:
Green well label font indicates extraction or injection well.
MCL=Maximum Contaminant Level (specified in OU-1 Record of Decision)
ND=Nondetect
NA=Depth is not applicable - sample is from pumping well
J=Estimated value
TCE=Trichlorethene
µg/L=Micrograms per liter

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU1_PFC_HA_Tech_Memo\(2-03)TCE_2006-2014.mxd
8/23/2016 CNL
Source: HGL

HGL HydroGeoLogic, Inc

Figure 2.4
Special Groundwater Protection Zones
June 2016



Legend

- Assessor's Parcel
- Prohibition Zone
- Consultation Zone

Notes:
Prohibition Zone: Well construction is restricted due to the presence of organic contaminants at concentrations exceeding state and federal guidelines and to prevent interference with ongoing remedial activities.
Consultation Zone: Well construction is restricted due to the proximity to organic contamination and associated remedial activities.

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU1_PFC_HA_Tech_Memo\(2-04)GW_Protection.mxd
8/22/2016 CNL
Source: HGL, Monterey County Assessor's Office, USACE ArcGIS Online Light Gray Canvas Basemap

HGL HydroGeoLogic, Inc

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ATTACHMENT 1

REGULATORY CLOSEOUT APPROVAL DOCUMENTATION BASED ON ATTAINMENT MONITORING RESULTS

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Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

April 4, 2016

Mr. Bill Collins
BRAC Environmental Coordinator
Fort Ord Base Realignment and Closure Office
Post Office Box 5008
Monterey, California 93944-5008

REVIEW OF FINAL TECHNICAL MEMORANDUM OPERABLE UNIT 1, ATTAINMENT MONITORING RESULTS, SAMPLING EVENTS #1 THROUGH #4, FORMER FORT ORD, CALIFORNIA, MARCH 16, 2016

Dear Mr. Collins:

The Department of Toxic Substances Control (DTSC) Geological Services Unit (GSU) has reviewed the *Final Technical Memorandum Operable Unit 1 (OU-1), Attainment Monitoring Results, Sampling Events #1 through #4, Former Fort Ord, California* (Tech Memo) dated March 16, 2016. The Tech Memo was prepared by HydroGeoLogic, Inc. for the U.S. Army Corps of Engineers, Sacramento District.

DTSC concurs with the data provided in the Tech Memo, the conclusion that OU-1 groundwater remediation efforts are complete and an OU-1 site closure report should be prepared for regulatory review.

DTSC appreciates the opportunity to review the subject document. If you have any questions, please contact me by email at Min.Wu@dtsc.ca.gov, or at (916) 255-3621.

Sincerely,

Min Hwang Wu

Min H. Wu, Ph.D.
Project Manager
Military Sites and Corrective Action Unit
Brownfields and Environmental Restoration Program

cc: See next page.

cc: (Via email)

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Brownfields and Environmental Restoration Program
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Noel.Shrum@dtsc.ca.gov

cc: Mr. Stephen C. Sterling, P.G., P.G.P., C.E.G., C.H.G
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Geological Services Unit
Brownfields and Environmental Restoration Program
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

February 21, 2017

Mr. William Collins
Department of the Army
Fort Ord Base Realignment and Closure (BRAC) Office
BRAC Environmental Coordinator
P.O. Box 5008
Monterey, California 93944-5008

Re: Technical Memorandum, Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminants in Operable Unit 1 Groundwater, Fritzsche Army Airfield, Former Fort Ord, California, August 25, 2016

Dear Bill,

EPA has reviewed the *Technical Memorandum, Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminants in Operable Unit 1 Groundwater, Fritzsche Army Airfield, Former Fort Ord, California,* dated August 25, 2016. This document was prepared at the request of EPA, the California EPA Department of Toxic Substances Control (DTSC), and the Central Coast Regional Water Quality Control Board (RWQCB) in response to concerns regarding potential perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) contamination at Operable Unit 1 (OU-1) despite the completion of remediation of other contaminants of concern.

During our review, we considered EPA's 2016 health advisory (HA) value of 70 ng/L for the sum of PFOA and PFOS concentrations, monitoring data and closeout information presented in this memo, comment letters from DTSC (September 20, 2016) and the RWQCB (August 20, 2016 and September 8, 2016), and a map prepared by the Army Corps of Engineers in February 2017 showing all nearby private groundwater wells. We have also consulted with the EPA Federal Facilities Restoration and Reuse Office as required by EPA policy.

Based on the information currently available, EPA concurs with the recommendation for site closure without additional sampling or remediation of PFOA and PFOS at this time, for the following reasons:

- PFOA and PFOS Source No Longer Present
  The source of contamination at OU-1 was a fire drill training pit. Training activities were discontinued in 1985. In 1987 approximately 4,000 cubic yards of contaminated soil were removed, down to a maximum depth of 31 feet below ground surface, and replaced with clean backfill. The removal action was implemented to address benzene, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, methyl ethyl ketone, 1,1,1-trichloroethane, and trichloroethene. Releases of these chemicals, the PFOA, and the PFOS happened during fire drill training exercises. Given the recent PFOA and PFOS concentrations in the monitoring wells near the fire drill pit training area, it is unlikely that the source area is currently contributing these compounds to groundwater in the A-aquifer.

- Concentrations Above the 2016 HA Are Not Migrating Off Site
  Monitored values at the former Fort Ord boundary are at, or near, the detection limit of 2 ng/L for PFOA. PFOS was not detected during any of the sampling events. Levels exceeding, or potentially exceeding, the 2016 HA are located approximately 1600-2200 feet from the boundary of the former Fort Ord.

- No Exposure Pathway
  OU-1 historic groundwater contamination was limited to the A-aquifer which is not used for drinking water purposes. A Monterey County ordinance prohibits the installation of wells and use of the A-aquifer for drinking due to a number of factors, including low yield rates. Four historic private wells are in the vicinity of OU-1. Three are closed. The remaining well is approximately 2600 feet from the historic plume extent and in the cross gradient direction. It is only used for irrigation purposes.

  The Salinas Valley Aquiclude (SVA) underlies the A-aquifer and continues in a downgradient direction more than 5,000 feet beyond the farthest historic extent of the OU-1 plume. The SVA prevents significant vertical migration of groundwater between the A-aquifer and underlying upper 180-foot aquifer.

  Additionally, OU-1 is located within the Fort Ord Natural Reserve (FONR). Development is prohibited and well installation is allowed only as part of the OU-1 remediation effort. Access is controlled by the University of California Santa Cruz which uses the FONR as a nature laboratory for the study of rare plant species and associated habitat.

This concurrence applies only to Fort Ord OU-1 and does not represent EPA policy on the closeout of Superfund site operable units with PFOA and PFOS levels exceeding the 2016 HA. I appreciate the accommodations you have made to extend the due date of EPA comments on this technical memo. If you have any questions, please do not hesitate to call me at (415) 947-4105 or e-mail me at clancy.maeve@epa.gov.

Sincerely,

Maeve Clancy

Maeve Clancy
Remedial Project Manager

cc: (via email)
Grant Himebaugh, Central Coast RWQCB
Alex Kan, Department of the Army, USACE
Noel Shrum, Cal EPA DTSC
Min Wu, Cal/EPA DTSC

February 26, 2016

Mr. Bill Collins
Base Environmental Coordinator
U.S. Department of the Army
Base Realignment and Closure
Fort Ord Field Office
P. O. Box 5004
Monterey, CA 93944-5004
william.k.collins@us.army.mil

Sent via U.S. Mail and Electronic Mail

Dear Mr. Collins:

FORMER FORT ORD: DRAFT TECHNICAL MEMORANDUM OPERABLE UNIT 1 ATTAINMENT MONITORING RESULTS ACCEPTANCE

Central Coast Regional Water Quality Control Board (Water Board) staff has reviewed the subject technical memorandum (report), prepared by the Army and its contractor, and received on February 1, 2016. In the report, the Army transmits the latest groundwater monitoring well data demonstrating consistent attainment of site closure goals. The Water Board accepts the report, as written.

Demonstration of aquifer cleanup levels or goals for trichloroethylene, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) is a major milestone on the way to site closure. We appreciate the considerable effort expended by all parties to arrive at this point in the site cleanup process.

If you have any questions or comments regarding this letter, please call **Grant Himebaugh at (805) 542-4636** (grant.himebaugh@waterboards.ca.gov), or Sheila Soderberg at (805) 549-3592.

Sincerely,

for Lisa Horowitz McCann
Interim Executive Officer

cc:

Ms. Teresa M. Rodgers, USACE, Teresa.M.Rodgers@usace.army.mil
Mr. Roy Evans, HGL, Inc., revans@hgl.com
Mr. Judy Huang, USEPA, huang.judy@epa.gov
Mr. Min Wu, DTSC, Min.Wu@dtsc.ca.gov
Mr. Ed Walker, DTSC, Ed.Walker@dtsc.ca.gov
Mr. Steven Sterling, DTSC, Stephen.Sterling@dtsc.ca.gov
Mr. Grant Himebaugh, Water Board, grant.himebaugh@waterboards.ca.gov
Ms. Sheila Soderberg, Water Board, Sheila.soderberg@waterboards.ca.gov
Water Board – GeoTracker File, Jessica.Duffy@waterboards.ca.gov

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GeoTracker ID DOD100220500

APPENDIX B

OU-1 WELL DESTRUCTION AND NWTS DECOMMISSIONING COMPLETION

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APPENDIX B

OU-1 SITE CLOSURE REPORT
FORMER FORT ORD, CALIFORNIA
PRELIMINARY DRAFT
OU-1 WELL DESTRUCTION AND NORTHWEST TREATMENT PLANT DECOMMISSIONING COMPLETION REPORT

PROJECT:	Delivery Order for Operable Unit 1, Former Fort Ord, California (Delivery Order CM11)
CLIENT:	U.S. Army Corps of Engineers
CONTRACT NUMBER:	W912DY-10-D-0023
PROJECT MANAGER:	Roy Evans, P.E.
PREPARATION DATE:	September 2017

Roy Evans, P.E.
HydroGeoLogic, Inc.
Project Manager

Date

Laura McNamara, P.E.
HydroGeoLogic, Inc.
Senior Technical Reviewer

Date

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LIST OF ATTACHMENTS

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%	percent
BCT	BRAC Cleanup Team
bgs	below ground surface
BRAC	Base Realignment and Closure
CTS	California tiger salamander
DD&A	Denise Duffy & Associates, Inc.
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EM	Environmental Monitor
EPA	U.S. Environmental Protection Agency
FONR	Fort Ord Natural Reserve
HGL	HydroGeoLogic, Inc.
MCHD	Monterey County Health Department
MS	Monterey spineflower
NWTS	Northwest Treatment System
OU	operable unit
SG	sand gilia
UCSC	University of California Santa Cruz
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
YP	Yadon's piperia

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APPENDIX B

OU-1 SITE CLOSURE REPORT
FORMER FORT ORD, CALIFORNIA
PRELIMINARY DRAFT
OU-1 WELL DESTRUCTION AND NORTHWEST TREATMENT PLANT DECOMMISSIONING COMPLETION REPORT

1.0 INTRODUCTION

This report describes the methods and procedures used in destroying the remaining Operable Unit (OU)-1 groundwater monitoring, injection, and extraction wells and decommissioning of the associated Northwest Treatment System (NWTS) at the former Fort Ord, California (Figure B1.1 and Figure B1.2). HydroGeoLogic, Inc. (HGL) prepared this report for the U.S. Army Corps of Engineers (USACE), Sacramento District, under the Small Business Worldwide Environmental Remediation Services Contract No. W912DY-10-D-0023, task order number CM11. The term "decommissioning" includes the demolition, removal, and proper disposal of the above-ground treatment system facilities and associated components.

The regulatory agencies concurred in February 2017 (Appendix A of main text) that OU-1 groundwater remediation is complete and no further monitoring or groundwater treatment is needed. The wells that were destroyed are no longer needed for collecting groundwater chemical data or water level data. In addition, these wells represented an ongoing maintenance responsibility for the USACE and a potential liability if they were vandalized. Consequently, all remaining OU-1 wells were destroyed. Field operations were not started until the following had occurred:

- The Base Realignment and Closure (BRAC) Cleanup Team (BCT) approved the OU-1 Fort Ord Natural Reserve Well Destruction and Northwest Treatment System Decommissioning Work Plan (HGL, 2017a); this document is referred to hereafter as the Work Plan. The BCT consists of the following regulatory agencies: U.S. Environmental Protection Agency (EPA), California Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board.
- HGL received the approved well destruction permits from Monterey County Health Department (MCHD).
- Utility clearance was completed.
- Property owners were notified concerning work activities and schedule.

The well destruction activities fulfilled the State of California and Monterey County requirements for proper abandonment of inactive wells. The MCHD was notified before field activities began and received updates as work progressed. No complications were encountered in the field and there were no deviations from the Work Plan, except that the electric power cables at two

extraction wells sites were capped above ground at the request of the University of California Santa Cruz (UCSC); the UCSC is the property owner.

The equipment staging area was located within the Fort Ord Natural Reserve (FONR) adjacent to the NWTS. The FONR is owned and managed by the UCSC. Best management biological protection measures were implemented to protect sensitive habitat, as described in Section 2.1.5.

HGL provided on-site construction management throughout the project. The principal subcontractors and their roles are:

- Cascade Drilling: Grouting, excavating, demolition; C-57 License Number: 938110.
- Denise Duffy & Associates, Inc. (DD&A): On-call for habitat and biological survey / monitoring / protection services if needed.

2.0 WELL DESTRUCTION ACTIVITIES

Thirty-five wells were destroyed during this effort. Well destruction activities began on 11 July 2017 and were completed on 18 July 2017. Well characteristics (location coordinates, depth, diameter, etc.) are presented in Table B2.1 and locations are shown on Figure B2.1. The corresponding Monterey County Well Permits and State of California Destruction Forms are presented in Attachment B-1. All wells constructed as part of the OU-1 groundwater investigation and remediation program have now been destroyed.

Destruction activities included: (1) decommissioning wells in accordance with federal, state, and local requirements including, but not limited to, those of the MCHD; (2) removing the well casing to a depth of approximately 1 foot below ground surface (bgs) at wells located within the FONR habitat and to a depth of 5 feet bgs at wells located within grassland habitat; (3) removing and disposing of all surface pads and bollards (if applicable) from around the wells; and (4) sealing all wells with pressure grout.

The following subsections describe the procedures followed and field activities conducted during the well destruction effort.

2.1 PREPARATION AND SITE MANAGEMENT

Personnel entering the construction zone were required to comply with applicable Occupational Safety and Health Administration requirements and the Final Site Safety and Health Plan, (HGL, 2017a, Attachment C). Level D personal protective equipment was worn. Compliance included, but was not limited to, the use of hard hats where appropriate, steel-toed boots, high visibility vests, safety glasses, and hearing protection.

Before setting up associated well destruction equipment, HGL field personnel inspected the equipment for potential hazards to verify that the equipment was in safe operating condition. Tailgate safety meetings were held every morning before daily operations began to address potential safety concerns. On-site HGL and subcontractor personnel signed the health and safety plan acknowledging their discussion of environmental awareness, safe work practices, potential hazards, and site history.

An equipment and material staging area was established in the area adjacent to the NWTS on the north side of the dirt of road that parallels the northwest boundary of the former Fort Ord. This area was used for staging equipment and material in previous OU-1 construction projects.

A variety of management practices were adopted to minimize impacts to the FONR area. Key elements of the management effort included the following:

- Field staff received a training session before they began work to acquaint them with the issues and procedures necessary to protect the FONR during construction activities.
- An Environmental Monitor (EM) approved by the Army BRAC Office was on site or available by telephone during field activities. The EM trained workers to recognize critical habitat and protected species, inspected proposed construction sites before activity began, and remained on call to respond to any unexpected issues or field questions.
- Close coordination was maintained, as applicable, with the Army BRAC Office and USACE staff throughout the construction activity.

- Site access was controlled to prevent unauthorized visitors.

2.1.1 Coordination

MCHD issued the initial well destruction permits on 13 October 2016. The approved well destruction permits are included in Attachment B-1. HGL coordinated with local municipalities and private property owners throughout field activities.

2.1.2 Notifications

Notifications were made in advance to the following:

- Fort Ord BRAC Office
- Marina Airport Management personnel
- UCSC management personnel

2.1.3 Traffic Control Plan

Thirty-four of the 35 wells destroyed and the NWTS are located within the FONR. The FONR is fenced along its entire perimeter and access is through locked gates. The 35th well was located along the access road to the FONR. Figure B1.2 shows the location of the work area. The gates were kept locked and HGL and subcontractor vehicles and equipment at each work site were positioned to allow other traffic to pass. Traffic was rare and limited to UCSC staff working at other parts of the FONR and visitors from the Army, regulatory agencies, or BRAC Office.

2.1.4 Right of Entry

Upon the transfer of property to UCSC, the USACE retained the rights to perform remediation activities within the FONR. No right of entry was required for this activity, however, UCSC was notified before work began.

2.1.5 Biological Clearance and Protection

Several federally and state protected species are known or suspected to be present within the FONR. These include the federally endangered and state threatened sand gilia (SG), the federally threatened Monterey spineflower (MS), the federally endangered Yadon's piperia (YP), and the federally threatened California tiger salamander (CTS).

Project activities were conducted in a manner consistent with the current biological opinions and guidance regarding conservation measures (USFWS, 2015). Compliance with these measures reduces or avoids impacts to species of concern on the project site. The following is the guidance that was followed during project activities:

- *The 28 March 2015 Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74). (USFWS, 2015)*
- *Guidance and direction from University of California FONR staff*
- *Installation-Wide Multispecies Habitat Management Plan (U.S. Army, 1997)*

- *OU-1 Fort Ord Natural Reserve Well Destruction Work Plan, including the Environmental Protection Plan presented in Appendix D (HGL, 2017a)*

To minimize the potential for impacts to sensitive species, each well destruction site was included in a baseline survey during the peak blooming season conducted in April 2017 (for SG and YP) and in May 2017 (for MS). The baseline surveys were performed by qualified field personnel from DD&A under subcontract to HGL. The results of the baseline survey are presented separately (HGL, 2017b).

HGL, DD&A, and UCSC personnel conducted an on-site briefing for all staff involved in well destruction activities before fieldwork began at sites within the FONR. DD&A staff provided site-specific guidance to the field crews at well sites located in any area of potentially sensitive habitat. The following best management biological protection measures were implemented:

- HGL and the DD&A biologist conducted an on-site briefing for all staff involved in well destruction or pipeline removal activities before fieldwork began. This briefing ensured that all field crew members understood the security measures and protocols enforced to minimize impact to the natural resources. Staging areas and access routes were clearly delineated and shown to field personnel. Field staff were given information to identify protected species (such as the federally threatened California tiger salamander, for example) that might be encountered during work activities. No encounters with any protected animal species occurred during field activities.
- The DD&A biologist was approved by U.S. Fish and Wildlife Service (USFWS) to handle CTS and relocate as specified in the Biological Opinion (USFWS, 2015). The DD&A biologist is also familiar with the Fort Ord plant and wildlife identified in the Habitat Management Plan (U.S. Army, 1997) and was on call during all work activities.
- Heavy equipment was washed before entering the FONR to minimize the potential for carrying non-native plant species into the FONR.
- The general environmentally proactive work practices and general mitigation measures to minimize environmental impacts presented in the Work Plan (HGL, 2017a) were followed.
- A Habitat Checklist (Work Plan [HGL, 2017a]) was completed before work began.

2.1.6 Security

Site access was controlled with locked gates controlling access to the FONR. Entrance into the work area around individual well sites was controlled and monitored by project personnel. Only project personnel, subcontractor personnel, and authorized visitors with proper identification and health and safety training credentials visited the work site.

2.2 WELL DESTRUCTION METHODS

Before field activities began, well destruction permits were obtained from the MCHD. All approved well destruction permits are included for reference in Attachment B-1. The well destruction procedures were performed in accordance with California's Department of Water Resources (DWR) Bulletin 74-81 (California DWR, 2009) and Monterey County Code of Ordinances (Monterey County, 2014).

The well destruction sequence proceeded as follows:

- The wells were sounded and their depths were checked prior to destruction to identify any obstructions that could have interfered with filling and sealing the casing and/or well screen. No obstructions were encountered.
- The entire well was pressure-filled with a mixture of five percent (%) bentonite, 95% cement using a tremie pipe to reduce the potential for bridging. Details regarding grout placement are discussed in Section 2.2.1. The photograph below shows the drilling rig used to place the grout.

Photograph 1 – Setting up to pressure grout. Equipment shown: CME 75 drill rig.

- The sealing material was placed under pressure using the tremie method starting from the bottom of the well and proceeding continuously upward until the casing was completely filled. The volume of sealing material placed was monitored as the sealing operation proceeded and was compared to the calculated volume of the well casing and screen intervals. The sealing material volumes are presented in Table B2.2; field documentation is provided in Attachment B-3.
- The surface completion of each well was removed, including any well boxes, well pads, and bollards. At well locations within potentially sensitive habitat, approximately the top six inches of the surface soil was set aside for use during restoration.

Photograph 2 – Removing bollards and surface completion. Equipment shown: John Deere 310L Backhoe.

- After setting and/or curing times for the sealing material were met, (as described in California DWR Water Well Standards Section 9, Subsection D) the well destruction crew excavated around the casing to remove the uppermost 5 feet of the well casing at wells MW-B-02-A and MW-OU1-27-A. All other well locations were within potentially sensitive habitat and only the top foot (approximately) of well casing was excavated. A cement plug was then poured over the top of the cut off casing.
- The casing excavation was then backfilled with native material and regraded to match the surrounding topography.
- All debris (well casing, excess seal material, and trash) and surface components from the destroyed well (bollards, well pad, protective casing, and well boxes) were transported to the staging area pending proper disposal.

2.2.1 Grout Seal

Pressure grouting began on 11 July 2017 using a 5% bentonite neat cement grout. This sealing material is consistent with the approved impervious sealing materials described in Section 9, Subsection D, of the DWR Water Well Standards (California DWR, 2009). The wells were filled with a sufficient volume of cement grout to completely fill the well casing and force grout through the well screens into the gravel pack and surrounding lithology. The wells were filled from the bottom up using a tremie pipe to prevent dilution of the grout, avoid bridging, and ensure proper grout placement. No significant settling was observed in any of the 35 wells. There was no leftover water from grouting activities.

2.3 ENVIRONMENTAL MONITORING

The destruction activities on Armstrong Ranch were planned to be consistent with the biological opinions and guidance described in Section 2.1.5. The worker environmental training program also included general and site-specific environmental minimization measures that, if implemented properly, significantly lessen adverse effects to the local environment.

DD&A was contracted as an unbiased third party to assist HGL in developing procedures and policies to comply with the above guidance. DD&A provided an EM to conduct the worker environmental training program during the site mobilization effort before field activities began. The role of the EM was to assist field personnel in following environmental mitigation guidelines and to ensure that any protected species encountered were not harmed by project activity. The EM was available by telephone for consultation as needed during the project activities.

- The EM prepared a summary report describing the actions taken and observations made during the well destruction effort. This report is included in Attachment B-2. The environmental monitoring effort focused on well sites within potentially significant habitat. The NWTS and wells MW-OU1-27-A and MW-B-02-A were located in grassland areas and were not addressed by the EM.

2.4 WELLS DESTROYED

A total of 35 wells were destroyed between 11 July 2017 and 18 July 2017 as listed in Table B2.1. Well destruction activities were performed using a back hoe, drill rig, water tank, mixing tank/high pressure pump, and hand tools as needed. A summary of information for each destroyed well can be found in Table B2.1 and Table B2.2. Figure B2.1 shows the locations of the destroyed wells. Well destruction completion reports were submitted to the MCHD and DWR for each well that was destroyed; these reports are included in Attachment B-1. All well destruction activities were supervised by HGL personnel.

Pumps, piping, power, and controls were removed from the extraction wells before grouting began. Likewise, piping and controls were removed from the two injection wells before they were sealed.

Photograph 3 – Pulling injection pipe at IW-OU1-73-A. Equipment shown: CME 75 drill rig.

Additional photographs showing typical well destruction activities are presented in Attachment B-4.

2.5 RESTORATION

Upon completion of the destruction activities, surface restoration was performed to return the well locations to their pre-disturbed conditions. Site restoration efforts consisted of backfilling the casing excavation area with native soil and re-grading the immediate area to conform to the surrounding ground surface. At well locations within potentially sensitive habitat (all wells except MW-OU1-27-A and MW-B-02-A), the previously segregated and stored top six inches of the surface soil were used to make up the restored surface. Photographs showing restoration results are included in Attachment B-2 and Attachment B-4. All debris and surface components from the destroyed wells were transported to the rolloff bins in the staging areas for disposal.

3.0 NWTS DECOMMISSIONING

Decommissioning the NWTS included removing the entire physical plant, associated piping, fixtures, system components, transfer pumps, carbon treatment tanks, influent and treated water holding tanks, and debris. Selected components left in place for future reuse by UCSC were the Pacific Gas and Electric transformer, electrical meter, outdoor lighting, power outlet, fence, and concrete pad. The removal effort was accomplished between 12 July and 14 July 2017. Modifications were completed on 02 August 2017 to the power cables within the NWTS to maintain future operability for lighting and one power outlet.

All power was disconnected and lockout/tagout protocols implemented before decommissioning began. Power was restored intermittently to test the electrical modifications. HGL notified PG&E to discontinue electric service on 03 August 2017. UCSC may elect to restore power in the future.

The activated carbon contained in the carbon tanks was removed from the tanks and transported for recycling. Residual water in the carbon tanks, piping, and water tanks was drained and pumped into the infiltration trench at the NWTS. Residual water is water that remained in the NWTS components after the NWTS was shut down. All residual water is derived from the extraction wells. Sample results show that extraction well discharge did not contain contamination above site cleanup levels for at least 18 months and at least 6 consecutive samples before the well was shut down (HGL, 2016; Appendix B). Consequently, the residual water does not pose a threat to human or ecological health. The piping, pumps, valves, and gauges were disconnected using hand tools and placed in the rolloff bin for disposal. The carbon and water tanks were unbolted from the concrete pad and lifting straps were attached to hooks permanently affixed to the top of each tank. A telescopic forklift was used to lift each tank out of the containment basin and load all tanks for transport to the recycling facility.

Photograph 4 – Removing holding tank at NWTS. Equipment shown: SkyTrak 10054 telescopic forklift.

Photograph 5 – Water holding tanks being loaded on truck for disposal.

3.1 PIPELINES AND INJECTION VAULT

The existing water transmission pipelines were left in place to minimize disturbance to the FONR habitat. The pipelines are shown on Figure B2.2 (blue indicates untreated groundwater conveyed to the NWTS and orange indicates treated water pumped to the injection wells and infiltration trenches).

The pipelines were cut at each well site and at the NWTS and sealed by hand with approximately one linear foot of grout. The electric conduit at each extraction well was also cut and sealed except at two locations as described in Section 3.3. Any water remaining in the pipeline was derived from the extraction wells. The extraction well sample results show that water in the extraction well discharge does not contain contamination above site cleanup levels (HGL, 2016; Appendix B). Consequently, this remaining water does not pose a threat to human or ecological health and was allowed to drain into the ground before endpoints were sealed as per the Work Plan (HGL, 2017a). Soil removed during pipeline sealing activities was used to fill in and regrade the excavated area. The excavated area was completely closed at the end of each workday. No trenching took place during this field effort and the excavations during pipeline capping did not exceed 3 feet in depth.

The vault at the head of the FONR System Infiltration Trenches (Figure B2.2) was also excavated using a backhoe. The concrete was transported to a rolloff bin for disposal as construction debris and the vault lid was recycled.

Photograph 6 – FONR infiltration trench vault lid.

Soil removed during the vault excavation and from the area around the vault was used as backfill. The grassland area surrounding the injection vault is primarily loose sand. The sand was easily regraded to fill in the relatively shallow void left from the injection vault. No imported backfill was used. Photograph 7 shows the regraded area after site demobilization.

Photograph 7 – Regraded area at former FONR System infiltration trench vault.

3.2 DEBRIS DISPOSAL

Debris was collected in rolloff dumpsters in the staging area and held for disposal as nonhazardous material. The dumpsters were transported to Monterey Peninsula Landfill in Marina, California. Disposal documentation is included in Attachment B-5. A summary of materials and infrastructure removed is presented on Table B3.1.

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4.0 CONCLUSIONS

Thirty-five wells were destroyed and the NWTS was decommissioned. All well destruction activities fulfilled the State of California and Monterey County requirements for proper abandonment of inactive wells.

All work was performed in accordance with the approved Work Plan (HGL, 2017a) with two exceptions as noted below:

- At UCSC's request, the electric power conduit was not cut at two extraction well locations (MW-OU1-87-A and IW-OU1-10-A). The electric conduit was kept in place when the well boxes and controls were removed; the conduit projected above ground approximately 36 inches. The wires within the conduit were cut and the conduit was capped to provide an opportunity for UCSC to restore power at those locations in the future
- The Work Plan assumed that the two poly water tanks would be cut into pieces and/or crushed with a backhoe to facilitate transport to the rolloff bin for disposal. Instead, the tanks were lifted intact and transported to a recycling facility to process into smaller sizes at that location.

UCSC accepted the final condition of the NWTS and the individual work areas as satisfactory. The NWTS is shown below after decommissioning was complete.

Photograph 8 – NWTS after demobilization.

All field activities were conducted in a manner consistent with the various biological opinions and guidance regarding mitigation measures.

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5.0 REFERENCES

California Department of Water Resources (DWR), 2009. Water Well Standards at URL http://www.water.ca.gov/groundwater/well_info_and_other/well_standards.cfm

HGL, 2016. Final 2016 Annual Groundwater Monitoring Report, Operable Unit 1 Fritzsche Army Airfield Fire Drill Area, Fort Ord, California. August. Administrative Record Series Number OU1-624*.

HydroGeoLogic, Inc. (HGL), 2017a. Final OU-1 Fort Ord Natural Reserve Well Destruction and Northwest Treatment System Decommissioning Work Plan Former Fort Ord, California. July. Administrative Record Series Number OU1-629*.

HGL, 2017b. Draft 2017 Impact Assessment and FONR Baseline and Rare Plant Survey Results Operable Unit 1 Former Fort Ord, California. In progress. Administrative Record Series Number OU1-628*.

Monterey County, 2014. Monterey County Code of Ordinances, Title 15- Public Services, Chapter 15- Water Wells at URL: https://library.municode.com/index.aspx?clientID=16111&stateid=9&statename=California

U.S. Army, 1997. Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California. April. Administrative Record Series Number BW-1787*.

U.S. Fish and Wildlife Service (USFWS), 2015. Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74). May 28. Administrative Record Series Number BW-2747*.

* When using the Fort Ord Data Integration System, to see a complete listing of all documents, grouped by a specific report, use an asterisk (*) as a wildcard search in the "Record Number" field on that particular number series. For example:

- Searching for: BW-1283* will show every item related to the main document of BW-1283.
- Searching for: BW-1283B* - will only show the items that came after "B" (BW-1283-C, BW-1283-D, etc.)
- Searching for: ESCA* will show all document numbers with prefix 'ESCA.

The asterisk is also a useful feature for finding comment letters related to a report.

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TABLES

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Table B2.1
Destroyed Well Characteristics

Well Identification	Northing Location Coordinate	Easting Location Coordinate	Well Type	Casing Diameter	Total Well Depth	Top of Screen	Bottom of Screen	Screen Length	Remarks
				inches	ft bgs	ft bgs	ft bgs	feet	
Monitoring Wells on NW Boundary Road (5 Total)									
MW-OU1-67-A	2,145,146.910	5,746,128.750	Monitoring well	4.0	102.3	92.0	102	10	Northwest boundary road location adjacent to grassland
MW-OU1-57-A	2,145,064.165	5,745,918.771	Monitoring well	6.0	95.5	61.0	91.0	30	
MW-OU1-58-A	2,145,135.397	5,746,101.889	Monitoring well	6.0	102.8	67.0	96.5	30	
MW-OU1-61-A	2,145,093.660	5,746,002.560	Monitoring well	4.0	96.5	91.2	96.2	5	
MW-OU1-68-A	2,145,206.490	5,746,264.480	Monitoring well	4.0	103.8	58.5	103.5	45	
Northwest Part of Marina Airport Property on Access Route (1 Total)									
MW-B-02-A	2,146,530.206	5,749,507.454	Monitoring well	6.0	80.0	55.0	75.0	20	Grassland well
Extraction Wells (9 Total)									
EW-OU1-60-A	2,145,082.110	5,745,974.440	Extraction well	6.0	95.7	55.2	95.2	40	Northwest boundary road location adjacent to grassland
EW-OU1-62-A	2,145,176.620	5,746,197.950	Extraction well	6.0	100.9	60.4	100.4	40	
EW-OU1-63-A	2,145,039.090	5,745,859.970	Extraction well	6.0	91.5	51.0	91.0	40	
EW-OU1-66-A	2,145,111.140	5,746,043.900	Extraction well	6.0	101.6	56.1	101.1	45	
MW-OU1-46-AD	2,144,778.116	5,746,791.994	Extraction well	4.0	125.4	104.3	124.3	20	FONR well
EW-OU1-71-A	2,144,372.988	5,747,400.254	Extraction well	6.0	116.0	66.0	116.0	50	FONR well
IW-OU1-10-A	2,143,956.400	5,748,004.350	Extraction well	6.0	133.5	94.0	134.0	40	FONR well
MW-OU1-85-A	2,144,635.096	5,747,164.990	Extraction well	6.0	122.0	72.1	122.1	50	FONR well
MW-OU1-87-A	2,144,314.009	5,747,774.400	Extraction well	6.0	119.0	71.0	121.0	50	FONR well
Remaining FONR and Grassland Wells (20 Total)									
EW-OU1-53-A	2,143,778.418	5,748,369.881	Monitoring well	6.0	131.1	104.5	134.5	30	FONR well
EW-OU1-52-A	2,143,941.682	5,748,310.174	Monitoring well	6.0	124.5	84.5	114.5	30	FONR well
PZ-OU1-10-A1	2,143,978.280	5,747,981.540	Monitoring well	2.0	116.5	81.5	116.5	35	FONR well
IW-OU1-02-A	2,144,117.040	5,748,079.410	Monitoring well	6.0	133.5	88.0	128.0	40	FONR well
MW-OU1-26-A	2,144,141.800	5,747,960.000	Monitoring well	5.0	102.0	82.0	102.0	20	FONR well
MW-OU1-88-A	2,144,246.831	5,747,761.098	Monitoring well	4.0	122.0	72.0	122.0	50	FONR well
EW-OU1-49-A	2,144,355.179	5,747,796.775	Monitoring well	6.0	109.6	78.5	108.5	30	FONR well
PZ-OU1-49-A1	2,144,353.560	5,747,766.780	Monitoring well	2.0	122.3	91.5	121.5	30	FONR well
MW-OU1-86-A	2,144,285.082	5,747,414.248	Monitoring well	6.0	126.0	76.0	126.0	50	FONR well
MW-OU1-27-A	2,144,578.100	5,747,460.400	Monitoring well	5.0	89.8	55.0	85.0	30	Grassland well
EW-OU1-72-A	2,144,576.724	5,747,243.822	Monitoring well	6.0	108.5	61.0	111.0	50	FONR well
MW-OU1-84-A	2,144,683.376	5,746,730.867	Monitoring well	4.0	127.0	80.5	130.5	50	FONR well
MW-OU1-83-A	2,144,908.009	5,746,717.940	Monitoring well	4.0	123.0	73.0	123.0	50	FONR well
MW-OU1-82-A	2,144,952.025	5,746,360.764	Monitoring well	4.0	123.0	73.0	123.0	50	FONR well
MW-OU1-50-A	2,144,999.072	5,746,101.724	Monitoring well	4.0	111.2	80.0	110.0	30	FONR well
PZ-OU1-02-A1	2,144,099.970	5,748,088.780	Monitoring well	6.0	137.0	90.0	130.0	40	FONR well
MW-OU1-46-A	2,144,773.124	5,746,795.274	Monitoring well	5.0	105.0	75.0	105.0	30	FONR well
MW-OU1-59-A	2,144,852.762	5,746,195.379	Monitoring well	6.0	103.7	76.0	106.0	30	FONR well
IW-OU1-73-A	2,144,508.890	5,746,782.737	Injection Well	6.0	126.0	76.5	126.5	50	FONR well
IW-OU1-74-A	2,144,573.499	5,746,674.984	Injection Well	6.0	119.5	70.0	120.0	50	FONR well

Notes: FONR = Fort Ord Natural Reserve ft bgs = feet below ground surface

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Table B2.2 Calculated Grout Volume versus Actual Grout Volume

Well Identification	Date Demolition Complete	Well Diam. (in)	Known Total Depth (ft below TOC)	Measured Total Depth (ft below TOC)	Calculated Casing Volume (Gal)	Date Sealing Material Placed	Volume of Sealing Material Placed (Gal)	Volume of Sealing Material Divided by Casing Volume as %	Volume of Sealing Material Exceeds Volume of Well Casing and Screen?
Monitoring Wells on the NW Boundary Road									
MW-OU1-67-A	07/12/2017	4	102.3	102	66.8	7/11/2017	105	157%	YES
MW-OU1-57-A	07/13/2017	6	95.5	91.0	140.3	7/12/2017	205	146%	YES
MW-OU1-58-A	07/12/2017	6	102.8	96.5	151.0	7/11/2017	245	162%	YES
MW-OU1-61-A	07/12/2017	4	96.5	96.2	63.0	7/11/2017	100	159%	YES
MW-OU1-68-A	07/12/2017	4	103.8	103.5	67.8	7/11/2017	135	199%	YES
Northwest Part of Marina Airport Property on Access Route									
MW-B-02-A	07/18/2017	6	80.0	75.00	117.5	7/17/2017	190.0	162%	YES
Extraction Wells									
EW-OU1-60-A	07/12/2017	6	95.7	95.2	140.6	7/11/2017	225	160%	YES
EW-OU1-62-A	07/13/2017	6	100.9	100.4	148.2	7/12/2017	230	155%	YES
EW-OU1-63-A	07/13/2017	6	91.5	91.0	134.4	7/12/2017	220	164%	YES
EW-OU1-66-A	07/12/2017	6	101.6	101.1	149.2	7/11/2017	230	154%	YES
MW-OU1-46-AD	07/14/2017	4	125.4	124.3	81.9	7/13/2017	150	183%	YES
EW-OU1-71-A	07/16/2017	6	116.0	116.0	170.4	7/15/2017	275	161%	YES
IW-OU1-10-A	07/17/2017	6	133.5	134.0	196.1	7/16/2017	250	127%	YES
MW-OU1-85-A	07/15/2017	6	122.0	122.1	179.2	7/14/2017	250	140%	YES
MW-OU1-87-A	07/16/2017	6	119.0	121.0	174.8	7/15/2017	475	272%	YES
Remaining FONR and Grassland Wells									
EW-OU1-53-A	07/18/2017	6	131.1	134.5	192.6	7/17/2017	250	130%	YES
EW-OU1-52-A	07/18/2017	6	124.5	114.5	182.9	7/17/2017	275	150%	YES
PZ-OU1-10-A1	07/17/2017	2	116.5	116.5	19.0	7/16/2017	65	342%	YES
IW-OU1-02-A	07/18/2017	6	133.5	128.0	196.1	7/17/2017	225	115%	YES
MW-OU1-26-A	07/17/2017	5	102.0	102.0	104.0	7/16/2017	170	163%	YES
MW-OU1-88-A	07/17/2017	4	122.0	122.0	79.6	7/16/2017	250	314%	YES
EW-OU1-49-A	07/16/2017	6	109.6	108.5	161.0	7/15/2017	225	140%	YES
PZ-OU1-49-A1	07/16/2017	2	122.3	121.5	20.0	7/15/2017	50	251%	YES
MW-OU1-86-A	07/16/2017	6	126.0	126.0	185.1	7/15/2017	350	189%	YES
MW-OU1-27-A	07/15/2017	5	89.8	85.0	91.6	7/14/2017	225	246%	YES
EW-OU1-72-A	07/15/2017	6	108.5	111.0	159.4	7/14/2017	250	157%	YES

Table B2.2 Calculated Grout Volume versus Actual Grout Volume

Well Identification	Date Demolition Complete	Well Diam. (in)	Known Total Depth (ft below TOC)	Measured Total Depth (ft below TOC)	Calculated Casing Volume (Gal)	Date Sealing Material Placed	Volume of Sealing Material Placed (Gal)	Volume of Sealing Material Divided by Casing Volume as %	Volume of Sealing Material Exceeds Volume of Well Casing and Screen?
MW-OU1-84-A	07/14/2017	4	127.0	130.5	82.9	7/13/2017	320	386%	YES
MW-OU1-83-A	07/14/2017	4	123.0	123.0	80.3	7/13/2017	150	187%	YES
MW-OU1-82-A	07/15/2017	4	123.0	123.0	80.3	7/14/2017	125	156%	YES
MW-OU1-50-A	07/15/2017	4	111.2	110.0	72.6	7/14/2017	125	172%	YES
PZ-OU1-02-A1	07/18/2017	6	137.0	130.0	201.2	7/17/2017	275	137%	YES
MW-OU1-46-A	07/14/2017	5	105.0	105.0	107.1	7/13/2017	365	341%	YES
MW-OU1-59-A	07/15/2017	6	103.7	106.0	152.3	7/14/2017	225	148%	YES
IW-OU1-73-A	07/14/2017	6	126.0	126.5	185.1	7/13/2017	325	176%	YES
IW-OU1-74-A	07/14/2017	6	119.5	120.0	175.5	7/13/2017	250	142%	YES

Notes:

Diam - diameter
ft - feet
Gal - gallon
in - inch
EW - extraction well
MW - monitoring well

Table B3.1 Demolition Items and Disposal Summary

Item	Units	Quantity	Remarks	Disposal Method	Disposal Site
Well materials: bollards, housings, concrete (well pads), PVC piping and metal conduit	20 cubic yard roll off dumpster	1	Removed by subcontractor (Cascade Drilling)	landfill	Monterey Peninsula Landfill
HDPE influent and treated water holding tanks	each	2	Transported by A&S Metals Recycling & Demolition	recycled	A&S Metals Recycling Facility (Castroville, CA)
Steel treatment vessels	each	4			
(A) Injection vault lid and (B) bag filter housings	each	(A) 1 (B) 3			
Piping, fittings, hoses, brackets, concrete, miscellaneous destruction debris from treatment plant	30 cubic yard roll off dumpster	1	Transported by Greenwaste, Inc.	landfill	Monterey Peninsula Landfill
Electrical wiring, transformer, variable frequency drives, gauges, conduits	pounds	e-waste: ~50 ; debris: ~100	Removed by subcontractor (Telemetrix)	landfill	Monterey Peninsula Landfill

Notes:
HDPE = high density polyethylene
PVC = polyvinyl chloride

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FIGURES

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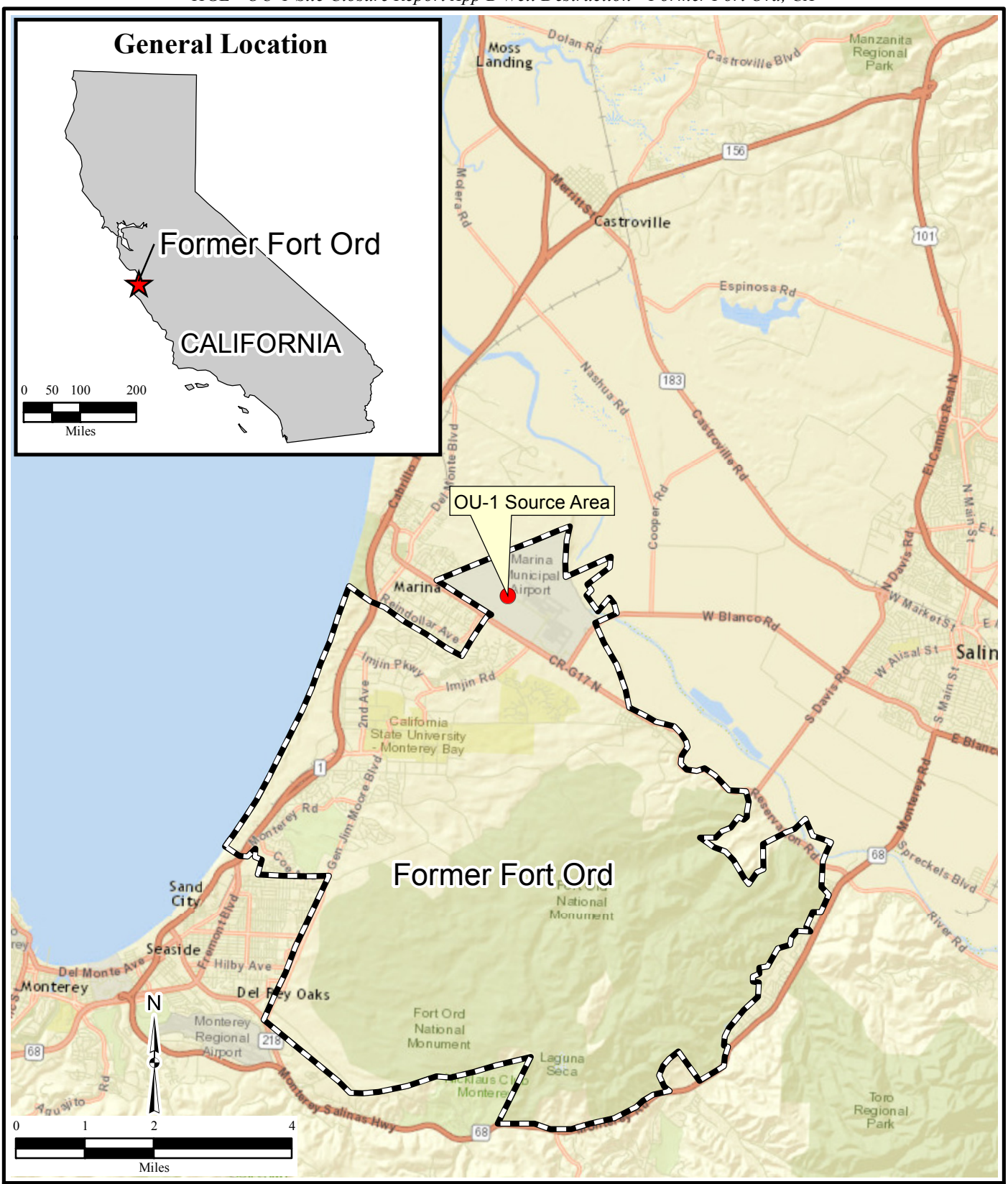

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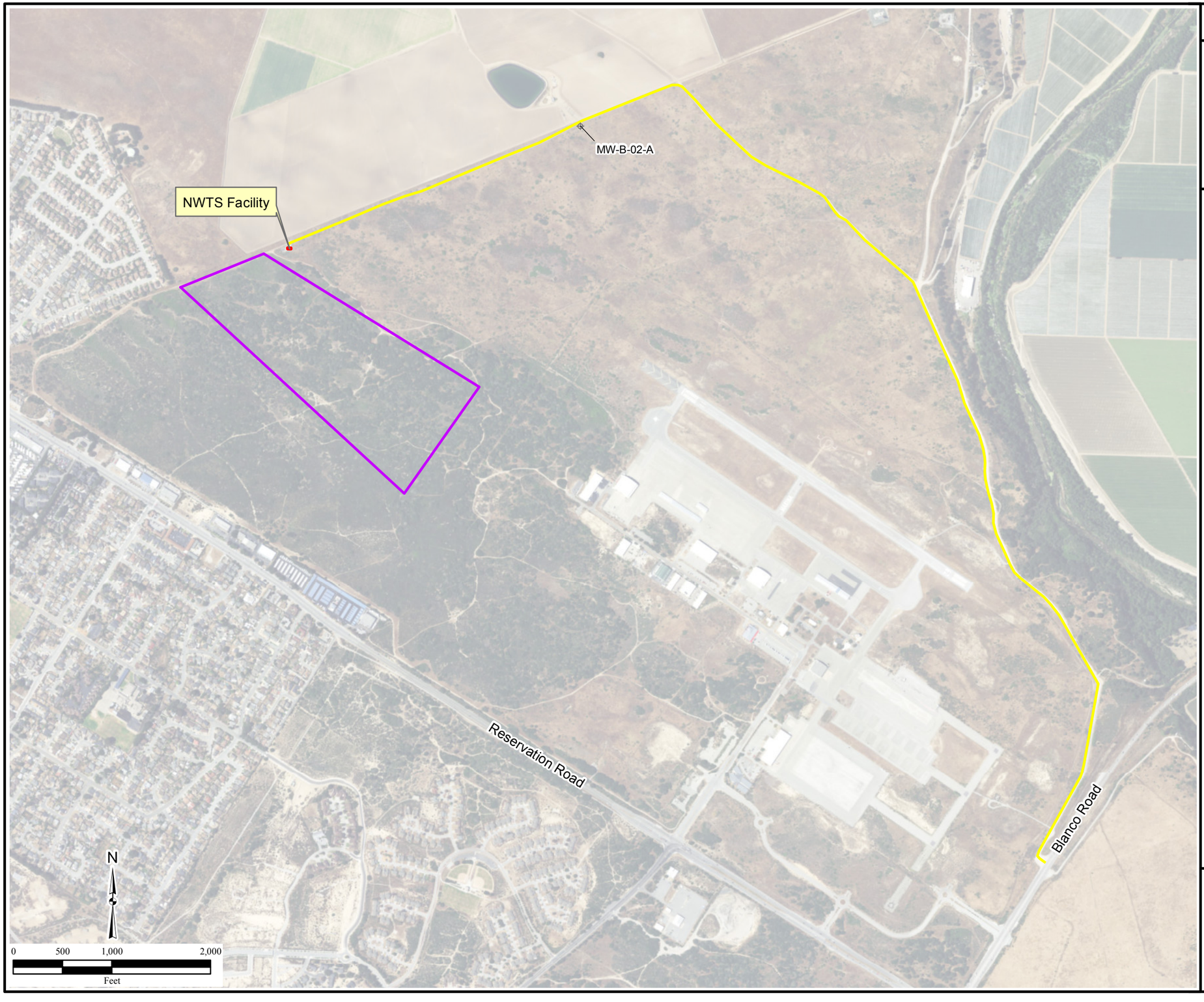
Source: HGL
ESRI World Street Map

Legend

- Site OU-1 Source Area
- Former Fort Ord

Figure B1.1
Former Fort Ord
Location Map

Figure B1.2
OU-1 Work Area and Access Route
Former Fort Ord, CA



Legend

- Monitoring Well
- Access Route to OU-1
- Well Destruction Project Area
- NWTS Facility

Note:
NWTS=Northwest Treatment System

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Source: HGL
ArcGIS Online Imagery

HGL HydroGeoLogic, Inc

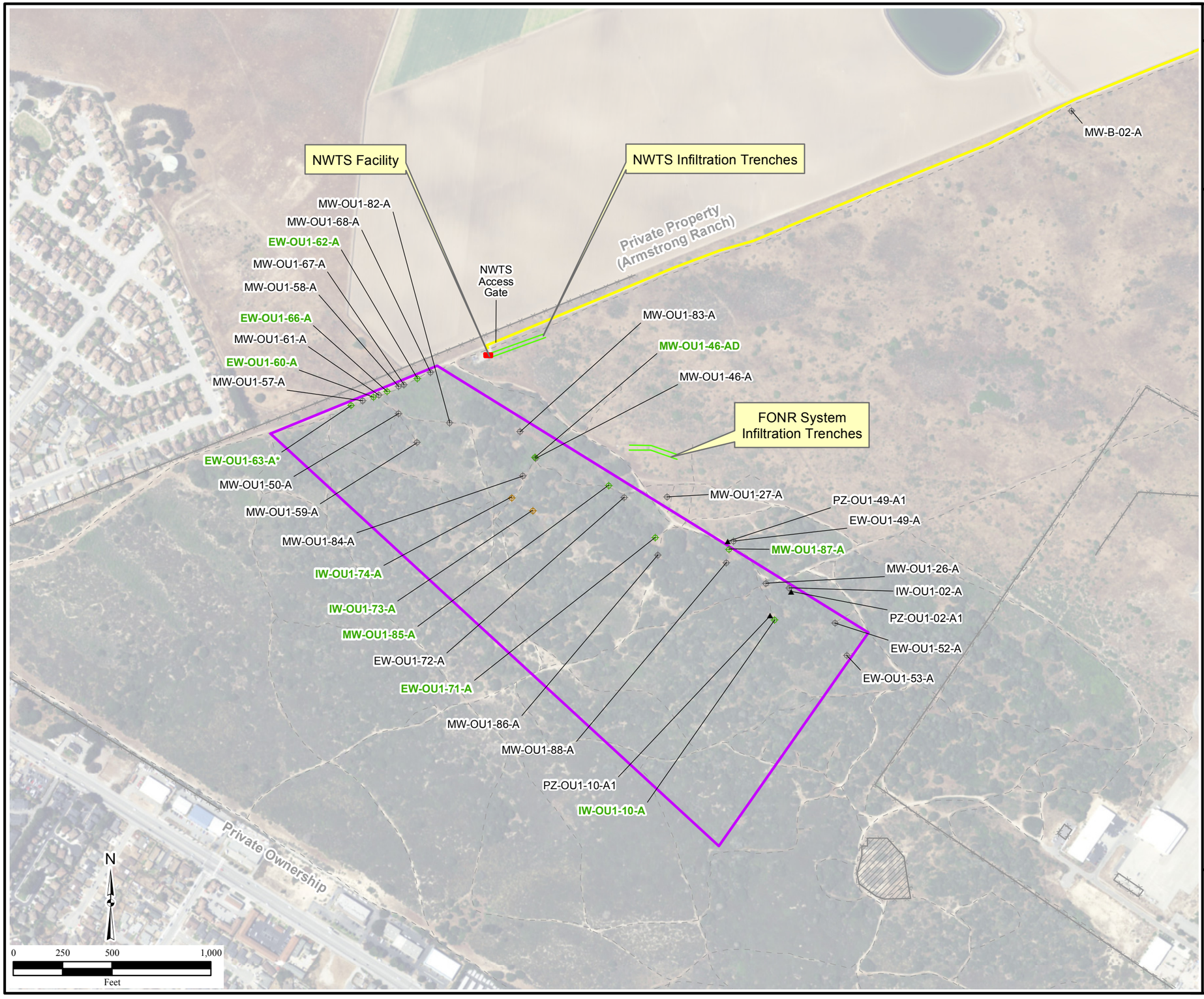


Figure B2.1
OU-1 Destroyed Well Locations
Former Fort Ord, CA

Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- Access Route to OU-1
- Fence
- Trail/Unimproved Road
- Treated Water Infiltration Trench
- Well Destruction Project Area
- Former Fire Drill Area
- NWTS Facility

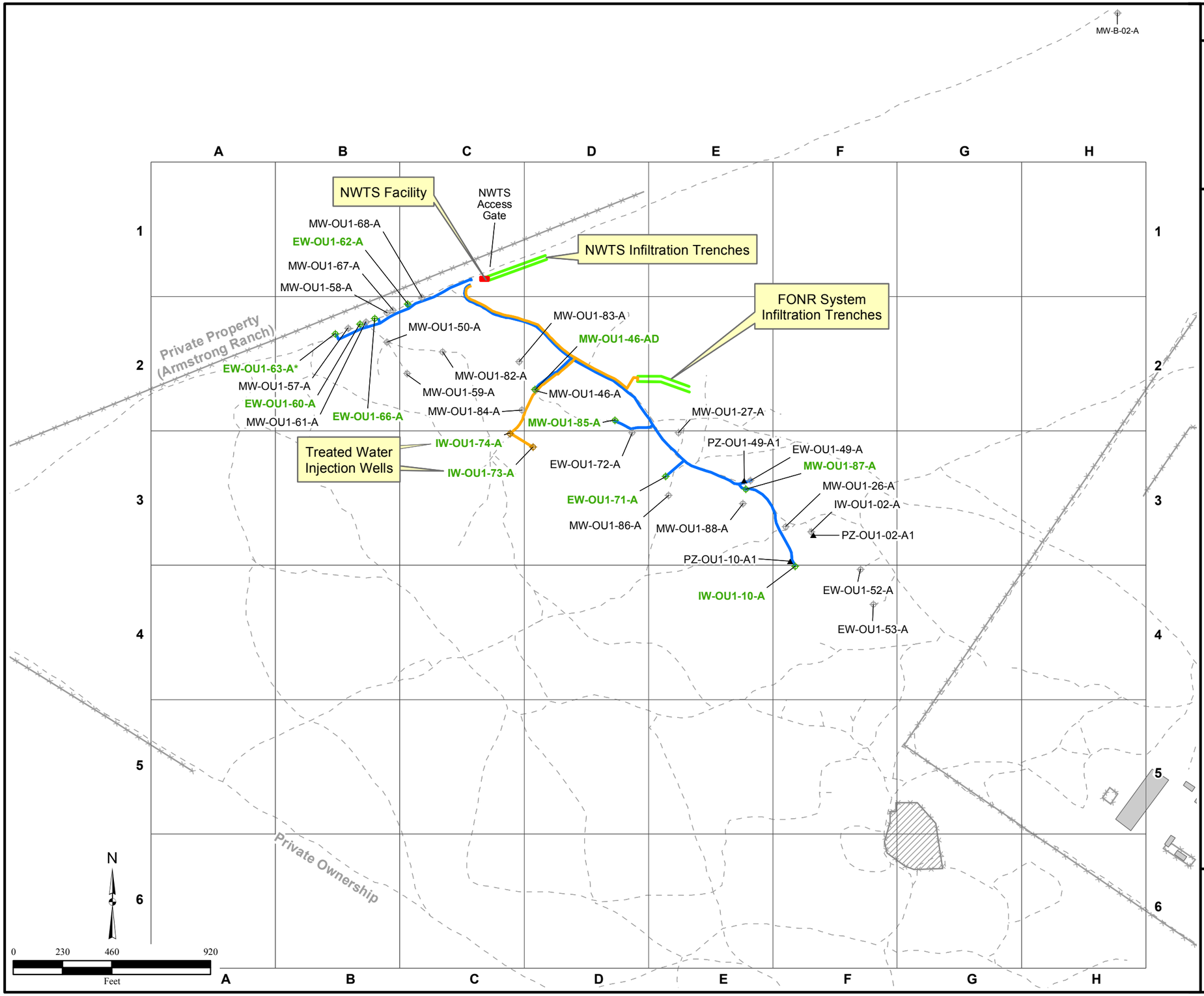
Notes:
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System
Well labels in green font indicate extraction or injection well.
All pumping suspended.

* Disconnected extraction well. No longer operable.

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU-1_Site_Closure_App_B_Well_Destruction\(B2-1)Destroyed_Well.mxd
8/8/2017 CNL
Source: HGL
ArcGIS Online Imagery

HydroGeoLogic, Inc

Figure B2.2
OU-1 Pipeline Locations
Former Fort Ord, CA



Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Extraction Pipeline
- Treated Water Pipeline
- Former Fire Drill Area
- NWTS Facility

Notes:
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System
Well labels in green font indicate extraction or injection well.
All pumping suspended.

* Disconnected extraction well. No longer operable.

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU-1_Site_Closure_App_B_Well_Destruction\(B2-2)Existing_MW_Locations.mxd
8/8/2017 CNL
Source: HGL

HydroGeoLogic, Inc

ATTACHMENT B-1

MONTEREY COUNTY WELL DESTRUCTION PERMITS
AND
COMPLETION CERTIFICATES

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State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0348506

Page 1 of 1

Owner's Well Number MW-OU1-61-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5282, MW-OU1-61A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method pressure grout Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	96.5	Well Destruction: Pressure grout 1" well 0-96.5', trimmie Grout, Backfill neat cement

Total Depth of Boring 96.5 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name former Bradley Office, William Collins/Env. coordinator

Mailing Address P.O. Box 5009

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord.

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (inches)	Type	Material	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if Any (inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	96.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☒ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor 7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348524

Page 1 of 1

Owner's Well Number MW-OU1-57-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5781, MW-OU1-57-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 60# Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	95.5'	Well Destruction: Pressure Grout 0-95.5' trimmie grout Backfill neat cement

Total Depth of Boring 95.5 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Seaside Base office - William Collins / Env. Coordinator

Mailing Address PO BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	95.5	Cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor Date Signed 7-31-17

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348525

Page 1 of 1

Owner's Well Number MW-OU1-58-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5283-MW-OU1-58-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	102.8'	Well Destruction: Pressure grout 0-102.8' trimmie grout Backfill w/neat cement

Total Depth of Boring 102.8 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord Base office - William Collins/Env. Coordinator

Mailing Address PO BOX 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort Ord

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	102.8	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed [signature] / A. Arroyo — C-57 Licensed Water Well Contractor
Date Signed 7-31-17
C-57 License Number 938110

DWR 188 REV 1/2006

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State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0348503

Page 1 of 1

Owner's Well Number MW-OU1-67-A

Date Work Began 2-11-17 Date Work Ended 2-19-17

Local Permit Agency Monterey County Health Department

Permit Number W2-5280, MW-OU1-67-A Permit Date 5/30/17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0	102.3'	Well Destruction, pressure grout 4" well 0-102.3' trimmie grout, Back fill w/ neat cement

Total Depth of Boring 102.3' Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name Fort Ord Brac Office-William Collins/Env. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort ord.

City Marina County Monterey

Latitude ___ Deg ___ Min ___ Sec. N Longitude ___ Deg ___ Min ___ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long. _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
  ○ Deepen
  ○ Other _____
● Destroy
  Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
  ☐ Domestic ☐ Public
  ☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	102.3'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed a.arroyo C-57 Licensed Water Well Contractor Date Signed 7-31-17

938110 C-57 License Number

DWR 188 REV 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348507

Page 1 of 1

Owner's Well Number MW-OU1-68A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5284, MW-OU1-68A Permit Date 5/30/17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method PRESSURE grout Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	103.8'	Well Destruction: Pressure grout 4" well 0-103.8' trimmie grout, Back fill w/neat cement

Total Depth of Boring 103.8' Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortard Base office - William Collins/ENV. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fortard.

City Marina County Monterey

Latitude Deg Min Sec N Longitude Deg Min Sec W

Datum Dec. Lat. Dec. Long

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	103.8	Cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed A. Arroyo C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2006

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Page 1 of 1

Owner's Well Number MW-B-02-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5285, MW-B-02-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348526

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	80'	Well Destruction: Pressure grout 0-80' trimmie grout backfill neat cement

Total Depth of Boring 80' Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortord BRAC Office-William Collins/Env. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort Ord

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	80'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed C-57 Licensed Water Well Contractor Date Signed 7-30-17

938110 C-57 License Number

DWR 188 REV. 1/2006

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Page 1 of 1

Owner's Well Number FORMER FW-OUL-LO-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 528b, FW-OUL-LO-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348508

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 10" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc.
0'	95.7'	Well Destruction: Pressure grout 10" well, 0-95.7' trimmie grout, Backfill w/neat cement

Total Depth of Boring 95.7' Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name Fortord Base Office - William Collins/ENV. Coordinator

Mailing Address PO Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fortord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other _____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	95.7'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☒ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor Date Signed 7-31-17

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0348527

Page 1 of 1

Owner's Well Number EW-OU1-02-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5287, EW-OU1-02-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N Latitude W Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 10" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	100.9	Well Destruction: Pressure grout 0-100.9', trimmie grout, Backfill w/neat cement

Total Depth of Boring 100.9 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Federal Bureau office - william collins/ENV. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	100.9	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor 7-31-17 Date Signed 938110 C-57 License Number

DWR 188 REV 1/2008

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page 1 of 1

Owner's Well Number EW-SU1-63-A

Date Work Began 7-11-17 Date Work Ended 7-12-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5289, EW-SU1-63-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348509

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 16" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	91.5	Well Destruction: Pressure grout 16" well 0-91.5' trimmie grout, Backfill neat cement

Total Depth of Boring 91.5 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fort ord Brac office - William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort ord.

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	91.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348528

Page 1 of 1

Owner's Well Number EW-OU1-16-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5789 EW-OU1-16-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In
State Well Number/Site Number
Latitude N / Longitude W
APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	101.6	Well Destruction: Pressure grout 0-101.6, tremie grout, backfill w/neat cement

Total Depth of Boring 101.6 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord Base office - William Collins / ENV. Coordinator

Mailing Address PO BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	101.6	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed [signature] (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348510

Page 1 of 1

Owner's Well Number MW-OU1-46-AD

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5290-MW-OU1-46-AD Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method PRESSURE grout 4" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	125.4'	Well Destruction: pressure grout 4" well 0-125.4' trimmie grout, backfill neat cement

Total Depth of Boring 125.4 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Former Base office: William Collins/ENV. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well

○ Modification/Repair

○ Deepen

○ Other ____

● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	125.4	cement	

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348529

Page 1 of 1

Owner's Well Number EW-OU1-71-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey county Health Dept.

Permit Number 5291, EW-OU1-71-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	116'	Well Destruction: Pressure Grout 0-116' tremmie grout Back-fill w/ neat cement

Total Depth of Boring 116 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fortord Base attn: William Collins / ENV. Coordinator

Mailing Address PO. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort ord

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	116	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed ____ C-57 Licensed Water Well Contractor Date Signed 7-31-17

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348511

Page 1 of 1

Owner's Well Number IW-OU1-10-A

Date Work Began 7-11-17 Date Work Ended 7-12-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5292, IW-OU1-10-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 16" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	133.5'	Well Destruction: Pressure grout well 0-133.5 trimmie grout, Backfill w/neat cement

Total Depth of Boring 133.5 Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name ~~Fortord Base office~~ - William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long. _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other _____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	133.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed a.arroyo C-57 Licensed Water Well Contractor 7-31-17 Date Signed 938110 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348530

Page 1 of 1

Owner's Well Number MW-OUI-85-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5293, MW-OUI-85-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 10" Drilling Fluid

Depth from Surface Feet	to Feet	Description: Describe material, grain size, color, etc
0'	122	Well Destruction: Pressure Grout 0-122', trimmed Grout, Back Fill w/neat cement

Total Depth of Boring 122' Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fortord Base office: william collins / ENV. coordinator

Mailing Address PO BOX 5008

City Monterey, c ____ State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	122'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed ____ C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348512

Page 1 of 1

Owner's Well Number MW-OU1-87-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 6194-MW-OU1-87-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	119	Well Destruction: Pressure grout well 0-119 trimmie grout, backfill neat cement

Total Depth of Boring 119 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord BRAC office - William Collins/ENV. coordinator

Mailing Address PO Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	119	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed D. Arroyo C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348531

DWR Use Only – Do Not Fill In
State Well Number/Site Number:
Latitude: N Longitude: W
APN/TRS/Other:

Page 1 of 1

Owner's Well Number EW-OU1-53-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5295, EW-OU1-53-A Permit Date 5-30-17

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify ______

Drilling Method Pressure grout well Drilling Fluid ______

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	131.1'	Well Destruction: pressure grout 0-131.1, tremmie grout, Backfill w/neat cement

Total Depth of Boring 131.1 Feet

Total Depth of Completed Well ______ Feet

Well Owner

Name Fort Ord BRAC Office - William Collins/Env. Coordinator

Mailing Address PO BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ______ Dec. Lat. ______ Dec. Long. ______

APN Book ______ Page ______ Parcel ______

Township ______ Range ______ Section ______

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well

○ Modification/Repair

○ Deepen

○ Other ______

● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other ______

Water Level and Yield of Completed Well

Depth to first water ______ (Feet below surface)

Depth to Static Water Level ______ (Feet) Date Measured ______

Estimated Yield * ______ (GPM) Test Type ______

Test Length ______ (Hours) Total Drawdown ______ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	131.1	cement	

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
(Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed [signature] (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page 1 of 1

Owner's Well Number EW-DUL-52-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 52910-EW-DUL-52-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348513

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 10" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc.)
0'	124.5	Well Destruction: Pressure grout well 0-124.5' trimmie Grout, backfill neat cement

Total Depth of Boring 124.5 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fort Ord BRAC office - William Collins / EW. coordinator

Mailing Address PO Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	124.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed A. Arroyo C-57 Licensed Water Well Contractor 7-31-17 Date Signed 938110 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348516

Page 1 of 1

Owner's Well Number PZ-OU1-49-A1

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5302-PZ-OU1-49A1 Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 2" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	122.3'	WELL DESTRUCTION: Pressure grout well 0-122.3 trimmie grout, backfill w/ neat cement

Total Depth of Boring 122.3 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fortord Brac office, William Collins / ENV- coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	122.3	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] a. arrey. C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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File Original with DWR

State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0348514

Page 1 of 1

Owner's Well Number IW-OU1-02-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5298, IW-OU1-02-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ○ Vertical ○ Horizontal ○ Angle Specify

Drilling Method pressure grout 16" Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	133.5	Well Destruction: pressure grout well 0-133.5 trimmie grout, backfill w/neat cement

Total Depth of Boring 133.5 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Portola Base Office-William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	133.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed ____ (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page 1 of 1

Owner's Well Number MW-OU1-26-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5209, MW-OU1-26-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348533

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 5" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	102	Well Destruction: Pressure grout, trimmie grout w/neat cement

Total Depth of Boring 102 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortord Base office-William collins/ENV. coordinator

Mailing Address P.O. BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	102'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed C-57 Licensed Water Well Contractor Date Signed 7-31-17

938110 C-57 License Number

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348515

Page 1 of 1

Owner's Well Number MW-OU1-88-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5300, MW-OU1-88-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 4" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	122'	Well Destruction: Pressure grout well 0-122' trimmie grout, Backfill w/neat cmt.

Total Depth of Boring 122 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord Base office – William Collins / Env. coordinator

Mailing Address PO Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well

○ Modification/Repair

○ Deepen

○ Other

● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	122'	cement	

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING

Person, Firm or Corporation

120 S. 23RD STREET RICHMOND CA 94804

Address City State Zip

Signed [signature] C-57 Licensed Water Well Contractor

Date Signed 938110 C-57 License Number

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348534

Page 1 of 1

Owner's Well Number EW-OU1-49-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 530, EW-OU1-49-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc.)
0'	109.6	Well Destruction: Pressure grout, trimmie grout w/neat cement

Total Depth of Boring 109.6 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortord Env. office-William Collins/Env. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	109.6	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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Page 1 of 1

Owner's Well Number P2-OU1-49-A1

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number _____ Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348516

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify _____

Drilling Method Pressure grout 2" Drilling Fluid _____

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	122.3'	WELL DESTRUCTION: Pressure grout well 0-122.3 trimmie grout, backfill w/ neat cement

Total Depth of Boring 122.3 Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name Fort Ord Brac office, William Collins / ENV- coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord

City Marina County Monterey

Latitude _____ Deg. _____ Min. _____ Sec. N Longitude _____ Deg. _____ Min. _____ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long. _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other _____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	122.3	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed [signature] C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2008

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348535

Page 1 of 1

Owner's Well Number MW-OU1-B1e-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5303, MW-OU1-B1e-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	126'	Well Destruction: Pressure Grout 0-126', trimmie grout, w/neat cement

Total Depth of Boring 126 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord Brac office- William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	126	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed a. arroyo C-57 Licensed Water Well Contractor 7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348517

Page 1 of 1

Owner's Well Number MW-OU1-27-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5304, MW-OU1-27-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 5" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	89.8	Well Destruction: Pressure grout well 0-89.8' trimmie grout, Backfill w/neat cement

Total Depth of Boring 89.8 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord BRAC office, William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort Ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well

○ Modification/Repair

○ Deepen

○ Other

● Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply

☐ Domestic ☐ Public

☐ Irrigation ☐ Industrial

○ Cathodic Protection

○ Dewatering

○ Heat Exchange

○ Injection

○ Monitoring

○ Remediation

○ Sparging

○ Test Well

○ Vapor Extraction

○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	89.8	cement	

Attachments

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analyses

☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING

Person, Firm or Corporation

120 S. 23RD STREET RICHMOND CA 94804

Address City State Zip

Signed [signature] arroyo 7-31-17 938110

C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

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State of California
Well Completion Report

Refer to Instruction Pamphlet

No. e0348536

Owner's Well Number FW-OU1-72-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5305/EW-OU1-72-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description: Describe material, grain size, color, etc
0'	108.5	WELL DESTRUCTION: Pressure grout, trimmie grout Backfill w/neat cement Remove top 5'

Total Depth of Boring 108.5 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortord BRAC office - William Collins / ENV. coordinator

Mailing Address P.O. BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	108.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☒ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET RICHMOND CA 94804
Address City State Zip

Signed
C-57 Licensed Water Well Contractor

7-31-17
Date Signed

938110
C-57 License Number

DWR 188 REV 1/2006

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Well Completion Report

Refer to Instruction Pamphlet

No. e0348519

Page 1 of 1

Owner's Well Number MW-MW-84-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5306, MW-MW-84-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 4" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	127'	Well Destruction: Pressure Grout 0-127' from via Grout Backfill w/neat cement

Total Depth of Boring 127' Feet

Total Depth of Completed Well Feet

Well Owner

Name Former Brat office-William collins/Env. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	127'	Cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET RICHMOND CA 94804
Address City State Zip

Signed [signature] 7-31-17 938110
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

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State of California
Well Completion Report
Refer to Instruction Pamphlet
No. e0348537

Page 1 of 1
Owner's Well Number MW-OU1-83-A
Date Work Began 7-11-17   Date Work Ended 7-19-17
Local Permit Agency Monterey
Permit Number S307, MW-OU1-83-A   Permit Date 5-30-17

DWR Use Only – Do Not Fill In
State Well Number/Site Number
N Latitude   W Longitude
APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify ____
Drilling Method Pressure grout 4"   Drilling Fluid ____

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	123'	Well Destruction: pressure grout, trimmie grout Backfill w/neat cement Remove top 2'

Total Depth of Boring 123' Feet
Total Depth of Completed Well ____ Feet

Well Owner

Name Fort Ord Bra office - william collins / ENV. coordinator
Mailing Address P.O. Box 5008
City Monterey State CA Zip 93944

Well Location

Address former fort ord.
City Marina County Monterey
Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W
Datum ____ Dec. Lat. ____ Dec. Long. ____
APN Book ____ Page ____ Parcel ____
Township ____ Range ____ Section ____

Location Sketch
(Sketch must be drawn by hand after form is printed.)
North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity
○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses
○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well
Depth to first water ____ (Feet below surface)
Depth to Static Water Level ____ (Feet) Date Measured ____
Estimated Yield * ____ (GPM) Test Type ____
Test Length ____ (Hours) Total Drawdown ____ (Feet)
*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	123'	cement	

Attachments
☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site Map
Attach additional information, if it exists.

Certification Statement
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief
Name CASCADE DRILLING
Person, Firm or Corporation
120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)
Signed [signature] C-57 Licensed Water Well Contractor   Date Signed 7-31-17   C-57 License Number 938110

DWR 188 REV. 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348520

Page 1 of 1

Owner's Well Number MW-OU1-82-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey county Health Dept.

Permit Number 5308, MW-OU1-82-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number: ____ N ____ W

Latitude / Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify ____

Drilling Method Pressure Grout 4" Drilling Fluid ____

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	123'	Well Destruction: Pressure grout
		0-123' tremmie grout
		Backfill w/neat cement

Total Depth of Boring 123' Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Ord Military Community office, William Collins/Env. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord

City Marina County Monterey

Latitude ____ Deg. ____ Min. ____ Sec. N Longitude ____ Deg. ____ Min. ____ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
  ○ Deepen
  ○ Other ____
● Destroy
  Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
  ☐ Domestic ☐ Public
  ☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	123'	Cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed [signature] A. Arroyo (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV 1/2006

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348538

Page 1 of 1

Owner's Well Number MW-OU1-50-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5309, MW-OU1-50-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number: ______

Latitude ______ N Longitude ______ W

APN/TRS/Other: ______

Geologic Log

Orientation: ● Vertical ○ Horizontal ○ Angle Specify ______

Drilling Method: Pressure grout 4" Drilling Fluid ______

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	111.2	Well Destruction: Pressure grout, tremmie grout Backfill w/ neat cement Remove top 2'

Total Depth of Boring 111.2 Feet

Total Depth of Completed Well ______ Feet

Well Owner

Name fortord base office-william collins / env. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former fort ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ______ Dec. Lat. ______ Dec. Long. ______

APN Book ______ Page ______ Parcel ______

Township ______ Range ______ Section ______

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

- ○ New Well
- ○ Modification/Repair
  - ○ Deepen
  - ○ Other ______
- ● Destroy
  Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

- ○ Water Supply
  - ☐ Domestic ☐ Public
  - ☐ Irrigation ☐ Industrial
- ○ Cathodic Protection
- ○ Dewatering
- ○ Heat Exchange
- ○ Injection
- ○ Monitoring
- ○ Remediation
- ○ Sparging
- ○ Test Well
- ○ Vapor Extraction
- ○ Other ______

Water Level and Yield of Completed Well

Depth to first water ______ (Feet below surface)

Depth to Static Water Level ______ (Feet) Date Measured ______

Estimated Yield * ______ (GPM) Test Type ______

Test Length ______ (Hours) Total Drawdown ______ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	111.2	cement	

Attachments

- ☐ Geologic Log
- ☐ Well Construction Diagram
- ☐ Geophysical Log(s)
- ☐ Soil/Water Chemical Analyses
- ☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120 S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed [signature] (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348521

Page 1 of 1

Owner's Well Number D2-DW1-02-A1

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5310, D2-DW1-02-A1 Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	137'	Well Destruction: Pressure grout well 0-137' trimmie grout, Backfill w/neat cement

Total Depth of Boring 137 Feet

Total Depth of Completed Well ____ Feet

Well Owner

Name Fortord Base office, William Collins/ENV. coordinator

Mailing Address PO. BOX 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ____ Dec. Lat. ____ Dec. Long. ____

APN Book ____ Page ____ Parcel ____

Township ____ Range ____ Section ____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ____

Water Level and Yield of Completed Well

Depth to first water ____ (Feet below surface)

Depth to Static Water Level ____ (Feet) Date Measured ____

Estimated Yield * ____ (GPM) Test Type ____

Test Length ____ (Hours) Total Drawdown ____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	137'	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemistry Analyses
☑ Other Site Map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET RICHMOND CA 94804
Address City State Zip

Signed A. Arroyo 7-31-17 938110
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348659

Page 1 of 1

Owner's Well Number MW-OU1-46-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5311, MW-OU1-46-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify ______

Drilling Method Pressure grout 5" Drilling Fluid ______

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	105'	Well Destruction: Pressure grout
		5" well - 105', trimmie grout
		Backfill w/neat cement
		Remove top 2'

Total Depth of Boring 105' Feet

Total Depth of Completed Well ______ Feet

Well Owner

Name Fort Ord BRAC Office William Collins/ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address Former Fort Ord.

City Marina County Monterey

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum ______ Dec. Lat. ______ Dec. Long. ______

APN Book ______ Page ______ Parcel ______

Township ______ Range ______ Section ______

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other ______
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other ______

Water Level and Yield of Completed Well

Depth to first water ______ (Feet below surface)

Depth to Static Water Level ______ (Feet) Date Measured ______

Estimated Yield * ______ (GPM) Test Type ______

Test Length ______ (Hours) Total Drawdown ______ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	105	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120S. 23RD STREET RICHMOND CA 94804
Address City State Zip

Signed Rick Alcartado [signature] 7-31-17 938110
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348522

Page 1 of 1

Owner's Well Number MW-OU1-59-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 5312-MW-OU1-59-A Permit Date 5-30-17

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure Grout 10" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	103.7'	Well Destruction - Pressure grout well 0-103.7' trimmie grout, backfill w/neat cement

Total Depth of Boring 103.7' Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name Fort Ord Base office, William Collins/ENV. coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord

City Marina County Monterey

Latitude ___ Deg ___ Min ___ Sec N Longitude ___ Deg ___ Min ___ Sec W

Datum _____ Dec. Lat. _____ Dec. Long _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other _____
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	103.7'	Cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed A. Arroyo C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348660

Page 1 of 1

Owner's Well Number IW-OU1-73-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey county Health Dept.

Permit Number 5313, IW-OU1-73-A Permit Date

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Pressure grout 6" Drilling Fluid

Depth from Surface Feet	to Feet	Description (Describe material, grain size, color, etc)
0'	126'	Well Destruction: Pressure grout, trimmie grout Backfill w/neat cement Remove top 2'

Total Depth of Boring 126. Feet

Total Depth of Completed Well Feet

Well Owner

Name Fort Ord BRAC Office - William Collins / Env. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort Ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North / West / East / South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	126	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING (Person, Firm or Corporation)

120S. 23RD STREET (Address) RICHMOND (City) CA (State) 94804 (Zip)

Signed Rick Alcartado (C-57 Licensed Water Well Contractor) 7-31-17 (Date Signed) 938110 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

Page 1 of 1

Owner's Well Number IW-OU1-74-A

Date Work Began 7-11-17 Date Work Ended 7-19-17

Local Permit Agency Monterey County Health Dept.

Permit Number 534, IW-OU1-74-A Permit Date 5-30-17

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0348523

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method pressure grout tc Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0'	119.5'	Well Destruction: pressure grout 0-119.5', trimmie grout, Backfill w/neat cement

Total Depth of Boring 119.5 Feet

Total Depth of Completed Well Feet

Well Owner

Name Fortord Base office - William Collins / ENV. Coordinator

Mailing Address P.O. Box 5008

City Monterey State CA Zip 93944

Well Location

Address former Fort ord.

City Marina County Monterey

Latitude Deg. Min. Sec. N Longitude Deg. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book Page Parcel

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

○ New Well
○ Modification/Repair
○ Deepen
○ Other
● Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
☐ Domestic ☐ Public
☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0'	119.5	cement	

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Site map

Attach additional information, if it exists

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name CASCADE DRILLING
Person, Firm or Corporation

120 S. 23RD STREET Address RICHMOND City CA State 94804 Zip

Signed D. Arroyo C-57 Licensed Water Well Contractor

7-31-17 Date Signed

938110 C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

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ATTACHMENT B-2

BIOLOGICAL MONITORING DURING WELL DESTRUCTION

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Denise Duffy & Associates, Inc.

PLANNING AND ENVIRONMENTAL CONSULTING

MEMORANDUM

Date: **Friday, August 11, 2017**

To: **Roy Evans, HydroGeoLogic, Inc.**

From: **Matthew Johnson, Senior Environmental Scientist, Denise Duffy and Associates, Inc.**

RE: **Summary Memorandum for the Operable Unit 1 Fort Ord Natural Reserve Environmental Monitoring in Support of 2017 Deconstruction Activities**

Denise Duffy and Associates, Inc. (DD&A) was contracted to provide biological services within the Fort Ord Natural Reserve (FONR), in support of the decommissioning and destruction of 33 well sites within the FONR and the associated groundwater treatment facility. DD&A reviewed the baseline biological survey and other historic surveys to determine the quantity and specific location(s) of any threatened or endangered plants and animals within the planned well destruction and treatment plant decommissioning areas; this review was performed prior to the onset of any intrusive activities. DD&A used this information to identify potential impacts from the proposed activities, if any, at each well site that could result in failure to comply with the guidance presented in the Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord, California (USACE 1997) and the Programmatic Biological Opinion (PBO) for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (USFWS, 2015 and USFWS, 2017).

Before well destruction began, DD&A identified and marked-off potential access routes and acceptable work area boundaries, as necessary, to maintain personnel and vehicles in designated work areas and limit access to protected areas. On the first day of well destruction, DD&A conducted a briefing to the well destruction field crew to inform them of the habitat protection requirements and procedures that must be followed, as well as other topics as needed to ensure the work is performed in accordance with the 2015/16 PBO, HMP, and site-specific guidance and direction from University of California, Santa Cruz (UCSC) staff. The briefing included descriptions of the species of concern that are known to be or potentially present within the work area and appropriate encounter protocols. The briefing included protocols to be followed for encounters with rare wildlife, such as California tiger salamander (*Ambystoma californiense*) and black legless lizard (*Anniella pulchra nigra*).

Following the briefing, the DD&A biologist remained onsite during a majority of the first day of the well destruction effort to observe work practices and provide guidance/direction as needed to ensure the work proceeded in compliance with the identified guidance documents. After the well destruction effort and before demobilization, DD&A inspected the well sites, the deconstructed groundwater treatment facility site, and access routes to identify any potential damage and/or absence of damage to rare plant populations or associated habitats. Finally, DD&A prepared this summary report presenting the actions taken and observations made during the well destruction effort.

The field activities, which included the destruction of multiple wells in the FONR groundwater remediation system, were initiated on July 11, 2017, and were completed on July 18, 2017. The following is a summary of specific monitoring events and communication by DD&A personnel during well destruction activities at FONR. The summary below documents communication and meetings with staff from UCSC FONR and HGL, as well as construction oversight by the DD&A environmental monitor. DD&A staff was present on-site, as needed and as summarized below. DD&A's environmental monitor took pictures documenting construction impact areas after the completion of the well destruction effort. A map for each photograph and a photographic record compiled by the DD&A environmental monitor is included in Attachment A. The map included in Attachment A also includes site locations that will be referred to throughout this text.

- DD&A environmental monitor conducted an initial site visit on July 11, 2017. During the initial site visit DD&A environmental monitor participated in the construction initiation meeting. This meeting included a worker education on special-status species and contact protocol for all construction personnel expected to be involved in FONR well destruction activities. Additionally, the DD&A environmental monitor surveyed the construction site with HGL, FONR staff, and construction personnel to outline any environmental issues that may arise as part of the planned effort. Prior to the initiation of well destruction, the DD&A environmental monitor surveyed all the wells scheduled for destruction and mapped rare plants. the DD&A environmental monitor also flagged access routes when it was necessary to avoid specific resources. the DD&A environmental monitor inspected each well with the drilling crew responsible for well destruction and instructed them on how to avoid the sensitive natural resources.

- The DD&A environmental monitor conducted a site visit on July 12, 2017. The DD&A environmental monitor conferenced with HGL staff to ensure environmental compliance and inspected the well destruction and vegetation removal activities. The DD&A environmental monitor inspected the construction site to ensure all practices discussed during the worker education training were applied onsite.

- The DD&A environmental monitor conducted a site visit on July 14, 2017. The DD&A environmental monitor discussed vegetation removal with HGL Field Supervisor. The DD&A environmental monitor observed a coast live oak tree limb along main access corridor. Discussed measures with HGL Field Supervisor and drilling crew and reiterated the need for caution with overhanging branches and the excavator arm when driving along access routes between well sites. HGL Field Supervisor informed the FONR Steward of the damage to the coast live oak. The FONR Steward indicated that he would return to the location and properly trim the limb so that no additional impacts would arise in the future. No additional mitigation was necessary. DD&A environmental monitor discussed work progress with HGL Field Supervisor.

- The DD&A environmental monitor conducted a site visit on July 17, 2017. Environmental monitor discussed work progress with HGL Field Supervisor and observed ongoing activities.

- The DD&A environmental monitor conducted a final site visit on July 18, 2017. During this site visit the DD&A environmental monitor visited and photographed the construction site. Photos of each deconstructed well site have been appended to this report (Attachment A).

Monitoring efforts were concluded on July 18, 2017. All well destruction activities were conducted with an emphasis on minimal impact and consistent with the HMP and PBOs. The 2017 field activities at OU-1 FONR followed all recommendations and requirements of the UCSC FONR staff that were discussed during the construction initiation meeting.

References

U.S. Army Corps of Engineers [USACE], 1997. Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord, California. April. BW-1787.

U.S. Fish and Wildlife Service [USFWS]. 2015. Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (8-8-09-F-74) (2015 Biological Opinion). May 28. AR# BW-2747.

_____2017. Reinitiation of Formal Consultation for Cleanup and property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California (Original Consultation #8-8-09-F-74, 81440-2009-F-0334). June 7. AR# BW-2747A.

Attachment A
OU-1 Fort Ord Natural Reserve Site Photos

Document Path: F:\GIS\GIS_Projects\2646 OU1 Rare Plant\Final Products\2017 Report\Attachment A Photo Map.mxd

Date: 8/10/2017

DD&A

Attachment A OU1 FONR 2017 Photo Map

Photo 1. FONR OU-1 Well Sites EW-OU1-66-A, MW-OU1-67-A, MW-OU1-58-A, EW-OU1-62-A, and MW-OU1-68-A Prior to Destruction. (July 11, 2017)

Photo 2. OU-1 FONR Well Sites EW-OU1-66-A, MW-OU1-67-A, MW-OU1-58-A, EW-OU1-62-A, and MW-OU1-68-A After Destruction. (July 18, 2017)

Photo 3. OU-1 FONR Well Sites MW-OU1-61-A, EW-OU1-60-A, MW-OU1-57-A, and EW-OU1-63-A Prior to Destruction. (July 11, 2017)

Photo 4. OU-1 FONR Well Sites MW-OU1-61-A, EW-OU1-60-A, MW-OU1-57-A, and EW-OU1-63-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 5. OU-1 FONR Well Site MW-OU1-50-A Prior to Destruction. (July 11, 2017)

Photo 6. OU-1 FONR Well Site MW-OU1-50-A After Destruction. (July 18, 2017)

Photo 7. OU-1 FONR Well Site MW-OU1-59-A Prior to Destruction. (July 11, 2017)

Photo 8. OU-1 FONR Well Site MW-OU1-59-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 9. OU-1 FONR Well Site MW-OU1-82-A Prior to Destruction. (July 11, 2017)

Photo 10. OU-1 FONR Well Site MW-OU1-82-A After Destruction. (July 18, 2017)

Photo 11. OU-1 FONR Well Site MW-OU1-83-A Prior to Destruction. (July 11, 2017)

Photo 12. OU-1 FONR Well Site MW-OU1-83-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 13. OU-1 FONR Well Sites MW-OU1-46-A & MW-OU1-46-AD Prior to Destruction. (July 11, 2017)

Photo 14. OU-1 FONR Well Sites MW-OU1-46-A & MW-OU1-46-AD After Destruction. (July 18, 2017)

Photo 15. OU-1 FONR Well Site MW-OU1-84-A Prior to Destruction. (July 11, 2017)

Photo 16. OU-1 FONR Well Site MW-OU1-84-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 17. OU-1 FONR Well Site IW-OU1-74-A Prior to Destruction. (July 11, 2017)

Photo 18. OU-1 FONR Well Site IW-OU1-74-A After Destruction. (July 18, 2017)

Photo 19. OU-1 FONR Well Site IW-OU1-73-A Prior to Destruction. (July 11, 2017)

Photo 20. OU-1 FONR Well Site IW-OU1-73-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 21. OU-1 FONR Well Site MW-OU1-85-A Prior to Destruction. (July 11, 2017)

Photo 22. OU-1 FONR Well Site MW-OU1-85-A After Destruction. (July 18, 2017)

Photo 23. OU-1 FONR Well Site EW-OU1-72-A Prior to Destruction. (July 11, 2017)

Photo 24. OU-1 FONR Well Site EW-OU1-72-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 25. OU-1 FONR Well Site MW-OU1-27-A Prior to Destruction. (July 11, 2017)

Photo 26. OU-1 FONR Well Site MW-OU1-27-A After Destruction. (July 18, 2017)

Photo 27. OU-1 FONR Well Site EW-OU1-71-A Prior to Destruction. (July 11, 2017)

Photo 28. OU-1 FONR Well Site EW-OU1-71-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 29. OU-1 FONR Well Site MW-OU1-86-A Prior to Destruction. (July 11, 2017)

Photo 30. OU-1 FONR Well Site MW-OU1-86-A After Destruction. (July 18, 2017)

Photo 31. OU-1 FONR Well Sites PZ-OU1-49-A1 and EW-OU1-49-A Prior to Destruction. (July 11, 2017)

Photo 32. OU-1 FONR Well Sites PZ-OU1-49-A1 and EW-OU1-49-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 33. OU-1 FONR Well Site MW-OU1-87-A Prior to Destruction. (July 11, 2017)

Photo 34. OU-1 FONR Well Site MW-OU1-87-A After Destruction. (July 18, 2017)

Photo 35. OU-1 FONR Well Site MW-OU1-88-A Prior to Destruction. (July 11, 2017)

Photo 36. OU-1 FONR Well Site MW-OU1-88-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 37. OU-1 FONR Well Site MW-OU1-26-A Prior to Destruction. (July 11, 2017)

Photo 38. OU-1 FONR Well Site MW-OU1-26-A After Destruction. (July 18, 2017)

Photo 39. OU-1 FONR Well Sites PZ-OU1-10-A1 and IW-OU1-10-A Prior to Destruction. (July 11, 2017)

Photo 40. OU-1 FONR Well Sites PZ-OU1-10-A1 and IW-OU1-10-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 41. OU-1 FONR Well Sites IW-OU1-02-A and PZ-OU1-02-A1 Prior to Destruction. (July 11, 2017)

Photo 42. OU-1 FONR Well Sites IW-OU1-02-A and PZ-OU1-02-A1 After Destruction. (July 18, 2017)

Photo 43. OU-1 FONR Well Site EW-OU1-52-A Prior to Destruction. (July 11, 2017)

Photo 44. OU-1 FONR Well Site EW-OU1-52-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

Photo 45. OU-1 FONR Well Site EW-OU1-53-A Prior to Destruction. (July 11, 2017)

Photo 46. OU-1 FONR Well Site EW-OU1-53-A After Destruction. (July 18, 2017)

OU-1 FONR 2017 Well Deconstruction Site Photos

July 2017

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ATTACHMENT B-3

FIELD DOCUMENTATION

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DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
01	**07/11/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

Pressure grouted wells listed below.

Removed protective housing and pulled pumps from: EW-OU1-60A and EW-OU1-66A.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17		
MW-OU1-58-A	7-11-17		
MW-OU1-61-A	7-11-17		
MW-OU1-68-A	7-11-17		
EW-OU1-60-A	7-11-17		
EW-OU1-66-A	7-11-17		
Totals			

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent	1		HGL Vehicles	3	
CQCSM/HSO	1		Drillers trucks	3	
Assoc. Scientist			Trailers	1	
Sub-Contractors			Backhoe		
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller					
Drillers Helper					
Cal Safety-sub to National					
DDA					
Total Hours					

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions

Photographs

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/11/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
02	**07/12/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.
2) Removed protective housing and pulled pumps from: EW-OU1-62A and EW-OU1-63A.
3) Removed GAC from four GAC vessels. GAC was transported off site for regeneration.
4) Began removing piping and electrical components from the Northwest Treatment System.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17		
EW-OU1-62-A	7-12-17		
EW-OU1-63-A	7-12-17		
Totals			

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent	1		HGL Vehicles	3	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager	1		Trailers	1	
Sub-Contractors			Backhoe	2	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA	1				
Ultra Environmental	2				
Total Hours					

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions

Photographs

Photo 01 – Removing bollards and surface completion.

Photo 02 – Removing GAC from vessels.

Photo 03 – Seven super sacks of GAC removed from vessels.

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/12/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
03	**07/13/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.
2) Removed protective housing and pulled pumps and/or piping from: MW-OU1-64AD, IW-OU1-73A and IW-OU1-74A.
3) Continued disassembling the Northwest Treatment System.
4) Removed injection vault in grassland area and backfilled hole with surrounding soil. Smoothed surface to blend with surrounding grade.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17		
MW-OU1-46-AD	7-13-17		
MW-OU1-46-A	7-13-17		
MW-OU1-84-A	7-13-17		
IW-OU1-74-A	7-13-17		
IW-OU1-73-A	7-13-17		
Totals			

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent	1		HGL Vehicles	3	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager	1		Trailers	1	
Sub-Contractors			Backhoe	2	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA					
Ultra Environmental	2				
Total Hours					

HGL

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions

Photographs

Photo 01 – Removing protective housing at MW-OU1-46-AD.

Photo 02 – Disassembling NWTS.

Photo 03 – Pulling injection pipe at IW-OU1-73-A.

Photo 04 – Grassland Surface After Treated Water Infiltration Vault Removed

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/13/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number
W912DY-10-D-0023 CM 11

UPC/Project Title and Location of Work
OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING

CQC Report Number`
04

Date or Time Period
07/14/2017

Contractor
HydroGeoLogic
11107 Sunset Hills Rd, Suite 400
Reston, VA 20190 (703) 478-5186

Weather Conditions:

Temp Low: 50 °F
Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.
2) Removed protective housing and pulled pumps and/or piping from: MW-OU1-85A.
3) Completed decommissioning the Northwest Treatment System, except for re-wiring to maintain lights and power. All tanks and equipment hauled off site for disposal.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17	7-14-17	7-14-17
MW-OU1-46-AD	7-13-17	7-14-16	7-14-16
MW-OU1-46-A	7-13-17	7-14-16	7-14-16
MW-OU1-84-A	7-13-17	7-14-16	7-14-16
IW-OU1-74-A	7-13-17	7-14-16	7-14-16
IW-OU1-73-A	7-13-17	7-14-16	7-14-16
MW-OU1-27-A	7-14-16		
EW-OU1-72-A	7-14-16		
MW-OU1-82-A	7-14-16		
MW-OU1-50-A	7-14-16		
MW-OU1-59-A	7-14-16		
MW-OU1-85-A	7-14-16		
Totals			

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent	1		HGL Vehicles	3	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager	1		Trailers	1	
Sub-Contractors			Backhoe	2	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	3				
Cal Safety-sub to National					
DDA	1				
Ultra Environmental	2				
Total Hours					

HGL

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions

Photographs

Photo 01 – Removing holding tank at NWTS.

Photo 02 – Tanks loaded on truck for disposal.

Photo 03 – NWTS decommissioning complete.

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/14/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
05	**07/15/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.
2) Removed protective housing and pulled pumps and/or piping from: EW-OU1-71A and MW-OU1-87-A.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17	7-14-17	7-14-17
MW-OU1-46-AD	7-13-17	7-14-17	7-14-17
MW-OU1-46-A	7-13-17	7-14-17	7-14-17
MW-OU1-84-A	7-13-17	7-14-17	7-14-17
IW-OU1-74-A	7-13-17	7-14-17	7-14-17
IW-OU1-73-A	7-13-17	7-14-17	7-14-17
MW-OU1-27-A	7-14-17	7-15-17	7-15-17
EW-OU1-72-A	7-14-17	7-15-17	7-15-17
MW-OU1-82-A	7-14-17	7-15-17	7-15-17
MW-OU1-50-A	7-14-17	7-15-17	7-15-17
MW-OU1-59-A	7-14-17	7-15-17	7-15-17
MW-OU1-85-A	7-14-17	7-15-17	7-15-17
EW-OU1-71-A	7-15-17		
MW-OU1-87-A	7-15-17		
EW-OU1-49-A	7-15-17		
PZ-OU1-49-A1	7-15-17		
MW-OU1-86-A	7-15-17		
Totals			

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent			HGL Vehicles	1	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager			Trailers	1	
Sub-Contractors			Backhoe	2	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA					
Ultra Environmental					
Total Hours					

HGL

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions

Photographs

Photo 01 – Excavating to 5 ft bgs to remove casing at MW-OU1-27-A.

Photo 02 – Pressure grouting.

Photo 03 – Removing extraction pump.

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/15/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
06	**07/16/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.
2) Removed protective housing and pulled pumps and/or piping from: IW-OU1-10A.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17	7-14-17	7-14-17
MW-OU1-46-AD	7-13-17	7-14-17	7-14-17
MW-OU1-46-A	7-13-17	7-14-17	7-14-17
MW-OU1-84-A	7-13-17	7-14-17	7-14-17
IW-OU1-74-A	7-13-17	7-14-17	7-14-17
IW-OU1-73-A	7-13-17	7-14-17	7-14-17
MW-OU1-27-A	7-14-17	7-15-17	7-15-17
EW-OU1-72-A	7-14-17	7-15-17	7-15-17
MW-OU1-82-A	7-14-17	7-15-17	7-15-17
MW-OU1-50-A	7-14-17	7-15-17	7-15-17
MW-OU1-59-A	7-14-17	7-15-17	7-15-17
MW-OU1-85-A	7-14-17	7-15-17	7-15-17
EW-OU1-71-A	7-15-17	7-16-17	7-16-17
MW-OU1-87-A	7-15-17	7-16-17	7-16-17
EW-OU1-49-A	7-15-17	7-16-17	7-16-17
PZ-OU1-49-A1	7-15-17	7-16-17	7-16-17
MW-OU1-86-A	7-15-17	7-16-17	7-16-17
IW-OU1-10-A	7-16-17		
PZ-OU1-10-A1	7-16-17		
MW-OU1-26-A	7-16-17		
MW-OU1-88-A	7-16-17		
Totals			

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent			HGL Vehicles	1	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager			Trailers	1	
Sub-Contractors			Backhoe	2	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA					
Ultra Environmental					
Total Hours					

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions
(None)

Photographs

Photo 01 – Setting up to pressure grout.

Photo 02 – Wellhead fitting used to connect to air compressor after a well has been filled with grout.

Photo 03 – Mixing grout.

DAILY QUALITY CONTROL REPORT

ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/16/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
07	**07/17/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Pressure grouted wells and demolished surface competitions. Locations specified in the table below.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17	7-14-17	7-14-17
MW-OU1-46-AD	7-13-17	7-14-17	7-14-17
MW-OU1-46-A	7-13-17	7-14-17	7-14-17
MW-OU1-84-A	7-13-17	7-14-17	7-14-17
IW-OU1-74-A	7-13-17	7-14-17	7-14-17
IW-OU1-73-A	7-13-17	7-14-17	7-14-17
MW-OU1-27-A	7-14-17	7-15-17	7-15-17
EW-OU1-72-A	7-14-17	7-15-17	7-15-17
MW-OU1-82-A	7-14-17	7-15-17	7-15-17
MW-OU1-50-A	7-14-17	7-15-17	7-15-17
MW-OU1-59-A	7-14-17	7-15-17	7-15-17
MW-OU1-85-A	7-14-17	7-15-17	7-15-17
EW-OU1-71-A	7-15-17	7-16-17	7-16-17
MW-OU1-87-A	7-15-17	7-16-17	7-16-17
EW-OU1-49-A	7-15-17	7-16-17	7-16-17
PZ-OU1-49-A1	7-15-17	7-16-17	7-16-17
MW-OU1-86-A	7-15-17	7-16-17	7-16-17
IW-OU1-10-A	7-16-17	7-17-17	7-17-17
PZ-OU1-10-A1	7-16-17	7-17-17	7-17-17
MW-OU1-26-A	7-16-17	7-17-17	7-17-17
MW-OU1-88-A	7-16-17	7-17-17	7-17-17
MW-B-02-A	7-17-17		
EW-OU1-53-A	7-17-17		
EW-OU1-52-A	7-17-17		
IW-OU1-02-A	7-17-17		
PZ-OU1-02-A1	7-17-17		
Totals	**35**		

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent			HGL Vehicles	1	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager			Trailers	1	
Sub-Contractors			Backhoe	1	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA	1				
Ultra Environmental					
Total Hours					

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions
(None)

Photographs

Photo 01 –Pressure grouting EW-OU1-52-A.

Photo 02 – Setting up at MW-B-02-A.

Photo 03 – Grouting MW-B-02-A.

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/17/17

Site Superintendent _____ **Date** _____

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Contract Number / Delivery Order Number	UPC/Project Title and Location of Work
W912DY-10-D-0023 CM 11	**OU-1 WELL DESTRUCTION AND TREATMENT PLANT DECOMMISSIONING**

CQC Report Number`	Date or Time Period	Contractor
08	**07/18/2017**	**HydroGeoLogic** **11107 Sunset Hills Rd, Suite 400** **Reston, VA 20190 (703) 478-5186**

Weather Conditions:

Temp Low: 50 °F Temp High: 65 °F
Wind Speed: 5-10 mph

Quality Control Inspections Performed This Date (Include inspections, results, deficiencies observed and corrective action.)

Preparatory Phase Checklist:	**Yes**	**No**
Initial Phase Checklist:	**Yes**	**No**
Follow-up Phase Checklist:	**Yes**	**No**

Deficiencies noted and/or corrected this day (Include corrective action taken and anticipated date of correction).

None noted.

Sampling and Testing

Has field-testing been performed this date?	**Yes**	**No**	**NA**
Have data quality objectives been achieved?	**Yes**	**No**	**NA**

Notes: None

Health and Safety

Worker protection levels this date: **Level D**

Was any work activity conducted within a confined space?	**Yes**	**No**	
Was any work activity conducted within an area determined to be immediately dangerous to life and health?	**Yes**	**No**	
Were approved decontamination procedures used on workers and equipment as required?	**Yes**	**No**	**NA**

Safety Comments: **(Include any infractions of approved safety plan and include instructions from government personnel. Specify corrective action taken.)**

Work Activities Performed This Date

1) Demolished surface competitions. Locations specified in the table below.
2) Complete restoration activities at well locations.
3) Equipment and roll off bins picked up. All well destruction activities are complete.
4) Demob from site.

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Well ID	Grouted	Surface Demolished	Complete
MW-OU1-67-A	7-11-17	7-12-17	7-12-17
MW-OU1-58-A	7-11-17	7-12-17	7-12-17
MW-OU1-61-A	7-11-17	7-12-17	7-12-17
MW-OU1-68-A	7-11-17	7-12-17	7-12-17
EW-OU1-60-A	7-11-17	7-12-17	7-12-17
EW-OU1-66-A	7-11-17	7-12-17	7-12-17
MW-OU1-57-A	7-12-17	7-13-17	7-13-17
EW-OU1-62-A	7-12-17	7-13-17	7-13-17
EW-OU1-63-A	7-12-17	7-13-17	7-13-17
MW-OU1-83-A	7-13-17	7-14-17	7-14-17
MW-OU1-46-AD	7-13-17	7-14-17	7-14-17
MW-OU1-46-A	7-13-17	7-14-17	7-14-17
MW-OU1-84-A	7-13-17	7-14-17	7-14-17
IW-OU1-74-A	7-13-17	7-14-17	7-14-17
IW-OU1-73-A	7-13-17	7-14-17	7-14-17
MW-OU1-27-A	7-14-17	7-15-17	7-15-17
EW-OU1-72-A	7-14-17	7-15-17	7-15-17
MW-OU1-82-A	7-14-17	7-15-17	7-15-17
MW-OU1-50-A	7-14-17	7-15-17	7-15-17
MW-OU1-59-A	7-14-17	7-15-17	7-15-17
MW-OU1-85-A	7-14-17	7-15-17	7-15-17
EW-OU1-71-A	7-15-17	7-16-17	7-16-17
MW-OU1-87-A	7-15-17	7-16-17	7-16-17
EW-OU1-49-A	7-15-17	7-16-17	7-16-17
PZ-OU1-49-A1	7-15-17	7-16-17	7-16-17
MW-OU1-86-A	7-15-17	7-16-17	7-16-17
IW-OU1-10-A	7-16-17	7-17-17	7-17-17
PZ-OU1-10-A1	7-16-17	7-17-17	7-17-17
MW-OU1-26-A	7-16-17	7-17-17	7-17-17
MW-OU1-88-A	7-16-17	7-17-17	7-17-17
MW-B-02-A	7-17-17	7-18-17	7-18-17
EW-OU1-53-A	7-17-17	7-18-17	7-18-17
EW-OU1-52-A	7-17-17	7-18-17	7-18-17
IW-OU1-02-A	7-17-17	7-18-17	7-18-17
PZ-OU1-02-A1	7-17-17	7-18-17	7-18-17
Totals	**35**		

DAILY QUALITY CONTROL REPORT
ENVIRONMENTAL QUALITY CONTROL/QUALITY ASSURANCE REPORT

Manpower and Equipment

Labor Classification	Number	Hours	Equipment Type	Number	Hours Used
HGL					
Site Superintendent			HGL Vehicles	1	
CQCSM/HSO	1		Drillers trucks	3	
Project Manager			Trailers	1	
Sub-Contractors			Backhoe	1	
Cascade			Cal Safety truck		
Site Foreman/SSHO			Total Hours		
Driller	1				
Drillers Helper	2				
Cal Safety-sub to National					
DDA	1				
Ultra Environmental					
Total Hours					

Instructions given by the Government to the Contractor (Include names, reactions, and remarks.)

(None)

Work Progress	Were there any contractor-caused delays or potential finding of fact?	Yes	No
	Were there any government caused delays or potential finding of fact?	Yes	No
	Were there any unforeseeable or weather-related delays? NO		

Comments/Unusual Conditions
(None)

Photographs

Photo 01 – Roll off bin of construction debris picked up for disposal.

Photo 02 – Well destruction and restoration complete at EW-OU1-53-A.

Contractor's Verification: On behalf of the Contractor, I certify that this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the plans and contract requirements, to the best of my knowledge, except as may be noted above.

CQC System Manager Kevin Wierengo **Date** 7/18/17

Site Superintendent _____ **Date** _____

831-917-3242

Former Fort Ord OU-1 Calculated Grout Volume versus Actual Grout Volume

Well Identification	Date Demolition Complete	Well Diam. (in)	Known Total Depth (ft below TOC)	Measured Total Depth (ft below TOC)	Calculated Casing Volume (Gal)	Date of Initial Sealing Material	Volume of Sealing Material Placed (Gal)	Date of Final Sealing Material	Volume of Sealing Material Placed (Gal)	Total Volume of Sealing Material Placed (Gal)	Volume of Sealing Material Exceeds Volume of Well Casing and Screen?
Remaining Wells on the NW Boundary											
MW-OU1-67-A		4	102.3	102	66.8	7-10-17 @ 1050	105				
MW-OU1-57-A		6	95.5	91.0	140.3	7-12-17	205				
MW-OU1-58-A		6	102.8	96.5	151.0	7-11-17 @ 1245	245				
MW-OU1-61-A		4	96.5	96.2	63.0	7-11-17 @ 1505	100				
MW-OU1-68-A		4	103.8	103.5	67.8	7-11-17 10:15	135				
Marina Airport Property Well (1 Total)											
MW-B-02-A		6	80.0	75.00	117.5	7-17-17	190				
				76		*Extraction Wells (9 Total)*					
EW-OU1-60-A		6	95.7	95.2	140.6	7-11-17 @ 1600	225				
EW-OU1-62-A		6	100.9	100.4	148.2	7-12-17	230				
EW-OU1-63-A		6	91.5	91.0	134.4	7-12-17	220				
EW-OU1-66-A		6	101.6	101.1	149.2	7-11-17 @ 1405	230				
MW-OU1-46-AD		4	125.4	124.3	81.9	7-13-17	150				
EW-OU1-71-A		6	116.0	116.0	170.4	7-15-17	275				
IW-OU1-10-A		6	133.5	134.0	196.1	7-16-17	250				
MW-OU1-85-A		6	122.0	122.1	179.2	7-14-17	250				
MW-OU1-87-A		6	119.0	121.0	174.8	7-15-17	475				

Former Fort Ord OU-1 Calculated Grout Volume versus Actual Grout Volume

Well Identification	Date Demolition Complete	Well Diam. (in)	Known Total Depth (ft below TOC)	Measured Total Depth (ft below TOC)	Calculated Casing Volume (Gal)	Date of Initial Sealing Material	Volume of Sealing Material Placed (Gal)	Date of Final Sealing Material	Volume of Sealing Material Placed (Gal)	Total Volume of Sealing Material Placed (Gal)	Volume of Sealing Material Exceeds Volume of Well Casing and Screen?
Remaining FONR and Grassland Wells (20 Total)											
EW-OU1-53-A		6	131.1	134.5	192.6	7-17-17	250				
EW-OU1-52-A		6	124.5	114.5	182.9	7-17-17	275				
PZ-OU1-10-A1		2	116.5	116.5	19.0	7-16-17	65				
IW-OU1-02-A		6	133.5	128.0	196.1	7-17-17	225				
MW-OU1-26-A		5	102.0	102.0	104.0	7-16-17	170				
MW-OU1-88-A		4	122.0	122.0	79.6	7-16-17	250				
EW-OU1-49-A		6	109.6	108.5	161.0	7-15-17	225				
PZ-OU1-49-A1		2	122.3	121.5	20.0	7-15-17	50				
MW-OU1-86-A		6	126.0	126.0	185.1	7-15-17	350				
MW-OU1-27-A		5	89.8	85.0	91.6	7-14-17	225				
EW-OU1-72-A		6	108.5	111.0	159.4	7-14-17	250				
MW-OU1-84-A		4	127.0	130.5	82.9	7-13-17	320				
MW-OU1-83-A		4	123.0	123.0	80.3	7-13-17	150				
MW-OU1-82-A		4	123.0	123.0	80.3	7-14-17	125				
MW-OU1-50-A		4	111.2	110.0	72.6	7-14-17	125				
PZ-OU1-02-A1		6	137.0	130.0	201.2	7-17-17	275				
MW-OU1-46-A		5	105.0	105.0	107.1	7-13-17	365				
MW-OU1-59-A		6	103.7	106.0	152.3	7-14-17	225				
IW-OU1-73-A		6	126.0	126.5	185.1	7-13-17	325				
IW-OU1-74-A		6	119.5	120.0	175.5	7-13-17	250				

Notes:

Diam - diameter
ft - feet
Gal - gallon
in - inch
EW - extraction well
MW - monitoring well
OU - operable unit
TOC - top of casing

Enter information during field event

Former Fort Ord OU-1 Calculated Grout Volume versus Actual Grout Volume

Well Identification	Date Demolition Complete	Well Diam. (in)	Known Total Depth (ft below TOC)	Measured Total Depth (ft below TOC)	Calculated Casing Volume (Gal)	Date of Initial Sealing Material	Volume of Sealing Material Placed (Gal)	Date of Final Sealing Material	Volume of Sealing Material Placed (Gal)	Total Volume of Sealing Material Placed (Gal)	Volume of Sealing Material Exceeds Volume of Well Casing and Screen?
Remaining Wells on the NW Boundary											
MW-OU1-67-A	07/12/2017	4	102.3	102	66.8	7/11/2017	105	7/11/2017	N/A	105.0	YES
MW-OU1-57-A	07/13/2017	6	95.5	91.0	140.3	7/12/2017	205	7/12/2017	N/A	205.0	YES
MW-OU1-58-A	07/12/2017	6	102.8	96.5	151.0	7/11/2017	245	7/11/2017	N/A	245.0	YES
MW-OU1-61-A	07/12/2017	4	96.5	96.2	63.0	7/11/2017	100	7/11/2017	N/A	100.0	YES
MW-OU1-68-A	07/12/2017	4	103.8	103.5	67.8	7/11/2017	135	7/11/2017	N/A	135.0	YES
Marina Airport Property Well (1 Total)											
MW-B-02-A	07/18/2017	6	80.0	75.00	117.5	7/17/2017	190.0	7/17/2017	N/A	190	YES
Extraction Wells (9 Total)											
EW-OU1-60-A	07/12/2017	6	95.7	95.2	140.6	7/11/2017	225	7/11/2017	N/A	225.0	YES
EW-OU1-62-A	07/13/2017	6	100.9	100.4	148.2	7/12/2017	230	7/12/2017	N/A	230.0	YES
EW-OU1-63-A	07/13/2017	6	91.5	91.0	134.4	7/12/2017	220	7/12/2017	N/A	220.0	YES
EW-OU1-66-A	07/12/2017	6	101.6	101.1	149.2	7/11/2017	230	7/11/2017	N/A	230.0	YES
MW-OU1-46-AD	07/14/2017	4	125.4	124.3	81.9	7/13/2017	150	7/13/2017	N/A	150.0	YES
EW-OU1-71-A	07/16/2017	6	116.0	116.0	170.4	7/15/2017	275	7/15/2017	N/A	275.0	YES
IW-OU1-10-A	07/17/2017	6	133.5	134.0	196.1	7/16/2017	250	7/16/2017	N/A	250	YES
MW-OU1-85-A	07/15/2017	6	122.0	122.1	179.2	7/14/2017	250	7/14/2017	N/A	250.0	YES
MW-OU1-87-A	07/16/2017	6	119.0	121.0	174.8	7/15/2017	475	7/15/2017	N/A	475.0	YES
Remaining FONR and Grassland Wells (20 Total)											
EW-OU1-53-A	07/18/2017	6	131.1	134.5	192.6	7/17/2017	250	7/17/2017	N/A	250	YES
EW-OU1-52-A	07/18/2017	6	124.5	114.5	182.9	7/17/2017	275	7/17/2017	N/A	275	YES
PZ-OU1-10-A1	07/17/2017	2	116.5	116.5	19.0	7/16/2017	65	7/16/2017	N/A	65	YES
IW-OU1-02-A	07/18/2017	6	133.5	128.0	196.1	7/17/2017	225	7/17/2017	N/A	225	YES
MW-OU1-26-A	07/17/2017	5	102.0	102.0	104.0	7/16/2017	170	7/16/2017	N/A	170	YES
MW-OU1-88-A	07/17/2017	4	122.0	122.0	79.6	7/16/2017	250	7/16/2017	N/A	250	YES
EW-OU1-49-A	07/16/2017	6	109.6	108.5	161.0	7/15/2017	225	7/15/2017	N/A	225	YES
PZ-OU1-49-A1	07/16/2017	2	122.3	121.5	20.0	7/15/2017	50	7/15/2017	N/A	50	YES
MW-OU1-86-A	07/16/2017	6	126.0	126.0	185.1	7/15/2017	350	7/15/2017	N/A	350	YES
MW-OU1-27-A	07/15/2017	5	89.8	85.0	91.6	7/14/2017	225	07/14/2017	N/A	225	YES
EW-OU1-72-A	07/15/2017	6	108.5	111.0	159.4	7/14/2017	250	07/14/2017	N/A	250	YES
MW-OU1-84-A	07/14/2017	4	127.0	130.5	82.9	7/13/2017	320	7/13/2017	N/A	320	YES
MW-OU1-83-A	07/14/2017	4	123.0	123.0	80.3	7/13/2017	150	7/13/2017	N/A	150	YES
MW-OU1-82-A	07/15/2017	4	123.0	123.0	80.3	7/14/2017	125	07/14/2017	N/A	125	YES
MW-OU1-50-A	07/15/2017	4	111.2	110.0	72.6	7/14/2017	125	07/14/2017	N/A	125	YES
PZ-OU1-02-A1	07/18/2017	6	137.0	130.0	201.2	7/17/2017	275	7/17/2017	N/A	275	YES
MW-OU1-46-A	07/14/2017	5	105.0	105.0	107.1	7/13/2017	365	7/13/2017	N/A	365	YES
MW-OU1-59-A	07/15/2017	6	103.7	106.0	152.3	7/14/2017	225	7/14/2017	N/A	225	YES
IW-OU1-73-A	07/14/2017	6	126.0	126.5	185.1	7/13/2017	325	7/13/2017	N/A	325	YES
IW-OU1-74-A	07/14/2017	6	119.5	120.0	175.5	7/13/2017	250	7/13/2017	N/A	250	YES

Notes:

Diam - diameter
ft - feet
Gal - gallon
in - inch
EW - extraction well
MW - monitoring well
OU - operable unit
TOC - top of casing

Enter information during field event

ATTACHMENT B-4

DESTRUCTION ACTIVITIES PHOTOGRAPHS

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NWTS DECOMMISSIONING ACTIVITIES

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Removing carbon from NWTS treatment vessel 20170712_094451

Carbon from NWTS in bags staged for transport to regeneration facility 20170712_144028

Removing treated water holding tank from NWTS containment basin 20170714_093942

Transporting treated water holding tank from NWTS 20170714_094024

Loading treated water holding tank for transport 20170714_094932

Influent and treated water holding tanks being loaded for transport 20170714_101028

First carbon vessel removed and staged for transport 20170714_104526

Remaining carbon vessels removed and staged for transport 20170714_104541

Infiltration trench pipe sealed with concrete 20170714_125759

NWTS containment basin after decommissioning 20170714_164405

Loading roll-off bin at staging area for transport to disposal facility 20170718_115923

TYPICAL WELL DESTRUCTION ACTIVITIES

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Utility clearance on northwest boundary road 20170710_151412

Setting tremie pipe before grouting 20170711_101136

Well sealing in progress 20170711_111319

Removing well housing and pipe on boundary well 20170711_141514

Removing pump from extraction well 20170711_142707

Pump removed from extraction well 20170711_143330

Well sealing operation equipment setup 20170711_151214

Mixing and pumping grout to seal well on northwest boundary 20170711_152623

Grout mixing setup 20170712_084443

Removing bollards at well site on northwest boundary 20170712_090055

Removing JOBOX type well housing 20170713_091802

Mixing and pumping grout to seal well in habitat area 20170714_132221

Removing well casing to 5 feet below ground 20170715_090044

TYPICAL CONDITIONS AT WELL LOCATIONS AFTER PROJECT DEMOBILIZATION

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Site condition after completing destruction and demobilization at well MW-OU1-57-A 20170718_110656

Site condition after completing destruction and demobilization at well MW-OU1-82-A 20170718_111533

Site condition after completing destruction and demobilization at well EW-OU1-66-A 20170718_112251

Site condition after completing destruction and demobilization at well MW-OU1-83-A 20170718_122402

Site condition after completing destruction and demobilization at well EW-OU1-72-A 20170718_123235

Site condition after completing destruction and demobilization at well MW-OU1-87-A 20170718_125026

Site condition after completing destruction and demobilization at well EW-OU1-52-A 20170718_131124

ATTACHMENT B-5

DEMOLITION DEBRIS DISPOSAL DOCUMENTATION

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Emailed 07-27-17

Destination Facility	Red Bluff		Profile Shipping Notes: (1) Red Bluff - RB and AC	Confirmation Number
Appointment Date / Time	7/27/2017		(2) Parker - RH, SH, NH, EX, AC (3) Exxon Mobil No.	12122
Parker Approval Signature			W20071AC Must be Shipped to Red Bluff	

SPENT CARBON SHIPMENT LOAD LIST MUST HAVE A CONFIRMATION NUMBER BEFORE TRUCK LEAVES YOUR WAREHOUSE.

Generator Name Site City	Profile #	Expiration Date	Job Number	Container Weight	Container Type	Container Qty	Comments
SMI Holdings Mountain View, CA	W130240AC-1	3/7/2018	51794035	2,400	drums	6	Aqua
Oakland Bulk Plant Oakland, CA	W170045AC	4/5/2019	51790445	5,100	bulk bag	3	Vapor
Michaels Pipe Serv Woodland, CA	W160137AC	8/29/2018		2,300	bulk bag	2	Aqua
Fritzche Army Marina, CA	W170078AC	6/29/2019	51776722	16,000	bulk bag	8	Aqua
Harper Lease Plans Eureka, CA	W170030AC	2.17/2019		400	drums	1	Aqua
KB McCarthy Eureka, CA	W170031AC	2/17/2019		400	drums	1	Aqua
AC1230C OAK INV. -AMERIPRIDE	FRESH	10BB	LOT#27916-L	10,000	bulk bag		10K fresh carbon

Requested Date / Time							
Requisition Approval Signature:							

Received 7-27-17

eVOQUA
WATER TECHNOLOGIES

CN# 12122
CT# 23587
200382

NON-HAZARDOUS MANIFEST

CONSIGNEE (TO):	SHIPPER (FROM):
eVOQUA WATER TECHNOLOGIES	1 Fritzsche Army Airfield - 001Plast
☐ 2523 Mutahar Street Parker, AZ 85344	2 3239 Imjin Rd Marina CA 93933
☒ 11711 Reading Road Red Bluff, CA 96080	
☐ 5375 S. Boyle Ave. Los Angeles, CA 90058	

JOB #: 3 51776722

NO. SHIPPING UNITS	TYPE*	DESCRIPTION	WEIGHT
4 5	5 BA	Spent Carbon - Non-Hazardous Waste	6 16,000#
		Not DOT Regulated Material	
		Circle One: AQUA VAPOR	
		Profile # 7 W170078AC Exp- 06/29/19	

CUSTOMER INFORMATION:

DATE:	PRINT NAME:	SIGNATURE:
8 7/12/17	9 Todd Arroyo	10

TRANSPORTER:

NAME OF CARRIER #1: Shawn White (Evoqua)	DATE: 11 7-12-17	SIGNATURE: 12
NAME OF CARRIER #2: 13 Ben's Truck	DATE: 14 7-27-17	SIGNATURE: 15 Lloyd Manry
RECEIVED BY (FULL NAME): 16 Fay Youngblood	DATE: 17 7-27-17	SIGNATURE: 18

1.) Name of Generator
2.) Generator site address
3.) Given job number
4.) Number of units being picked up
5.) Type of unit being picked up
6.) Total weight
7.) Profile number, MANDATORY
8.) Date of service and/or pick up performed
9.) Name of person signing for Generator
10.) Signature of person in box 9
11.) Same as box 8
12.) Signature of driver for Transporter #1
13.) Name of carrier transporting to Plant
14.) Date the load was picked up to go to the Plant
15.) Driver's signature for Transporter #2
16.) Full name of Receiving person
17.) Date received to Plant
18.) Signature of Receiving person

NON-HAZARDOUS MANIFEST

WHITE: THE PLANT YELLOW: TRANSPORTER #2 PINK: FILE GOLD: GENERATOR

Evoqua Water Technologies - Red Bluff
11711 Reading Road
Red Bluff, CA 96080

Telephone: (530) 527-2664
Facsimile: (530) 527-2109

July 27, 2017

,

This is to certify the following spent carbon received at Evoqua Water Technologies Carbon Reactivation facility was reactivated in accordance with applicable regulations:

Site Address:	Former Fort Ord NW Treatment System 3239 Imjin Road, Marina, CA
Profile Number:	W170078AC
Manifest Document Number:	23587
Date Of Receipt:	July 27, 2017
Container Quantity - Type:	8 - Bag
Reactivation Date:	07-27-2017

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations, I verify the information contained above is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification this information is true, accurate and complete.

Evoqua Water Technologies
EPA ID No. CAR000058784

Sincerely,

Bret Meyer
Plant Manager

EVOQUA WATER TECHNOLOGIES

2523 Mutahar Street - Box 3308 Parker, AZ 85344 AZD 982 441 263
11711 Reading Road Red Bluff, CA 96080 CAR 000 058 784

June 26, 2017

Consultant:

Roy Evans
HydroGeoLogic, Inc.
Phone: (720) 381-5591

FAX: (866) 757-3048

Generator Mailing Address:

(831) 242-7933
US Army
Presidio of Monterey
DPW-Haz Waste Office
Monterey, CA 93944-5005

The following Spent Carbon Profile has been approved for acceptance at Evoqua Water Technologies LLC:

Generator:	US Army
EPA ID:	CA7210020676
Site Address:	Former Fort Ord NW Treatment System 3239 Imjin Road Marina, CA 93933-
Waste Codes:	None No Waste Codes Per Generator
Carbon Type:	Aqueous
PH Range:	4.1 to 10.5
FL Range:	1 to 15
Profile Number:	W170078AC
Valid Through:	6/26/2019

Please feel free to call the undersigned at (928) 669-5758 if you have any questions.

Sincerely,

Evoqua Water Technologies LLC has all the necessary permits and licenses for the waste that has been characterized and identified by this profile.

Roy Provins
EHS Manager

Monte McCue
Director of Plant Operations

Evans, Roy

From: Jason Jefferson <JJefferson@ASMETALS.COM>
Sent: Thursday, July 27, 2017 3:54 PM
To: Evans, Roy
Subject: Former Fort Ord Tank Removal

Roy,
The following materials were removed from the former Fort Ord ground water treatment facility adjacent to Marina Airport on July 14, 2017 (2) 5,000 gal poly storage tanks, and (4) steel filter tanks. These units were removed and hauled by A&S Metals Recycling & Demolition to the A&S Metals recycling facility located at 11340 Commercial Parkway in Castroville, Ca to be mechanically processed into smaller pieces. From there the material is able to be shipper to a number of smelters either foreign or domestic .

Regards,

Jason Jefferson
Demolition Manager
11340 Commercial Parkway
PO Box 955
Castroville, Ca. 95012
Office: (831) 633-3379
Cell: (831) 970-9834
jjefferson@asmetals.com

From: kim@telemetrix.com [mailto:kim@telemetrix.com]
Sent: Monday, August 14, 2017 12:40 PM
To: Evans, Roy <revans@hgl.com>
Subject: Disposition of equipment

Roy,

All equipment removed from OU-1 site was e-wasted or disposed at the Monterey regional landfill.

Approximately 50 pounds of electronics were recycled at e-waste at the Monterey regional landfill.

Approximately 100 pounds of other equipment, wire, enclosures, and miscellaneous items were disposed at the landfill.

Kim

Kim Cohan
Telemetrix
3024 Owen Ave
Marina, CA 93933
kim@telemetrix.com