Final
4th Five-Year Review Report for Fort Ord Superfund Site Monterey County, California

September 2017

Prepared by

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Signature Sheet for 4th Five-Year Review Report
For the Former Fort Ord

Signature Sheet for the 4th Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California.

William K. Collins — 9/8/17

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Thomas E. Lederle — 8 September 2017

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Date

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ACRONYMS AND ABBREVIATIONS

ACL	aquifer cleanup level
AOC	Administrative Order on Consent
AFCEC	Air Force Civil Engineer Center
Ahtna	Ahtna, Environmental Inc.
APC	armored personnel carriers
ARAR	Applicable or Relevant and Appropriate Requirements
Army	U.S. Department of the Army
AS	air sparge
ASR	Aquifer Storage Recovery
AST	above-ground storage tank
BACT	Best Available Control Technology
BCT	BRAC Cleanup Team
bgs	below ground surface
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
BTOC	below top of casing
Cal/EPA	California Environmental Protection Agency
CalAm	California American Water Company
CAMU	Corrective Action Management Unit
CAO	Cleanup and Abatement Order
CB&I	CB&I Federal Services LLC
CBR	chemical, biological, and radiological
CCCVC	California Central Coast Veterans Cemetery
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Chenega	Chenega Support Services
CHHSL	California Human Health Screening Levels
CIW	Community Involvement Workshop
CMC	Central Maritime Chaparral
COC	chemical of concern
COPC	contaminant of potential concern
CRUP	Covenant to Restrict Use of Property
CSU	California State University
CSUMB	California State University Monterey Bay
CT	carbon tetrachloride
CTS	California Tiger Salamander
cy	cubic yards
-DCA	-dichloroethane
-DCE	-dichloroethene
°C	degrees Celsius
DEH	Directorate of Engineering and Housing
DGM	digital geophysical mapping

ACRONYMS AND ABBREVIATIONS (Continued)

DMM	discarded military munitions
DO	dissolved oxygen
DoD	Department of Defense
DOL	Directorate of Logistics
DPR	California Department of Parks and Recreation
DRO	Del Rey Oaks
DTSC	California Department of Toxic Substances Control
EIS	Environmental Impact Statement
EISB	enhanced in situ bioremediation
ELAP	Environmental Laboratory Accreditation Program
EP	extraction points
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	Ecological Risk Assessment
ESCA	Environmental Services Cooperative Agreement
ESD	Explanation of Significant Differences
FAAF	Fritzsche Army Airfield
FDA	Fire Drill Area
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FONR	Fort Ord Natural Reserve
FORA	Fort Ord Reuse Authority
FOSET	Finding of Suitability for Early Transfer
FOST	Finding of Suitability to Transfer
FO-SVA	Fort Ord-Salinas Valley Aquitard
FS	Feasibility Study
GAC	granular activated carbon
gpm	gallons per minute
GRU	groundwater remedial unit
GST	Groundwater Statistics Tool
GWETS	groundwater extraction and treatment system
GWMP	groundwater monitoring program
GWTS	groundwater treatment system
GWTP	groundwater treatment plant
HA	historical area
HCPP	hydraulic control pilot project
HE	high explosive
HGL	HydroGeoLogic, Inc.
HGV	Health Guidance Value
HHRA	human health risk assessment
HLA	Harding Lawson Associates
HMP	Habitat Management Plan
HMX	cyclotetramethylene tetranitramine
HRP	habitat restoration plan
HTW	hazardous and toxic waste

ACRONYMS AND ABBREVIATIONS (Continued)

IA	Interim Action
IAROD	Interim Action Sites ROD
IC	Institutional Controls
IRP	Installation Restoration Program
IRIS	Integrated Risk Information System
ISD	insufficient data
ITSI	Innovative Technical Solutions, Inc.
lbs/day	pounds per day
LLDPE	linear-low density polyethylene
LOD	limit of detection
LTM	long-term monitoring
LUC	land use controls
LUCI	land use control implementation
LUCIP	Land Use Control Implementation Plan
MACTEC	MACTEC Engineering and Consulting, Inc.
MAROS	Monitoring and Remediation Optimization System
MBARD	Monterey Bay Air Resources District
MCL	maximum contaminant level
MD	munitions debris
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MGSTP	Main Garrison Sewage Treatment Plant
MK	Mann-Kendall
mm	millimeter
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
MODFLOW	MODFLOW 2000 Version 1.19.01 Software
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MPC	Monterey Peninsula College
MPWMD	Monterey Peninsula Water Management District
MRA	Munitions Response Area
MRS	Munitions Response Site
MRWPCA	Monterey Regional Water Pollution Control Agency
NCA	non-completed area
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
No.	number
ng/L	nanograms per liter
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRMA	natural resource management area
NTCRA	non time-critical removal action
NTU	nephelometric turbidity units
NWTS	Northwest Treatment System

ACRONYMS AND ABBREVIATIONS (Continued)

OE	ordnance and explosives
OEHHA	California Office of Environmental Health Hazard Assessment
OF	outfall
O&M	operations and maintenance
OMP	Operations and Maintenance Plan
ORP	oxidation/reduction potential
OU	Operable Unit
OUCTP	Operable Unit Carbon Tetrachloride Plume
PCE	tetrachloroethene
PFC	Perfluorinated Chemicals
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PG&E	Pacific Gas & Electric
PHA	Preliminary Health Advisories
POM	Presidio of Monterey
PRG	Preliminary Remediation Goal
PRHRA	Post-Remediation Health Risk Assessment
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RACR	Remedial Action Completion Report
RAO	remedial action objective
RAGS	Risk Assessment Guidance for Superfund
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RDX	cyclotrimethylene trinitramine
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RORE/ITSI	RORE Innovative Solutions Joint Venture
RP	Remediation Program
RPI	Residential Protocol Implementation
RQA	Residential Quality Assurance
RRD	range-related debris
RSL	regional screening level
RWQCB	California Central Coast Regional Water Quality Control Board
SCA	Special Case Area
SCADA	Supervisory Control and Data Acquisition
SGCL	soil gas cleanup levels
SGRU	soil gas remedial unit
SG-SL	soil gas screening level
SPRR	Southern Pacific Railroad
SRU	soil remedial unit
SS/GS	SiteStat/GridStat
SSWP	Site-Specific Work Plan

ACRONYMS AND ABBREVIATIONS (Continued)

SVE	soil vapor extraction
SVETS	soil vapor extraction and treatment system
SVTU	soil vapor treatment unit
SWMU	Solid Waste Management Unit
TAMC	Transportation Agency for Monterey County
TCE	trichloroethene
TCRA	time-critical removal action
TM	Technical Memorandum
TNT	trinitrotoluene
TPH	total petroleum hydrocarbons
TPH-d	TPH as diesel
TPH-unknown	TPH as unknown origin
TTU	thermal treatment unit
UCL	upper confidence level
UCNRS	University of California Natural Reserve System
UCSC	University of California Santa Cruz
ug/dL	micrograms per deciliter
ug/L	micrograms per liter
ug/m3	micrograms per cubic meter
uS/cm	microsiemens per centimeter
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UU/UE	unlimited use and unrestricted exposure
UV-Ox	ultraviolet chemical oxidation
UXO	unexploded ordnance
VC	vinyl chloride
VFD	variable frequency drive
VOC	volatile organic compound
WGBA	Watkins Gate Burn Area
WWII	World War II

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EXECUTIVE SUMMARY

The United States Department of the Army (Army) has completed this 4th Five-Year Review of all in-place cleanup remedies for the Fort Ord Superfund Site in Monterey County, California. The 3rd Five-Year Review for Fort Ord was completed on September 25, 2012 (Army, 2012) and was the triggering action for this Five-Year Review.

Fort Ord served primarily as a training and staging facility for infantry troops beginning in 1917 until its deactivation in 1994. Activities conducted throughout the base, including industrial activities and military munitions training, have resulted in the identification of numerous sites where chemicals have been detected in soil and groundwater and munitions and explosives of concern (MEC) have been found in former munitions training areas.

Since 1986, the Army has been conducting investigation and cleanup actions at Fort Ord. Initially, the studies concentrated on identifying chemical contaminants in soil and groundwater, generally as a result of industrial and waste disposal activities. These sites constitute the Hazardous and Toxic Waste (HTW) sites at the former Fort Ord. In 1993, the Army also began investigating sites where MEC were suspected to be present. These Munitions Response Sites (MRSs) and Munitions Response Areas (MRAs) include approximately 12,000 acres of the former Fort Ord. These sites have been identified through archive searches, interviews, and visual inspections. The types of MEC found include, but are not limited to, artillery projectiles, rockets, hand grenades, land mines, pyrotechnics, bombs, demolition materials. The Military Munitions Response Program (MMRP) sites at Fort Ord are categorized according to MEC-related characteristics to expedite cleanup, reuse, and/or transfer of former Fort Ord property. According to this process, areas are assigned to Tracks 0 through 3.

The soil and groundwater cleanup, or HTW, sites and the MMRP Sites have been grouped into the remedial categories described below; Records of Decision (RODs) have been or are being developed for each site or group to specifically address the hazards. For each of sites included in this Five-Year Review, the effectiveness of their respective cleanup remedies has been evaluated, or an update on the status of the cleanup process has been provided. A brief summary of the general categories of sites and groups of sites, and definitions of the terms used in this Five-Year Review Report to describe these groupings follows.

- **No Action Sites** are those that require no action, either because no release of contaminants was identified at the site, or because the site activities are excluded under Superfund (e.g. underground storage tank remediation).
- **Interim Action (IA) Sites** are those that have contaminated soil with a limited volume and extent and, as a result, the soils were excavated as an interim action.
- **Remedial Investigation (RI) Sites** are those with complex problems that require long-term remediation, development of a risk assessment, and an assessment of the applicable or relevant and appropriate requirements for cleanup. A basewide RI sites ROD was developed to address these sites.
- **Operable Units (OUs)** are sites with complex cleanup remedial actions that are ongoing. These sites include: OU 1, the Fritzsche Army Airfield Fire Drill Area; OU 2, the Fort Ord Landfills; and the OU Carbon Tetrachloride Plume (OUCTP), the former vadose zone source area of carbon tetrachloride and associated groundwater plume. These OUs are supported by their own individual RODs.
- **MMRP Sites and Groups of Sites** have been undergoing munitions response actions designed to minimize the explosive safety risk to the public under designated future uses. In the interim, some restricted MRSs are fenced and warning signs are posted, while other areas have undergone sufficient evaluations to be released for unrestricted use. The MMRP sites are grouped into Tracks 0 through 3.

- **Environmental Services Cooperative Agreement (ESCA) Areas** - In connection with the early transfer of a portion of the former Fort Ord, the Fort Ord Reuse Authority (FORA) assumed some of the Army's cleanup obligations funded under an ESCA grant. Pursuant to the ESCA process, FORA is responsible for completion of response actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), except for those responsibilities retained by the Army, deemed necessary to protect human health and the environment under future uses. The land under the Finding of Suitability for Early Transfer (FOSET) 5 included approximately 3,300 acres. Remedial actions have been completed on approximately 2,135 acres and a total of approximately 1,206 acres have been transferred by FORA to local jurisdiction and universities.

A list of the sites and OUs evaluated in the 4th Five-Year Review (with the associated report Section numbers) and a summary of the results of the evaluation are provided below.

OU 1 - Fritzsche Army Airfield Fire Drill Area (Section 5.0): OU 1 is at the end of its remediation, and the regulatory agencies have approved an exit strategy and attainment monitoring program, and site closure is pending final approval. The technical assessment identified **no issues** affecting the protectiveness of the remedy at OU 1. The OU 1 remedy was deemed **protective** of human health and the environment based on the fact that the remedial action objectives (RAOs) stipulated in the 1995 ROD and the 2010 Explanation of Significant Differences (ESD) have been achieved. OU 1 will be eliminated from future Five-Year Reviews.

OU 2 - Fort Ord Landfills (Section 6.0): The OU 2 remedy is ongoing. Construction of a new groundwater treatment plant has been initiated and will replace the existing plant. The assessment has concluded that improved hydraulic capture and overall remedy effectiveness are anticipated outcomes from the new plant. The technical assessment identified **no issues** affecting the protectiveness of the remedy at OU 2. The remedy was deemed **protective** of human health and the environment. The ongoing remedial activities continue to adequately address all exposure pathways that could result in unacceptable risks.

Site 2 – Main Garrison Sewage Treatment Plant and Site 12 - Lower Meadow Disposal Area, Directorate of Logistics Automotive Yard, Cannibalization Yard, and Southern Pacific Railroad Spur (Section 7.1): The soil vapor and groundwater extraction/treatment systems are performing as intended. Opportunities for future system optimization are discussed in the section. The technical assessment identified **no issues** that affect current or future protectiveness of the Sites 2 and 12 remedy. The remedy was deemed **protective** of human health and the environment. The remedial activities that have been completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

Site 31 - Former East Garrison Dump Site (Section 7.3): The current remedy includes a land use restriction, which prohibits excavation, exposure of the soil, or residential development of the area. This remedy is functioning as intended. The technical assessment identified **no issues** for Site 31. The remedy at Site 31 was deemed **protective** of human health and the environment.

Site 39 - Inland Ranges (Section 7.4): The Site 39 remedy of excavation and onsite placement of contaminated soils at the OU 2 landfill beneath a cap is ongoing. This remedy is functioning as intended. The technical assessment identified **no issues** for Site 39. The overall remedy at Site 39 was deemed **protective** of human health and the environment. The long-term protectiveness at sites HA-18D and HA-23D for potential future residential development is being further evaluated as indicated in Section 7.3.8 of this Five-Year Review Report.

Site 33 - Golf Course Maintenance Facility (Section 7.7): The selected remedy for Site 33 is a deed restriction on the property prohibiting residential use. The technical assessment identified **no issues** for Site 33. The Site 33 remedy was deemed **protective** of human health and the environment; the remedy is consistent

with the designated uses for the property. Potential exposure pathways that could result in unacceptable risks are being controlled by the land use controls (LUCs).

Site 3 – Beach Trainfire Ranges, also known as MRS-22 (Section 8.0): The Army has completed the remedial action at Site 3 and the area is now a California State Park. The technical assessment identified **no issues** for Site 3. The remedy at Site 3 is **protective** of human health and the environment. Ecological monitoring indicates no adverse ecological impacts at the site. The LUCs and access restrictions in effect for the State Park continue to provide human health protection.

IA Sites - 21 soil excavation sites (Section 9.0): The Army has completed remedial actions at the IA Sites. The remedy included excavating, treating, recycling, and/or disposing of contaminated soil from IA areas, and backfilling the areas with clean soil. All 21 IA sites have received regulatory agency concurrence for No Further Action (NFA). The technical assessment identified **no issues** for the IA sites. The remedy for the IA Sites has performed as intended and has been deemed **protective** of human health and the environment. Regulatory concurrence of the confirmation reports and the results of the reevaluation of lead at the fourteen lead-impacted sites clarifies that the remedy has performed as intended, RAOs have been achieved, and the remedy remains protective of human health and the environment.

OUCTP (Section 10.0): The selected remedy for OUCTP includes: in-situ enhanced biodegradation (A-Aquifer); groundwater extraction and treatment (Upper 180-Foot Aquifer); and monitored natural attenuation with wellhead treatment contingency (Lower 180-Foot Aquifer). Additional components included in the ROD were institutional controls, such as deed restrictions for all aquifers (to prevent access to or use of the groundwater within the OUCTP area for any purpose until cleanup levels are met and to maintain the integrity of any current or future remedial or monitoring system including monitoring, extraction, and injection wells), and long-term monitoring. The remedy is ongoing and recommendations to improve performance, reduce costs, and increase likelihood of achieving cleanup goals are described in the section. The technical assessment identified **no issues** for OUCTP. The OUCTP remedy **will be protective** of human health and the environment upon completion. In the interim, ongoing remedial activities and groundwater use prohibitions continue to adequately address all exposure pathways that could result in unacceptable risks. Specific controls include groundwater prohibitions provided by Chapter 15.08 of Title 15, Monterey County Code, deed restrictions, and the CRUP.

Track 0 – No Action MR Areas (Section 11.0): The Track 0 ROD selected the No Action remedy based on the finding that there are no current or potential future risks to human health or the environment posed by MEC at Track 0 sites. The previous Five-Year Review Report identified **no issues** affecting the protectiveness of the remedy for Track 0 areas and recommended termination of the Track 0 areas from further reviews. Therefore, the Track 0 sites are not evaluated further in this Five-Year Review Report.

Track 1 - NFA MR Areas (Section 12.0): The selected remedy for the Track 1 sites is NFA, based on the results of the site-specific evaluations. The technical assessment identified **no issues** affecting the protectiveness of the remedy for Track 1 sites. The Track 1 remedy was deemed **protective** of human health and the environment. The NFA remedy allows for unrestricted use; therefore, Track 1 sites will be eliminated from future five-year reviews.

Track 2 - Parker Flats Munitions Response Area (Section 13.0): MEC sampling and removal actions have been conducted at the Track 2 Parker Flats MRA. The Final ROD documents the selected the remedy of LUCs to manage the risk to future land users from MEC that might potentially remain at the property. The technical assessment identified **no issues** in regard to the protectiveness of the remedy for the Parker Flats MRA. The remedy was deemed **protective** of human health and the environment. Protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.

Interim Action Sites Munitions Response - Ranges 43-48, Range 30A, and MRS-16 (Section 14.0): The selected remedies for the IA MRSs include (1) vegetation clearance via prescribed burning or mastication, (2) MEC remedial action via surface and subsurface MEC removal, and (3) detonation of MEC with engineering controls. Interim remedial actions have been completed at Ranges 43-48 to remove surface MEC and munitions debris (MD) from open and accessible areas. The technical assessment identified **no issues** in regard to the protectiveness of the remedy for the IA MRSs. The remedy is **protective** of human health and the environment. Selection of final remedies for the Interim Action sites has completed the interim action program. The Interim Action MR Sites will be eliminated from future Five-Year Reviews.

Track 3 - Impact Area Munitions Response Area (Section 15.0): The Impact Area MRA remedy is ongoing. The selected remedy includes: (1) vegetation clearance via prescribed burning or mastication; (2) technology-aided surface MEC removal; (3) subsurface MEC removal in selected areas; (4) a digital geophysical mapping (DGM) survey; and (5) LUCs. The technical assessment identified **no issues** affecting the protectiveness of the Impact Area MRA remedy. The remedy for the Track 3 Impact Area MRA **will be protective** of human health and the environment upon completion. In the interim, ongoing remedial activities, along with access controls, adequately address all exposure pathways that could result in unacceptable risks. Specific controls include: security patrols; munitions recognition and safety training for authorized personnel; fencing, gate, and signage upkeep; and annual monitoring.

Track 2 - Del Rey Oaks Munitions Response Area (Section 16.0): MEC investigation and removal activities have been completed for the Del Rey Oaks (DRO) MRA. The property was transferred to the City of Del Rey Oaks in 2005. Specific components of the selected remedy specified in the ROD included: munitions recognition and safety training; construction support in the 11-Grid Area; site-wide construction support (to be implemented by the City of Del Rey Oaks); and use restrictions. The Army has transferred some of the procedural responsibilities to the City of Del Rey Oaks, but retains ultimate responsibility for remedy integrity. The technical assessment identified **no issues** affecting the protectiveness of the Track 2 DRO MRA. The remedy is **protective** of human health and the environment. Remedial actions have been completed at the MRA. Furthermore, protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.

MRS-34 (Section 17.0): MEC removal actions were performed at MRS-34 using multiple detection technologies designed to address surface and subsurface MEC. All detected MEC items were removed or destroyed. The Fritzsche Army Airfield property, including the MRS-34 parcel, was transferred to the City of Marina in 2001 prior to the completion of the CERCLA process. The MRS-34 ROD was finalized in 2015 and specified that no further action was required. There are no use restrictions specified in the ROD, and no changes to protectiveness requirements are applicable. Based on the NFA status specified in the ROD, no subsequent five-year reviews are necessary for MRS-34.

BLM Area B and MRS-16 (Section 18.0): The majority of the property within BLM Area B was transferred to BLM in 1996 as a habitat reserve. MEC at MRS-16 was addressed in accordance with the remedy described in the IA MR ROD. The technical assessment identified **no issues** for BLM Area B and MRS-16. The BLM Area B and MRS-16 RI/FS was finalized in 2015; the Army has completed a 30-day public comment period for the Proposed Plan (Army, 2015) for the proposed remedy, and the final ROD was signed in May 2017. There are **no issues** affecting the protectiveness of the selected remedy. The remedy for BLM Area B and MRS-16 **will be protective** of human health and the environment upon implementation.

ESCA Areas – four groups, defined as Group 1, Group 2, Group 3, and Group 4 (Sections 19.0 through 22.0): The technical assessment identified **no issues** for the ESCA areas, although the RODs for the Group 1 and Group 4 areas are not yet completed. The remedy for the Group 2 and Group 3 areas were deemed **protective** of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled. The remedy for the Group 1 and Group 4 areas currently protects human health and

environment because land use restrictions are placed on the properties. However, in order for the remedy for these areas to be protective in the long term, a final ROD must be completed for Group 1 and Group 4.

Other Investigations (Section 23.0): Other investigations described in this Five-Year Review Report include: the Solid Waste Management Units (SWMU), the Comprehensive Basewide Range Assessment (BRA) Areas, and the Remaining Areas. No investigative sampling was needed for the SWMU sites, and most of the sites have been transferred for reuse. The ongoing Comprehensive BRA investigation evaluates the potential presence of metals and/or explosive compounds in soil at ranges and munitions training areas, and identifies HAs that require additional investigation or remediation. The Remaining Areas are undergoing investigations for potential explosives safety hazards. Previously generated Technical Memoranda for various sites, subsequent field investigation activities, and associated site assessments provided the basis for the remaining areas to be addressed as either Track 1 or Track 2 sites. A status update for these Other Investigations is included in the section.

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FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Fort Ord		
EPA ID: CA7210020676		
Region: 9	**State:** CA	**City/County:** Marina / Monterey

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: Other Federal Agency **If "Other Federal Agency" was selected above, enter Agency name:** U.S. Department of the Army
Author name (Federal or State Project Manager): William K. Collins
Author affiliation: U.S. Department of the Army
Review period: 10/1/2011 - 9/30/2016
Date of site inspection: 7/12/2016 through 10/17/16
Type of review: Statutory
Review number: 4
Triggering action date: 9/25/2012
Due date *(five years after triggering action date)*: 9/25/2017

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Five-Year Review Summary Form (Continued)

Issues/Recommendations		Protectiveness Statements
Issues and Recommendations Identified in the Five-Year Review and Sites/Operable Units (OUs) without Issues/Recommendations Identified in the Five-Year Review		
OU(s): Section 5: OU 1 — Fritzsche Army Airfield Fire Drill Area	There are no issues affecting the protectiveness of the remedy at OU 1.	*Protectiveness Statement:* **Protective**. The remedy at OU 1 is protective of human health and the environment. The remedial action objectives stipulated in the 1995 Record of Decision (ROD) and 2010 Explanation of Significant Differences (ESD) have been achieved.
OU(s): Section 6: OU 2 – Fort Ord Landfills	There are no issues affecting the protectiveness of the remedy at OU 2. Additionally, this assessment did not identify any unresolved issues previously raised by regulatory agencies, the community, or other interested parties.	*Protectiveness Statement:* **Protective**. The remedies at OU 2 are protective of human health and the environment. The ongoing remedial activities continue to adequately address all exposure pathways that could result in unacceptable risks. During the course of the remediation process, potential environmental and human health concerns are being addressed by mitigation measures, such as control and treatment of landfill gases. The soil vapor exposure pathway is being controlled by the on-going groundwater remedy (which includes soil gas extraction and granular activated carbon [GAC] treatment). Potential exposure pathways are also being controlled by the restrictions of Chapter 15.08 of Title 15, Monterey County Code, and the Covenant to Restrict Use of Property (CRUP).
OU(s): Section 7.1: Basewide Remedial Investigation (RI) Sites – Site 2 – Main Garrison Sewage Treatment Plant and Site 12 - Lower Meadow Disposal Area, Directorate of Logistics (DOL) Automotive Yard, Cannibalization Yard, and Southern Pacific Railroad Spur	This technical assessment did not identify any issues that affect current or future protectiveness of the Sites 2 and 12 groundwater remedy.	*Protectiveness Statement:* **Protective.** The remedies at Sites 2 and 12 are protective of human health and the environment. The remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas. Pathways are being controlled by groundwater use restrictions, modifications to the groundwater remedy (including soil vapor extraction and treatment), and the presence of Monterey County Ordinance 4011 and the CRUP.
OU(s): Section 7.2: Basewide RI Sites – Site 31 – Former East Garrison Dump Site	There are no issues affecting the protectiveness of the remedy at Site 31.	*Protectiveness Statement:* **Protective**. The remedy at Site 31 is protective of human health and the environment. The successful completion of the remedy establishes that the site is protective of human health and the environment. The land use restrictions incorporated into the Quitclaim Deed and CRUP apply to the entire site and run with the land ensuring protectiveness.
OU(s): Section 7.3: Basewide RI Sites – Site 39 – Inland Ranges	There are no issues affecting the protectiveness of the remedy at Site 39.	*Protectiveness Statement:* **Protective**. The overall remedy at Site 39 is protective of human health and the environment. The long-term protectiveness at sites Historical Area (HA)-18D and HA-23D for potential future residential development is being further evaluated as indicated in Section 7.3.8 of this Five-Year Review Report.

Issues/Recommendations		Protectiveness Statements
Issues and Recommendations Identified in the Five-Year Review and Sites/Operable Units (OUs) without Issues/Recommendations Identified in the Five-Year Review		
OU(s): Section 7.4: Basewide RI Sites – Site 33 - Golf Course Maintenance Area	There are no issues affecting the protectiveness of the remedy at Site 33.	*Protectiveness Statement:* **Protective**. The remedy at Site 33 is protective of human health and the environment. The remedy is protective and is consistent with the designated uses for the property. Potential exposure pathways that could result in unacceptable risks are being controlled by the land use controls (LUCs).
OU(s): Section 8: Site 3 – Beach Trainfire Ranges	There are no issues affecting the protectiveness of the remedy at Site 3.	*Protectiveness Statement:* **Protective**. The remedy at Site 3 is protective of human health and the environment. Ecological monitoring indicates no adverse ecological impacts at the site. The LUCs and access restrictions in effect for the State Park continue to provide human health protection.
OU(s): Section 9: Interim Action (IA) Sites – Contaminated Surface Soil Remediation	There are no issues affecting the protectiveness of the remedy at the IA Sites.	*Protectiveness Statement:* **Protective**. The remedy at the IA sites is protective of human health and the environment. Regulatory concurrence of the confirmation reports and the results of the reevaluation of lead at the fourteen lead-impacted sites clarifies that the remedy has performed as intended, RAOs have been achieved, and the remedy remains protective of human health and the environment.
OU(s): Section 10: Operable Unit Carbon Tetrachloride Plume (OUCTP)	There are no issues affecting the protectiveness of the remedy at OUCTP.	*Protectiveness Statement:* **Will be Protective.** The remedy at OUCTP is expected to be protective of human health and the environment upon completion. In the interim, ongoing remedial activities and groundwater use prohibitions continue to adequately address all exposure pathways that could result in unacceptable risks. Specific controls include groundwater prohibitions provided by Chapter 15.08 of Title 15, Monterey County Code, deed restrictions, and the CRUP.
OU(s): Section 12: Track 1 Sites	There are no issues affecting the protectiveness of the remedy at the Track 1 sites.	*Protectiveness Statement:* **Protective**. The remedy at the Track 1 sites is protective of human health and the environment. The No Further Action remedy allows for unrestricted use.
OU(s): Section 13: Track 2 Parker Flats Munitions Response Area (MRA)	Army Parcels: There are no unresolved issues in relation to parcels F2.6, L2.3, and L2.4.1 that have been identified in regard to the protectiveness of human health and the environment. Environmental Services Cooperative Agreement (ESCA) Parcels: No new issues affecting the protectiveness of the remedy at Parker Flats MRA Phase I have been identified.	*Protectiveness Statement:* **Protective**. The remedy for the Track 2 Parker Flats MRA is protective of human health and the environment. Remedial actions have been completed at the MRA. Furthermore, protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.

Issues/Recommendations		Protectiveness Statements
Issues and Recommendations Identified in the Five-Year Review and Sites/Operable Units (OUs) without Issues/Recommendations Identified in the Five-Year Review		
OU(s): Section 14: IA Munitions Response Sites (MRSs) - Ranges 43-48, Range 30A, and MRS-16	There are no issues affecting the protectiveness of the IA Sites MR ROD remedy.	*Protectiveness Statement:* **Protective.** The remedy at the IA MRSs is protective of human health and the environment. Selection of final remedies for the three Interim Action sites, Ranges 43-48, Range 30A, and MRS-16, has completed the interim action program under the 2002 IA Sites MR ROD. The interim action MR sites will not be reviewed again in future five-year reviews.
Section 15: Track 3 Impact Area MRA	There are no issues affecting the protectiveness of the Track 3 Impact Area MRA remedy.	*Protectiveness Statement:* **Will be Protective.** The remedy at the Track 3 Impact Area MRA is expected to be protective of human health and the environment upon completion. In the interim, ongoing remedial activities, along with access controls, adequately address all exposure pathways that could result in unacceptable risks. Specific controls include: security patrols; munitions and explosives of concern (MEC) recognition and safety training for authorized personnel; fencing, gate, and signage upkeep; and annual monitoring.
OU(s): Section 16: Track 2 Del Rey Oaks (DRO) MRA	There are no issues affecting the protectiveness of the Track 2 DRO remedy.	*Protectiveness Statement:* **Protective**. The remedy at the DRO MRA is protective of human health and the environment. Remedial actions have been completed at the MRA. Furthermore, protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.
Section 18: BLM Area B and MRS-16	There are no issues affecting the protectiveness of the selected remedy.	*Protectiveness Statement:* **Will be Protective.** The remedy for BLM Area B and MRS-16 is expected to be protective of human health and the environment upon implementation.
OU(s): Section 20: ESCA Group 2	There are no issues affecting the protectiveness of the remedy at the ESCA Group 2 California State University Monterey Bay (CSUMB) Off-Campus MRA.	*Protectiveness Statement:* **Protective.** The remedy at the ESCA Group 2 areas is protective of human health and the environment. Potential exposure pathways that could result in unacceptable risks are being controlled.
OU(s): Section 21: ESCA Group 3	There are no issues affecting the protectiveness of the remedy at the ESCA Group 3 areas which include the Del Rey Oaks/Monterey MRA, Laguna Seca Parking MRA, and Military Operations in Urban Terrain (MOUT) Site MRA.	*Protectiveness Statement:* **Protective.** The remedy at the ESCA Group 3 areas is protective of human health and the environment. Potential exposure pathways that could result in unacceptable risks are being controlled.

Acronyms used in Summary Table:

CA	California	ESD	Explanation of Significant Differences	MRA	Munitions Response Area
CRUP	Covenant to Restrict Use of Property	GAC	Granular activated carbon	MRS	Munitions Response Site
CSUMB	California State University Monterey Bay	HA	Historical Area	OU	Operable Unit
DOL	Directorate of Logistics	IA	Interim Action	OUCTP	Operable Unit Carbon Tetrachloride Plume
DRO	Del Rey Oaks	ID	identification	RI	Remedial Investigation
ESCA	Environmental Services Cooperative Agreement	MEC	munitions and explosives of concern	ROD	Record of Decision
EPA	U.S. Environmental Protection Agency	MOUT	Military Operations in Urban Terrain	U.S.	United States

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1.0 INTRODUCTION

The purpose of a five-year review is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them. This Five-Year Review Report was prepared in accordance with the United States (U.S) Environmental Protection Agency (EPA) *Comprehensive Five-Year Review Guidance* (EPA, 2001).

1.1 Five-Year Review Report Organization

This Five-Year Review Report is organized as follows:

Section 1 – Introduction. Describes the purpose and scope of this Five-Year Review Report and summarizes its organization.

Section 2 – Site Chronology Table. Summarizes the chronology of cleanup-related events at Fort Ord that are reviewed in this report.

Section 3 – Fort Ord Background. Describes the general physical characteristics and land uses, including land transfers, at Fort Ord; presents the history of contamination; summarizes the initial responses to the presence of contamination; and provides the basis for actions taken to address the contamination.

Section 4 – Five-Year Review Process. Summarizes the components of the 4th Five-Year Review process, including administrative and community involvement components; and describes the data review, site inspection, and interview procedures.

Sections 5 through 23 present background information for each site, or group of sites, or operable unit (OU) below (listed by section number and associated Record of Decision [ROD] document); provide summaries of remedial actions (RAs), technical assessments of the actions taken at the site(s), and progress since the last Five-Year Review Report was issued; identify any issues related to the protectiveness of the remedies based on the review; present recommendations and follow-up actions, if needed, to address any issues identified during the review; and provide protectiveness statements on a site-by-site basis.

Section 5 – OU 1 ROD - Fritzsche Army Airfield (FAAF) Fire Drill Area (FDA).

Section 6 – OU 2 ROD - Fort Ord Landfills.

Section 7 – Basewide Remedial Investigation (RI) Sites ROD, which includes the following sites:

- **7.1 Site 2 – Main Garrison Sewage Treatment Plant and Site 12 – Four Sub-Areas** (Site 2: Main Garrison Sewage Treatment Plant [MGSTP]; Site 12: Lower Meadow Disposal Area, Directorate of Logistics [DOL] Automotive Yard, Cannibalization Yard and Industrial Area, Southern Pacific Railroad [SPRR] Spur, and Outfall [OF]-31 Area)**.**
- **7.2 Site 31** (Former Dump Site)**.**
- **7.3 Site 39** (Inland Ranges; includes Sites 5 and 9)**.**
- **7.4 Site 33** (Golf Course Maintenance Area)**.**

Section 8 – Site 3 ROD (Beach Trainfire Ranges)**.**

Section 9 – Interim Action (IA) Sites ROD.

Section 10 – Operable Unit Carbon Tetrachloride Plume (OUCTP) ROD.

Section 11 – Track 0 ROD (No Action Military Munitions Response Program [MMRP] Sites)**.**

Section 12 – Track 1 ROD (No Further Action [NFA] MMRP Sites)**.**

Section 13 – Parker Flats Munitions Response Area (MRA), Track 2 ROD.

Section 14 – IA Sites MR ROD (Ranges 43-48, Range 30A, and Munitions Response Site [MRS]-16).

- Includes Environmental Services Cooperative Agreement (ESCA) IA Ranges MRA ROD.

Section 15 –- Impact Area MRA, Track 3 ROD.

Section 16 –- Del Rey Oaks (DRO) MRA, Track 2 ROD.

Section 17 – MRS-34 ROD.

Section 18 – Bureau of Land Management (BLM) Area B and MRS-16 (ROD signed in May 2017)**.**

Section 19 – ESCA Group 1 Areas (Remedial Investigation/Feasibility Study [RI/FS] Report finalized in May 2017; ROD is pending).

Section 20 – ESCA Group 2 ROD.

Section 21 – ESCA Group 3 ROD.

Section 22 – ESCA Group 4 Areas (RI/FS Report finalized in June 2017; ROD is pending).

Section 23 – Status of Other Investigations (areas not addressed under one of the RODs above).

- **23.1 Solid Waste Management Units (SWMUs)**.
- **23.2 Comprehensive Basewide Range Assessment (BRA).**
- **23.3 Remaining Areas** (Remaining RI/FS Areas for Munitions Response)**.**

Section 24 – Next Five-Year Review.

2.0 SITE CHRONOLOGY TABLE

The table below presents a summary of the chronology of cleanup-related events at Fort Ord.

Event	Date
Pre-National Priorities List (NPL) Responses	
FAAF FDA Investigation (later referred to as OU 1)	1984
Fort Ord Landfills Investigation (later referred to as OU 2)	1986
NPL Listing	2/1990
Federal Facility Agreement (FFA)	7/1990
Base Realignment and Closure (BRAC) Listing	7/1991
IA Sites ROD	3/1994
OU 2, Fort Ord Landfills, ROD	8/1994
No Action Sites Proposed Plan and ROD	4/1995
OU 1 FAAF FDA ROD	9/1995
OU 2 Explanation of Significant Differences (ESD) #1	8/1995
Basewide RI/FS Report	10/1995
OU 2 ESD #2	8/1996
OU 2 ESD #3	1/1997
Interim ROD, Site 3 Beach Trainfire Ranges	1/1997
Basewide RI Sites ROD	1/1997
ROD, Disposal and Reuse Supplemental Environmental Impact Statement	6/1997
Ordnance and Explosives (OE) RI/FS Technical Memorandum (TM), Track 0	1/2000
No Action MR Proposed Plan, Track 0	2/2000
IA MR RI/FS Report for Ranges 43-48, Range 30A, and MRS-16	3/2002
IA MR Proposed Plan for Ranges 43-48, Range 30A, and MRS-16	3/2002
No Action MR ROD, Track 0	6/2002
IA MR ROD for Ranges 43-48, Range 30A, and MRS-16	9/2002
Site 39 ESD	12/2003
Track 1 MR RI/FS Report	6/2004
NFA Proposed Plan, Track 1 Sites	9/2004
NFA ROD for Track 1 Sites and for Site 3 (MRS-22) with monitoring	3/2005
Track 0 ESD	4/2005
Post-Decision Proposed Plan, IA MR ROD for MRS-16	1/2006
OU 2 ESD #4	8/2006
OUCTP Proposed Plan	5/2006
Track 2 Parker Flats MRA MR RI/FS Report	8/2006
Comprehensive BRA Report	11/2006
Track 2 Parker Flats MRA Proposed Plan	2/2007
Track 3 Impact Area MRA RI/FS Report	6/2007
Track 3 Impact Area MRA MR Proposed Plan	6/2007
Amendment 01 to the 1990 FFA	7/2007
Track 2 MR RI/FS Report DRO MRA	8/2007
Track 2 MR Proposed Plan, DRO MRA	8/2007
OUCTP ROD	2/2008
FS Addendum, Site 39 Ranges	3/2008
Site 39 Proposed Plan	4/2008
Track 3 Impact Area MRA ROD	5/2008
Track 2 Parker Flats MRA ROD	8/2008
Track 2 DRO MRA ROD	11/2008
Comprehensive BRA Report, Revision 1	6/2009
Site 39 ROD Amendment	9/2009

OU 1 ESD #1	8/2010
Comprehensive BRA Report, Revision 2	1/17/2012
Memorandum for Record, ROD Remedy Optimization for OU 1	3/29/2012
Final RI/FS Report, ESCA Group 3, DRO / Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain (MOUT) Site MRAs	7/31/2012
Final MR RI, Track 2, MRS-34, FAAF Area	9/28/2012
Final RI/FS Report, ESCA Group 2, California State University at Monterey Bay (CSUMB) Off-Campus MRA	2/18/2013
Proposed Plan, Track 2 MR RI, NFA is Proposed for MRS-34, FAAF	5/28/2013
Proposed Plan, ESCA Group 2 RI/FS Report, RA is Proposed for CSUMB Off-Campus MRA	6/5/2013
Army Memorandum to document non-significant post-ROD change to selected remedy for OU 2	11/13/2014
Final ROD, ESCA Group 3, DRO / Monterey, Laguna Seca Parking, and MOUT Site MRAs	11/25/2014
Final (revised) Remedial Action Completion Report (RACR), Site 39 Inland Ranges Habitat Reserve	12/11/2014
Final ROD, ESCA Group 2, CSUMB Off-Campus MRA	2/26/2015
Final Interim RACR, ESCA IA Ranges MRA Phase II	1/28/2015
Final RI/FS Report Addendum, Sites 2 and 12	2/27/2015
Final Proposed Plan, ESCA IA Ranges MRA	3/14/2015
Proposed Plan for Track 2, BLM Area B and MRS 16 MR RI/FS Report	4/8/2015
Final Revision 2 RI/FS Report, Track 2, BLM Area B and MRS-16	5/6/2015
Final ROD, Track 2 MRS-34, FAAF Area	9/3/2015
Final Focused FS, ESCA IA Ranges MRA	10/23/2015
Draft RI/FS Report, ESCA Group 1, Seaside and Parker Flats (Phase II) MRAs	12/18/2015
Final Supplement Number (No.) 1, RI/FS Report Addendum, Sites 2 and 12, Michael's and Recreational Equipment Inc. retail stores Investigation at Site 12	1/29/2016
ESD No. 1 to the Basewide RI Sites ROD	2/16/2016
Draft RI/FS Report, ESCA Group 4, Future East Garrison MRA	2/26/2016
Letter Regarding Legal Opinion on new Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) EPA Health Advisory for OU 1 from Regional Water Quality Control Board (RWQCB)	8/19/2016
ESCA IA Ranges MRA ROD	1/18/2017
Letter from EPA to the Army regarding concurrence with the recommendation for OU 1 site closure without additional sampling or remediation of PFOA and PFOS	2/21/2017
ROD for BLM Area B and MRS-16	3/9/2017
Final RI/FS for ESCA Group 1 MRA	5/4/2017
Final RI/FS for ESCA Group 4 MRA	6/21/2017

3.0 FORT ORD BACKGROUND

This subsection describes the general physical characteristics and land uses at Fort Ord, the history of contamination, initial responses to the presence of contamination, and the basis for actions taken to address the contamination.

3.1 Physical Characteristics

Fort Ord is a former base run by the U.S. Department of Army (Army) adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and DRO to the south, and the city of Marina to the north. Highway 1 passes through the western part of Fort Ord, separating the beachfront portions from the rest of the base. Laguna Seca Recreation Area and Toro Regional Park also border Fort Ord to the south and southeast, respectively, and several small communities are located along Highway 68.

3.1.1 History

Beginning in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. The Army originally bought the present day East Garrison and nearby lands on the east side of Fort Ord in 1917 to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey (POM). No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1938, additional agricultural property was purchased for the development of the Main Garrison. At the same time, the beachfront property was donated to the Army. The Main Garrison was constructed between 1940 and the 1960s, starting in the northwestern corner of the base and expanding southward and eastward. During the 1940s and 1950s, an area within the Main Garrison was utilized as a small airfield. In the early 1960s, construction of the FAAF was completed. The smaller Main Garrison airfield was then decommissioned, and its facilities were redeveloped as motor pools and other facilities.

From 1947 to 1974, Fort Ord was a basic training center. The 7th Infantry Division was activated at Fort Ord on 21 October 1974. The 7th Infantry Division was converted to a light division in 1983. Light infantry troops operate without heavy tanks, armor, or artillery. In 1991, Fort Ord was selected for closure; the post was officially closed in 1994. RIs and cleanup actions at the former Fort Ord have been performed and documented since 1986.

3.2 Land Use

Fort Ord consists of both developed and undeveloped land. The three principal developed areas at the time of base closure in 1994 were the East Garrison, the FAAF, and the Main Garrison; these areas collectively comprised approximately 8,000 acres. The remaining 20,000 acres are largely undeveloped. Land uses in both the developed and undeveloped areas are described below.

3.2.1 Developed Land

Developed areas at Fort Ord resembled a medium-sized city during its active history, with family housing, medical facilities, warehouses, office buildings, industrial complexes, and gas stations. In 1991, there were 14,372 active duty military personnel and 3,855 civilian employees (based on the *Final Fort Ord Disposal and*

Reuse Environmental Impact Statement [EIS; Army, 1993]). Individual land use categories within developed areas were as follows:

- Residential areas included military housing, such as training and temporary personnel barracks, enlisted housing, and officer housing.
- Local services/commercial areas provided retail or other commercial services, such as gas stations, mini-markets, post exchange, commissary, and fast food facilities.
- Military support/industrial areas included industrial operations, such as motor pools, machine shops, a cannibalization yard (where serviceable parts are removed from damaged vehicles), and the FAAF.
- Mixed land use areas combined residential, local services/commercial, and military support operations.
- Schools included the Thomas Hayes Elementary, Roger S. Fitch Junior High, General George S. Patton Elementary, and Gladys Stone schools. High school students attended Seaside High, just outside Fort Ord's southwestern boundary.
- Hospital facilities included the Silas B. Hayes Army Hospital, medical and dental facilities, and a helipad.
- Training areas included a central running track and athletic field, firing ranges, and obstacle courses.
- Recreational areas included a golf course and club house, baseball diamonds, tennis courts, gymnasiums, and playgrounds.

The three principal developed areas are described below and shown on Plate 1.

East Garrison: The East Garrison is in the northeastern side of the base, adjacent to undeveloped training areas. Military/industrial support areas at the East Garrison included tactical vehicle storage facilities, defense recycling and disposal areas, a sewage treatment plant, and a small arms range. The East Garrison also contained recreational open space, including primitive camping facilities, baseball diamonds, a trap and skeet range, and tennis courts. Recreational open space comprised 25 of the approximately 350 acres of the East Garrison.

Fritzsche Army Airfield: The former FAAF is in the northern portion of Fort Ord, on the north side of Reservation Road and adjacent to the city limits of Marina. The primary land use was for military/industrial support operations. Facilities included runways, a motor park, aircraft fuel facilities, a sewage treatment plant, aircraft maintenance facilities, an air traffic control tower, a fire and rescue station, and aircraft hangars.

Main Garrison: Highway 1 separates Fort Ord's Main Garrison from the coastal zone. The Main Garrison consisted of a combination of the various land use categories. Facilities included schools; a hospital; housing; commercial facilities, including a dry cleaner and a gasoline service station; and industrial operations, including motor pools and machine shops; military services, military units, offices, and barracks.

3.2.2 Undeveloped Land

The undeveloped portions of the Fort Ord occur primarily in their natural state and typically do not contain developed facilities. Two undeveloped areas include:

Coastal Zone: A system of sand dunes lies between Highway 1 and the shoreline. There is an abrupt drop in elevation of 40 to 70 feet at the western edge of the dunes. On the gentler, eastern slopes, the dunes reach an elevation of 140 feet above mean sea level. The dunes provide a buffer zone that isolated the Beach Trainfire Ranges (RI Site 3) from the shoreline to the west. In some areas, spent ammunition accumulated on the dune

slopes as the result of years of range operation. Based on the presence of rare, threatened, and/or endangered species and because of its visual attributes, Monterey County has designated Fort Ord's coastal zone an environmentally sensitive area. In accordance with its planned reuse, the area of the former Beach Trainfire Ranges is now a State park called Ford Ord Dunes State Park. The park consists of hiking trails, campgrounds, and ancillary facilities.

Inland Areas: Undeveloped land in the inland portions of Fort Ord included infantry training areas and open areas used for livestock grazing and recreational activities, such as hunting, fishing, and camping. A large portion of this undeveloped land is occupied by the former Inland Trainfire Ranges (part of Site 39); this area was used for advanced military training operations. The proposed future use of most of the Inland Ranges will be as a natural resource management area (NRMA) and as habitat reserve areas. Public access will be restricted in this area, which will be managed by the U.S. Department of the Interior, BLM.

3.2.3 Transferred Land

Over 19,000 acres of former Fort Ord property have been transferred. Parcel sizes ranged from 0.1 acre to over 4,900 acres (see Plate 10, Property Transfer Status Map). The major property recipients have been the BLM, California State Parks, CSUMB, Fort Ord Reuse Authority (FORA), the University of California, the City of Marina, and the City of Seaside. Table 1 lists parcels transferred as of September 30, 2016.

3.2.3.1 Early Transfer Associated with Environmental Services Cooperative Agreement

The early transfer of a portion of the Former Fort Ord Army Base, pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120(h)(3)(C), was requested by FORA in a letter dated May 18, 2005. Under CERCLA Section 120(h)(3), the United States is required to provide a covenant in the deed conveying the property warranting that all RAs necessary to protect human health and the environment has been taken before the date of transfer. CERCLA Section 120(h)(3)(C) authorizes the U.S. EPA Administrator, with the concurrence of the Governor of the State in which the Federal facility is located, to defer the CERCLA Covenant that requires all necessary RA to be completed before Federal property at facilities listed on the NPL is transferred. The United States will provide the warranty after transfer of the property when all of the response actions necessary to protect human health and the environment have been completed.

In 2007, approximately 3,300 acres of property at Fort Ord were transferred to FORA by quitclaim deed under the authority provided by CERCLA Section 120(h)(3)(C) under the *Finding of Suitability for Early Transfer* (FOSET 5; Army, 2007b). In accordance with the ESCA, FORA is responsible for all response actions on the Early Transfer Property (defined in the FFA Amendment No. 1 [Army et al., 2007]) except for "Army Obligations" as defined in the FFA Amendment No. 1 (Army et al., 2007).

Response actions have been completed with regulatory agency concurrence on approximately 2,135 acres of the approximately 3,300 acres transferred to FORA. Response actions have been completed on the remaining approximately 1,165 acres; however, the actions are currently under regulatory agency review. Approximately 1,160 acres (3 whole and 5 partial United States Army Corps of Engineers [USACE] property transfer parcels) have been transferred by FORA to Monterey County, Monterey Peninsula College (MPC), the State of California, and the City of Seaside, after receiving regulatory closure. Approximately 702 acres of FORA's property have final RODs and are in the process of final documentation to support transfer. Final ROD was signed in January 2017 for an additional approximately 227 acres of FORA's property.

3.3 History of Contamination

The Army began conducting RI and cleanup actions at Fort Ord in 1986. Initially, the studies concentrated on identifying chemical contaminants in soil and groundwater which resulted from industrial and waste disposal activities. In 1993, the Army also began investigating sites where munitions and explosives of concern (MEC) were suspected to be present by performing archive searches, interviews, and visual inspections. The history of contamination is discussed on a site-by-site basis in Sections 5.0 through 23.0.

3.4 Initial Responses

After completion of the initial phase of RI/FS field work, the 43 Installation Restoration Program (IRP) sites at Fort Ord were categorized by the level and complexity of the contamination associated with each site. Sites were identified as IA sites if they had a limited volume and extent of contaminated soil and, as a result, could be easily excavated as an IA; sites were identified as RI sites if they had sufficient contamination to warrant a full RI, Baseline Risk Assessment, Ecological Risk Assessment (ERA), and FS. The individual IA and RI sites are each supported by their own RODs. In addition, two OUs at Fort Ord (OU 1, the FAAF FDA, and OU 2, the Fort Ord Landfills) were supported by their own RODs. Individual RODs were also generated for OUCTP, Site 3, and Site 39. Locations of the sites and OUs are shown on Plate 2.

3.5 Munitions Response

The Army has been investigating and cleaning up MRSs at Fort Ord since 1993. Seven separate RODs were prepared between 2002 and 2015 to address MRSs. Identified MRSs were categorized into Tracks 0 through 3 based on similar MEC-related characteristics to expedite cleanup, reuse, and/or transfer of the property. A No Action MR ROD was signed in September 2002 for the Track 0 areas. Also in 2002, an IA MR ROD was signed for Ranges 43-48, Range 30A, and MRS-16 (formerly known as Site OE-16). A NFA ROD for Track 1 sites and ecological monitoring at Site 3 (MRS-22) was signed in April 2005. Three RODs were prepared for Track 2 Areas: the Track 2 Parker Flats MRA ROD was signed in August 2008, the Track 2 DRO MRA ROD was signed in November 2008, and the Track 2 MRS-34, FAAF MR ROD was signed in September 2015. The Track 3 Impact Area MRA ROD was signed in May 2008. The Track 2 ROD for BLM Area B and MRS-16 was signed in May 2017. Appendix D provides a glossary of MMRP terms.

3.5.1 Environmental Services Cooperative Agreement

The Army and FORA entered into an ESCA (Army, 2007a), under which the Army provided funds for FORA to conduct all response actions (except for those responsibilities the Army has retained) and to obtain regulatory closure for the ESCA properties. Subsequently, an Administrative Order on Consent (AOC) was entered into by FORA, the EPA, and the California Department of Toxic Substances Control (DTSC) for the ESCA parcels. The effective date for the AOC was July 25, 2008 (EPA, 2008). The AOC concerns the preparation and performance by FORA of potential removal actions, RIs and FSs, and remedial designs and RAs for MEC present on portions of the former Fort Ord, and the reimbursement for future response costs incurred by the EPA and the DTSC in connection with such CERCLA response actions. Under the AOC, FORA is also responsible for providing information to the public explaining activities at the former Fort Ord being performed under the AOC.

The ESCA Remediation Program (RP) encompasses the remediation of MEC at the ESCA MRAs. The purpose of the ESCA RP is to conduct the characterization, assessment of risk of explosive hazards, FS, remediation alternatives analysis, and performance of remediation, in accordance with the ESCA and the AOC. The ESCA RP includes the completion of MR efforts initiated by the Army on properties transferred in connection with the ESCA. The primary objective of the ESCA RP is to complete a timely cleanup of the

property in accordance with the ESCA and the AOC, while promoting and enhancing the public health and safety of current and future users of the property.

An AOC was entered into by FORA, the EPA, and the DTSC for the ESCA parcels. The effective date for the AOC was July 25, 2008 (EPA, 2008). The AOC concerns the preparation and performance by FORA of potential removal actions, RIs and FSs, and remedial designs and RAs for MEC present on portions of the former Fort Ord, and the reimbursement for future response costs incurred by the EPA and the DTSC in connection with such CERCLA response actions. Under the AOC, FORA is also responsible for providing information to the public explaining activities at the former Fort Ord being performed.

3.5.2 Fort Ord Federal Facility Agreement Amendment

As required under CERCLA Section 120, the Army, the EPA, the DTSC, and the California Central Coast RWQCB entered into an FFA, which became effective on November 19, 1990. Under the FFA (Army, et al., 1990), the Army was designated as the lead agency, and the EPA, the DTSC, and the RWQCB were established as regulatory agencies for the Superfund process at Fort Ord. Amendment No. 1 to the FFA effective July 26, 2007 (Army et al., 2007) reflects FORA's assumption of the Army's cleanup responsibilities for the ESCA parcels, except for those responsibilities which the Army has retained. The FFA Amendment No. 1 also provides that the Army and/or EPA will continue to be responsible for the selection of response actions for the Early Transfer Property in accordance with CERCLA Section 120(e)(4)(A). In the event the EPA, in consultation with the DTSC, determines FORA is in default, the Army will complete the response actions in accordance with the terms and conditions of the FFA and the FFA Amendment No. 1. The EPA is the lead regulatory agency (Army et al., 2007) for FORA's ESCA Remediation Program, which is subject to the AOC.

3.6 Basis for Action

The basis for the action is discussed on a site-by-site basis in Sections 5.0 through 23.0.

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4.0 FIVE-YEAR REVIEW PROCESS

This section summarizes the components of the five-year review process, including administrative and community involvement components, document and data review, site inspections, land use controls (LUC), incidental military munitions discoveries, and interview procedures.

4.1 Administrative Component

The Army is preparing this Five-Year Review Report pursuant to CERCLA Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the 4th Five-Year Review for the Fort Ord Superfund Site located in Monterey County, California (see Plate 1). The initial triggering action for this statutory review is the start of the RA at the OU 2 Landfills on May 17, 1997. The 1st Five-Year Review Report was submitted in 2002. The 2nd Five-Year Review Report was finalized in September 2007, and the 3rd Five-Year Review Report was finalized in September 2012 (Army, 2012). This 4th Five-Year Review Report has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

This report documents the results of the review of remedies implemented as specified in the respective RODs for the Fort Ord sites, groups of sites, and OUs. Several other areas, which do not have RODs in place, are reviewed as well. The sites discussed in this report are shown on Plates 2 and 4 and listed in Section 1.1. (Plate 3 presents information on IRP Sites with groundwater plumes.)

Sites that are no longer included in five-year reviews because the completed remedies allow for unrestricted use, as documented in previous five-year reviews, include:

- Basewide RI Sites ROD
    - Sites 16 and 17 (Site 16: DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension; Site 17: Disposal Area, and Other Areas)
    - Surface Water OFs (OF-1 through OF-14; OF-16 through OF-30; OF-32; OF-33)
    - Site 25 (Equipment Storage Area)
- No Action Sites ROD (multiple sites)
- Track 0 No Action ROD

The Fort Ord Superfund Site Five-Year Review was led by the Army. The review began on April 13, 2016 with a kickoff meeting and conference call attended by the review team. The multidisciplinary Fort Ord Superfund Site Five-Year Review team was led by William K. Collins, the BRAC Environmental Coordinator, and included the USACE staff and its contractors, and agency representatives. The review team includes members with expertise in engineering, hydrogeology, geology, treatment system operations, risk assessment, and munition responses. Portions of this Five-Year Review Report pertaining to areas and topics that are subject to the ESCA were generated by FORA in cooperation with the Army.

4.2 Community Involvement

A public notice was made available by providing a Five-Year Review announcement flyer in July 2016 at the Community Involvement Mobile Workshop (CIW). A Fact Sheet explaining the Five-Year Review process was distributed in December 2016 via U.S Mail and email to a list of several thousand local community

members who have expressed interest in Fort Ord activities. The Fact Sheet was made available on the Fort Ord public website: *www.fortordcleanup.com*. These documents stated that the Army was initiating a five-year review and invited the public to submit any comments to the Army community relations representative (contact information was provided in the flyer and fact sheet). The results of the review and the report will be made available in the Administrative Record and via the Fort Ord website. Fort Ord environmental cleanup information is also available through the Administrative Record Library at 4463 Gigling Road, Ord Military Community, Seaside. The 4th Five-Year Review Report will also be included in the Fort Ord information repositories located at the Seaside Library and the CSUMB Library, both in Seaside, California.

4.3 Document Review

Relevant documents contained in the Fort Ord Administrative Record were reviewed for basewide considerations, and on a site-specific basis, for each individual site. Site-specific document review discussions are provided within each site subsection. Appendix A provides a comprehensive list of reference documents organized into specific lists for each section.

The public may review the documents contained in the Administrative Record on-site or on-line. The Administrative Record documents are physically located in the BRAC Office, Building 4463 Gigling Road, Ord Military Community (former Fort Ord). In addition, the Fort Ord BRAC Office administers the Fort Ord environmental cleanup website (*www.fortordcleanup.com*). This public website provides background information, a description of current activities, documents available for public comment, maps, notices, CIW agendas and summaries, the Administrative Record index, and documents and references for further cleanup and environmental information through Army, EPA, DTSC, RWQCB, FORA, and related agency websites.

4.4 Data Review

This 4th Five-Year Review consisted of a review of relevant data presented in a variety of documents, including operations and maintenance (O&M) records; quarterly and annual monitoring reports; RODs; ESDs to the RODs, where applicable; confirmation reports; closure reports; and other reports referenced herein, and listed in Appendix A. Table 2 presents a summary of the current status of the Fort Ord Hazardous and Toxic Waste (HTW) sites relative to their inclusion in this Five-Year Review.

Site RI/FS and ROD documents describe how human health and environmental risk were assessed and what criteria were developed for evaluating cleanup actions implemented to reduce those risks. In this Five-Year Review Report, a comparison of current site conditions and trends with previous site conditions, particularly over the last five years, were the basis for evaluating remedial progress at reducing human health and environmental risk.

In addition, a comparison of the criteria established in the RODs, work plans, and other pertinent decision documents, with current regulatory criteria is performed to help determine the continued protectiveness of the site remedies. The remedy is considered currently protective when the regulatory criteria continue to be met, unless the criteria or other Applicable or Relevant and Appropriate Requirements (ARAR) have changed, making the site remedial objectives potentially no longer compliant.

4.5 Site Inspections

Inspections at the sites were conducted between July 12 and October 17, 2016 for the purpose of assessing the protectiveness of the remedies. The Army and its contractors conducted the site inspections. Site inspections focusing on the treatment facilities were performed at sites undergoing active groundwater treatment (OU 1, OU 2, OUCTP, and Sites 2 and 12). The remaining sites and/or areas were visually inspected to confirm compliance with their respective deed or access restrictions, access management measures, or in-place

remedies (Sites 3, 31, 33, 39, the Impact Area MRA, MRS-16, and ESCA Group 2 and Group 3 MRAs). Documentation of the inspections is included as Appendix B and a summary of the observations noted during each inspection is included within the relevant site subsections. No site inspections were necessary or performed for closed No Action or the non-munitions IA sites.

4.6 Land Use Controls

LUCs, including Federal deed restrictions and State Covenants to Restrict Use of Property (CRUPs), are required on some former Fort Ord property to ensure protection of human health and the environment. These restrictions are based on environmental evaluations of the property. Deed restrictions run with the land and apply to the property in perpetuity. CRUPs are executed by the Army and DTSC and are recorded, which is provided to the property recipient at the time of property transfer. Implementation and enforcement of Fort Ord CRUPs is in accordance with *the Memorandum of Agreement (MOA) Among the FORA, Monterey County, and Cities of Seaside, Monterey, Del Rey Oaks, and Marina, CSUMB, University of California Santa Cruz (UCSC), MPC, and the DTSC Concerning Monitoring and Reporting on Environmental Restrictions on the Former Fort Ord* (DTSC, 2007).

As part of this Five-Year Review, deeds associated with transferred property were reviewed, and any deed restrictions were identified. The Army verified that the restrictions required by the remedies are still in place. Table 1 includes a list of all Fort Ord property that has been transferred to date, listed by USACE parcel number, and including USACE deed tracking number, a reference to the Finding of Suitability to Transfer (FOST) document or the FOSET document that included the particular parcel (if applicable), and any applicable Federal deed notices/restrictions that were determined to be necessary. Table 3 lists which HTW sites have deed restrictions. Land use restrictions that may be applicable to transferred former Fort Ord property include prohibitions on the installation of groundwater wells, restrictions on residential use, restrictions on soil excavation and disturbance, and other parcel-specific reuse restrictions.

4.6.1 Early Transfer Associated with Environmental Services Cooperative Agreement

In March 2007, the Army and FORA entered into an ESCA to provide funding for MEC remediation services. In accordance with the ESCA, the AOC, and the FFA Amendment No. 1, FORA is responsible for completion of the CERCLA remedial activities, except for those responsibilities retained by the Army, on forty-two parcels (approximately 3,300 acres of developed and undeveloped land on the former Fort Ord) with funding provided by the Army. The property subject to the ESCA was transferred to FORA in 2009. To ensure protection of human health and the environment, land use restrictions were placed on the Early Transfer Parcels. As part of the early transfer of the Early Transfer Parcels, the Army has entered into State CRUPs with the DTSC that document the land use restrictions.

In 2013, approximately 1,160 acres (3 whole and 5 partial USACE property transfer parcels) were transferred from FORA to Monterey County, MPC, the State of California, and the City of Seaside, after receiving regulatory closure. The Army has modified the existing land use restrictions in the federal deeds, as necessary, to reflect the selected remedies for the transferred properties.

4.7 Incidental Military Munitions

Records documenting the discovery of incidental military munitions at Fort Ord were reviewed to determine if any of the discoveries had occurred on transferred property. The incident reports are compiled by the Fort Ord BRAC Office as part of the MRS Security Program in response to discoveries by private citizens, contractors, BLM employees, and Army personnel. The reports contain a description and location of each item found, as

well as the date of the discovery, who made the discovery, the date and time of the response, status of the item (e.g., MEC, munitions debris [MD], etc.), results of any inspection of the surrounding area, and the final disposition of the item. Historical incidental military munitions incident data is analyzed annually in accordance with the Fort Ord MRS Security Program to determine if the locations, frequencies, or types of incidents indicate a need for changes in security procedures. If a change is deemed appropriate, a notice is provided to regulatory agencies to include the recommended change.

A total of 83 discoveries of incidental military munitions items were reported on transferred or non-transferred property over the five-year period from 2011 through 2015, as documented in the Fort Ord Military MRS Security Program Annual Report for each year. These items are discussed in the following paragraphs and listed in Table 5.

Fifteen incidents of discovery of MEC or related items were reported in 2011, as documented in the *Fort Ord Munitions Response Site Security Program Annual Report 2011* (Fort Ord BRAC, 2012). The reports involved: 15 discoveries of 29 items classified as MD. Of those reports, nine discoveries occurred inside and six discoveries occurred outside currently restricted areas.

Twenty incidents of discovery of MEC or related items were reported in 2012, as documented in the *Fort Ord Munitions Response Site Security Program Annual Report 2012* (Fort Ord BRAC, 2013). The reports involved: one unexploded ordnance (UXO) item; one discarded military munitions (DMM) item, and one item classified as insufficient data (ISD). The 17 remaining discoveries were of items classified as MD. Of those reports, 10 discoveries occurred inside and 10 discoveries occurred outside currently restricted areas.

Sixteen incidents of discovery of MEC or related items were reported in 2013, as documented in the *Fort Ord Munitions Response Site Security Program Annual Report 2013* (Fort Ord BRAC, 2014). The reports involved: two DMM items in one discovery and one DMM item in another discovery; and one range-related debris (RRD) item. The 13 remaining discoveries were of items classified as MD. Of those reports, nine discoveries occurred inside and seven discoveries occurred outside currently restricted areas.

Twenty-three incidents of discovery of MEC or related items were reported in 2014, as documented in the *Fort Ord Munitions Response Site Security Program Annual Report 2014* (Fort Ord BRAC, 2015). The reports involved: three UXO items in one discovery; and 22 discoveries in which items were classified as MD. Of those reports, 15 discoveries occurred inside and eight discoveries occurred outside currently restricted areas.

Nine incidents of discovery of MEC or related items were reported in 2015, as documented in the *Fort Ord Munitions Response Site Security Program Annual Report 2015* (Fort Ord BRAC, 2016). The reports involved: two UXO items in two discoveries; and seven discoveries in which items were classified as MD. Of those reports, one discovery occurred inside and eight discoveries occurred outside currently restricted areas.

All incidents were reported using appropriate reporting systems, and the items were disposed of in accordance with explosives safety standards and MRS Security Program guidance.

4.8 Community Interviews

During this Five-Year Review process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date**.** The results of these interviews are summarized below.

On July 16, 2016, a survey questionnaire and invitation to interview was mailed to local officials, community leaders, and other community members. On July 18, 2016, notification that the 4th Five-Year Review process was underway and an invitation to the public to participate in the interview process was posted on the Fort Ord

website. Individuals participating in the survey were given three options for responding: (1) returning the questionnaire by mail in an addressed envelope, (2) participating in an interview by phone, or (3) participating in an interview in person.

The interviews were structured using EPA guidance, allowing participants to discuss their interests and concerns fully and openly. Interview participants were encouraged to express their perspective and knowledge of community interests and concerns, environmental issues, and the needs of the community in relation to the cleanup. As a result of this outreach effort, 54 survey questionnaires were returned by mail or email, and one phone interview was conducted. The breakdown of interviews is as follows: one city official, two county officials, three local regulatory agency representatives, and 48 community group representatives/individuals. Copies of the survey responses are included in Appendix C.

Information gathered during interviews indicates that the majority of community members are comfortable with their level of participation in the cleanup decision process and that they were confident that the cleanup was being conducted thoroughly. Of the 54 interviewees expressing interest or concern about community relations issues during the interview process, seven did not feel well-informed about the site's activities and progress and two interviewees voiced concern that the public opinion was not being considered. Conversely, 43 comments on community relations issues endorsed or complimented existing outreach programs; six comments specifically mentioned that the tours of Fort Ord were particularly informative and helpful for them. Two comments associated with cleanup activities that were commonly expressed were related to the prescribed burn events and their impact on the surrounding communities, as well as a desire to see the Army accelerate the cleanup process in order to expedite reuse and/or redevelopment of the area. Ongoing outreach efforts have noted similar community concerns and have addressed and continue to address these concerns.

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5.0 OU 1 ROD - FRITZSCHE ARMY AIRFIELD FIRE DRILL AREA

This section presents background information on the OU 1 ROD; provides a summary of remedial actions and a technical assessment of the actions taken; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address issues identified during the review; and provides a statement regarding the protectiveness of the site remedies.

5.1 OU 1 Background

The FAAF FDA was established in 1962 as a training area for the Fort Ord Fire Department (see Plate 2). As part of training activities, waste fuel (primarily composed of outdated or water-contaminated JP-4) was discharged from an on-site storage tank into a pit, ignited, and then extinguished. Other fuels included hydraulic and lubrication oils, gasoline, diesel, and solvents. Training activities at the FDA were discontinued in 1985 and the associated structures (pipeline and storage tank) were removed. These training activities are believed to have resulted in the release of contaminants to soil and groundwater.

The FDA lies within the hydrogeologic groundwater basin defined as the Salinas Basin. The Salinas groundwater basin is relatively large and extends well beyond the boundaries of Fort Ord. At Fort Ord, the Salinas Basin is composed of relatively flat-lying to gently dipping, poorly consolidated sediments. Although relatively simple structurally, the sediments are stratigraphically complex, reflecting a variety of depositional environments. Aquifers within the Salinas Basin at Fort Ord, from top to bottom, include:

- A-Aquifer (unconfined),
- Upper 180-foot Aquifer (confined),
- Lower 180-foot Aquifer (confined and unconfined), and
- 400-foot and 900-foot aquifers (confined).

The above aquifer names reflect local historical water levels and do not directly correlate to present water levels at Fort Ord. The A-Aquifer is not currently used to supply drinking water. However, it is identified in the *Water Quality Control Plan for the Central Coast Basin* (RWQCB, 2016) as a potential drinking water source. In other areas of Fort Ord, the A-Aquifer is in hydraulic communication with the underlying Upper180-foot aquifer, which is a drinking water resource (Army, 1995). Contaminants at OU 1 have been detected only in the A-Aquifer.

OU 1 is located within a habitat reserve managed by the University of California and is part of the University of California Natural Reserve System (UCNRS). The habitat reserve is referred to as the Fort Ord Natural Reserve (FONR). The dominant habitats within the FONR are annual grassland, maritime chaparral, and coastal live oak woodland. The April 1997 *Installation-wide Multispecies Habitat Management Plan, Former Fort Ord, California* (Army, 1997) identified sensitive habitats, such as the maritime chaparral.

The first site investigation was conducted at the FDA in 1984, which led to the conclusion that soil and groundwater cleanup were required in this area. Groundwater monitoring within OU 1 began in January 1986 and ended in December 2015. In 1987, approximately 4,000 cubic yards (cy) of contaminated soil were removed from the FDA, and the area was then backfilled with clean fill (soil). The OU 1 ROD was finalized in 1995 and indicated that the contaminated soils at the FDA had been remediated (Army, 1995). The OU 1 ROD defined groundwater extraction and treatment as the selected remedial action for OU 1 groundwater. The remedial action objectives specified in the OU 1 ROD are (1) hydraulic control and containment of contaminated groundwater and (2) extraction and treatment of groundwater exceeding aquifer cleanup levels

(ACLs). The second objective is expressed in terms of aquifer concentrations for 10 specific chemicals of concern (COCs), all of which are volatile organic compounds (VOCs). The 10 COCs and their associated ACLs specified in the ROD are shown in Table 4.

Trichloroethene (TCE) has historically exhibited the highest concentrations and greatest geographic extent (i.e., footprint of the 10 COCs) at OU 1. Because the TCE footprint encompasses that of the other nine COCs, TCE concentrations are used to define the boundaries of groundwater contamination for all COCs identified within the OU 1 area. Since January 1998, only benzene, total 1,2-dichloroethene (-DCE), and TCE have exceeded their respective ACLs. For 1,2-DCE, the last detection at a concentration greater than its ACL of 6 micrograms per liter (ug/L) was in 2002. Except for a single sample in 2008 where benzene exceeded the ACL, TCE was the only COC detected above its ACL through the last two Five-Year Review periods. Consequently, groundwater quality evaluations in this Five-Year Review Report are based primarily on the concentration and extent of TCE.

Groundwater remediation efforts began in 1988 by initiating the groundwater extraction and treatment system (GWETS). The GWETS included two extraction wells placed downgradient from the FDA connected to a granular activated carbon (GAC) treatment system located within the Former FDA footprint. This remediation system is identified as the "original GWETS" to distinguish it from subsequent treatment areas (see Plate 5a). Treated groundwater from the GWETS was recharged to the groundwater through a spray irrigation system at the FDA.

When the ROD was signed in 1995, the VOC plume length was estimated to extend to approximately 1,160 feet northwest (approximate groundwater flow direction) from the FDA. Groundwater monitoring results obtained after the original GWETS began operation indicated that the VOC plume was present beyond the designed capture zone of the original GWETS. In July 2003, the VOC plume was believed to cover an elongated area extending approximately 2,700 feet from the FDA with a width of approximately 600 feet. In 2005, TCE was detected at the northwestern boundary of Fort Ord at a concentration exceeding its ACL. In 2006, sampling results from downgradient monitoring wells constructed on private property (Armstrong Ranch) confirmed that the TCE plume had traveled beyond the Fort Ord boundary.

In 2011, the Army prepared a report (*Understanding Soil Gas at Former Fort Ord, Frequently Asked Questions about Soil Gas and Soil Vapor Intrusion* [Army, 2011]) that describes the potential for soil vapor intrusion to occur at several sites at Former Fort Ord, including OU 1. The report describes concentrations of COCs in groundwater in these areas as relatively low, and states that groundwater contamination tends to be stratified in the A-Aquifer with concentrations of COCs being very low or not detectable in the upper (or shallower) part of the A-Aquifer and relatively higher in the lower (or deeper) part of the A-Aquifer. The property above the groundwater plume resides completely within the FONR where no buildings are present. This land will remain part of the FONR in perpetuity and no buildings will be constructed. "Since no buildings are present over the groundwater plume or within 100 feet of the boundary of the plume, the possibility of soil vapor intrusion does not exist at OU-1" (Army, 2011). In 2013, TCE was detected above its ACL for the last time and the plume was located entirely within the FONR (see Plate 5b). The 2011 report was reviewed by the USEPA, DTSC, and the RWQCB, and all were in concurrence.

All monitoring wells within the original GWETS capture zone met the aquifer cleanup targets in 2005, and the original GWETS was shut down on February 22, 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 September 2011 *Final Rebound Evaluation Report* (HydroGeoLogic, Inc. [HGL], 2011).

Over the next several years, the Army responded to the changing architecture of the VOC plume with incremental expansions to the groundwater treatment system. The remediation efforts remained consistent with the remedy selected in the ROD.

- Four extraction wells and a treatment system were constructed along the northwest border of Fort Ord in 2006 to prevent continued off-site migration of groundwater contamination. This effort began as the hydraulic control pilot project (HCPP). It was successful and was incorporated into the full-scale remediation effort and renamed the Northwest Treatment System (NWTS). Under this system, treated water was discharged to the groundwater through infiltration trenches along the northwest Fort Ord boundary.
- In October 2007, four additional extraction wells were constructed within the central portion of the TCE plume. These wells were connected to the NWTS and, for ease of reference, are identified as the FONR component of the remedy. The purpose of these wells was to accelerate the overall groundwater cleanup.
- Some groundwater with TCE concentrations exceeding the ACL had migrated off site before the HCPP began operating. In 2008, the Off-Site Groundwater Extraction Pilot Study GWETS (off-site system) began to capture and treat the off-site TCE plume. The remedy constructed for the off-site system consisted of two extraction wells and a treatment system. Treated groundwater was recharged to the A-Aquifer through infiltration trenches. Sampling results from off-site monitoring wells showed that the VOCs met the ACL cleanup targets in 2009.
- In 2010, monitoring well IW-OU1-10-A was converted to an extraction well and connected to the NWTS. This well is located in the southern portion of the VOC plume within the FONR. Converting IW-OU1-10-A from a monitoring well to an extraction was accomplished to reduce the time required to achieve the groundwater cleanup throughout OU 1.

The initial implementation of the HCPP component provided additional plume definition and system performance data and field tests provided data describing potential pumping rates for several wells. These data were used during design of the FONR component. The formulation and 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 (MW-OU1-46-AD, MW-OU1-85-A, and MW-OU1-87-A) became extraction wells. Conversely, well EW-OU1-72-A has been used only for monitoring VOC concentrations. Several wells were named as potential injection well sites, but only two (IW-OU1-73-A and IW-OU1-74-A) were connected to the NWTS for this purpose.

The cumulative effects of expanding the remedy meet the second remedial action objective specified in the 1995 OU 1 ROD: extraction and treatment of groundwater exceeding ACLs. Plate 5a illustrates the locations of the various components of the OU 1 groundwater remedy.

Overall, the NWTS system operated 83 percent of the time and treated approximately 28 million gallons of impacted groundwater water. The average flow rate during this period was approximately 51.7 gallons per minute (gpm). Analytical results from the groundwater monitoring program showed that groundwater quality within the OU 1 area improved throughout 2011. The average TCE influent concentration during the 2010 to 2011 period was relatively stable and ranged between 2.5 ug/L and 2.6 ug/L. There was a slight increase in the total VOC mass removed, approximately 0.5 pound in the 2009 to 2010 period as opposed to 0.6 pound during the 2010 to 2011 period (HGL, 2012).

5.2 Remedial Actions

5.2.1 Remedy Selection

Several response actions to address contaminated groundwater were evaluated and considered in the selection process. According to the RI/FS Report (Harding Lawson Associates [HLA], 1987), these responses were as follows:

- No action
- Remove and contain contaminated groundwater using barrier walls
- Remove and contain contaminated groundwater using interceptor trench(es)
- Remove and contain contaminated groundwater using extraction wells
- Treat contaminated groundwater off site
- Treat contaminated groundwater on site

To determine a selected remedy, the following three treatment alternatives were considered:

- Air stripping with vapor phase carbon treatment of effluent
- Air stripping with vapor phase carbon off-gas treatment and effluent polishing with aqueous carbon
- Effluent treatment using aqueous carbon

Groundwater extraction and treatment using aqueous carbon, i.e. GAC, was the remedy selected based on a comparison of the alternatives in the RI/FS Report. This approach was approved and implemented in June 1987 and was approved in the OU 1 ROD.

Explanation of Significant Difference

In 2010, the Army signed an ESD that addressed the expanded remediation efforts needed at OU 1 (Army, 2010). The primary factors driving the need for the ESD are as follows:

- The TCE plume migrated outside the capture zone of the original GWETS. Because the TCE plume extended downgradient of the Former Fort Ord property boundary and under the adjacent property (Armstrong Ranch), the size and configuration of the remedial action were altered.
- The size of the remedial action changed causing significant increases in the costs from those estimated in the OU 1 ROD.
- Institutional controls regarding contaminated groundwater at Fort Ord were signed after the OU 1 ROD was signed. These controls prohibit the use of groundwater from OU 1 without permission from state and county regulators, thereby eliminating potential exposure pathways.

The OU 1 ROD states the remedial action objective (RAO) for soil and groundwater is to address current or potential future significant risks to human health and the environment posed by OU 1 groundwater contamination. Soil remediation was considered complete and NFA was selected. The selected remedy for groundwater was extraction and treatment (via carbon adsorption) of groundwater that contains VOCs from the A-Aquifer at and downgradient of the FDA, and recharge of treated water to the A-Aquifer.

In 1995, the plume length was approximately 1,163 feet; however, results of groundwater monitoring and an offsite study initiated in 2006 indicated the plume had migrated under the Armstrong Ranch property and was approaching the City of Marina. Based on this information, the plume length was determined to be approximately 3,650 feet. This resulted in a significant difference in the size and configuration of the remedial action. The cost to construct the original GWETS in 1988 and annual operations and maintenance costs from 1988 to 1994 was estimated at $942,000 in the RI/FS Report (HLA, 1987). The OU 1 ROD estimated the cost of 24 more years of operations and maintenance (1994 to 2018) to be $950,000. In 2009 dollars, the total cost of construction and operations and maintenance to completion of the remedial action (with the original GWETS) would be approximately $3.2 million[1].

In response to the significant change in the size and configuration of the plume, the Army constructed the NWTS, the FONR System and the Off-Site System; however, their construction, operation, and maintenance costs through 2009 have been approximately $8.29 million, which is a significant difference from the costs estimated in the OU 1 RI/FS Report (HLA, 1987) and ROD document (Army, 1995).

In addition to the remedy selected for groundwater, institutional controls (e.g. deed restrictions and land use controls) are to be applied to prevent access or use of the groundwater within the OU 1 area for any purpose, until the ACLs are met, and to maintain the integrity of any current or future remedial or monitoring system including monitoring, extraction, and injection wells.

For most of this Five-Year Review reporting period, the property overlying and surrounding a portion of OU 1 was within the "Prohibition Zone" of the "Special Groundwater Protection Zone." The Prohibition Zone is identified on the Former Fort Ord "Special Groundwater Protection Zone Map," which is on file with the County of Monterey. County Ordinance No. 04011 (Monterey County Code Title 15, Chapter 15.08.140) prohibits construction of water wells within the Prohibition Zone. See Plates 2 and 4 for the current (as of July 2016) Prohibition and Consultation Zones and Plate 3 for the Prohibition and Consultation Zones that were in effect in 2012.

5.2.2 Remedy Implementation

In 2009, the sampling frequency for the long-term monitoring (LTM) program was reduced from quarterly to semiannually. The semiannual sampling events occur in the first and third quarters (March and September). Select wells are sampled only annually in September. This annual summary of groundwater monitoring is based on the "water year" hydrologic cycle: October through September of the following year. In 2011, performance monitoring sampling from the extraction wells and treatment system was reduced from quarterly to semiannually (March and September). In September 2012, the LTM results showed significant progress toward meeting the ACLs throughout OU 1. Consequently, quarterly sampling was resumed at select wells along the main axis of contaminant migration to provide a more timely notification of when the ACLs would be achieved.

In March 2012, the Army evaluated the ongoing OU 1 remedy to optimize its performance. The Army's plan was approved by the regulators in April 2012. Select extraction wells in the central FONR were shut down. Injection well (IW-OU1-10-A) also was turned off (August 2012) as a part of the plan. Except for extraction well (EW-OU1-63-A), which was disconnected, all other extraction wells that were shut down remain operable and could be restarted, if needed. During the Fourth Quarter of 2011 and the First and Second Quarters of 2012, pumping typically occurred at six of the eight extraction wells connected to the NWTS; during the Third Quarter, pumping occurred at two extraction wells. Together, the eight extraction wells, NWTS facility, the infiltration trenches, and the injection wells comprise the expanded OU 1 groundwater remediation system.

[1] Based on rates of inflation from December 1987 through January 2009.

Since 2012, only the infiltration trench along the northwest boundary was used to return treated groundwater to the A-Aquifer (HGL, 2013).

Overall, the NWTS system operated 94.2 percent of the time between October 1, 2012 and September 30, 2013 and treated approximately 9.3 million gallons of water. The average flow rate during this period was approximately 19.3 gallons per minute. Analytical results from the groundwater monitoring program showed that groundwater quality within the OU 1 area improved throughout 2013. Pumping was suspended at individual extraction wells as groundwater within their respective capture zones achieved the ACL for TCE. Consequently, the TCE influent concentration in 2013 varied between 1.8 ug/L and 2.0 ug/L. There was a slight decrease in the total VOC mass removed from approximately 0.58 pound in the 2011 to 2012 period to 0.14 pound during the 2012 to 2013 period (HGL, 2014). Optimization activities continued into 2014 and generally included changing sampling frequencies and periods of groundwater extraction.

Between October 1, 2013 and September 30, 2014, the NWTS system operated 99.3 percent of the time and treated approximately 10.6 million gallons of water. The average flow rate during this period was 18.5 gallons per minute. The total VOC mass removed varied minimally between the 2013 to 2014 period (0.13 pound) (HGL, 2015). The last TCE ACL exceedance was from June 2014 at a concentration of 5.4 ug/L in monitoring well MW-OU1-61-A. TCE was not detected above its ACL in any subsequent sampling conducted in 2014. Based on the trends observed in the LTM monitoring data from 1988 through 2014, and the sample results from September and December 2014, the Army proposed that the remediation effort for the OU 1 groundwater is complete.

The original GWETS was deactivated in December 2010 and the monitoring and extraction wells within the GWETS capture zone were destroyed in October 2011. With regulatory approval, the original treatment plant and the offsite treatment system were decommissioned and removed in 2014 (HGL, 2015a). Additional monitoring wells in areas where groundwater met the cleanup targets or where the TCE plume had not been detected in any sample were also destroyed in 2014. In 2016, the monitoring wells, extraction wells, and associated pipelines on the Armstrong Ranch were destroyed and removed.

5.2.3 System Operations and Maintenance

The remote monitoring systems for the off-site GWETS and the NWTS operated independently. Both treatment systems operated automatically and operational status was tracked using remote monitoring systems. The appropriate project team members were notified of unusual or failed operation through automated phone alerts and respond as needed to restore normal operation. Performance data was collected and routine maintenance was performed during regularly scheduled site visits. Both systems are connected to the local electric power utility. O&M costs included the following:

- Supplying electrical power
- Performing remote monitoring
- Conducting regular site visits to monitor conditions
- Providing routine maintenance and making any necessary repairs
- Collecting performance samples
- Facilitating laboratory analyses
- Replacing and disposing of spent carbon

A short circuit in the electric utility meter box occurred in October 2014 and caused the NWTS to automatically shut down. Based on the September 2014 sampling results showing that the ACLs had been met,

the regulatory agencies concurred that the NWTS be repaired and placed on standby status pending review of future sampling results. Subsequent sampling results confirmed that the OU 1 remediation effort was complete and the NWTS should remain on standby status. The utility meter box repairs were made in June and July 2015 to restore full NWTS operability, except for extraction well EW-OU1-60-A (B2). The NWTS remained on standby until a lightning strike in August 2015 rendered it inoperable. Repairs in August and September 2015 restored operability except for extraction well EW-OU1-66-A (B2). The NWTS has been operable but on standby status since September 2015 except for brief periods (less than 8 hours per event) to test repairs made to correct minor malfunctions resulting from temporary power loss or power surges. Annual O&M costs during this Five-Year Review reporting period, up until the time the system was placed on standby mode, was approximately $282,000 (rounded to the nearest thousand). Utility costs have been estimated at $5,200 per year of operation. The NWTS has been maintained in standby status during attainment monitoring, and O&M costs have been nominal.

5.3 Progress Since the Last Five-Year Review

The system was determined to be "Operating Properly and Successfully" in 2011 (EPA, 2011). Its continued operation and recurring optimization efforts have shown that the cleanup objectives stipulated in the ROD, and as supplemented by the 2010 ESD, have been met. As detailed in Section 5.4.2, the attainment monitoring and associated statistical evaluations confirm these goals have been met and will endure over time. 2015 groundwater level measurements show that the aquifer water levels and flow patterns have returned to pre-groundwater extraction conditions before attainment monitoring began. In accordance with Monterey County Ordinance No. 04011 (Monterey County Code Title 15, Chapter 15.08.140), portions of the OU 1 area were remapped from a Prohibition to a Consultation Zone (see Plates 3 and 4).

The March 2016, *Final Remedial Action Completion Report/Technical Memorandum Operable Unit 1 Attainment Monitoring Results, Sampling Events #1 Through #4, Former Fort Ord, California* (HGL, 2016), summarizes groundwater cleanup efforts and monitoring data from 2006 through 2015; these data indicate that the OU 1 remediation effort is complete and that COC concentrations will continue to decrease in the future. In addition, four successive sampling rounds (during attainment monitoring for COCs) showed that PFOA and PFOS concentrations are significantly less than the Preliminary Health Advisories (PHA) screening criteria in place at that time and vary within a narrow range at each well. PFOA and PFOS were not identified as COCs in the OU 1 ROD. In March 2016, DTSC, RWQCB, and EPA determined that OU 1 remediation is complete; these agencies directed the Army to proceed with closeout activities (RWQCB, 2016a).

In May 2016, EPA replaced the PHA screening levels for PFOA and PFOS (0.4 ug/L and 0.2 ug/L, respectively) with a Health Advisory (EPA, 2016); the Health Advisory lowered the reference concentration to 0.070 ug/L (or 70 nanograms per liter [ng/L]) total for combined PFOA/PFOS concentrations. The May 2015 PHA values were used as a benchmark in evaluating PFOA and PFOS sampling results. PFOA was detected in all wells and PFOS was detected at two wells (MW-OU1-26-A and MW-OU1-88-A) during the first attainment monitoring sampling event (May 2015). Consequently, sampling for PFOA and PFOS was included in all subsequent attainment monitoring events. The May 2016 health advisory level of 70 ng/L for the sum of concentrations of PFOA and PFOS was exceeded at wells PZ-OU1-10A-1 and MW-OU1-88-A in May 2015. Well PZ-OU1-10-1 was removed from the sampling network after the May 2015 sampling event over concerns that suspended sediments in the collection device could potentially impact sample results. The DTSC and RWQCB (both are members of the BRAC and signatories of the FFA) determined that the new Health Advisory values do not alter their previous decision to support the determination of no further remediation and monitoring at OU 1 or their recommendation to proceed to closeout (RWQCB, 2016a) and (DTSC, 2016). In a letter from the EPA to the Army dated February 21, 2017, the EPA states "*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*" (EPA, 2017).

5.3.1 2012 Five-Year Review Protectiveness Statement

The following is an excerpt from the *3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California* (Army, 2012).

> "The remedy at OU 1 is protective of human health and the environment and, in the interim, potential exposure pathways that could result in unacceptable risks are being controlled."
>
> "The remedy was designated by the EPA as "Operating Properly and Successfully" (EPA, 2011). The groundwater monitoring network shows that COC concentrations in groundwater in the offsite region of OU 1 are less than the corresponding cleanup targets. In those parts of OU 1 within the Former Fort Ord boundary where COC concentrations in groundwater still exceed the cleanup targets, exposure pathways that could result in unacceptable risks are being controlled. Access to the OU 1 area is restricted by fences, gates, and posted signs prohibiting entry. The on-post OU 1 area is part of the California Natural Reserve System and access would be restricted regardless of the OU 1 remedial action. Drilling new wells for public or private use is prohibited or regulated by state agencies and the local water district."
>
> "Protectiveness was assessed in the Baseline Risk Assessment (BRA) discussed in the 1995 ROD (Army, 1995). The BRA identified the chemicals of concern for human health and the environment as those that have been consistently detected in groundwater. The objective of the BRA was to qualitatively evaluate and characterize the potential human health impacts associated with conditions at the site as it existed prior to any remedial efforts associated with the remedial treatment. The BRA presents a qualitative evaluation by comparing the maximum detected concentrations of the 10 COCs with preliminary remediation goals (PRGs) developed by EPA Region IX."
>
> "A post cleanup human health risk assessment (HHRA) was performed for the groundwater at the FDA. The purpose of the HHRA was to evaluate potential health risks associated with ingestion of tap water at the proposed Aquifer Cleanup Goals. The methods used to conduct the HHRA were consistent with EPA recommended guidance. Although it is unlikely that onsite groundwater will be used as a drinking water source, the exposure pathways for a child and adult receptor that might be exposed to the COCs through ingestion of tap water were evaluated."
>
> "The results of the HHRA indicated that human health risks associated with COC concentrations in groundwater equal to the ACLs will not result in adverse human health effects. The resulting excess cancer risk estimated for site conditions at the time that ACLs are achieved is 2×10^{-6} to 3×10^{-5}. In other words, if the human receptors identified above were exposed to groundwater at the FDA less than three out of one hundred thousand people would be at risk of developing cancer. These excess cancer risks are within the 10^{-4} to 10^{-6} identified as acceptable residual risks for Federal Superfund sites (Army, 1995)."

The attainment of ACLs, as confirmed by rebound studies and attainment monitoring, demonstrates that the remedy is protective of human health and the environment.

5.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The previous Five-Year Review Report did not identify any issues that would require follow-up action to ensure that the current remedy will achieve the groundwater cleanup objectives.

5.4 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities have been performed for Fort Ord, using a basewide approach and are detailed in Sections 4.1 and 4.2. Document review, data review, site inspection, and interviews, if applicable, have been conducted on a site-by-site basis, described in the following subsections.

5.4.1 Document Review

This Five-Year Review consisted of evaluating relevant documents including O&M records, groundwater elevation records, groundwater VOC concentration monitoring data, and remediation system performance data. Applicable groundwater cleanup standards, as listed in the 1995 ROD (Army, 1995) were reviewed. Key documents included the following:

- February 1995 *Record of Decision, Operable Unit I, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California* (Army, 1995)
- August 2010 *Explanation of Significant Differences No. 1 Operable Unit I, Fritzsche Army Airfield Fire Drill Area, Fort Ord, California* (Army, 2010)
- September 2011 *Final 2010 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2011a)
- April 2014 *Final 2013 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2014)
- February 2015 *Final 2014 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2015)
- October 2015 *Final 2015 Annual Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2015b
- May 2015 *Final Technical Memorandum, Operable Unit 1, Exit Strategy, Former Fort Ord, California* (HGL, 2015a)
- March 2016 *Final Remedial Action Completion Report/Technical Memorandum, Operable Unit 1 Attainment Monitoring Results, Sampling Events #1 through #4, Former Fort Ord, California* (HGL, 2016a)
- August 2016 *Final 2016 Annual Groundwater Monitoring Report Operable Unit 1 Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2016b)

Refer to Appendix A References for a complete list of documents reviewed.

5.4.2 Data Review

ROD Cleanup Goals

Several statements in the ROD are relevant to determining when the cleanup goals have been met for OU 1:

- The following excerpt is from Section 2.5 of the ROD:

  ”The primary remedial objectives for the A-aquifer are hydraulic control and containment of contaminated groundwater in the A-aquifer, and extraction and treatment of groundwater exceeding

aquifer cleanup levels. Remedial actions for these two components are intended to be final remedial solutions to risks posed by contaminants present within these units."

- The following excerpts are from Section 2.7.2 of the ROD:

  "A post cleanup human health risk assessment (HHRA) was performed for the groundwater at the FDA [Fire Drill Area]… Although it is unlikely that onsite groundwater will be used as a drinking water source, the exposure pathway evaluated was a child and adult receptor that might be exposed to the COCs through ingestion of tap water (groundwater)."

  "The results of the HHRA indicated that human health risks associated with chemicals in groundwater at the Aquifer Cleanup Goals will not result in adverse human health effects."

  "In summary, even if unlimited use occurred at this site, the resultant risks from exposure to soils and groundwater at remediation would be no greater than that described above for groundwater, and no institutional controls (i.e., deed restrictions) are needed."

- The following excerpts are from Section 2.9 of the ROD:

  "To protect human health and comply with federal and state applicable or relevant and appropriate requirements (ARARs), groundwater must be returned through cleanup to a condition that will allow beneficial uses to occur, including future potential use as a drinking water source, without unacceptable risks to the users. Thus, the remedial cleanup goals for groundwater include cleaning up the contaminated groundwater to at least maximum contaminant levels (MCLs)…"

The rationale expressed throughout the ROD is that the cleanup targets were set to achieve a groundwater quality that would allow beneficial uses to occur without unacceptable risks to the users, including future potential use of the groundwater as a drinking water source.

ROD Cleanup Goals Achieved

The decreasing TCE concentration throughout OU 1 has resulted in a corresponding decrease in the amount of total VOCs being removed by the extraction wells during each year of operation. TCE has not been detected above 0.5 ug/L in an extraction well since March 2013. The boundary of the TCE plume, as defined by the 5 ug/L concentration contour, has steadily reduced in size since the NWTS began operation in 2006 (see Plate 5b). Sampling data indicates the groundwater at OU 1 met the ACL in 2014.

To verify that the site conditions are protective of site receptors and allow for future beneficial use to occur, human health risks were calculated based on exposure to site groundwater using the most recent attainment monitoring sample results from December 2015. Exposure assumptions were obtained in accordance with EPA *Risk Assessment Guidance for Superfund* (RAGS) (EPA, 1989, 1991, 2004, and 2014) and incorporate the exposure factor revisions issued by EPA in February 2014. All exposure assumptions (ingestion rate, exposure duration, etc.) are summarized in Tables E5.1 and E5.2 (Appendix E). The more stringent of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard (OEHHA) and the EPA Integrated Risk Information System (IRIS) toxicity criteria were used in calculating the risk for each COC. These values are summarized in Tables E5.3 through E5.7 (Appendix E). Toxicity values for the dermal exposure route were estimated from the oral reference doses and cancer slope factors in accordance with RAGS, Part E (EPA, 2004).

As shown in Table E5.10 (Appendix E), the excess carcinogenic human health risk corresponding to the December 2015 sampling results is 1×10^{-5}. For these calculations, the maximum detected TCE concentration of 3.9 ug/L was used as the TCE exposure point concentration (EPC) and one-half of the limit of detection

(LOD) was used as the EPC for the nine COCs that were not detected. The excess carcinogenic human health risk under current conditions is less than the 3 x 10^{-5} value in the ROD corresponding to attainment of the aquifer cleanup targets (HGL, 2015a).

The cancer risk estimates for the child and adult resident receptors presented in the ROD considered only the ingestion and dermal contact exposure pathways. The ROD identified the cumulative cancer risk associated with exposure to the ten COCs at the cleanup targets to be 3x 10^{-5}. The ROD did not consider potential non-cancer effects of the COCs (HGL, 2015a).

Current risk assessment guidance requires evaluation of the inhalation exposure pathway in addition to the ingestion and dermal contact pathways. In addition, current guidance also requires the evaluation of cancer risks using the age-adjusted resident receptor. For comparison purposes, the cumulative cancer risks and non-cancer hazards associated with residential exposure to groundwater were calculated according to current risk assessment guidance using both the aquifer cleanup targets and the December 2015 attainment sampling results. As before, the maximum detected TCE concentration of 3.9 ug/L was used as the EPC for TCE and one-half of the LOD was used as the EPC for the nine COCs that were not detected. The calculations are presented in Appendix E, Tables E5.8, E5.9, and E5.10, and the results are summarized in the following table.

Overall Cumulative Cancer Risk And Non-Cancer Hazard Indices

Inputs to Risk Calculations	Cumulative Cancer Risk (Age-Adjusted Resident)	Cumulative Non-Cancer Hazard Index (Child Resident)	Cumulative Non-Cancer Hazard Index (Adult Resident)
Aquifer Cleanup Targets	$3x10^{-5}$	3	2
December 2015 Sampling Results	$1x10^{-5}$	1	1

As indicated above, the overall cumulative cancer risk and non-cancer hazard indices using the December 2015 sampling results are all less than the corresponding risks based on the use of cleanup targets, indicating that current conditions meet and exceed risk-reduction objectives corresponding to the ROD cleanup targets. Based on these comparisons and the completion of the cleanup within the source area, the requirements of the OU 1 ROD have been met and remediation of OU 1 groundwater may be considered complete.

Attainment Monitoring

To confirm that the ACLs for all COCs had been attained, the Army, in consultation with regulatory agencies, developed a monitoring program (HGL, 2015a). Its purpose was to verify COC groundwater concentrations, through the collection and analysis of groundwater samples from eight strategically located monitoring wells (EW-OU1-53-A, EW-OU1-52-A, PZ-OU1-10-A1, IW-OU1-02-A, MW-OU1-26-A, MW-OU1-88-A, PZ-OU1-49-A1 and MW-OU1-61-A) and to compare those results to the ACLs for the COCs. This activity occurred in four sampling events: May, July, October, and December, 2015.

During discussions with the regulatory agencies concerning attainment monitoring requirements, the agencies expressed concern that PFOA and PFOS may have been used during fire training activities at the OU 1 source area. These compounds were known to be used as film-forming foam to extinguish fires, and had been identified by the EPA as emerging contaminants. Although these compounds were not identified in the OU 1 ROD and have not been included in previous OU 1 sampling efforts, the regulatory agencies stated that the attainment monitoring sampling program must include these potential contaminants in order for the regulatory agencies to evaluate the case for OU 1 closure. The regulatory agencies stated that EPA's PHA standards for concentrations in groundwater for PFOA and PFOS will be used as screening values to assess the need, if any,

for further action(s) regarding PFOA and/or PFOS in OU 1 groundwater. PFOA and PFOS sampling was conducted during all attainment sampling events (HGL, 2015a). Well PZ-OU1-10-A1 (F3) was the second well at which the combined PFOA and PFOS concentration exceeded the Health Advisory (at 120 ng/L) in the single sample collected from that well).

Attainment Monitoring Results

The data shows the decline of COC concentrations in Attainment Monitoring wells, generally located along the plume historic centerline, from the maximum concentration noted in the ROD to the 2014 annual groundwater monitoring event, which effectively concluded the annual monitoring as all COCs were detected at concentrations below their respective ACLs. The Attainment Monitoring Program results were below the cleanup targets for COCs specified in the ROD and below the pre-May 2016 PHA screening values established for PFOA and PFOS. The concentration of each COC was stable or generally decreased at each well since 2013 or earlier. The PFOA and PFOS concentrations at each well changed minimally between the 2015 analytical results, see the Table below.

In May 2016, the EPA issued Health Advisory values for PFOA and PFOS (EPA, 2016). As before, the Health Advisory values are published as advisory information only and are not regulations or requirements. The Health Advisory concentration value published in May 2016 is 70 ng/L for the sum of concentrations of PFOA and PFOS. This value is less than the previous PHA values of 400 ng/L for PFOA and 200 ng/L for PFOS and also less than the sampling results observed at two of the eight attainment monitoring wells. The maximum PFOS concentration was detected in well MW-OU1-88-A (E3) at 72 ng/L. PFOA was detected in all samples collected during the Attainment Monitoring Program. The maximum PFOA concentration was observed in well MW-OU1-88-A (E3) at 270 ng/L (HGL, 2016).

OU 1 Attainment Monitoring Results for TCE, PFOA, and PFOS

Analyte	TCE				PFOA				PFOS				PFOA/PFOS			
ACL or Screening Value	5 ug/L				400 ng/L (2009 Provisional Health Advisory)				200 ng/L (2009 Provisional Health Advisory)				70 ng/L (May 25, 2016 Health Advisory) Sum of PFOA/PFOA per Sampling Event			
Sample Event #	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sample Date(s)	5/8/ 2015	7/17/ 2015	10/2 /2015	12/11/ 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	5/11/ 2015	7/20/ 2015	10/5/ 2015	12/14/ 2015
Well Identification																
EW-OU1-53-A	1.6	1.8	1.3	1.4	14J-	13.0	9	12	UJ-	U	U	U	14J-	13.0	9	12
EW-OU1-52-A	3.8	3.7	3.0	2.9	3J-	4.0	4	5	UJ-	U	U	U	3J-	4.0	4	5
PZ-OU1-10-A1**	3.3	2.5	2.0	1.6	120J-	Not Sampled			UJ-	Not Sampled			120J-	Not Sampled		
IW-OU1-02-A	1.8	1.8	1.8	1.9	9J-	10.0	7	9	UJ-	U	U	U	9J-	10.0	7	9
MW-OU1-26-A	2.5	2.5	2.3	2.2	34J-	44.0	42	39	7J-	12.0	15	12	41J-	56.0	57.0	51
MW-OU1-88-A	4.0	3.3J-	3.9	3.9	270J-	230.0	180	210	64J-	62.0	37	33	334J-	292	217	243
						260.0*	200*	200*		72.0*	44*	36*		332	244*	236*
PZ-OU1-49-A1	1.8	2.0	2.2	1.9	7J-	8.0	9	11	UJ-	U	U	U	7J-	8.0	9	11
MW-OU1-61-A	3.9	4.4	3.7	3.4	3J-	3.0	2J-	2	UJ-	U	U	U	3.0	3.0	2J-	2
	4.4*	4.3*	3.7*	3.5*	4*J-				UJ-				4*J-			

Notes:
* = Field duplicate
** 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.

ACL = aquifer cleanup level
J- = Potential low bias in reported result

ng/L = nanograms per liter
OU 1 = Operable Unit 1
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
TCE = Trichloroethene
U = Not detected
ug/L = micrograms per liter
UJ = Data qualified as estimated.

Source:
Final Remedial Action Completion Report/Technical Memorandum, Operable Unit 1 Attainment Monitoring Results, Sampling Events #1 through #4 (HGL, 2016).

The treatment system remained off during attainment monitoring, with the exception of brief periods of pumping (less than eight hours) to test and maintain operability of the NWTS.

Statistical Evaluations of TCE Concentration Trends

Statistical tests were performed to provide a more definitive, quantitative characterization of TCE concentration trends. Site data were analyzed using the Monitoring and Remediation Optimization System (MAROS) Software Version 3.0 for individual well data. The EPA's Groundwater Statistics Tool (GST) was also used to evaluate the sample results from the attainment monitoring wells, since the ACLs were reached at each well. Statistical methods programmed in MAROS are consistent with guidance provided in the *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (EPA, 2009). The January 2006 through December 2014 remediation period dataset was imported into MAROS where the Mann-Kendall (MK) statistical test was used to identify the TCE concentration trend at each attainment monitoring well (HGL, 2015a).

The MK analysis for TCE concentration trends for the remediation and Attainment periods are shown in the table below. This table shows that the TCE concentration trend during the Attainment Period at all wells was either: No Trend, Stable, or Strongly Decreasing (more than approximately 98 percent probability that the trend exists).

OU 1 TCE Groundwater Concentration Trends in Attainment Monitoring Well Network										
Well ID	**Last TCE Concentration > ACL**		**Number of Samples Since TCE > ACL[1]**	**Most Recent TCE Concentration (ug/L)[2]**	**TCE Concentration Trend by Mann-Kendall Evaluation**					
					Remediation Period (2006-2014)			**Attainment Period (2015)**		
	Date	**Concentration (ug/L)**			**Trend**	**Percent Confidence in Trend**	**S Statistic**	**Trend**	**Percent Confidence in Trend**	**S Statistic**
IW-OU1-02-A	9/16/2009	5.1	8	1.90	Stable	64.8%	-6	No Trend	72.9%	3
PZ-OU1-10-A1	3/15/2012	12	7	1.60	Stable	79.0%	-13	Strongly Decreasing	95.8%	-6
MW-OU1-26-A	9/27/2012	5.2	9	2.20	Strongly Decreasing	100.0%	-162	Stable	89.6%	-5
PZ-OU1-49-A1	3/20/2008	5.9	15	1.90	Strongly Decreasing	100.0%	-103	No Trend	62.5%	2
EW-OU1-52-A	9/21/2011	6.4	7	2.90	Stable	53.0%	-2	Strongly Decreasing	95.8%	-6
EW-OU1-53-A	6/7/2011	5.3	6	1.40	Strongly Decreasing	100.0%	-54	Stable	62.5%	-2
MW-OU1-61-A	6/27/2014	5.7	6	3.40	Stable	85.3%	-85	Strongly Decreasing	95.8%	-6
MW-OU1-88-A	12/17/2013	6.2	8	3.90	Strongly Decreasing	100.0%	-255	Stable	50.0%	-1

Notes:
1 - Excludes duplicate samples
2 - Most recent sample was collected December 11, 2015

ACL = Aquifer cleanup level
TCE = Trichloroethene
ug/L = micrograms per liter
% = percent

Source: *Final Remedial Action Completion Report/Technical Memorandum, Operable Unit 1 Attainment Monitoring Results, Sampling Events #1 through #4, Former Fort Ord, California* (HGL, 2016).

The GST was run using TCE concentrations from the attainment monitoring well network, with the exception of well PZ-OU1-10-A1 (F3), for all sample events since the ACL was met at each well. At well PZ-OU1-10-A1 (F3), the September 2012 and September 2013 TCE concentrations of 0.4 J ug/L and 0.2 J ug/L were not input into the GST to avoid potentially biasing the evaluation results to the low side. The September 2012 and September 2013 sample results may have been affected by vertical mixing from changes in pumping at nearby extraction well IW-OU1-10-A (F3). These sample results were much less than the range of TCE concentrations (from 3.3 ug/L to 1.6 ug/L) observed in the five subsequent samples collected between September 2014 and December 2015. The GST evaluation for each well showed the following common results for all 8 wells (HGL, 2015a):

- The mean concentration was less than the ACL
- The median value (calculated independently from the GST) at each well was similar to the mean with a maximum difference of 0.6 ug/L at well MW-OU1-26-A (F3)
- The TCE concentration trend at each well is "decreasing or statistically insignificant" as defined by the GST
- The value for the 95 percent upper confidence level (UCL) TCE concentration is less than the ACL

Post Groundwater Extraction – Hydraulic Control and Containment

The depth to groundwater was measured at all accessible locations within OU 1 in September 2014, November 2014, January 2015, and during all four attainment monitoring events. The frequency of these measurements between September 2014 and May 2015 was increased in comparison to previous years to collect data to determine if/when groundwater flow paths returned to ambient conditions after the cessation of pumping from the remediation extraction wells in October 2014 (HGL, 2016).

The May 2015 groundwater flow paths were found to be consistent with the pre-pumping flow direction. The groundwater elevation contours and the relative changes in groundwater elevation indicate that the A-Aquifer groundwater flow regime had returned to the pre-pumping condition by May 2015 (HGL, 2016).

5.4.3 Site Inspection and Interviews

A site inspection was performed on July 13, 2016, by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to assess the overall condition of the remedy as it relates to effectiveness, including the physical condition of the system, system integrity, system operations, site security, and access controls. Mr. Peter Arroyo (HGL, OU 1 Site Supervisor) was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. Detailed inspection forms and site photographs are included in Appendix B.

The treatment system is in standby mode. The active groundwater treatment system is an outdoor facility enclosed by a gated chain-link fence to limit access. The extraction wells are connected to the treatment system by a network of underground pipes. Critical control panels and sensitive monitoring systems are housed in weather resistance steel enclosures. The system was operated continuously until October 2014; however, in the last two years, it was operated only sporadically to ensure that it was operable in the event it was ever needed. Automated shutdown and operator notification systems are in place in the event of a malfunction if the operator is not on site. System components generally are in good condition but are showing some signs of age.

5.5 Technical Assessment

5.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Yes. The remedial action objectives stipulated in the 1995 ROD (Army, 1995) and 2010 ESD (Army, 2010) have been achieved, therefore, the remedy at OU 1 remains protective of human health and the environment.

5.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

The exposure assumptions are still valid. The applicable toxicity data has changed; however, the cleanup levels have not. The remedial action objectives stipulated in the 1995 ROD (Army, 1995) and 2010 ESD (Army, 2010) are still valid and have been achieved; therefore, the remedy at OU 1 remains protective of human health and the environment. The groundwater RAOs are based on MCLs, meaning the recent changes to the toxicity values for PCE and TCE are not directly relevant to the protectiveness of the remedy.

The OU 1 ROD states that the RAO for soil and groundwater is to address current or potential future significant risks to human health and the environment posed by OU 1 groundwater contamination. Soil remediation was considered complete and NFA was selected. For more information, see Section 5.2 Remedial Actions.

5.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

No. The Army, EPA, DTSC, and RWQCB 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. After acceptance of the final Close-out Report, this site can be eliminated from future five-year reviews.

5.6 Issues

There are no issues affecting the protectiveness of the remedy at OU 1.

5.7 Recommendations and Follow-up Actions

TCE was the only COC specified in the ROD that exceeded the ACLs within the OU 1 groundwater LTM network since March 2008. 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 (HGL, 2015). Collection of these samples marked the end of the remediation phase. The Army, EPA, DTSC, and RWQCB 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 through the initiation of the Closure Plan, as described in the August *Final 2016 Annual Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California* (HGL, 2016a).

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:

- OU 1 monitoring, extraction, and injection wells within the FONR

3. Decommission and remove NWTS treatment plant
    - Remove treatment equipment
    - Leave the Pacific Gas & Electric (PG&E) power transformer and meter, fence, and containment basin in place
4. Perform site restoration if needed, and
5. Prepare reports to satisfy regulatory documentation of site closure:
    - Draft and final reports describing the work activities performed in accordance with the Closure Plan
    - OU 1 Closeout Report

After acceptance of the final Close-out Report, this site can be eliminated from future five-year reviews.

5.8 Protectiveness Statement

Protective. The remedy at OU 1 is protective of human health and the environment.

The remedial action objectives stipulated in the 1995 ROD (Army, 1995) and 2010 ESD (Army, 2010) have been achieved.

6.0 OU 2 ROD – FORT ORD LANDFILLS

This section presents background information on OU 2, the Fort Ord Landfills and associated groundwater plume; provides a summary of remedial activities and a technical assessment of remedial actions taken at the site; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies.

6.1 OU 2 Background

OU 2, the Fort Ord Landfills, consist of landfill cells historically covering approximately 150 acres (see Plates 2 and 6), the immediate surrounding area, and the underlying contaminated groundwater.

The Fort Ord Landfills were used from 1950 to 1987 for disposal of residential and commercial waste generated at Fort Ord. There were six landfill cells, referred to as Areas A through F. Area A was located north of Imjin Parkway and Areas B through F are located south of Imjin Parkway (Plate 6). Area A operated from 1956 to 1966. Areas B through F operated from 1960 until interim closure of the facility in May 1987. In addition to household and commercial refuse, Area B through F also may have received a small amount of chemical waste (Army, 1994). The expected future use for the land around Area A includes residential use.

As a result of detections of VOCs in Fort Ord and Marina Coast Water District water supply wells, the RWQCB issued Cleanup and Abatement Order (CAO) 86-87 that required the initiation of soil and groundwater studies to assess the potential impact of the Fort Ord Landfills on underground water resources. The RWQCB also issued CAO 86-317 and CAO 88-139 requiring the investigation and cleanup of groundwater contamination caused by the Landfill and Waste Discharge Requirements No. 87-153 requiring landfill closure by 1989. The Army initiated studies, as documented in the April 1990 *Fort Ord Landfills: Preliminary Hydrogeologic Investigation, Fort Ord, California* (HLA, 1990) to evaluate whether chemicals from the Fort Ord Landfills had affected the underlying soil or the quality of groundwater beneath the Fort Ord Landfills.

The June 1993 *Final Remedial Investigation Report, Remedial Investigation/Feasibility Study, Fort Ord Landfills, Fort Ord, California* (Dames & Moore, 1993) indicated the presence of VOCs in groundwater samples collected from both the A-Aquifer and the Upper 180-Foot Aquifer. TCE was the most frequently detected chemical in groundwater with a maximum concentration of 80 ug/L. Other VOCs detected in groundwater samples during this time period included: tetrachloroethene (PCE), benzene, cis-1,2-DCE, and methylene chloride.

Contamination at OU 2 affected the upper three groundwater aquifers, as described in the June 1993 *Final Remedial Investigation Report, Remedial Investigation/Feasibility Study, Fort Ord Landfills, Fort Ord, California* (Dames & Moore, 1993). This includes the A-Aquifer and the Upper 180-Foot Aquifer, and the Lower 180-Foot Aquifer. In the vicinity of OU 2, the tops of each of these aquifers typically are first encountered at depths of about 90 feet below ground surface (bgs) and 150 feet bgs, and 250 feet bgs, respectively. None of these three aquifers within OU 2 is used as a direct source for drinking water, although the Lower 180-Foot Aquifer outside of OU 2 is a significant source of potable water for the former Fort Ord and the City of Marina (Army, 2008). The COCs and ACLs for OU 2 are listed in Table 4. The August 1995 *Explanation of Significant Differences, Operable Unit 2, Fort Ord Landfills, Fort Ord, California* (Army, 1995) indicates that the "Lower 180-foot aquifer does not require remediation", and is not included in the OU 2 five-year review process.

The primary indicator chemical for the distribution of COCs is TCE. The 2012 footprint of the OU 2 TCE plume is shown on Plate 3and the 2016 footprint is shown on Plate 4. The distribution of COCs within the

aquifers is summarized below. The Federal and State MCLs for TCE in groundwater are 5.0 ug/L, which has been identified as the ACL.

Conceptual Site Model

The following text is an excerpt from the February 2017 *Draft Operable Unit 2, Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, Environmental Inc.[Ahtna], 2017).

Residential waste was placed in parallel trenches 10 to 30 feet deep and then covered over with the native dune sand excavated during trenching operations. Detailed disposal records are not available. However, information gathered during field activities and from other sources indicates that household and on-base commercial refuse, dried sewage sludge, construction debris, and small amounts of chemical waste (paint, oil, pesticides, electrical equipment, ink and epoxy adhesive) were placed in the Fort Ord Landfills. These activities led to the release of contaminants to the underlying unconfined A-Aquifer, west of the A-Aquifer groundwater divide. The OU 2 plume, primarily identified by the COC TCE, migrated west to the edge of the Fort Ord Salinas Valley Aquitard (FO-SVA)[2] where it entered the Upper 180-Foot Aquifer and migrated east and then down into the Lower 180-Foot Aquifer through a natural discontinuity in the Intermediate 180-Foot Aquitard. Low concentrations of COCs associated with OU 2 co-mingle in the Lower 180-Foot Aquifer with the OUCTP associated plume west of Reservation Road[3].

Depth to groundwater in the unconfined A-Aquifer is between 24 feet to 175 feet below ground surface. Groundwater in the A-Aquifer flows radially from the south to the north and deviates to the west and east along a north to northeast-trending groundwater divide, which extends from the eastern portion of the Fort Ord Landfills to the former Fritzsche Army Airfield (now the Marina Municipal Airport). Groundwater west of the A-Aquifer divide flows toward the western edge of the FO-SVA where it enters the unconfined portion of the Upper 180-Foot Aquifer. Groundwater flowing east of the A-Aquifer divide eventually discharges to the Salinas River. The A-Aquifer lithology consists primarily of fine to medium well-sorted dune sands and is separated from the Upper 180-Foot Aquifer by the FO-SVA, which consists primarily of blue-gray plastic clay with interbedded units of fine sand.

Depth to groundwater in the Upper 180-Foot Aquifer is between 45 feet and 260 feet below ground surface. To the west where the FO-SVA pinches out, the unconfined A-Aquifer and confined Upper 180-Foot Aquifer combine to form a continuous, unconfined hydrostratigraphic unit (identified as the unconfined Upper 180-Foot Aquifer). A north-trending groundwater divide in the unconfined Upper 180-Foot Aquifer exists midway between the FO-SVA and Monterey Bay. Groundwater in the unconfined Upper 180-Foot Aquifer west of the divide flows west and discharges to the Monterey Bay. Groundwater in the unconfined Upper 180-Foot Aquifer east of the divide flows under the FO-SVA (becoming confined) toward the Salinas Valley. The Upper 180-Foot Aquifer lithology consists primarily of sandy deposits with some gravel approximately 60 feet thick and is separated from the Lower 180-Foot Aquifer by the Intermediate 180-Foot Aquitard, which consists primarily of silt and clay units.

Additional information on the A-Aquifer, and the Upper and Lower-180 foot Aquifers is provided in the October 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California Volume II - Remedial Investigation Introduction and Basewide Hydrogeologic Characterization* (HLA, 1995).

Property overlying and surrounding OU 2 is within the "Prohibition Zone" of the "Special Groundwater Protection Zone." County Ordinance No. 04011 (Monterey County Code Title 15, Chapter 15.08.140) prohibits construction of water wells within the Prohibition Zone. See Plates 2 and 4 for the current (as of July

[2] The FO-SVA thins and disappears (pinches out) near the western edge of OU 2 and eastern edge of Site 12.
[3] There are no ACLs for OU 2 in the Lower 180-Foot Aquifer. This aquifer is discussed separately in the OUCTP quarterly and annual groundwater monitoring reports.

2016) Prohibition and Consultation Zones and Plate 3 for the Prohibition and Consultation Zones that were in effect in 2012.

6.2 Remedial Actions

The RAOs and the remedy for OU 2 are described in the ROD for the Fort Ord Landfills (Army, 1994). The RAOs for the shallow soils and waste materials are to restrict rainfall infiltration and prevent leaching to underlying groundwater of VOCs remaining in waste materials and soil and to prevent potential exposure of VOCs to the environment or people who use the site in the future. The ROD also states the provisional goals for the Upper 180-Foot Aquifer are to clean groundwater to these same levels. Five remedial alternatives for OU 2 were evaluated in the FS (Dames & Moore, 1993):

- Alternative 1: No Action
- Alternative 2: Containment
- Alternative 3: A-Aquifer Cleanup and Landfill Capping.
- Alternative 4: A-Aquifer Cleanup and Landfill Capping - Interim Action on the 180-Foot Aquifer
- Alternative 5: A-Aquifer Cleanup and Removal, Treatment, and Disposal of Landfill Waste - Interim Action on 180-Foot Aquifer

6.2.1 Remedy Selection

Alternative 4, A-Aquifer Cleanup and Landfill Capping - Interim Action on the 180-Foot Aquifer, was selected as the appropriate site remedy and the ROD was issued for OU 2 (Army, 1994). This selected alternative includes use of groundwater extraction wells screened in the A-Aquifer; a treatment system designed to meet the remedial action objective of achieving groundwater and chemical removal as well as contaminant plume containment in the A-Aquifer; and reuse or recharge of treated groundwater to the subsurface. This alternative also includes a landfill cap to minimize rainwater infiltration and migration of contaminants to the underlying groundwater aquifers and to protect the surrounding environment from exposure to landfill waste.

In addition, this alternative includes removal and treatment of groundwater and COCs (see Table 4) from the 180-Foot Aquifer. Groundwater extraction from the 180-Foot Aquifer was considered an interim measure in the OU 2 ROD with the final remedy for the 180-Foot Aquifer to be addressed in a subsequent decision document.

The following four ESD documents identified additional remediation criteria that were not specified in the original OU 2 ROD:

ESD 1

In August 1995, the *Explanation of Significant Differences, Operable Unit 2, Fort Ord Landfills* (Army, 1995) was signed. This ESD finalized the 180-Foot Aquifer cleanup goals consistent with those established for the A-Aquifer in the OU 2 ROD.

ESD 2

In August 1996, the *Explanation of Significant Differences, Area A, Operable Unit 2, Fort Ord Landfills* (Army, 1996) was signed. This ESD specified soil cleanup criteria for the Fort Ord Landfills at which excavation was to be used to achieve closure. Planned excavation areas included Area A, and some areas on the perimeter of the main landfill (Areas B through F). Excavated materials were consolidated within the main landfill.

ESD 3

In January 1997, the *Explanation of Significant Differences, Consolidation of Remediation Waste in a Corrective Action Management Unit (CAMU), Operable Unit 2 Landfill* (Army, 1997) was signed. This ESD addressed the reuse of remediation waste (soil and debris with residual lead excavated from remediation areas at Fort Ord), and consolidation of the waste within the main landfill (Areas B through F) as a foundation layer rather than using clean soil for the same purpose.

ESD 4

In August through October 2006, the *Explanation of Significant Differences, No Further Action for Munitions and Explosives of Concern, Landfill Gas Control, Reuse of Treated Groundwater, Designation of Corrective Action Management Unit (CAMU) Requirements as Applicable or Relevant and Appropriate Requirements (ARARs), Operable Unit 2, Fort Ord Landfills, Former Fort Ord, California* (Army, 2006) was signed. This ESD concludes that no further action regarding MEC within the Fort Ord Landfills is required, clarifies landfill gas control measures; documents the decision to reuse treated groundwater for non-potable construction purposes (including dust control and soil compaction); clarifies that the intent and purpose of ESD 3 (Army, 1997) was not to formally designate the Fort Ord Landfills as a CAMU, as suggested by ESD 3, but to state that the substantive CAMU requirements of California Code of Regulations (CCR) Title 22 and Resource Conservation and Recovery Act (RCRA) are applicable to the Fort Ord Landfills.

6.2.2 Remedy Implementation

Fort Ord Landfills Cap

From 1996 to 1998, debris from Area A (see Plate 6), an approximately 25-acre area of the Fort Ord Landfills complex located north of Imjin Parkway, was excavated and transferred to the main portion of the landfill to consolidate the debris into one area. The consolidation of approximately 1,000,000 cy of refuse and soil impacted by the refuse allowed for clean closure of Area A, which now is available for unrestricted use (IT, 2001). The remaining areas of the Fort Ord Landfills (Areas B, C, D, E, and F) have been covered by a landfill cap constructed after consolidation activities were completed. A seven-acre portion of Area E (Interim Area E) was kept open to allow the placement of additional waste from other Fort Ord remediation sites (Army, 1997a). Construction of the engineered cover over Interim Area E was completed in December 2002. In addition to three perimeter legs, piping previously installed to connect the treatment system to a landfill gas collector trench in Area E was incorporated into the extraction system. This collector pipe is intended to provide additional landfill gas, if needed or desired for future applications. The horizontal gas collection pipe was installed just below the liner. The landfill cap was completed over the Interim Area E in December 2002.

The Army completed construction of the engineered cover over Areas B through F from 1997 to 2002 (Shaw, 2005). The engineered cap generally consists of a 2-foot foundation layer (general fill on top of refuse), a linear-low density polyethylene (LLDPE) membrane, completed by a 2-foot vegetated cover.

Area E Vertical Expansion

To accommodate the remediation at the Site 39 Inland Ranges, additional capacity in the form of a vertical expansion was required at the Fort Ord Landfills. Additional capacity was available by placing remediation waste within the confines of the existing Area E footprint. Construction of the vertical expansion involved placing additional remediation waste above the existing geomembrane and providing a new cover consisting of a foundation layer, geomembrane, and vegetative layer over the remediation waste. The additional remediation waste is sealed above and below by a geomembrane. The vertical expansion allows for placing about 200,000 cy of remediation waste in at least two phases. Phase 1 was completed in 2013 with approximately 150,000 cy placed in the vertical expansion at Area E.

Remediation of Site 39 and placement of soil in the Area E vertical expansion may continue in future years; therefore, the vertical expansion was designed to accept another 50,000 cy of remediation waste in the Phase 2

area. During Site 39 remediation activities in 2013, approximately 8,300 cy of remediation waste were placed in the Phase 2 area on top of approximately 12 inches of the pre-existing vegetative soil layer that covered the original Area E geomembrane. The remediation waste was then temporarily covered with approximately 12 inches of clean soil, which was obtained from the Fort Ord Landfills borrow source area, in 2015. Until the vertical expansion is complete, the remediation waste in the Phase 2 area will remain sealed below by a geomembrane and covered by 12 inches of clean soil, which is being managed to prevent exposure of remediation waste to the environment. Details of the Area E vertical expansion design are provided in the August 2012 *Final Design Report, Revised OU2 Landfill Area E Expansion Construction, Former Fort Ord, California* (Innovative Technical Solutions, Inc. [ITSI]/Gilbane, 2012). Details of the Area E Phase 1 vertical expansion construction are provided in the October 2014 *Final Construction Quality Control and Quality Assurance Report, Area E, Phase 1, Operable Unit 2 Landfills, Former Fort Ord, California* (Gilbane, 2014).

Groundwater Treatment

A groundwater treatment system (GWTS) was constructed in 1995 to remediate groundwater contaminated by discharges from the Fort Ord Landfills. The treatment facility is connected to a network of extraction and injection wells as described in Section 6.3. Remediation is expected to require approximately 30 years for completion. During operation of the treatment system, groundwater is sampled periodically to confirm the effectiveness of treatment system operation. Since 1995, water samples and water levels from groundwater MWs have been collected every three months. This information has been compiled into quarterly and annual reports to show the long-term trends of system operation. The general subsurface extent of the groundwater contaminant plume as of June 2016 is shown on Plate 4

The OU 2 groundwater treatment system originally consisted of carbon adsorption followed by polishing via catalyzed ultraviolet chemical oxidation (UV-Ox). The UV-Ox was included in the treatment chain because vinyl chloride and methylene chloride were predicted to be the initial GAC breakthrough compounds and UV-Ox would be a cost effective secondary treatment. It was later shown that 1,1-dichloroethane (-DCA) and chloroform were the initial breakthrough compounds. Carbon adsorption originally was accomplished using two 20,000-pound GAC connected in series. The original system extracted water from two Upper 180-Foot Aquifer extraction wells and 13 A-Aquifer extraction wells to produce a total flow of approximately 765 gpm. Following treatment, the extracted water was injected back into its source aquifer (either the A-Aquifer or Upper 180-Foot Aquifer). The OU 2 groundwater remedy was formally recognized as "Operating Properly and Successfully" by the EPA in January 1996 (EPA, 1996).

Expansion of the OU 2 treatment system was initiated following discovery that capture of the contaminant plume was incomplete and that the plume area exceeding ACLs extended farther than previously identified during design of the remediation system. In response, a system expansion was designed and implemented to enable complete hydraulic capture of the plume in accordance with the OU 2 ROD remediation objectives. The system modifications were completed in April 2001, as described in the September 2001 *Construction Completion Report Operable Unit 2 Groundwater Remedy Expansion* (IT, 2001). Modifications included removal of the UV-Ox system and installation of two additional 20,000 pound GAC vessels and seven additional extraction wells. The two additional GAC vessels were connected in series and operated in parallel with the original GAC vessels. In addition to the expanded treatment capacity, a pipeline was constructed to transport some of the OU 2 effluent to the Sites 2 and 12 areas for injection to enhance control of groundwater flow.

The 2001 system modification effectively doubled the potential throughput capacity of the groundwater treatment plant (GWTP) to more than 1,200 gpm. However, water flow into the GWTP was limited by the pipeline flow capacity until installation of a 1,200 gpm in-line pump in 2006. The OU 2 treatment system was expanded again in 2006/2007 with the addition of two new extraction wells (EW-OU2-07-180 and EW-OU2-08-180) in the Upper 180-Foot Aquifer that were connected to the treatment system by a new pipeline. One of these wells (MW-OU2-08-180) became operational in July 2007; the second well (MW-OU2-07-180) has not

been brought on line for extraction to date because of limited effectiveness in the currently targeted extraction areas, as demonstrated by pumping tests.

Based on the findings presented in annual evaluation reports (2011 through 2016), optimization activities have occurred and generally include modifications to improve performance, reduce costs, and increase the likelihood of achieving cleanup goals. These modifications typically include continued evaluation of system flow rates and COC concentrations to optimize groundwater treatment system GWTS operation parameters, and replacement or upgrade of various system components (e.g., repair/replace pumps) to improve the efficiency and capabilities of the GWTS.

A new treatment system is currently being constructed at the Fort Ord Landfills to help shorten the time to clean up the plume. Groundwater treatment will continue through the construction process which is expected to be completed in 2018. The current system will continue to operate until the new system is fully functional. The project entails constructing new groundwater-extraction wells; installing new water treatment units GAC vessels and other process equipment; constructing new injection wells for treated water; startup and prove-out of the GWTP-New; and decommissioning the GWTP-Existing (existing system). Additional information can be found in the November 2015 *Design Analysis Report, Design-Build Groundwater Treatment Plant Relocation and System Improvements, Former Fort Ord, Seaside, California* (RORE Innovative Solutions Joint Venture [RORE/ITSI], 2015).

Landfill Gas Treatment

A landfill gas extraction and treatment system was installed in 2001 to prevent migration of landfill gas toward residential housing east of the Fort Ord Landfills Area F. The system consisted of eleven extraction wells, associated piping, and the landfill gas treatment system, which included GAC (to remove VOCs) and potassium permanganate (to remove vinyl chloride). This system maintained methane concentrations along the fence line adjacent to the eastern side of Area F to less than five percent by volume, which is compliant with CCR Title 27 Section 20921(a)(2).

The landfill gas extraction and treatment system was expanded in 2006 to improve vapor recovery and reduce migration of VOCs to underlying groundwater in addition to reducing atmospheric emissions of VOCs and methane. The expansion included addition of vertical extraction wells along the perimeter and interior of Area F and replacing the existing GAC/potassium permanganate treatment system with a thermal treatment unit (TTU). After the landfill gas extraction and treatment system expansion was completed, intermittent operation of the TTU was initiated as part of the startup testing in April 2006, and full-time operation began on August 2, 2006.

The TTU comprises four process flow trains; Area F interior, Area F perimeter, Area D, and Area E. The system filters out moisture condensed from the extracted landfill gas and the gas is routed into a high-temperature combustion chamber (enclosed ground flare) where the gas is destroyed by burning. The systems include flow and pressure monitoring devices, fail-safe shut down systems to stop gas flow in the event of system malfunctions, flame arrestors to prevent backward propagation of flame from the combustion chamber, and computerized control systems to measure and record system processes and optimize the gas destruction. The system is described in detail in the June 2010 *Operation and Maintenance Plan, Operable Unit 2 Landfills, Former Fort Ord, California, Revision 2* (O&M Plan; Shaw E&I, 2010).

In February 2011, four additional passive vents in Areas D and F (VD-2, VD-3, VF-3, and VF-5) were converted to extraction points (EPs) to additionally augment the methane output. The addition was documented in Field Work Variance TII-154 to the O&M Plan (Shaw E&I, 2008). No additional sources of landfill gas have been added since 2011 (Gilbane, 2015).

6.2.3 System Operations and Maintenance

Groundwater Treatment and Effluent Monitoring

The effectiveness of the remedy is evaluated based on data from groundwater monitoring conducted throughout the OU 2 treatment area and within the affected aquifers. Continuing O&M activities performed since the start of groundwater treatment operations in 1995 have provided assurance that the OU 2 GWTS has functioned in accordance with the objectives of the ROD and system design parameters. The system is operated in accordance with the August 2009 *Final Operations and Maintenance Manual, Volume 1, Operable Unit 2 Groundwater Remedy, Former Fort Ord, California,* (Ahtna, 2009) and the June 2016 *Final Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix D, Draft Final Revision 1, Groundwater Remedies and Monitoring at Operable Unit 2, Sites 2 and 12, and Operable Unit Carbon Tetrachloride Plume* (QAPP; Ahtna, 2016a). Summaries of O&M activities are presented in annual groundwater treatment systems operation data summary reports (through 2013) and quarterly groundwater monitoring and treatment system reports (2014 through 2016). The most recent report describing OU 2 O&M is the April 2016 *Final Annual Report, 2015, Operations and Maintenance, Operable Unit 2 Landfills, Former Fort Ord, California* (Ahtna, 2016d).

The following provides a discussion of the treatment system efficiency for this reporting period and provides information on problems (typical) that affected system performance. Additional details are provided in the annual groundwater treatment systems operation data summary reports and quarterly groundwater monitoring and treatment system reports; references for these reports are provided in Appendix A.

October – December 2011 GWTS Performance

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 98.9 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment system efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 98.4 percent efficiency.

Problems Encountered with GWTS Operation

- EW-OU2-12-A: shutdown in February due to leak in vault piping (remedied in December 2016)
- EW-OU2-14-A: failed pressure transducer; replaced in July
- EW-OU2-16-A: failed pump motor; replaced in June

January – December 2012 GWTS Performance

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 98.9 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment system efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 97.6 percent efficiency.

Problems Encountered with GWTS Operation

- Intermittent communication loss causing pump shutdowns through March 2012. A new radio was installed in March 2012.
- EW-OU2-06-180: failed pump in February 2012. This extraction well will remain offline; neighboring well EW-OU2-05-180 is providing sufficient capture of the plume.
- Supervisory Control and Data Acquisition (SCADA): GWTP shutdown due to power outage in October 2012 and SCADA did not alert the operator due to server storage limitations. New operating system installed in November 2012 in preparation for new servers.

January – December 2013 GWTS Performance

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 99.8 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 98.1 percent efficiency.

Problems Encountered with GWTS Operation

- Shoppette and Landfill Power Line Communication: failure on March 6, 2013 for 4 hours due to vandalism (unauthorized power shutdown at landfill gas TTU).
- Fire Alarm: the fire alarm panel showed a trouble fault indicating communications failure with the alarm service provider. The telephone lines to the fire alarm panel were replaced on August 19, 2013.
- On December 9, 2013, an electrical malfunction in the variable frequency drive (VFD) for injection pump P510, which supplies SW INJ (INF-OU2-02-180 and IW-OU2-02-180), triggered a smoke detector at the OU 2 GWTP and a response from the Marina Fire Department.

October 2013 – September 2014 GWTS Performance[4]

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 99.1 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment system efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 97.8 percent efficiency.

Problems Encountered with GWTS Operation (typical)

- On December 11, 2014, a major storm event caused communications loss resulting in a 20-hour GWTP shutdown. The GWTP was restarted on December 12, 2014.
- On January 29, 2015, an effluent tank low-level alarmed due to a communication loss which caused the GWTP to shut down for 12 hours.
- EW-OU2-02-A: pump failure occurred on September 13, 2014. Modeling analysis concluded that other operable extraction wells were sufficiently capturing the groundwater plume (western A-Aquifer TCE plume); therefore, the pump was not recommended for replacement.
- EW-OU2-05-A: pump failure occurred on November 5, 2013. The pump was replaced on August 4, 2014.

October 2014 – September 2015 GWTS Performance

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 99.3 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment system efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 98.5 percent efficiency.

Problems Encountered with GWTS Operation

- Programmable Logic Controller: On August 7, 2015, an electrical storm damaged controller components. Repairs were completed on September 2, 2015.
- EW-OU2-03-180: An electrical issue was identified that was causing low flow during the overnight hours of operation. The issue was exposed wiring due to worn insulation causing the VFD to go

[4] The annual reporting period was revised from the calendar year (January through December) to the federal fiscal year (October through September).

offline in colder temperatures during overnight hours. The wiring insulation was repaired and the VFD faulting was corrected on October 23, 2015.

October 2015 – September 2016 GWTS Performance[5]

The OU 2 groundwater remedy was operated during this period with an average GWTP operability rate of 99.5 percent, as defined by the ratio of downtime to operational time. This exceeded the operational goal of 95 percent. Groundwater treatment system efficiency is evaluated by comparing influent TCE to effluent TCE concentrations. This reporting period shows a 98.0 percent efficiency.

Problems Encountered with GWTS Operation

- EW-OU2-14-A: A loss of communication occurred on October 15, 2015; restored on October 27, 2015.
- EW-OU2-09-180: Extraction well went offline due to pump failure on November 4, 2015.
- EW-OU2-09-180: Extraction well online after the pump was replaced with a larger pump, which increased the flow rate to approximately 65 gpm.
- The OU 2 GWTP shut down for 19 hours beginning on February 20, 2016 due to flooding in the GAC vessel containment berms. The water was entirely contained within the GWTP containment berms. On February 21, 2016 the containment berms were pumped out, and the GWTP was restarted.
- EW-OU2-12-A: On April 29, 2016, the extraction well was left on at 10 gpm in "hand" mode (with no automatic control) due to a faulty transducer. The faulty transducer was replaced on May 5, 2016, and the extraction well was returned to automatic operations.

Discharge Compliance Monitoring

Discharge compliance monitoring during normal operations is conducted as specified in the Quality Assurance Project Plan (QAPP) (Ahtna, 2016a) to document compliance with treated discharge water requirements for aquifer recharge. The combined OU 2 GWTP influent is sampled at TS-OU2-INF prior to entering the GAC vessels. Injection monitoring samples are collected at TS-OU2-INJ. The concentration of TCE at the injection point of compliance is reported as an average for each month. The table below summarizes the compliance point analysis.

[5] The annual reporting period (October 2015 through September 2016) was not yet complete as of the date of this report.

Summary of Compliance Point Laboratory Results		
Reporting Period	**Maximum TCE Influent Concentration (ug/L)**	**TCE Concentration at the Injection Monitoring Sampling Point (ug/L)**
October to December 2011	6.5	ND
January to December 2012	7.9	Four TCE detections ranging from 0.15 to 0.38 ug/L
January to December 2013	6.0	ND
January to December 2014	7.7	One TCE detection at 0.29 ug/L
January to December 2015	8.7	ND
January to June 2016	5.7	One TCE detection at 0.10 ug/L

Notes:
ND – non-detect for every month in the reporting period
ug/L – micrograms per liter
The discharge limit for TCE is 0.5 ug/L.

Sources:
1) *Operable Unit 2, First Quarter 2016, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2016b)
2) *Draft Operable Unit 2 Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2017)
3) *Operable Unit 2, Fourth Quarter 2014 through Third Quarter 2015, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2016c)
4) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2013, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2014)
5) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2012, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2013)
6) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2011, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2012a)

During the October 2015 through September 2016 reporting period, six COCs were detected at the injection monitoring point: 1,1-DCA; 1,2-DCA; chloroform; cis-1,2-DCE; methylene chloride; and TCE. All detected concentrations were below discharge limits except one detection of methylene chloride on September 19, 2016. Analysis of OU 2 GWTP influent and extraction well results indicated that the detection of methylene chloride result was likely due to laboratory contamination and not representative of actual groundwater conditions.

Landfill Cap

O&M at the Fort Ord Landfills includes inspection and maintenance of the landfill cover (vegetative cover and geomembrane), slope stability, survey monuments, settlement plates, erosion and drainage control, and security fence.

Routine maintenance work included setting traps for burrowing animals, filling burrows, wheel-rolling sloped areas to collapse burrows, and cleaning out drainage ditches to allow unencumbered flow of surface water. Other routine activities included tree trimming, fence and road maintenance, and mowing.

During this reporting period a State of California Registered Civil Engineer conducted annual inspections of the Fort Ord Landfills. Representatives of the Monterey County Department of Health (Local Enforcement Agency for the California Integrated Waste Management Board) conducted four quarterly inspections annually

during the reporting period. There were no violations; however, some minor maintenance improvements were recommended (e.g., controlling burrowing animals and controlling invasive plant growth) and were implemented. In general, inspections found that appropriate maintenance of the Fort Ord Landfills is being conducted, and the Landfills are functioning as designed.

In 2015, interim engineering controls were implemented at Area E to reduce the volume of storm water runoff that could flow into the tie-in trench[6]. Synthetic wattles[7] were placed upslope of the trench and a berm was constructed to divert surface runoff to the culvert through the catchment berm on the west side of Area E. After rain events, water collected in the tie-in trench was pumped into the culvert and the existing drainage system to reduce subsurface flow through the catchment berm and decrease the chances of downslope erosion damage. Additional permanent and/or semi-permanent engineering controls will be implemented in the next reporting period.

The construction of concrete V-ditches in 2015 at various areas of the Fort Ord Landfills was found to be a significant improvement in minimizing erosion. During the first rains of the season, the V-ditches appeared to be working as designed and are an effective erosion mitigation measure.

After the first rains, synthetic wattles were installed at critical locations (primarily on perimeter roads) and found to be effective in minimizing erosion. Unlike straw wattles, the synthetic wattles are extremely durable, with a life expectancy of five years or more, and may be moved from location to location as needed; therefore, their continued use as an erosion mitigation tool is recommended.

Landfill Gas Treatment and Monitoring

Currently, the TTU operates on an intermittent basis to optimize fuel/pressure ratios to provide the most complete COC consumption rate. Typical burn time is equivalent to about 54 hours per week (Shaw E&I, 2010). Although TTU emissions are subject to CERCLA requirements and are not subject to local air district permitting, system operations are within local emission limits during this reporting period. The table below shows total hours, total hours operated, and percent of operation.

Thermal Treatment Unit Operations 2006-2016

							4th Five-Year Review Reporting Period (Third Quarter 2011 to Third Quarter 2016)					
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016 (Jan-Sept)**	**Cumulative**
Total Hours[1,2]	6,528	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	5,785	91,153
Total Hours Operated	2,891	4,035	2,816	4,524	2,474	2,530	2,509	2,098	1,961	2,653	1,460	29,951
Percent Operation	44%	46%	32%	52%	28%	29%	29%	24%	22%	30%	25%	32.9%

[6] Remediation waste was placed and covered in the Phase 1 portion of Area E; however, in the Phase 2 portion of Area E, the tie-in trench was left in place so a new geomembrane cover could be secured to the existing geomembrane after additional Site 39 remediation waste is brought to the Fort Ord Landfills sometime in the future.

[7] A wattle is a man-made erosion/sediment control device typically constructed in a tubular form. Wattles are used to reduce storm water flow velocities to mitigate erosion. They can be made of straw materials woven into a tube/log or be made of synthetic materials.

Thermal Treatment Unit Operations 2006-2016												
							4th Five-Year Review Reporting Period (Third Quarter 2011 to Third Quarter 2016)					
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 (Jan-Sept)	Cumulative

Notes:
1- Hours include system start-up and shakedown, which started on April 4, 2006.
2- Thermal Treatment Unit started full time operation on August 2, 2006.
% - percent
Source:
Final Annual Report, 2015 Operations and Maintenance Operable Unit 2 Landfill, Former Fort Ord, California (Ahtna 2016d)

To monitor landfill gas migration, samples are collected from 67 monitoring probes and 2 utility trench probes located around Areas B through F. Monitoring probes were installed at a spacing not exceeding 1,000 feet as required by CCR Title 27 Section 20925(a)(1). The monitoring probes measure landfill gas at depths below surface ranging from 12 to 32 feet. The utility trench probes are 4 feet deep. All the monitoring probes installed around the Fort Ord Landfills are monitored quarterly to establish methane trends. Landfill gas compliance monitoring was conducted in 2011 to 2014 in accordance with Appendix F of the August 2008 *Operation and Maintenance Plan, Operable Unit 2 Landfills, Former Fort Ord, California, Revision 2* (Shaw E&I, 2008). The Landfills' QAPP was revised in 2016 to optimize monitoring of probes based on historic data. Decision criteria were also added to the QAPP to allow reductions in monitoring frequency or elimination of specific probes from the monitoring program. Additional detail is provided in the *Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix D, Final Revision 1, Operable Unit 2 Landfills* (Ahtna, 2016a).

Operation and Maintenance Costs

Costs for operations and maintenance over the last five years are summarized in the table below.

Annual Landfill and Groundwater Treatment System Operations and Maintenance Costs		
Dates		Total Cost (Rounded to the Nearest $1,000)
From	To	
2011	2012	$1,393,000
2012	2013	$1,416,000
2013	2014	$1,688,000
2015	2016	$2,909,000
January 2016	September 2016	$1,887,000

Based on costs listed in the ROD (Army, 1994), the predicted annual O&M costs for both the Landfills and the groundwater treatment system were estimated to be $480,000. Costs are higher than original estimates due to significant expansion of groundwater extraction and treatment operations and inclusion of the TTU for landfill gas that were not in the original ROD estimates.

6.3 Progress Since the Last Five-Year Review

Activities completed since the last Five-Year Review Report was issued supporting the continued remediation of OU 2 include:

- Reduction in COC mass and spatial distribution

- Maintained and enhanced hydraulic control of the affected aquifers
- Maintained institutional controls (e.g., updating the Monterey County Special Groundwater Protection Zones) and engineering controls (e.g., perimeter fence)[8]
- Completed five consecutive years of operations and maintenance[9]
- Completed five consecutive years of groundwater and treatment system monitoring and maintenance[10]
- The State of California Registered Civil Engineer conducted annual inspections of the Fort Ord Landfills throughout this reporting period
- The Monterey County Department of Health conducted quarterly inspections throughout this reporting period
- Vegetation control
- Maintained and enhanced erosion and surface water controls

These inspections have resulted in only minor recommendations, which have been effected. Internal maintenance programs have been very successful in self-monitoring and reporting. The issues and problems that challenge the efficient operation of the OU 2 remediation systems are identified and memorialized. Operators routinely propose optimization activities, many of which are put in place, that have further benefited the system's ability to operate safely and efficiently. These actions have resulted in the GWTS being operational 99.1 percent of the time (average over the last five years).

The mass of COCs and the spatial distribution, defined by TCE, in the OU 2 plumes (A-Aquifer and the Upper-180 Foot Aquifer) have decreased during this reporting period (see Plates 3 and 4). Vegetation is well established in closed landfill areas. Since the onset of TTU operations, the methane concentrations in perimeter monitoring probes have remained below remediation criteria (Ahtna, 2012a).

6.3.1 2012 Five-Year Review Protectiveness Statement

Regarding the protectiveness of the OU 2 remedy, the 2012 Five-Year Review Report (Army, 2012) stated that:

> "The OU 2 remedies are protective of human health and the environment, and, in the interim, potential exposure pathways that could result in unacceptable risks are being controlled. During the course of the remediation process, potential environmental and health concerns are being addressed by mitigation measures, such as control and treatment of landfill gases, and potential exposure pathways that could result in unacceptable risks are being controlled by restrictions of Chapter 15.08 of Title 15, Monterey County Code, and the CRUP."

6.3.2 Status of 2012 Five-Year Review Issues and Recommendations

This section summarizes the issues and recommendations identified during the previous Five-Year Review and the steps that have been taken to address any concerns pertaining to the effectiveness of the remedy.

[8] Additional details are provided in Appendix B Field Documentation of Site Inspections and Interviews.
[9] The Third Quarter 2016 data has been collected but to date the report has not been published.
[10] The Third Quarter 2016 data has been collected but to date the report has not been published.

Issues:

There are no issues affecting the protectiveness of the remedy at OU 2. Additionally, this assessment did not identify any unresolved issues previously raised by regulatory agencies, the community, or other interested parties (*Final 3rd Five-Year Review Report for Fort Ord Superfund Site Monterey County, California* [Army, 2012]).

Recommendations:

The OU 2 groundwater remedy and the Fort Ord Landfills O&M activities, including landfill gas monitoring, are operating as intended, and no follow-up actions are recommended.

Operation of the landfill gas treatment system should continue to ensure that landfill gas levels remain below regulatory standards. Operation of the OU 2 Groundwater Remedy should continue as designed with implementation of appropriate optimization measures until ACLs are reached and maintained. Relocation of the GWTS to the OU 2 Fort Ord Landfills was recommended in the August 2011 *Final Annual Groundwater Treatment Systems Operation Data Summary Report, January through December 2010* (Ahtna, 2011); the relocation and reconstruction began in June 2016 and is anticipated to be completed in early 2018. The new GWTP will include upgrades to system components that will reduce long-term O&M costs.

Annual operations and maintenance reports demonstrate that work at all major treatment and monitoring systems; landfill gas monitoring, landfill gas extraction and treatment, and landfill inspection and maintenance are conducted in accordance the October 2014 *Final Construction Quality Control and Quality Assurance Report, Area E, Phase 1, Operable Unit 2 Landfills, Former Fort Ord, California* (Gilbane, 2014) and the August 2008 *Operation and Maintenance Plan, Operable Unit 2 Landfills, Former Fort Ord California, Revision 2* (Shaw E&I, 2008). Conformance with these two primary documents will continue until the new treatment system is constructed and becomes fully operational, estimated in early 2018.

6.4 OU 2 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. Administrative and community involvement activities have been performed for Fort Ord using a basewide approach and are detailed in Sections 4.1 and 4.2. Document reviews, data reviews, site inspections, and interviews, if applicable, have been conducted on a site-by-site basis and are described in the following subsections.

6.4.1 Document Review

As part of the five-year-review for OU 2, pertinent site-specific documents were reviewed to evaluate current site conditions in the context of remedy implementation and progress toward remedial action objectives. Among the documents reviewed were the RI/FS Report, ROD, ESDs remedial design, remedy implementation work plans and completion reports, system modification reports, and quarterly and annual operations and monitoring reports. A complete list of the references reviewed is presented in Appendix A, References.

6.4.2 Data Review

Groundwater

The goals of the OU 2 groundwater remedy are to protect human health. Specifically, the RAO is to remediate COCs in the A-Aquifer and Upper 180-Foot Aquifer to federal or state drinking water MCLs or lower for some COCs (ACLs). These goals are accomplished through hydraulic control and containment of contaminated groundwater, and through extraction and treatment of groundwater exceeding ACLs. The table below shows the maximum COC concentrations from groundwater samples collected from extraction and monitoring wells screened in the A-Aquifer.

A-Aquifer Groundwater Analytical Results Maximum COC Concentrations: Beginning and End of the Five-Year Review Period[1]			
Analyte	**Aquifer Cleanup Level [2] Concentration (ug/L)**	**December 2011 Maximum Concentration (ug/L)**	**Third Quarter 2016 Maximum Concentration (ug/L)**
Benzene	1.0	**3.6**	0.66
Carbon Tetrachloride	0.5	ND	ND
Chloroform	2.0	**7.9**	**4.0**
1,1- Dichloroethane (1,1-DCA)	5.0	**50.9**	**36.3 J**
1,2-Dichloroethane (1,2-DCA)	0.5	**7.4**	**6.7 J**
cis-1,2-Dichloroethene (cis-1,2-DCE)	6.0	**18.7**	**14.8 J**
1,2-Dichloropropene (1,2-DCP)	1.0	**1.5**	0.90[3]
Methylene Chloride/Dichloromethane	5.0	3.5 J	2.9 J
Tetrachloroethene (PCE)	3.0	**14.5**	**14.7**
Trichloroethene (TCE)	5.0	**17.6**	**13.3**
Vinyl Chloride (VC)	0.1	**31.3**	**14.4**
Notes: [1] This table does not provide a well to well comparison. [2] The ACL is the lower of the Federal and State MCLs, and for some constituents more stringent levels. [3.] Data from Second Quarter 2016. J - estimated value ND - Not detected ug/L – micrograms per liter Values in bold are greater than the corresponding ACL.		Sources: *Report of Quarterly Monitoring, October through December 2011, Groundwater Monitoring Program Sites 2 and 12, OU2, OUCPT and OU1 off-site, Former Fort Ord, California* (Ahtna, 2012) *Draft Operable Unit 2 Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2017)	

The table below shows the maximum COC concentrations from groundwater samples collected from extraction and monitoring wells screened in the Upper 180-Foot Aquifer.

Upper 180-Foot Aquifer Groundwater Analytical Results Maximum COC Concentrations: Beginning and End of the Five-Year Review Period[1]			
Analyte	**Aquifer Cleanup Level [2] Concentration (ug/L)**	**December 2011 Maximum Concentration (ug/L)**	**Third Quarter 2016Maximum Concentration (ug/L)**
Benzene	1.0	ND	0.17 J
Carbon Tetrachloride	0.5	**6.2**	0.21 J
Chloroform	2.0	1.0	1.6 J
1,1- Dichloroethane (1,1-DCA)	5.0	0.37 J	0.69 J
1,2-Dichloroethane (1,2-DCA)	0.5	ND	0.15 J
cis-1,2-Dichloroethene (cis-1,2-DCE)	6.0	4.6	5.7 J
1,2-Dichloropropene (1,2-DCP)	1.0	0.10 J	0.29 J
Methylene Chloride/Dichloromethane	5.0	ND	1.6 J
Tetrachloroethene (PCE)	3.0	1.5	2.4
Trichloroethene (TCE)	5.0	**22.5**	**19.6 J**
Vinyl Chloride (VC)	0.1	ND	ND
Notes: [1] This table does not provide a well to well comparison. [2] The ACL is the lower of the Federal and State MCLs and, for some constituents, more stringent levels. J – estimate value ND - Not detected ND – not detected ug/L – micrograms per liter Values in bold are greater than the corresponding ACL.		Sources: *Report of Quarterly Monitoring, October through December 2011, Groundwater Monitoring Program Sites 2 and 12, OU2, OUCTP and OU1 off-site Former Fort Ord, California* (Ahtna, 2012) *Draft Operable Unit 2 Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2017)	

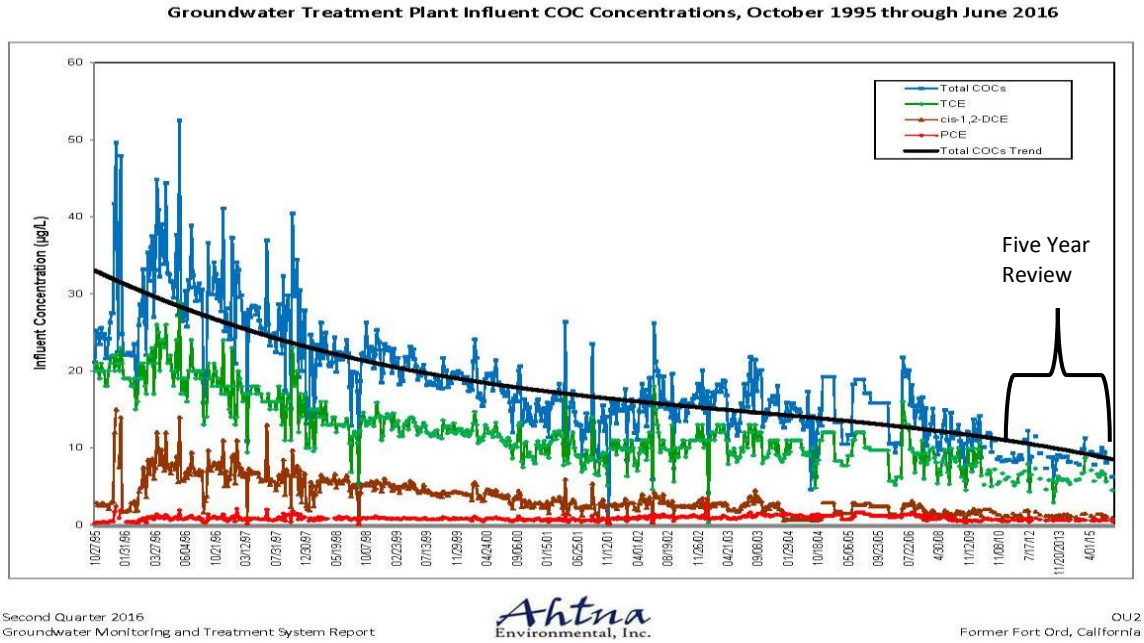
The total volume of treated groundwater for the reporting period was approximately 1.4 billion gallons. The average flow rate approximating the reporting period for this Five-Year Review is 598 gpm. The reported average monthly flow rate varies depending on flow rates for individual wells and downtime events at the GWTP or the extraction wells. Cumulative treated groundwater flow since startup on October 1995 through June 2016 is estimated at 6.8 billion gallons. The data shows an estimated 126.1pounds of COC mass was removed in a period approximating the reporting period for this Five-Year Review.

Annual GWTP Flow Rate and COC Mass Removal				
Reporting Period	**Volume (gallons)[1]**	**Average Flow Rate (gpm)**	**Mass Removal (pounds)**	**Cumulative Mass Removal[2]**
January through December 2011	374,251,647	712	26.0	700
January through December 2012	349,484.879	665	28.3	728
January through September 2013	236,055,648	600	17.5	745
October 2013 through September 2014	303,123,254	578	21	766
October 2014 through September 2015	265,878,616	505	19	786
October 2015 through September 2016	280,000,000 (approximately)	531	14.3	805
Totals	**1,459,658,650**	**598**	**130.8**	

Notes:
1 – Volume calculated as the sum of volumes from the extraction wells
2 - Since system start-up in October 1995.

Sources:
1) *Operable Unit 2, First Quarter 2016, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2016b)
2) *Operable Unit 2, First Quarter 2015, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2015)
3) *Final Operable Unit 2, Fourth Quarter 2014 through Third Quarter 2015, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2016e)
4) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2013, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2014)
5) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2012, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2013)
6) *Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2011, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California* (Ahtna, 2012a)

The following chart shows the groundwater treatment system influent COC concentrations from system start up to June 2016. All major COC concentrations are trending down since system start-up including through this Five-Year Review period.



Hydraulic Capture

Hydraulic capture analysis of the OU 2 GWTS includes groundwater elevation contour interpretation, model-simulated groundwater flow interpretation, and measured groundwater chemistry interpretation. The basewide numerical groundwater flow model (the "model") used to simulate groundwater conditions beneath the former Fort Ord has been updated from the previous version to evaluate hydraulic capture of COCs by the A-Aquifer and Upper 180-Foot Aquifer OU 2 extraction wells. The model simulates backward-tracking groundwater flow paths induced by operation of the OU 2 extraction wells. The model is based on the finite difference MODFLOW-2000 (MODFLOW) Version 1.19.01 software (Harbaugh et al., 2010) originally completed for the Fort Ord basewide hydrogeological characterization and used in the Basewide RI/FS (HLA, 1995).

A-Aquifer

The encapsulation of the TCE plume by backward-tracking particle pathlines emanating from the A-Aquifer extraction wells illustrates the successful capture of a portion of the western and southern sections of the TCE plume at OU 2 by the 2014/2015 extraction/injection configuration. The presence of a persistent groundwater divide in this area makes it difficult for the eastern extraction well network (EW-OU2-07-A through EW-OU2-13-A) to capture the area beneath Fort Ord Landfills Area F. This zone is also coincident with the area of highest concentrations of COCs other than TCE.

The long-term reduction of the TCE plume footprint illustrates that the current extraction well configuration has effectively removed TCE mass from this aquifer; however, the persistence of TCE and other COCs downgradient from Fort Ord Landfills Area F demonstrates the need for continued operation of the GWTS.

Upper 180-Foot Aquifer

The encapsulation of the TCE plume by backward-tracking particle pathlines emanating from Upper 180-Foot Aquifer OU 2 extraction wells illustrates that the 2014/2015 extraction/injection configuration was able to provide successful capture conditions. Extraction well EW-OU2-06-180 continues to provide the bulk of long-term hydraulic capture of the core areas of the Upper 180-Foot Aquifer TCE plume. Historically, wells EW-OU2-05-180 and EW-OU2-06-180 were operated in conjunction to control migration of this plume; however,

due to continued contraction of the plume in this area, operation of well EW-OU2-06-180 is likely sufficient to maintain capture. Although the operating extraction wells in the Upper 180-Foot Aquifer maintain hydraulic capture of the TCE plume, a persistent TCE footprint exceeding the ACL suggests an overall low efficiency of the GWTS for this aquifer. Model optimization simulations suggest that three additional extraction wells may reduce mass removal time of TCE above the ACL by approximately seven years due to closer proximity to core TCE-impacted areas of the aquifer, with concentrations falling below the ACL by 2027 (Gilbane, 2014). Modifications to individual extraction wells, such as limiting flow from portions of the screened interval associated with relatively clean groundwater, may also increase the mass removal efficiency.

Based on comparisons of the observed VOC distribution to hydraulic capture areas simulated using the updated model, the current extraction well configuration maintains TCE plume capture, though at low efficiencies. Several improvements that reduce contaminant mass and remedial response time are possible and recommended. It is anticipated that most of these improvements will occur in conjunction with the forthcoming relocation of the OU 2 GWTP, which includes an expansion of the OU 2 GWTS extraction well network.

Landfill Gas Monitoring

In compliance with 27CCR Section 20921(a)(2), quarterly monitoring for methane was conducted at the Landfills perimeter and at probes installed in utility trenches. All 21 perimeter compliance probes and the utility trench probes had concentrations of methane that were not detectable (less than or equal to 0.1percent by volume). These results indicate there is no landfill gas migration and the Fort Ord Landfills are in compliance with regulatory requirements. During the reporting period between 13 and 28 different VOC were detected in compliance probe samples. The 2013 data is reflective of what was detected during this reporting period and include: 1,1,1- trichloroethane, 2-butanone, 2-propanol, 4-methyl-2-pentanone, acetone, benzene, bromodichloromethane, carbon disulfide, chloroform, chloromethane, ethanol, freon 11, freon 113, freon 114, freon 12, hexane, and tetrachloroethene. Concentrations of three different COCs as defined in the Fort Ord Landfills ROD were quantified in the compliance probe samples: 1 detection of benzene, 14 detections of chloroform, and 10 detections of tetrachloroethene. Results from the 21 compliance probes included in the annual VOC monitoring were mostly not detected down to the reporting limit concentrations. Additional information can be found in the *Annual Reports for Operations and Maintenance, Operable Unit 2, Fort Ord Landfills* (years 2011 to 2015; the 2016 report has not been published).

Landfill Gas Extraction And Treatment System

Annual source testing of the TTU conducted during the reporting period demonstrated the TTU operated efficiently and met the substantive requirements of Monterey Bay Unified Air Pollution Control District Rule 207 and Rule 1000. It is estimated that the TTU operation averaged 97 hours biweekly throughout the reporting period without the need for supplemental fuel. The operating schedule was set to meet the requirement for balancing landfill gas extraction and generation. The table below shows a summary of VOCs and methane removed by the Fort Ord Landfills TTU from its startup and through this reporting period.

VOCs and Methane Removed by Fort Ord Landfills TTU
(In Pounds)

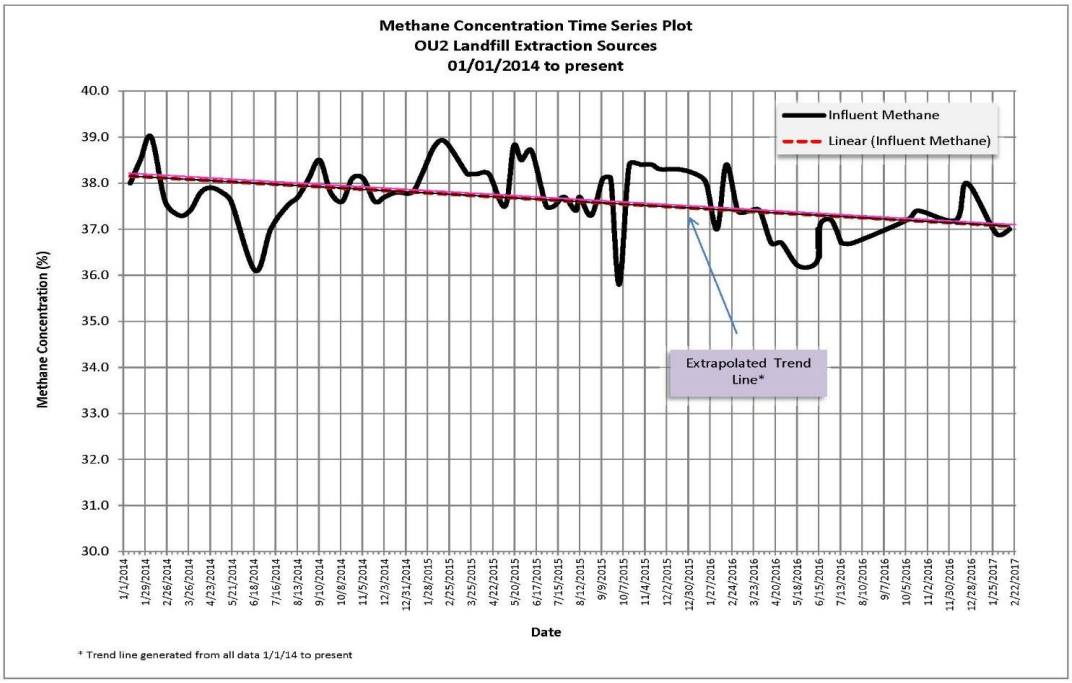
							4th Five-Year Review Period (Third Quarter 2011 to the Third Quarter 2016)					
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**Cumulative[2]**
Type[1]	04/04/06 12/31/06	01/01/07 12/31/07	01/01/08 12/31/08	01/01/09 12/31/09	01/01/10 12/31/10	01/01/11 12/31/11	01/01/12 12/31/12	01/01/13 12/31/13	01/01/14 12/31/14	01/01/15 12/31/15	01/2015 09/2016	04/04/06 12/31/15
Methane	428,214	532,181	288,433	448,148	211,634	228,085	229,400	186,000	174,430	237,574	128,152	3,092,251
VOCs[3]	55.4	64.7	31.2	33.3	11.9	12.1	11.0	9.9	9.4	12.1	--	> 251
COCs[4]	9.5	6.2	3.1	3.4	1.4	1.4	1.2	1.1	1.0	1.3	0.4	30

Notes:
1- The pounds removed is calculated based on the mixed influent concentration for the TTU. Sample concentrations were assumed to be constant during the operation period from the time of collection until the next sample set was collected. Pounds removed for methane is based upon field measurements made during normal landfill gas treatment/TTU operation. Conversion for all years assumes 1 atmosphere pressure, and 25°C temp.
2- For Total (methane, VOCs, and COCs) pounds, cumulative column provides total pounds 2006 - Third Quarter 2016
3- Includes all compounds that were measured in the samples collected (excluding methane). These are approximately 60 individual volatile organic compounds on the standard Air Toxics TO-15 list of analytes.
4- Includes all groundwater compounds as stated in Table 1, Chemicals of Concern, Remediation Goals, and Discharge Limits, of the OU 2 Record of Decision (Army, 1994).

Source: *Final Annual Report, 2015, Operations and Maintenance, Operable Unit 2 Landfills, Former Fort Ord, California* (Ahtna 2016d).

The table above summarizes total VOCs, groundwater COCs, and methane removed from 2006 to 2015/June2016. In the reporting period, the TTU removed not less than 12.1 pounds of VOCs (excluding methane), not less than 1.3 pounds of which were OU2 groundwater COCs. The TTU removed approximately 979,577 (applying ¼ of the amount in 2011 to better coincide with this Five-Year Review reporting period) pounds of methane in this reporting period and an estimated 3,059,251 pounds since startup.

The analytical results for the VOC samples collected from the different extraction sources and the TTU influent indicate the proportion of COCs relative to methane has declined by more than 50 percent since commencement of TTU operations on April 4, 2006 (Ahtna, 2015). The methane concentration measured at the TTU influent averaged 38 percent in the reporting period. The time series plot below shows methane concentrations starting in January 2014 and gives some indication that there is a reduction in landfill methane generation based on the trend line (February 24, 2017 BCT meeting handout).



Vapor Intrusion

Groundwater Plumes

In 2011, an analysis of the potential for soil vapor intrusion associated with chlorinated solvents (e.g., TCE) emanating from the Fort Ord Landfills area was conducted (Army, 2011). The analysis focused on the physical properties of TCE (principally its volatility and density relative to that of water), the concentrations detected in groundwater, the depth of TCE detections and its proximity to buildings. According to guidance documents from the EPA and DTSC, soil vapor intrusion is possible when buildings are located within 100 feet of a source of chlorinated solvents. This guidance is explained in the October 2011 *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (Vapor Intrusion Guidance; DTSC,

2011). The guidance also stipulates that 100 feet may not be applicable where preferential pathways exist or if the groundwater plumes are increasing is size.

Groundwater quality data shows that the plumes are not increasing in size and there are no apparent preferential pathways (see Plates 3 and 4). The most recent groundwater data was collected during the 2016 Third Quarter sampling event (Ahtna, 2017). Five COCs (1,1-DCA; 1,2-DCA; PCE; TCE; and vinyl chloride [VC]) were detected in monitoring well samples at concentrations exceeding their respective ACLs. The samples were obtained from monitoring wells MW-OU2-04-A, MW-OU2-44-A, and MW-OU2-73-A. Monitoring well MW-OU2-73-A is deeper than 100 feet, whereas monitoring wells MW-OU2-04-A and MW-OU2-44-A are 82 feet and 90 feet deep, respectively.

TCE was detected at a maximum concentration of 13.3 ug/L in MW-OU2-04-A. 1,1-DCA, 1,2-DCA, and PCE were detected at maximum concentrations of 36.3 ug/L (estimated concentration), 6.7 ug/L (estimated concentration), and 14.7 ug/L, respectively in well MW-OU2-44-A. All of these compounds are denser than water and well MW-OU2-44-A is more than 100 feet from the nearest building. Furthermore, samples collected from well MW-OU2-04-A in 2001, 2002, and 2003 showed that TCE was detected at 82 feet, but not at 67 feet indicating a clean-water barrier was present above the plume. The following lines of evidence suggest that vapor intrusion into buildings overlying the plumes is negligible: the density of these compounds are greater than the density of water; their concentrations are low; there is a clean-water barrier present; and the nearest buildings are more than 100 feet away (Army, 2011).

Soil vapor was also assessed during the 2012 Five-Year Review. The Johnson and Ettinger Model[11] for subsurface vapor intrusion was used to predict indoor air concentrations based on VOC concentrations in groundwater. The results demonstrate that, except for PCE and TCE, the predicted indoor air concentrations have cancer risks and hazard quotients that do not exceed 1×10^{-6} and the threshold level of 1, respectively. The estimated cancer risks based on the ACLs for PCE and TCE are 1×10^{-6} and 1×10^{-6}, respectively. The cumulative cancer risk is 4×10^{-6} and is within EPA's risk management range of 1×10^{-6} to 1×10^{-4}. The cumulative hazard index is 0.3, which is less than the threshold level of 1. Therefore, the ACLs for groundwater COCs are health-protective of indoor air exposures and remain valid.

Vapor Intrusion

Landfills

Both VOCs and methane have been detected in soil gas within the boundaries of the Fort Ord Landfills area. Although methane has little toxic effect, at levels of 5 to 15 percent in air, methane can be ignited. State regulations require that landfill gases be monitored at the property boundary (compliance requirements are: methane less than 5 percent by volume). The Army has installed underground probes and trenches to monitor landfill gases. Presently there are 67 monitoring probes and 2 utility trench probes located around Areas B-F. The monitoring probes installed around the Fort Ord Landfills area are monitored quarterly for methane and annually for the 11 groundwater COCs (see Table 4). The Army installed a landfill gas extraction and treatment system in 2001. The system's initial design has been optimized to maximize gas extraction and destruction of methane and VOCs by a thermal treatment unit which began full-time operation in August 2006. Since that time, the system has been further optimized to increase gas capture and system efficiency.

All 21 compliance probes had concentrations that were not detected (less than or equal to 0.1 percent by volume). Thirty-eight probes, some of which are adjacent to the landfill edge and are not part of the compliance monitoring, had concentrations that were not detected (less than or equal to 0.1 percent by volume). The two utility trench probes had concentrations that were not detected (less than or equal to 0.1

[11] Johnson and Ettinger introduced a screening-level model which incorporates both convective and diffusive mechanisms for estimating the transport of contaminant vapors emanating from either subsurface soils or groundwater into indoor spaces located directly above or in close proximity to the source of contamination.

percent by volume). These values confirm that methane and VOCs are not migrating outside the boundary of the Fort Ord Landfills area, demonstrating that soil vapor intrusion is not occurring for the landfill (Army 2011).

6.4.3 Site Inspection and Interviews

Groundwater

A site inspection was performed on July 12, 2016, by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to assess the overall condition of the remedy as it relates to its effectiveness, including the physical condition of the system, system integrity, system operations, site security, and access controls. Mr. Derek Lieberman (Ahtna Program Manager) was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. Detailed inspection forms and site photographs are included in Appendix B. The treatment system is partially housed in a metal-framed warehouse structure that limits access and provides protection from the elements. The extraction wells are connected to the treatment system by a network of underground pipes. The system operates continuously and is computer monitored. Automated shutdown and operator notification systems are in place in the event of a malfunction if the operator is not on site. System components generally are in good condition and show no unusual or unexpected wear or aging. In general, the system appears to be well maintained, in good condition, and functioning as designed. System integrity appeared good, and security systems generally appeared to be adequate.

Landfills

The Fort Ord Landfills are surrounded by a chain-link fence to restrict access, and the TTU is within the main Landfill area and enclosed by another chain-link fence. Components of the TTU appear to be in generally good condition, but show some indications of exposure to the elements. The GWTS and TTU are monitored remotely through the SCADA system during non-business hours. Additionally, the operators receive alarms via SCADA in the event of a system shutdown or other critical issue. The system operator visits the site at least weekly to evaluate maintenance needs and to implement minor system adjustments. In general, the system appears to be well maintained, in good condition, and functioning as designed. System integrity appeared good, and security systems generally appeared to be adequate.

The landfill cap appears to be in generally good condition, with minor erosion and animal burrowing that are regularly addressed. Vegetation is reasonably well developed within allowances for protection of the cap and provides suitable habitat for native fauna. Natural control of burrowing rodents is encouraged by the presence of raptor perches constructed within the landfill. In general, the landfill cap and TTU systems appeared to be in good condition and functioning as designed.

6.5 Technical Assessment

6.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Landfill Cap

The Landfill cap, which minimizes rainwater infiltration and migration of contaminants to the groundwater aquifers and protects the surrounding environment from exposure to landfill waste, is functioning as intended. Operation and maintenance for the Fort Ord Landfills includes the landfill cover, slope stability, survey monuments, settlement plates, erosion and drainage control, preventing and repairing wildlife damage to the landfill cap. Continued operation of the TTU will mitigate landfill gas emissions. A State of California Registered Civil Engineer conducts annual inspections of the landfill. Representatives of the Monterey County Department of Health conduct quarterly inspections each year during the reporting period. There were no

violations; however, some minor maintenance improvements were recommended and were implemented. In general, inspections found that appropriate maintenance of the landfill is being conducted, and the landfill is functioning as designed.

Groundwater Treatment

Groundwater treatment has continued to function as intended for OU 2, as documented by the summary of compliance point TCE concentrations over the period of October 2011 to September 2016. The TCE concentration after groundwater treatment was always lower than the OU 2 discharge limit of 0.5 ug/L for TCE (which is lower than the California TCE MCL of 5 ug/L by a factor of 10) [12]. Additionally, from October 2011 through September 2016 the groundwater treatment system was greater than 98 percent efficient, which exceeded the operational goal of 95 percent efficient.

6.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

Landfill Cap

Yes. The landfill cap remedy minimizes rainwater infiltration and migration of contaminants to the groundwater aquifers and protects the surrounding environment from exposure to landfill waste. Continued operation of the TTU will mitigate landfill gas emissions. The exposure assumptions remain the same. Inspections conducted by the State and County found that appropriate maintenance of the landfill is being performed and that the Fort Ord Landfills continue to function as intended. Although toxicity data and cleanup levels for landfill wastes, and remedial action objectives may have changed, such changes do not impact the protectiveness of the landfill cap. The groundwater RAOs are based on MCLs, meaning the recent changes to the toxicity values for PCE and TCE are not directly relevant to the protectiveness of the remedy.

The RAOs for the shallow soils and waste materials are to restrict rainfall infiltration and prevent leaching to underlying groundwater of VOCs remaining in waste materials and soil and to prevent potential exposure of VOCs to the environment or people who use the site in the future.

The RAOs for groundwater include cleaning the upper aquifer to MCLs or lower, as shown in Table 4. The provisional goals for the interim action in the 180-foot aquifer also include cleaning groundwater to these same levels. For more information, see Section 6.2 Remedial Actions.

Groundwater Treatment

Yes. The groundwater treatment system is effective in removing COC mass and the effluent has not exceeded the discharge limits during this reporting period.

6.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

Landfill Cap

There is no known current information that would call into question the protectiveness of the landfill cap and associated engineering and institutional controls.

Groundwater Treatment

There is no known current information that would call into question the protectiveness of the OU 2 groundwater treatment system for COCs identified in the OU 2 ROD.

[12] The Federal MCL for TCE is also 5.0 ug/L.

However, given historical use information, it is possible that products containing Perfluorinated Chemicals (PFCs) were disposed of at the OU 2 landfills. In accordance with Army policy on PFCs, the Army plans to collect samples from select wells to screen for the presence of PFOA and PFOS. Based on the analytical results, the Army will evaluate follow-up actions.

6.6 Issues

There are no issues affecting the protectiveness of the remedy at OU 2. Additionally, this assessment did not identify any unresolved issues previously raised by regulatory agencies, the community, or other interested parties.

6.7 Recommendations and Follow-Up Actions

The OU 2 groundwater remedy and the Fort Ord Landfills O&M activities, including landfill gas monitoring, are operating as intended, and no follow-up actions are recommended.

The assessment identified that improved hydraulic capture and overall remedy effectiveness are anticipated outcomes from the new groundwater treatment plant that will be located proximal to the TTU. Construction has already begun and its operation is anticipated to begin in early 2018, at which time the existing plant will be deconstructed. The plans indicate that the existing plant won't be decommissioned until the new one is operating as intended. The new groundwater treatment system for OU 2 is planned to be operational, assuming no unforeseen complications, by early 2018.

6.8 Protectiveness Statement

Protective. The remedies at OU 2 are protective of human health and the environment. The ongoing remedial activities continue to adequately address all exposure pathways that could result in unacceptable risks.

During the course of the remediation process, potential environmental and human health concerns are being addressed by mitigation measures, such as control and treatment of landfill gases. The soil vapor exposure pathway is being controlled by the on-going groundwater remedy (which includes soil gas extraction and GAC treatment). Potential exposure pathways are also being controlled by the restrictions of Chapter 15.08 of Title 15, Monterey County Code, and the CRUP.

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7.0 BASEWIDE REMEDIAL INVESTIGATION SITES ROD

This section presents background information on the Basewide RI sites; provides a summary of remedial actions, a technical assessment of the actions taken at these sites, and progress since the last Five-Year Review Report was issued; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides statements regarding the protectiveness of the site remedies.

7.1 Site 2 – Main Garrison Sewage Treatment Plant and Site 12 – Four Sub-Areas

Sites 2 and 12 comprise an area that is inclusive of five separate sub-areas of various types of operations within two separate investigation sites. The locations of the two sites are shown on Plate 2.

7.1.1 Sites 2 and 12 Background

Sites 2 and 12 were combined into one site after the first phase of the RI activities (HLA, 1995b) because similar groundwater contamination was identified at both sites and in the area between the two sites (see Plate 2). A description of the five individual areas of concern within the Sites 2 and 12 complex and a description of groundwater contamination associated with the complex are presented below. The eight groundwater COCs identified at Sites 2 and 12 and their respective ACLs are listed in Table 4.

7.1.1.1 Site 2 - Main Garrison Sewage Treatment Plant

Site 2 comprises an area of approximately 28 acres that included the infrastructure associated with the MGSTP, which was the primary sewage treatment facility for Fort Ord. This facility served the majority of the housing areas and the main industrial areas from the late 1930s until it was decommissioned in May 1990. The former treatment facility was fenced and contained several buildings and two large trickling filters. Three unlined sewage ponding areas and 10 asphalt-lined sludge-drying beds were located outside of the fenced area. During operation, effluent from the MGSTP was discharged in accordance with a National Pollutant Discharge Elimination System (NPDES) permit to a storm drain that emptied to the west onto Indianhead Beach during low tide and discharged to Monterey Bay during high tide. Sewage from the former Fort Ord area now flows via gravity to a pumping station in Marina, and is then pumped to the Monterey Regional Treatment Plant in Marina. Potential contaminants associated with the former MGSTP include metals, pesticides, and hydrocarbons.

7.1.1.2 Site 12

Site 12 includes four former operations areas south and east of Imjin Parkway and State Route 1 in an area now mostly occupied by commercial retail complexes. The four major areas include the Lower Meadow Disposal Area, the DOL Automotive Yard, the Cannibalization Yard, and the railroad spur[13], as described below.

Lower Meadow Disposal Area

The Lower Meadow was an approximately 2-acre grassy field east of Highway 1, near the former Twelfth Street gate. The Lower Meadow was approximately 5 feet lower than the adjacent DOL Automotive Yard and received runoff from it. Several drainpipes and outfalls were present in the eastern and southeastern portions of

[13] The Army owned the railroad spur until it was transferred in 2004 to FORA as part of Parcel L20.16.2. FORA then transferred it to the Transportation Agency for Monterey County (TAMC).

the site, but it is unknown whether these were designed as drainage lines. No buildings were present in the Lower Meadow. The Lower Meadow previously was used to dispose of waste material generated by the DOL such as scrap metal, oil, and batteries, and also was reported to contain road construction waste. Contaminated soil and associated debris were excavated during cleanup activities at the site, and the area was backfilled with clean soil (IT, 1999).

DOL Automotive Yard

The DOL Automotive Yard is east of State Route 1 and northeast of the railroad spur that runs east from First Avenue. The 8.5-acre fenced site was adjacent to Twelfth Street to the north and the Lower Meadow to the west. The site included a paint shop, two wash racks, one temporary hazardous waste container storage area, an oil/water separator, an above-ground storage tank (AST), and several buildings that housed automotive repair operations. The site was paved and sloped gently to the west. Documented site activities included transmission repair, degreasing, testing, vehicle steam-cleaning and washing of engines, and petroleum/oil/lubricant storage. A buried container, which originally was used as a muffler for exhaust from engine testing, also may have been used for liquid waste storage. Tanks and contaminated soils were excavated during cleanup activities at the site, and the area was backfilled with clean soil.

Cannibalization Yard and Industrial Area

The Cannibalization Yard was a small (0.5-acre) paved and fenced area located within the larger (18.5 acre) paved and fenced Industrial Area. The entire 18.5-acre area was bounded by State Route 1 to the west, a baseball field to the east, and Tenth Street to the south. The railroad spur separated the Industrial Area from the DOL Automotive Yard to the north. The area included a machine shop, a furniture repair shop, a laundry facility, a temporary hazardous waste container storage area, an oil/water separator, and an AST used for storing waste oil. Beginning in 1964, the Cannibalization Yard was used for disassembly of old equipment, primarily decommissioned military vehicles. Used motor oil was collected and stored on site in 55-gallon drums, and also in the 450-gallon AST for a brief period (between January 1988 and August 1988). Other vehicle maintenance activities included removal and storage of the following types of fluids and parts: gasoline (leaded and unleaded), diesel fuel, brake fluid, asbestos-containing brake shoes and linings, antifreeze/coolants, lead and acid from batteries, lubricating greases, and transmission fluids. Prior to the installation of the oil/water separator at the northeastern corner of the yard, runoff from the site flowed down the sloped area northeast of the Cannibalization Yard toward the baseball field. Contaminated soils were excavated during cleanup activities at the site, and the area was backfilled with clean soil.

Railroad Spur

The railroad spur (which is part of Site 13), included an area of approximately 0.8 acres of right-of-way along a portion of the railroad spur that extended northward from the Union Pacific Railroad track west of State Route 1 and curved east through an Ordnance Area. The portion of the railroad track within Site 12, and discussed here, extended from the main track east of State Route 1, across First Avenue, and between the DOL Automotive Yard and the Cannibalization Yard and surrounding Industrial Area. The rest of the railroad spur was investigated during the characterization of Site 13. The relatively flat right-of-way was mostly unpaved except in the areas adjacent to loading docks and where the railroad spur crossed First Avenue. The railroad spur was used to transport troop materials and equipment from the main rail line to storage facilities between the DOL Automotive Yard and the Industrial Area. The railroad spur was of concern because waste oil and/or fuels may have been sprayed in this area for dust control.

7.1.1.3 Sites 2 and 12 Groundwater Description

Groundwater investigated at Sites 2 and 12 included the upper two groundwater aquifers as described in the October 1995 *Final Basewide Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation: Introduction and Basewide Hydrogeologic Characterization* (HLA, 1995a). In the Sites 2 and 12 area, these two aquifers include the Upper 180-Foot Aquifer, and the Lower 180-Foot Aquifer.

The A-Aquifer, which is present elsewhere at Fort Ord, terminates a short distance east of the site. Depth to groundwater in the Upper 180-Foot Aquifer is approximately 40 feet bgs (at Site 2) to 80 feet bgs (at Site 12). The base of the confining aquitard beneath the Upper 180-Foot Aquifer and overlying the Lower 180-Foot Aquifer is encountered at approximately 110 feet bgs in the vicinity of the site. Groundwater in monitoring wells rises above this depth as a result of hydraulic pressure. The Lower 180-Foot Aquifer in the vicinity of Sites 2 and 12 is not used as a water supply source, but elsewhere is a significant source of potable water for Fort Ord and the City of Marina (Army, 2008). Existing water supply wells are located at least 3 miles away from the site. The natural flow of groundwater in the Upper 180-Foot Aquifer in the vicinity is westward toward the Pacific Ocean; however, reinjection of treated groundwater at Site 2 creates a localized hydraulic mound that causes an easterly groundwater flow to the extraction wells at Site 12.

The Intermediate 180-Foot Aquitard, a sandy clay layer, appears to have limited the downward migration of contaminants between the Upper and Lower 180-Foot Aquifers so that remediation was only necessary in the Upper 180-Foot Aquifer. The COCs and aquifer cleanup levels for Sites 2 and 12 are listed in Table 4. The primary indicator chemicals for the distribution of COCs at Sites 2 and 12 have been PCE and TCE. The footprints of the Sites 2 and 12 PCE and TCE plumes in 2012 and 2016 are shown on Plate 3[14] (AMEC/Ahtna, 2012) and Plate 4 (Ahtna, 2016e), respectively.

7.1.2 Remedial Actions

Remedial actions were implemented at Sites 2 and 12 in accordance with the Basewide RI Sites ROD (Army, 1997). For soil, the RAO for Sites 2 and 12 was to protect groundwater by remediating TPH in soil to a concentration of 500 milligrams per kilogram (mg/kg) or less. For groundwater, the RAO was to remediate the Upper 180-foot aquifer to MCLs, and for some constituents more stringent levels, for the detected VOCs. Finally, there was an RAO of removal of debris because contaminated soil was potentially mixed with the debris. Remedy implementation included removal of contaminated soil and construction of a groundwater treatment system. One groundwater remedial unit and three soil remedial units (SRUs) were defined at Sites 2 and 12, as described below (Army, 2012).

Groundwater Remedial Unit (VOC Plume at Sites 2 and 12)

The groundwater remedial unit is defined as the portion of groundwater at Sites 2 and 12 where the eight identified COCs exceed ACLs (see Table 4) (Army, 2012).

The vertical extent of the affected groundwater ranges from the top of the water table to the top of the sandy clay layer that divides the 180-Foot Aquifer into upper and lower zones. The affected water-bearing zone beneath Sites 2 and 12 is the Upper 180-Foot Aquifer, which is the uppermost water-bearing zone in the vicinity and has approximately 75 to 80 feet of saturated thickness. Depth to water is approximately 70 to 80 feet bgs at the eastern edge of the plume (Site 12) and approximately 40 feet bgs at the western edge (Site 2). The sandy clay layer dividing the Upper 180-Foot Aquifer from the Lower 180-Foot Aquifer appears to have limited vertical migration of dissolved VOCs. The groundwater plume as of June 2016 is shown on Plate 4.

Property overlying and surrounding Sites 2 and 12 is within the "Prohibition Zone" of the "Special Groundwater Protection Zone." County Ordinance No. 04011 (Monterey County Code Title 15, Chapter 15.08.140) prohibits construction of water wells within the Prohibition Zone. See Plates 2 and 4 for the current (as of July 2016) Prohibition and Consultation Zones and Plate 3 for the Prohibition and Consultation Zones that were in effect in 2012.

[14] Figures 4-1 and 12 depict the groundwater plumes using Federal MCLs of the most significant or aerially expansive COCs to better facilitate visual comparisons. The ACL for TCE at Sites 2 and 12 is 3.0 ug/L.

Soil Remedial Unit 1 (Lower Meadow Disposal Area)

The Lower Meadow Disposal Area, which is an approximately 0.5-acre portion of the Lower Meadow on Site 12, consists of a grassy field east of State Route 1 near the Twelfth Street Gate. This area, defined as SRU 1, contained concrete rubble and other construction debris intermixed with total petroleum hydrocarbon (TPH)-contaminated soil (Army, 2012).

Soil Remedial Unit 2 (Outfall-31 Area)

SRU 2 was defined as the OF-31 Area east of SRU 1. It consists of a grass-covered depression that received surface runoff and storm drainage flow from OF-31 and several other pipes. It had a catch basin area that collected precipitation and rainfall runoff. The catch basin was connected to subsurface piping, which ran to the west from the OF-31 Area to OF-15. The primary contaminants in soil associated with OF-31 included total TPH of unknown origin (TPH-unknown) and TPH as diesel (TPH-d) (Army, 2012).

Soil Remedial Unit 3 (Cannibalization Yard Area)

SRU 3 was the Cannibalization Yard Area, a shallow surface drainage area subject to runoff from the DOL Automotive Yard to the west and the Industrial Area to the south. Samples from the surface and shallow borings near an oil/water separator and along the eastern margin of the Cannibalization Yard indicated that elevated concentrations (greater than 500 mg/kg) of TPH were present in shallow soil. No TPH concentrations greater than 500 mg/kg were detected in soil samples collected below 0.5 feet bgs. The vertical and horizontal limits were defined by analytical data from soil borings and surface samples (Army, 2012).

7.1.2.1 Remedy Selection

The following four remedial alternatives were evaluated in the Sites 2 and 12 FS (HLA, 1995b).

- Alternative 1: No Action
- Alternative 2: Groundwater Extraction and Treatment by Publicly Owned Treatment Works
- Alternative 3: Groundwater extraction and treatment by GAC
- Alternative 4: Groundwater extraction, treatment, and disposal

Selected Remedy

Alternative 4 was selected as the remedy and includes the following components:

- Disposal of treated groundwater by: (1) reuse above ground or (2) injection or infiltration of treated water back into the aquifer
- Excavation of approximately 16,000 cy of soil and debris containing TPH concentrations above the cleanup goal of 500 mg/kg from the Lower Meadow Disposal Area, and placement at the Fort Ord Landfills[15]
- Excavation of approximately 3,800 cy of soil containing TPH concentrations above the cleanup goal of 500 mg/kg from the OF Area and Cannibalization Yard, and placement at the Fort Ord Landfills
- Groundwater extraction and treatment by GAC
- Deed restriction on groundwater use

[15] The extent of soil and debris containing TPH concentrations above 500 mg/kg was greater than originally estimated; therefore, a total of 58,400 cy was excavated (IT, 1999).

Significant Differences with the Selected Remedy

The following additional RAOs were proposed in the February 2015 *Final Remedial Investigation/Feasibility Study Addendum at Sites 2 and 12, Former Fort Ord, California* (Ahtna, 2015) for groundwater within Sites 2 and 12:

- Prevent migration of VOCs in soil gas that would result in groundwater concentrations in excess of ACLs.
- Remediation of PCE in groundwater to the federal and State MCL of 5.0 ug/L.

The Army formalized these RAO's in the February 2016 *Explanation of Significant Differences No. 1 Basewide Remedial Investigation Sites 2 and 12, Former Fort Ord, California* (Army, 2016). The ESD modifies the groundwater remedy to include the following elements:

- Continuation of the current groundwater monitoring program.
- Operation of the existing Sites 2 and 12 GWTS in accordance with the 1997 ROD.
- Revising the ACL for PCE from 3.0 ug/L to 5.0 ug/L.
- Expansion of the existing Sites 2 and 12 GWTS with additional groundwater extraction.
- Soil vapor extraction (SVE) and treatment with GAC.
- Soil gas cleanup levels (SGCLs) of 1,800 micrograms per cubic meter (ug/m^3) for PCE and 1,000 ug/m^3 for TCE.
- Implementation of a soil gas monitoring program.

The SGCL for PCE and TCE were determined by calculating the concentrations of these chemicals in soil gas that will not partition into groundwater at concentrations exceeding their respective ACLs. With ACLs of 5.0 ug/L for PCE and 5.0 ug/L for TCE, the calculated equilibrium concentrations in soil gas would be 2,417 ug/m3 for PCE and 1,432 ug/m3 for TCE; however, since these calculated equilibrium concentrations assume ideal conditions based on a static system with constant temperature, equilibrium and molecular heterogeneity, the SGCLs are conservatively set at 75 percent of the calculated concentrations rounded down to the nearest 100 ug/m3. The SGCLs are then 1,800 ug/m3 for PCE and 1,000 ug/m3 for TCE for protection of groundwater (Army, 2015).

7.1.2.2 Remedy Implementation

Soil Remedy

The soil remedy was implemented in accordance with the approved plan (HLA, 1995b) including a series of soil removal actions, as documented in the June 1999 *Draft Final Remedial Action Confirmation Report and Post-Remediation Health Risk Assessment, Site 12 Remedial Action, Basewide Remediation Sites, Fort Ord, California* (IT, 1999). Based on completion of the soil remediation activities, the site is available for unrestricted reuse (Army 2012).

Groundwater Remedy

The GWTS comprises a network of extraction wells screened in the Upper 180-Foot Aquifer (Plate 7), primary treatment by GAC, and injection and infiltration as described in the August 2016 *Sites 2 and 12, Second Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report* (Ahtna, 2016e). Operation of the groundwater pump-and-treat system to remediate COCs in groundwater began in 1999 and the EPA concurred with the Army's demonstration the system was "Operating Properly and Successfully" in 2002 (EPA, 2002). Sampling and analysis are routinely conducted to verify that the treatment system is operating effectively. Groundwater samples and water levels from monitoring wells are collected quarterly to evaluate

the effects of pumping and treatment on hydraulic capture and contaminant reduction. This information is compiled into quarterly and annual reports that summarize long-term trends resulting from system operation (Army, 2012).

The groundwater treatment system consists of carbon adsorption, accomplished using two GAC vessels connected in series. The GAC vessels have a 13,000 pound capacity, but the system is designed to use 10,000 pounds of GAC in each of the vessels. The original system extracted water from eight wells located at Site 12 and discharged into five Upper 180-Foot Aquifer recharge structures (2 injection wells and 3 infiltration galleries) at Site 2. However, system modifications were implemented shortly after startup due to the presence of vinyl chloride at concentrations greater than anticipated. System modifications included construction of a pipeline to transport and combine treated water from the OU 2 GWTP with treated water from the Sites 2 and 12 GWTP at the effluent tank (Plate 6). The pH is adjusted using sulfuric acid, as needed, at the GWTP influent port to prevent scaling in the GWTP equipment and prior to conveyance to the aquifer recharge structures at Site 2. In response to the presence of elevated vinyl chloride concentrations, the effectiveness of various remediation alternatives was evaluated to address vinyl chloride and optimize remediation efficiency (Ahtna, 2003; Shaw, 2006). Based on the study results, treatment system augmentation was completed in 2006, in accordance with the February 2006 *Treatment Augmentation Work Plan, Sites 2 and 12 Groundwater Remedy Expansion* (Shaw, 2006). Treatment augmentation consists of a modified low-profile air stripper, with vapor treatment by a substrate impregnated with potassium permanganate. Since the augmentation acts as a polishing step, the GAC groundwater remedy specified in the Basewide RI Sites ROD (Army, 1997) remained unchanged until ESD No. 1 in 2015. Photographs showing key components of the GWTP and GWTS are provided in Appendix B, Operable Unit 2, Pages 15-18 and Appendix B, Sites 2 and 12 Groundwater Remedy, Pages 12-18.

To accommodate redevelopment activities at the former Fort Ord, four extraction wells (EW-12-01-180U, EW-12-01-180M, EW-12-02-180U, EW-12-02-180M) and associated pipelines were abandoned and three replacement wells (EW-12-05-180M, EW-12-06-180M, and EW-12-07-180M) and associated pipelines were installed in 2006 (Army, 2012).

In 2015, the groundwater remedy was expanded to address a groundwater remedial unit (GRU) and a soil gas remedial unit (SGRU), both within Site 12. The existing GWTS includes three functional extraction wells (EW-12-05-180M, EW-12-06-180M, and EW-12-07-180M) screened in the middle zone of the Upper 180-Foot Aquifer. Well EW-12-07-180M has been offline since 2012 due to low COC concentrations. Wells EW-12-06-180M has been offline since 2015 due to low COC concentrations. Wells EW-12-05-180M and EW-12-08-180U are operated continuously, pumping a combined average of 140 gpm in the Second Quarter 2016. Well EW-12-08-180U is the newest extraction well. It was installed in 2015 to optimize the capture and extraction of PCE and TCE. The existing untreated groundwater conveyance system includes pipeline extending from well EW-12-05-180M to the Sites 2 and 12 GWTP on the west side of the retail buildings, pipeline extending from well EW-12-08-180U to the Sites 2 and 12 GWTP on the east side of the retail buildings, a treated groundwater pipeline from the OU 2 GWTP to the Sites 2 and 12 GWTP, and a treated groundwater pipeline that conveys combine Sites 2 and 12 and OU 2 GWTP effluent to aquifer recharge structures west of State Route 1; see Plate 7 (Ahtna, 2015b).

Five SVE wells (VE-12-01 through VE-12-05) were installed as part of a pilot study[16] in 2014 in the southern area of Site 12. These five SVE wells constitute the south SVE well field and are intended to remediate the primarily TCE plume in soil gas near the Cinemark Century Theaters. In July 2015, five additional SVE wells were installed in the northern area of Site 12. These five SVE wells constitute the north SVE well field and are intended to remediate the primarily PCE plume in soil gas under the parking lot of The Dunes on Monterey Bay retail center (see Plate 7). Additional detail on the systems design can be found in the October 2015 *Final*

[16] The pilot study also included air sparging of groundwater and five air sparge wells are collocated with the five SVE wells; however, air sparging is not part of the full scale remedial strategy.

Operations and Maintenance Manual Volume III, Sites 2 and 12 Soil Vapor Extraction and Treatment System, Former Fort Ord, California (Ahtna, 2015d).

These modifications to the groundwater remedy are expected to reduce the intrinsic threat posed by contamination in groundwater and restore groundwater for potential beneficial reuse within approximately 3 years of implementation because of active remediation of soil gas, additional extraction and treatment of groundwater, and revision of the ACL for PCE. Without these modifications, it is estimated achievement of RAOs (i.e., restoration of groundwater for beneficial use) would take 13 years with a 60 percent increase in costs.

Deed Restrictions

In accordance with the January 1997 *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California* (Army, 1997), a groundwater use restriction was made part of the remedy. This requirement was articulated in 2003 and 2007 quitclaim deeds indicating that the Grantee covenants for itself, its successors, and assigns not to access or use groundwater underlying the property for any purpose[17].

7.1.2.3 System Operations and Maintenance

The Sites 2 and 12 groundwater treatment system has been in operation since April 1999. The Sites 2 and 12 groundwater remedy is operated in accordance with the August 2009 *Final Operations and Maintenance Manual, Volume II, Sites 2 and 12 (Sites 2/12) Groundwater Remedy, Former Fort Ord, California* (Ahtna, 2009) and the March 2016 *Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix A, Final Revision 4, Groundwater Remedies and Monitoring at Operable Unit 2, Sites 2 and 12, and Operable Unit Carbon Tetrachloride Plume* (Ahtna, 2016b). O&M activities are summarized quarterly in groundwater monitoring and treatment system reports.

The SVE system was initially constructed as part of a pilot study with five soil vapor extraction wells in the southern area of Site 12 (south SVE well field). The pilot study system was operated from May 2014 to June 2014. Data from the pilot study was used to design and construct a full scale soil vapor extraction system, which incorporated the south SVE well field and added a north SVE well field with five additional soil vapor extraction wells. The full scale soil vapor extraction system has been operating since September 2015. The most recent reports describing O&M activities at Sites 2 and 12 are the August 2016 *Sites 2 and 12 Second Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California* (Ahtna, 2016e) and the October 2015 *Final Operations and Maintenance Manual Volume III, Sites 2 and 12 Soil Vapor Extraction and Treatment System, Former Fort Ord, California* (Ahtna, 2015e).

The combined integrated system (GWTP and soil vapor treatment unit [SVTU]) operates continuously except during routine maintenance, GAC servicing, and replacement of worn equipment, and has been operational approximately 99.7 percent[18] of the time (D. Lieberman, pers. comm.) Before GWTP augmentation with the air stripper (1999-2006), GAC replacement occurred approximately every 12 weeks. After GWTP augmentation with the air stripper (2007 - present), GAC replacement occurs approximately every 19 months.

Annual System Operations/O&M Costs

Based on costs listed in the ROD (Army, 1997), predicted annual O&M costs for the groundwater treatment system were estimated to range from $326,000 to $375,000. The actual O&M costs for this reporting period

[17] There are also State Land Use Covenants, also known as CRUPs, with similar restrictions. CRUPs are executed by California DTSC and either the Army or the transferee and are recorded with the quitclaim deed, which is provided to the property recipient at the time of property transfer and run with the land. See Section 4.6 for additional information.

[18] During the review period, the Sites 2 and 12 GWTP operated about 99.3 percent of the time. The Sites 2 and 12 SVTU operated 100 percent of the time, but only in the last year of the 5-year period, raising the combined integrated system operational time a few tenths of a percent.

ranged from $272,000 to $409,000, with the highest costs in 2015 and 2016. This is attributable to system modifications including the addition of SVE treatment to remove COCs from soil gas and further remediation of the PCE groundwater plume with additional groundwater extraction.

7.1.3 Progress Since the Last Five-Year Review

Starting in 2011, PCE concentrations in one monitoring well at Site 12 were consistently over the ACL for PCE identified in the 1997 ROD of 3.0 ug/L (Ahtna, 2015b). Based on this, the September 2012 *Final 3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey, California* (Army, 2012) identified the need for a soil vapor intrusion assessment. Initial vapor intrusion screening in February 2012 indicated the exposure pathway of soil gas to indoor workers via vapor intrusion was potentially complete. In October 2012 and April 2013, soil gas samples were collected at 37 locations at a depth of 5 feet bgs. PCE was detected in all 37 samples, several of which exceeded the soil gas screening level (SG-SL)[19] of 603 ug/m^3 (Army, 2015 and USACE, 2013). Based on these results, additional investigations were conducted in late 2013 and early 2014. Seventeen groundwater monitoring wells and 167 permanent soil gas probes were installed and sampled.

A HHRA was conducted using indoor air and sub-slab soil gas data collected as part of the RI/FS Report Addendum. Indoor air samples and sub-slab samples were collected at 25 locations in the retail stores now located at Site 12 (Army, 2016). Analytical results for indoor air and sub-slab samples were used to evaluate risk to indoor workers and shoppers at the commercial retail center now located at Site 12. The HHRA concluded the vapor intrusion pathway does not present an unacceptable risk to human health (Ahtna, 2015). Groundwater in the upper portion of the Upper 180-Foot Aquifer, where soil vapors may form, was investigated in 2013 and found to contain a plume of PCE above its ACL. Soil sample results from Site 12 show all analytes, including PCE, either were not detected or were observed at concentrations below their respective screening levels (Ahtna, 2015a). Soil gas was also investigated at Site 12 in 2013 and distinct PCE and TCE plumes were identified in the vadose (or unsaturated) zone of the Upper 180-Foot Aquifer (Ahtna, 2014a).

Follow-up investigations and operation of a SVE and air sparge (AS) pilot study treatment system in 2014 identified a groundwater plume and soil gas plume of TCE in the southern Site 12 area. The pilot study demonstrated that SVE and AS are effective technologies for remediation of soil gas and groundwater at Site 12; however, it was determined SVE and additional groundwater extraction and treatment (instead of AS) would likely be more effective for achieving remedial action objectives. Accordingly, the soil vapor extraction and treatment system (SVETS) and one additional groundwater extraction well (EW-12-08-180U) were constructed per the July 2015 *Final Remedial Action Work Plan Addendum, Sites 2 and 12 Groundwater Remediation, Former Fort Ord, California* (Ahtna, 2015b).

The ARARs for soil vapor collection and control at Sites 2 and 12 include Monterey Bay Air Resources District (MBARD) air quality standards. Regulation II (New Sources), Rule 207 provides for the review of new and modified stationary air pollution sources to meet the provisions of the federal Clean Air Act and the California Clean Air Act. The intent of Rule 207 is to ensure the most stringent requirements of these programs are applied to all new stationary sources and all modifications to existing stationary sources which, after construction or modification, emit or have the potential to emit any affected pollutants as defined in Section 2.1 of Rule 207.

[19] SG-SLs are conservative risk-based California Human Health Screening Levels (CHHSL) or site-specific values calculated per the *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (Vapor Intrusion Guidance; DTSC, 2011) that assume chemical concentrations in soil gas less than 5 feet below a building foundation or the ground surface (i.e., there is less risk associated with chemicals in soil gas deeper than 5 feet), and are intended for evaluation of potential vapor intrusion into buildings and subsequent impacts to indoor air.

Under Rule 207, Best Available Control Technology (BACT) is required for any new or modified stationary source with a potential to emit specific pollutants at rates greater than or equal to those listed in Table 4.1.1 of Rule 207. Based on soil gas and treatment system analytical results from samples collected during the pilot study, VOCs are the only pollutant listed in Table 4.1.1 that are expected to be potentially emitted; however, these analytical results also indicate the VOC emission rates at the pilot study SVETS effluent averaged 0.0236 pounds per day (lbs/day) with a peak rate of 0.0381 lbs/day. These emission rates are significantly lower than the Rule 207 threshold of 150 lbs/day; therefore, the proposed emission control device (GAC) is exempted from meeting the Rule 207 requirements for BACT (Ahtna, 2015d).

During the Five-Year Review reporting period, the GWTP operated continuously in the automatic control mode utilizing two GAC treatment vessels and a low-profile air stripper. The GWETS discharged treated water from both Sites 2 and 12 and OU 2 to the five-aquifer recharge structures (two injection wells and three infiltration galleries) at an average rate of 515 gpm (see Plate 7).

7.1.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 Five-Year Review Report (Army, 2012) for Sites 2 and 12 stated that:

> "A protectiveness determination for Sites 2 and 12 soil vapor should be deferred until evaluation of the recent increase in COC concentrations in groundwater is completed (this evaluation is expected by December 31, 2013). The Sites 2 and 12 groundwater remedy is protective of human health and the environment and, in the interim, potential exposure pathways that could result in unacceptable risks are being controlled."
>
> "Remedial actions regarding contaminated soil at Sites 2 and 12 already have been completed and are compliant with protectiveness criteria for human health and the environment."

7.1.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The issues and recommendations discussed in the 2012 Five-Year Review Report include the need to further evaluate COC concentrations in groundwater to determine if there is an actual increase in risk associated with potential exposure from soil vapor intrusion.

The HHRA concluded that the vapor intrusion pathway does not present an unacceptable risk to human health (Ahtna, 2015). The data collected also shows that the elevated COC concentrations in the vadose zone are adversely affecting site groundwater quality. *Explanation of Significant Differences No. 1* (Army, 2016) modifies the 1997 ROD requirements by expanding the GWTS, revising the ACL for PCE, conducting soil vapor extraction/treatment and the implementation of a soil gas monitoring program. A complete description of the modifications to the 1997 ROD can be found in the February 2016 *Explanation of Significant Differences No. 1* (Army, 2016).

The modifications to the groundwater remedy are expected to reduce the intrinsic threat posed by contamination in groundwater and restore groundwater for potential beneficial reuse within approximately 3 years of implementation because of active remediation of soil gas, additional extraction and treatment of groundwater, and revision of the ACL for PCE. Without these modifications, it is estimated achievement of RAOs (i.e., restoration of groundwater for beneficial use) would take 13 years (Army, 2016).

7.1.4 Sites 2 and 12 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities have been performed for Fort Ord using a basewide approach and are detailed in Sections 4.1 and 4.2. Document

reviews, data reviews, site inspections, and interviews, if applicable, have been conducted on a site-by-site basis and are described in the following subsections.

7.1.4.1 Document Review

As part of the five-year-review for Sites 2 and 12, pertinent site-specific documents were reviewed to evaluate current site conditions in the context of remedy implementation and progress toward remedial objectives. Among the documents reviewed were the RI/FS Report, ROD, RI/FS Report Addendum, ESD No. 1 remedial action work plan and remedial design, remedy implementation work plans and completion reports, and quarterly and annual operations and monitoring reports. A complete list of the references reviewed is presented in Appendix A.

7.1.4.2 Data Review

As shown in the table below, the maximum COC concentrations have declined over the period of this Five-Year Review.

Groundwater Analytical Results

Maximum COC Concentrations: Beginning and End of the Five-Year Review Period[1]

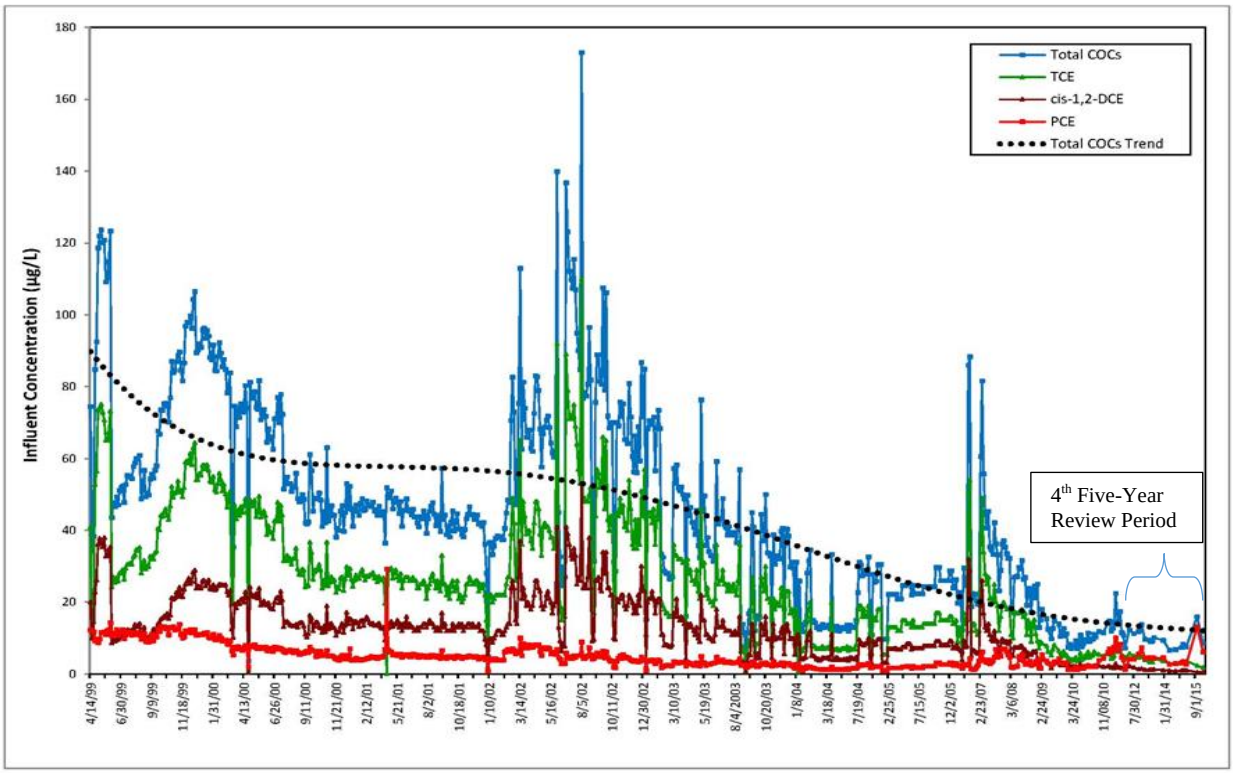
Analyte	Aquifer Cleanup Level (ACL)[3] Concentration (ug/L)	December 2011 Maximum Concentration (ug/L)	June 2016 Maximum Concentration (ug/L)
1,1-Dichloroethene (1,1-DCE)	6.0	0.11J[5]	ND
1,2-Dichloroethane (1,2-DCA)	0.5	**0.56**	0.28
1,3-dichloropropene (1,3-DCP)[2]	0.5	ND	ND
Chloroform	2.0	2.0	0.43
cis-1,2-dichloroethene (cis-1,2-DCE)	6.0	**6.2**	3.3
Tetrachloroethene (PCE)	3.0/5.0[4]	**21.5**	**18.3**
Trichloroethene (TCE)	5.0	**9.2**	3.5
Vinyl Chloride (VC)	0.1	ND	ND

Notes:
1 This table does not provide a well to well comparison.
2 The reported value is the sum of both cis- and trans-isomers.
3 The ACL is the lower of the Federal and State MCLs, and for some constituents more stringent levels.
4 – ACL for PCE was changed from 3.0 ug/L to 5.0 ug/L in 2015 by ESD No.1.
5 - Result is detected below the reporting limit or is an estimated concentration.

ug/L - micrograms per liter
ND - Not detected
Values in bold are greater than the corresponding ACL.

Sources: (Ahtna, 2012 and Ahtna, 2016e)

The chart below shows the groundwater treatment system influent COC concentrations from system start up to June 2016. All major COC concentrations are trending down since system start-up including through this Five-Year Review period. Additionally, the results of all quarterly groundwater monitoring events have been below the ACL for TCE (formerly the primary COC for Sites 2 and 12) since the First Quarter 2014 event, except TCE detections above the ACL in the Third Quarter 2015 at well MW-12-24-180U and in the First Quarter 2016 at well MW-12-31-180M.



During the Five-Year Review reporting period, the GWTP operated continuously in the automatic control mode utilizing two GAC treatment vessels and an air stripper. During the reporting period, the GWTS discharged treated water from both Sites 2 and 12 and OU 2 to the five aquifer recharge structures (two injection wells and three infiltration galleries) at an average rate of 515 gpm (see Plate 7). The total volume of treated groundwater for the reporting period was approximately 509 million gallons. The average flow rate approximating the reporting period for this Five-Year Review is 174 gpm. The reported average monthly flow rate varies depending on flow rates for individual wells and downtime events at the GWTP or the extraction wells. Cumulative treated groundwater flow since startup on April 13, 1999 through September 30, 2016 is estimated at 1.9 billion gallons.

The data shows a decline in COC mass from groundwater since the start of the system and through this Five-Year Review reporting period (most recent data set Second Quarter, 2016). The following table shows the volume of treated water from Site 12 extraction wells, average flow rates, mass removal for the Fourth Quarter 2011 reporting period and Second Quarter 2016, as well as the total mass removal (April 1999 to June 2016). The data show an estimated 45 pounds of COCs were removed in a period approximating the reporting period for this Five-Year Review.

Annual GWTP Flow Rate and COC Mass Removal				
Reporting Period	**Volume (gallons)[1]**	**Average Flow Rate (gallons per minute)**	**Mass Removed in Reporting Period (pounds)**	**Cumulative Mass Removed[2]**
January through December 2011	107,862,550	205	13.1	444
January through December 2012	111,410,259	211	10	454
January through September 2013	64,796,100	164	5.6	460
October 2013 through September 2014	87,919,400	167	6.0	465.7
October 2014 through September 2015	81,477,384	155	5.1	470.8
October 2015 through March 2016	55,851,871	142	5.8	476.5
Totals	509,317,564	174	**45.6**	477

Notes:
1 – Total water treated for the reporting period calculated as the sum of volumes from Site 12 extraction wells.
2 - Since system start-up in April 1999.
Sources: Ahtna, 2012, 2012a, 2013, 2014, 2015a, 2015c, 2015e, 2016, 2016c, 2016d, and 2016e

Similarly, the data shows COC mass removal from the SVTU since the system began operation in September 2015.

SVTU Flow Rate and COC Mass Removal[1]				
Reporting Period	**Cumulative Volume (standard cubic feet)**	**Average Flow (standard cubic feet per minute)**	**Total COC Mass Removed in Reporting Period (pounds)**	**Cumulative Total COC Mass Removed[2] (pounds)**
September 14-30, 2015	18,088,347	850	1.15	1.15
October 2015	57,795,255	894	1.02	2.18
November 2015	128,078,411	713	1.46	3.63
December 2015	182,805,959	798	0.89	4.52
January 2016	213,688,491	824	0.50	5.02
February 2016	253,038,563	834	0.64	5.66
March 2016	293,644,089	915	0.29	5.95
April 2016	331,671,109	920	0.27	6.22
May 2016	374,267,861	917	0.30	6.52
June 2016	413,815,944	919	0.20	6.72

Notes:
1 - System startup on September 14, 2015.
Sources: Ahtna, 2016d, 2016e, and personal communication from Derek Lieberman (Ahtna) to Paul Fluck (USACE), January 2017.

Since system start up on September 14, 2015, approximately 0.413 billion standard cubic feet of soil gas and approximately 6.7 pounds of COC have been removed.

As indicated in the table below, PCE and TCE concentrations in soil gas have progressively declined with the operation of the SVETS. PCE did not exceed its SGCL of 1,800 ug/m^3 in any of the soil gas probes during the Second and Third Quarters of the 2016 monitoring event. TCE exceeded its SGCL of 1,000 ug/m^3 in soil gas probes during the Fourth Quarter of 2015, but had only one exceedance in the First, Second, and Third Quarters of 2016 (Ahtna, 2016d, 2016e, and 2017).

Soil Gas Monitoring Results								
	Tetrachloroethene (PCE)				Trichloroethene (TCE)			
Soil Gas Probe ID	4Q 2015	1Q 2016	2Q 2016	3Q 2016	4Q 2015	1Q 2016	2Q 2016	3Q 2016
SG-12-01-10	NS	*700*	NS	*950*	ND	ND	NS	ND
SG-12-01-20	NS	170	NS	*970*	NS	ND	NS	ND
SG-12-01-30	NS	280	NS	*650*	NS	ND	NS	ND
SG-12-01-40	NS	NS	NS	350	NS	NS	NS	ND
SG-12-01-50	NS	84	NS	240	NS	ND	NS	ND
SG-12-01-58	NS	NS	NS	230	NS	NS	NS	ND
SG-12-02-10	*1,400*	*1,200*	*1,500*	*1,400*	ND	ND	ND	ND
SG-12-02-20	NS	NS	NS	*1,300*	NS	NS	NS	ND
SG-12-02-30	NS	NS	NS	*1,100*	NS	NS	NS	ND
SG-12-02-40	NS	NS	NS	*1,100*	NS	NS	NS	ND
SG-12-02-50	NS	NS	NS	*1,000*	NS	NS	NS	ND
SG-12-02-57	NS	NS	NS	*1,000*	NS	NS	NS	ND
SG-12-02-65	NS	NS	*1,100*	*1,000*	NS	NS	ND	ND
SG-12-04-10	41 J	ND	ND	140	ND	ND	ND	150
SG-12-04-20	NS	ND	NS	150	NS	NS	NS	120
SG-12-04-40	NS	NS	NS	130	NS	NS	NS	43J
SG-12-04-50	NS	NS	NS	130	NS	NS	NS	44J
SG-12-04-58	NS	NS	NS	120	NS	NS	NS	ND
SG-12-04-65	NS	NS	NS	140	NS	NS	NS	ND
SG-12-05-50	NS	NS	NS	160	NS	NS	NS	ND
SG-12-05-60	NS	NS	NS	200	NS	NS	NS	ND
SG-12-05-70	NS	NS	NS	220	NS	NS	NS	ND
SG-12-06-10	NS	NS	NS	110	NS	NS	NS	ND
SG-12-06-20	NS	220	NS	420	NS	ND	NS	ND
SG-12-06-30	**2,100**	*1,300*	700	570	ND	ND	ND	ND
SG-12-06-40	NS	570	NS	430	NS	ND	NS	ND
SG-12-06-50	NS	380	NS	430	NS	ND	NS	ND
SG-12-06-60	NS	260	180	400	NS	ND	NS	ND
SG-12-06-70	260	*820*	180	320	ND	ND	ND	ND
SG-12-07-10	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-07-20	NS	ND	NS	67J	NS	ND	NS	ND
SG-12-07-30	NS	ND	NS	70J	NS	ND	NS	ND
SG-12-07-40	NS	140	NS	110	NS	ND	NS	ND
SG-12-07-50	NS	64	NS	200	NS	ND	NS	ND
SG-12-07-57.5	NS	93	NS	420	NS	ND	NS	75
SG-12-07-65	NS	53J	NS	*670*	NS	ND	NS	96
SG-12-08-10	NS	92	NS	170	NS	ND	NS	ND
SG-12-08-20	NS	ND	NS	110	NS	ND	NS	ND
SG-12-08-30	NS	62J	NS	98	NS	ND	NS	ND
SG-12-08-40	NS	92	NS	170	NS	ND	NS	ND
SG-12-08-50	NS	73J	NS	230	NS	ND	NS	ND
SG-12-08-60	180	150	120	370	ND	ND	ND	ND
SG-12-08-70	*1,100*	160	150	390	ND	ND	ND	ND
SG-12-09-10	NS	NS	NS	370	NS	NS	NS	ND
SG-12-09-20	NS	NS	NS	310	NS	NS	NS	ND
SG-12-09-30	NS	NS	NS	220	NS	NS	NS	ND
SG-12-09-40	NS	NS	NS	140	NS	NS	NS	ND
SG-12-09-50	NS	NS	NS	160	NS	NS	NS	ND
SG-12-09-59	NS	NS	NS	160	NS	NS	NS	ND
SG-12-11-60	NS	NS	NS	89	NS	NS	NS	ND
SG-12-12-30	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-12-40	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-12-50	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-12-60	NS	NS	NS	100	NS	NS	NS	ND
SG-12-12-70	NS	NS	NS	57J	NS	NS	NS	ND
SG-12-13-10	NS	NS	NS	350	NS	NS	NS	ND
SG-12-13-20	NS	NS	NS	220	NS	NS	NS	ND
SG-12-13-30	NS	NS	NS	ND	NS	NS	NS	ND

Soil Gas Monitoring Results								
	Tetrachloroethene (PCE)				Trichloroethene (TCE)			
Soil Gas Probe ID	4Q 2015	1Q 2016	2Q 2016	3Q 2016	4Q 2015	1Q 2016	2Q 2016	3Q 2016
SG-12-13-40	NS	NS	NS	220	NS	NS	NS	ND
SG-12-13-50	NS	NS	NS	340	NS	NS	NS	ND
SG-12-13-60	NS	NS	NS	330	NS	NS	NS	ND
SG-12-16-10	ND	ND	ND	ND	**1,200**	ND	42J	ND
SG-12-16-20	ND	ND	ND	ND	**2,400**	150	140	35J
SG-12-16-30	NS	NS	NS	ND	NS	120	NS	54J
SG-12-16-40	NS	NS	NS	ND	NS	53J	NS	ND
SG-12-16-50	NS	NS	NS	ND	NS	220	NS	74
SG-12-16-60	ND	ND	ND	ND	340	130	76	44J
SG-12-16-70	ND	ND	ND	ND	490	140	85	77
SG-12-17-10	ND	ND	ND	ND	**3,500**	56J	ND	ND
SG-12-17-20	ND	ND	ND	ND	**20,000**	440	160	83
SG-12-17-30	ND	ND	ND	ND	**9,400**	340	**5,500**	55J
SG-12-17-40	ND	ND	ND	ND	**16,000**	210	220	**1,200**
SG-12-17-50	ND	ND	ND	ND	**23,000**	500	180	57J
SG-12-17-60	ND	ND	ND	ND	**23,000**	360	200	43J
SG-12-17-75	ND	ND	ND	ND	**1,900**	**1,300**	460	190
SG-12-18-50	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-18-60	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-19-20	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-19-30	NS	NS	NS	61J	NS	NS	NS	ND
SG-12-19-40	NS	NS	NS	57J	NS	NS	NS	ND
SG-12-19-50	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-19-60	NS	NS	NS	ND	NS	NS	NS	ND
SG-12-19-70	NS	NS	NS	59J	NS	NS	NS	ND
SG-12-20-10	**1,800**	390	560	*1,500*	ND	ND	ND	ND
SG-12-20-20	NS	82	NS	*1,100*	NS	ND	NS	ND
SG-12-20-30	NS	NS	NS	510	NS	NS	NS	ND
SG-12-20-40	NS	NS	NS	440	NS	NS	NS	ND
SG-12-20-50	NS	NS	NS	360	NS	NS	NS	ND
SG-12-20-60	NS	NS	NS	280	NS	NS	NS	ND
SG-12-20-70	NS	NS	NS	220	NS	NS	NS	ND

Notes:
J is an estimated result below the limit of quantitation (LOQ).
ND – not detected above the limit of detection (LOD).
NS – not sampled
Concentrations in bold exceed the SGCL
Concentrations in italics exceed the SG-SL
Results reported in micrograms per cubic meter (ug/m^3).
Source: Ahtna, 2016d, 2016e, and 2017

	SGCL (ug/m^3)	*SG-SL (ug/m^3)*
PCE	1,800	603
TCE	1,000	888

SGCL - soil gas cleanup level
SG-SL - soil gas screening level

SGCL and SG-SL exceedances are bold and highlighted in blue.

SG-SL exceedances are shown italicized and highlighted in yellow.

7.1.4.3 Site Inspection and Interviews

A site inspection was performed on July 12, 2016, by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to assess the overall condition of the remedy as it relates to its effectiveness, including the physical condition of the system, system integrity, system operations, site security, and access controls. Mr. Derek Lieberman (Ahtna Program Manager) was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. Detailed inspection forms and site photographs are included in Appendix B. The treatment system is housed in a metal-framed warehouse structure that limits access and provides protection from the elements. The extraction wells are connected to the treatment system by a network of underground pipes. The system operates continuously and is computer monitored. Automated shutdown and operator notification systems are in place in the event of a malfunction if the operator is not on site. System components generally are in good

condition and show no unusual or unexpected wear or aging. In general, the system appears to be well maintained, in good condition, and functioning as designed. System integrity appeared good, and security systems generally appeared to be adequate.

7.1.5 Technical Assessment

7.1.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Yes. Soil excavation at Sites 2 and 12 has been conducted. Groundwater extraction and treatment remains in progress. Deed restriction on groundwater use continues.

7.1.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

Yes. Exposure assumptions, cleanup levels and RAOs are still valid. Both PCE and TCE toxicity values were updated, however the PCE and TCE MCLs both remain 5.0 ug/L as presented in the *3rd Five-Year Review Report* (Table 5, ACLs) (Army, 2012). The groundwater RAOs are based on MCLs, meaning the recent changes to the toxicity values for PCE and TCE are not directly relevant to the protectiveness of the remedy.

For Sites 2 and 12, the soil RAO was to protect groundwater by remediating TPH in soil to a concentration of 500 mg/kg or less. The groundwater RAO was to remediate the Upper 180-foot aquifer to MCLs. For some constituents, more stringent levels were applicable; see Table 4. Finally, there was an RAO to remove debris because contaminated soil was potentially mixed with the debris.

The following additional RAOs were proposed in the February 2015 *Final Remedial Investigation/Feasibility Study Addendum at Sites 2 and 12, Former Fort Ord, California* (Ahtna, 2015) for groundwater within Sites 2 and 12:

- Prevent migration of VOCs in soil gas that would result in groundwater concentrations in excess of ACLs.
- Remediation of PCE in groundwater to the federal and state MCL of 5.0 ug/L.

The Army formalized these RAOs in the February 2016 *Explanation of Significant Differences No. 1 Basewide Remedial Investigation Sites 2 and 12, Former Fort Ord, California* (Army, 2016). For more information, see Section 7.1.2 Remedial Actions.

7.1.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

Yes. In 2015, the groundwater remedy was expanded to address soil gas within Site 12. However, the groundwater treatment system, in coordination with the SVE system, is effective at removing COC mass, and institutional controls are in place that prevent exposure to the public.

7.1.6 Issues

This technical assessment did not identify any issues that affect current or future protectiveness of the Sites 2 and 12 groundwater remedy.

COCs in soil gas were identified as an issue in the 3rd Five-Year Review. These COCs, particularly PCE, is a matter of interest as the presence of PCE in soil gas has the potential to adversely impact groundwater if unabated, as noted in the April 2015 *Explanation of Significant Differences No. 1, Basewide Remedial Investigation Sites 2 and 12, Former Fort Ord, California* (Army, 2016). It is important to note, sub-slab and indoor air assessments have shown that COC concentrations were below regulatory risk targets and that there were no complete exposure pathways. In addition, recent modifications have been added to the groundwater remedy, including a soil vapor extraction and treatment system. The data from that system show that the current configuration and operation of the remedy is removing contaminant mass. Quarterly soil gas monitoring results from the SVTU show approximately six pounds of COCs were removed during the period of September 2015 to June 2016.

7.1.7 Recommendations and Follow-Up Actions

There are no specific recommendations for this site. The soil vapor and groundwater extraction/treatment systems are performing as intended and should continue as designed until groundwater RAOs i.e., ACLs are attained, or be modified as site conditions warrant.

Opportunities for Optimization[20]

Opportunities for future system optimization may include adjustments to soil gas and groundwater sampling or extraction locations and rates coincident with changes in the site condition. Specifically, adjustments to the locations of, or rates of extraction (soil gas and/or groundwater) to those areas of greatest mass, may shorten the time to attain compliance.

Recently proposed activities that may improve system performance, reduce costs, and reduce the timeframe to achieve cleanup goals include:

Groundwater Recommendations:

- Continue operation of the Sites 2 and 12 GWTS, which includes optimization of flow rates to maximize mass removal and plume capture.
- Optimize individual extraction and monitoring well sampling frequencies in accordance with the decision rules presented in the Groundwater QAPP (Ahtna, 2016a).
- Repair the Site 2 injection programmable logic controller damaged due to vandalism.
- Replace Site 2 infiltration gallery control valves and controllers to prevent stripping of valve stems.
- Replace or repair damaged outside air louvers in the Sites 2 and 12 GWTP building.

Soil Gas Recommendations:

- Continue operation of the Sites 2 and 12 SVETS, which includes optimization of flow rates to maximize mass removal and plume capture.
- Optimize operation of individual extraction wells in accordance with recommendations presented in the quarterly Groundwater and Soil Gas Monitoring and Treatment System Reports.
- Optimize individual extraction well and soil gas probe sampling frequencies in accordance with the decision rules presented in the Soil Gas QAPP (Ahtna, 2016b).
- Operate one or more SVE wells in the south SVE well field to remove remaining concentrations of TCE above the SGCL.

[20] For additional details refer to Section 6 of the August 2016, *Sites 2 and 12 Second Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report* (Ahtna 2016e).

- Operate one or more SVE wells in the North SVE well field within the footprint of the groundwater PCE plume to determine whether SVE can expedite removal of COCs from groundwater.

7.1.8 Protectiveness Statement

Protective. The remedies at Sites 2 and 12 are protective of human health and the environment. The remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

Pathways are being controlled by groundwater use restrictions, modifications to the groundwater remedy (including soil vapor extraction and treatment), and the presence of Monterey County Ordinance 4011 and the CRUP.

7.2 Site 31

7.2.1 Site 31 Background

The selected remedies for the Basewide RI sites, including Site 31, are described in the January 1997 *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California* (Army, 1997). Site 31 is a former dump site in the southern part of the East Garrison, and is adjacent to a ravine approximately 0.2 mile southeast of the intersection of Watkins Gate Road and Barloy Canyon Road (see Plate 2). This dump site was at the boundary of the Leadership Reaction Training Compound on the northern side of the ravine. The visible extent of disposal encompassed an approximately 500- foot-long section of the northern slope of the ravine. The dump site was reportedly used in the 1940s and 1950s. Apparently, during this time, refuse was wholly or partially incinerated in a 500-ton incinerator, which was adjacent to the ravine, and the incineration waste was dumped over the side of the north side of the ravine (Army, 2012).

The site is underlain by fine- to medium-grained sand to silty or clayey sand. Loose to slightly cemented sand outcrops are present in several areas within the ravine (Army, 2012).

7.2.2 Remedial Actions

As described in the Basewide RI Sites ROD (Army, 1997), the RAO for soil at Site 31 was to remove soil containing lead intermixed with debris above the health-based level of concern of 1,860 mg/kg lead in surface soil as developed in the October 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volumes I-VI - Site 31* (HLA, 1995). At this concentration, blood levels would not be expected to exceed the 10 micrograms/deciliter (ug/dL) threshold level (Army, 1997).

Groundwater Remedial Unit

No chemicals were identified in soils posing a threat to groundwater; therefore, no groundwater remedial units were defined (Army, 1997).

Soil Remedial Unit

Based on the lead contamination detected in soil at concentrations above the human health-based level defined in the ROD, a single SRU was defined on the north slope of Site 31. The SRU consisted of shallow soil (up to 3 feet bgs) defined by five sample locations where lead in soil was above the ROD-specified soil cleanup level. The area is steep (1 foot horizontal per 1 foot vertical) and heavily vegetated. The steep slope and sandy non-cohesive soil make the SRU unstable.

The remainder of the debris and soil at the site that has not been shown to pose a human health risk does not require remediation. In addition, debris removal or treatment was not performed in these other areas for the following reasons:

- Steep topography and inaccessibility of the ravine
- Biological hazards (e.g., poison oak)
- Sensitive habitats that could be disturbed
- Overhead power lines traversing the site make maneuvering equipment difficult
- Unstable soil conditions

7.2.2.1 Remedy Selection

The following four remedial alternatives were evaluated for Site 31 in the October 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volumes I-VI - Site 31* (HLA, 1995):

- Alternative 1: No Further Action
- Alternative 2: Excavation and Treatment of Soil and Disposal of Debris
- Alternative 3: Excavation, Consolidation and On-site Disposal
- Alternative 4: Excavation and Off-site Disposal of Soil and Debris

Selected Remedy

Alternative 2 is the selected remedy and includes the following components:

- Excavation and segregation of approximately 350 cy of soil and debris containing lead above the ROD-specified soil cleanup level (1,860 mg/kg)
- Placement of soil and debris at the OU 2 landfill as part of the foundation layer
- Deed restrictions

7.2.2.2 Remedy Implementation

The selected remedy[21] was completed in June 1998, as described in the April 1999 *Remedial Action Confirmation Report, Site 31 Remedial Action, Basewide Remediation Sites* (IT/HLA, 1999). A *Post-Remediation Health Risk Assessment* (PRHRA) and a *Post-Remediation ERA* were included as Appendix A to the Confirmation Report. The PRHRA concluded that human health risks and hazards are unlikely to be associated with future site development, and the Post-Remediation ERA concluded that significant risks are not expected to ecological receptors that are exposed to chemicals remaining on site. The RAOs have been achieved and the Army received letters of NFA from the EPA (EPA, 1999) and DTSC (DTSC, 2006) on September 20, 1999 and June 28, 2006, respectively. Restrictive covenants prohibiting excavation, exposures to soil, or use of the area as part of any residential development are indicated in Exhibit B of Quitclaim Deed (No. DACA05-9-06-549) between the United States of America and the Fort Ord Reuse Authority (recorded on July 10, 2009).

7.2.2.3 System Operations and Maintenance

There are no ongoing activities related to the remedy that require operations and maintenance.

7.2.3 Progress Since the Last Five-Year Review

In September 2009, OEHHA published a revised set of soil screening levels based on the new Health Guidance Value (HGV), including updated values for commercial/industrial receptors based on a pregnant adult worker (Cal/EPA, 2009). In 2011, DTSC updated the LeadSpread model (DTSC, 2011) that had been used in the HHRA that was a part of the *Final Basewide Remedial Investigation/Feasibility Study* (HLA, 1995). The updated version of the model "LeadSpread 8" incorporates the new HGV and is designed to assess residential land use scenarios (DTSC, 2011). The September 2012 *Final 3rd Five-Year Review Report for Fort*

[21] The selected remedy assumed 350 cy of soil and debris; however, the actual amount of material excavated and placed in Landfill No. 2 was approximately 1,500 cy. The increased amount reflects additional soil from regrading activities and the removal of soil associated with the haul ramp cut through the crest of the slope (IT/HLA, 1999).

Ord Superfund Site (Army, 2012) recommended an evaluation of the protectiveness of the human health-based cleanup levels for lead at this and other sites.

The Army reevaluated protectiveness and found that the site is protective as long as the land use restrictions remain in effect. Additional information is provided in the January 2017 *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California* (KEMRON, 2017).

7.2.3.1 2012 Five-Year Review Protectiveness Statement

In 2012, the 3rd Five-Year Review Report (Army, 2012) stated that:

> "The Site 31 remedy is protective of the environment. However, a protectiveness determination for human health should be deferred until further information is obtained. Further information will be obtained by evaluating the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness of the human health-based cleanup levels for Site 31. It is expected that this evaluation will be completed by December 31, 2013 and, at that time, a protectiveness determination for human health will be made."

7.2.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The 2012 Five-Year Review Report noted the remedy is functioning as intended, however; changes to the OEHHA health guidance value for lead in blood and the DTSC methodology used to calculate the human health-based cleanup levels may affect protectiveness of human health. The 2012 Five-Year Review Report recommended the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness be reevaluated.

Issues from Previous Review	***Recommendations/ Follow-up Actions***	***Responsible Party***	***Milestone Date***	***Action Taken and Outcome***	***Date of Action***
Changes in OEHHA health guidance and DTSC methodology for calculating heath risk.	Reevaluate protectiveness using the updated OEHHA health guidance and DTSC methodology for calculating heath risk.	Army	December 31, 2013	The Army reevaluated the protectiveness of the remedy and found that the site is protective to human health as long as the land use restrictions remain in effect.	November 2013[1] August 2016[2] February 2017[3]

Notes:
1) *Draft Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (ITSI Gilbane, 2013)
2) *Draft Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (KEMRON, 2016)
3) *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (KEMRON, 2017)

7.2.4 Site 31 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities that have been performed for Fort Ord using a basewide approach are detailed in Sections 4.1 and 4.2. Document

review, data review, site inspection, and interviews, if applicable, have been conducted on a site-by-site basis and are described in the following subsections.

7.2.4.1 Document Review

Significant documents reviewed in this evaluation included the following:

- *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume I-VI - Site 31* (HLA, 1995)
- *Basewide Remedial Investigation Sites ROD* (Army, 1997)
- *Remedial Action Confirmation Report, Site 31 Remedial Action, Basewide Remediation Sites* (IT/HLA, 1999)
- *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord* (KEMRON, 2017)
- Quitclaim Deed DACA05-9-06-549.

A complete list of references is provided in Appendix A (Site 31 section of the reference list).

7.2.4.2 Data Review

No new sampling data have been generated since the previous Five-Year Review was conducted.

7.2.4.3 Site Inspection and Interviews

An inspection of Site 31 was performed by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers) on July 14, 2016. Significant observations include the following:

- The vegetation is intact and growth is good on the excavated slope.
- There are no signs of erosion or drainage problems.
- There are no signs of inappropriate activities.
- There are no changes in land use (site remains unimproved).

To assist with the inspections Mr. David Eisen, the MMRP Manager for Fort Ord, was interviewed the same day as the inspection. Site Inspection documentation and photographs are found in Appendix B, Field Documentation of Site Inspections and Interviews.

7.2.5 Technical Assessment

7.2.5.1 Question A

Is the remedy functioning as intended by the decision document?

The Army successfully completed the remedial action in 1999[22] in accordance with CERCLA and the RI Sites ROD. The RAOs of the time have been met and the remedy is functioning as intended.

[22] Date of the approved Remedial Action Completion Report (IT/HLA, 1999).

7.2.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions used at the time of remedy selection are still valid. However, the toxicity data and cleanup levels have both been updated. The RAOs used at the time of remedy selection remain valid.

The RAO for soil at Site 31 was to remove soil containing lead intermixed with debris above the health-based level of concern of 1,860 mg/kg lead in surface soil, as developed in the October 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volumes I-VI - Site 31* (HLA, 1995). At this concentration, blood levels would not be expected to exceed the 10 ug/dL threshold level. No chemicals were identified in soils posing a threat to groundwater; therefore, no groundwater remedial units were defined (Army, 1997). For more information see Section 7.2.2 Remedial Actions.

The 1998 removal of approximately 1,500 cy of soil and debris with lead concentrations above the human health-based level of concern of 1,860 mg/kg was conducted at Site 31. The maximum lead concentration in the post-remediation confirmation samples was 140 mg/kg. The objectives of the remedial action excavation were met in accordance with the ROD. Additionally, the maximum lead concentration in post-remediation confirmation samples are far less than the current EPA residential soil screening level of 400 mg/kg (or 800 mg/kg for commercial/industrial use).

7.2.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No information has come to light that could call into question the protectiveness of the remedy.

7.2.6 Issues

There are no issues affecting the protectiveness of the remedy at Site 31.

7.2.7 Recommendations and Follow-Up Actions

The current remedy is functioning as intended. The site should be included in the next Five-Year Review.

7.2.8 Protectiveness Statement

Protective. The remedy at Site 31 is protective of human health and the environment.

The successful completion of the remedy establishes that the site is protective of human health and the environment. The land use restrictions incorporated into the Quitclaim Deed and CRUP apply to the entire site and run with the land ensuring protectiveness.

7.3 Site 39

7.3.1 Site 39 Background

Site 39 is in the southwestern portion of the Former Fort Ord and includes the Inland Ranges (approximately 8,000 acres) and the 2.36-inch Rocket Range (approximately 50 acres). The Inland Ranges are bounded by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and General Jim Moore Blvd. to the west. The 2.36-inch Rocket Range is immediately north of Eucalyptus Road, near the north-central portion of the Inland Ranges. A majority of Site 39 is encompassed within the footprint of the Impact Area MRA (discussed in Section 15.0). In addition, the Comprehensive BRA was created to review all ranges that were being assessed under the various ongoing programs (e.g., Site 39, Site 39A, Site 39B, Site 3, East Garrison Ranges, etc.) The footprint of the Comprehensive BRA encompasses a different and larger area than the footprint of Site 39.

The Inland Ranges were reportedly used beginning in the early 1900s for ordnance training exercises. Over the years, various types of ordnance have been used or found in the Inland Ranges, including hand grenades, mortars, rockets, mines, artillery projectiles, and small arms ammunition. Some training activities using petroleum hydrocarbons also were conducted. The 2.36-inch Rocket Range reportedly was used for anti-armor (bazooka) training during and shortly after World War II.

The proposed future use of most of the Inland Ranges will be as a NRMA and as habitat reserve areas. These areas will be managed by the U.S. Department of the Interior, BLM, and public access will be restricted. Several areas within, but along the periphery of, the Inland Ranges have proposed future land use other than as a NRMA. The Military Operations on Urban Terrain Area, near the northeastern edge of the Inland Ranges, is proposed for use as a peace officer training area. The areas along the southern and western boundaries of the Inland Ranges are designated for future development under the Reuse Plan and Habitat Management Plan (HMP).

The remedial action for the Site 39 Inland Ranges at the Former Fort Ord was originally identified in the *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California* (Basewide RI Sites ROD) dated January 13, 1997 (Army, 1997). The selected remedy addresses risks to human health from lead contamination in soils co-located with bullets and constituents of explosives in soils from MEC usage at the Site 39 Inland Ranges.

The selected remedy for the Site 39 Inland Ranges is "Excavation and Onsite Placement at the Operable Unit 2 Landfill Beneath a Cap" at the Former Fort Ord based on the protection of human health for reuse of the site as development and habitat reserve. As discussed in Section 7.4.2, parts or all of six ranges or historical areas (HAs) were remediated in accordance with the Basewide RI Sites ROD before the 3rd Five-Year Review Report was issued in 2007 (Army, 2012).

Explanation of Significant Differences: Excavation and Segregation of Spent Ammunition from Soil

An ESD issued in December 2003 describes a change in the final remedy selected for lead contaminated soil at the Small Arms Ranges at Site 39. The portion of the remedy for Site 39 that addressed the Small Arms Ranges included segregation and recycling of spent ammunition from soil containing lead prior to placement of the soil at the Fort Ord Landfills. The remedy to dispose of lead-contaminated soils in the Fort Ord Landfills was selected in the OU 2 ROD, dated August 1994, and three ESDs for OU 2 dated August 1995, August 1996, and January 1997. The same remedy was selected to address lead-contaminated soils excavated from the Small Arms Ranges at Site 3 (the Beach Trainfire Ranges), where conditions are similar to those at Site 39. The Site 3 remedy was selected in the Interim ROD, Site 3, Beach Trainfire Ranges (Army, 1997).

Based on comments from the public, site conditions, and engineering constraints for the Site 3 remedial activities, segregation and recycling of spent ammunition prior to placement at the Fort Ord Landfills was found to be of significant public concern, and technically and economically impractical. Therefore, the Army eliminated these procedures from the remedy for the Small Arms Ranges at Site 39 (Army, 2012).

Comprehensive Basewide Range Assessment

The November 2009 *Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1* (MACTEC Engineering and Consulting, Inc. [MACTEC]/Shaw 2009) and the January 2012 *Basewide Range Assessment Report, Former Fort Ord, California, Revision 2* (Shaw, 2012) summarized the status of investigation for the presence of potential COCs at known or suspected small arms ranges, multi-use ranges, and military munitions training areas within the Former Fort Ord, including those within Site 39.

The objective of the Comprehensive BRA was to (1) ascertain whether the potential COCs could be present in sufficient amounts to warrant remediation, and if remediation was warranted based on available information, to determine the area(s) within a site where remediation should be recommended; (2) identify which HAs can be eliminated from consideration for potential remediation; and (3) identify sites that require additional investigation, or should be considered for remediation.

The Comprehensive BRA process involved five steps: (1) review of historical documents including historical training maps, historical aerial photographs, range control records, and military munitions after action removal reports; (2) site reconnaissance and mapping; (3) limited soil sampling for screening purposes; (4) site characterization; and (5) remediation/ habitat mapping. This investigation identified areas of additional soil contamination associated with ranges within Site 39 and resulted in a significant increase in the volume of soil to be excavated at the site (Shaw, 2012).

Ecological Risk Assessment

The October 2007 *Ecological Risk Assessment for Site 39 Ranges, Habitat Areas, Impact Area, Former Fort Ord, California* (Shaw/MACTEC, 2007) described the methods, approach, and results of an assessment conducted to evaluate potential ecological risks for the ranges within habitat areas of the Impact Area. The ERA was used to guide risk management decision-making. The overall approach for conducting the ERA was to evaluate potential ecological risk under a baseline scenario (i.e., current conditions with no remediation) and evaluate risk reduction based on various potential remediation scenarios developed based on an assessment of habitat quality and distribution and concentrations of contaminants.

The ERA focused on chemical contamination in soil associated with 22 Range Areas at Site 39; lead, copper, antimony, and explosive compounds were identified as chemicals of potential ecological concern. Ecological receptors at the Impact Area evaluated in the ERA included plants, reptiles, herbivorous/insectivorous mammals, omnivorous/carnivorous mammals, herbivorous birds, omnivorous/carnivorous birds, and insectivorous birds[23]. Aquatic receptors were also evaluated for pond areas.

Because previous ecological risk evaluations for the Impact Area were conducted using limited soil and biota data, an ERA sampling program was conducted to fill data gaps for the evaluation of ecological risks. A total of 40 locations within the ranges were sampled, and lead bioavailability tests also were conducted on soil and plant samples. Baseline (No Action) risks were estimated for the receptors and exposure areas, and risk estimates were then calculated for a range of remedial exposure scenarios to evaluate both the level of risk reduction and the amount of habitat destroyed under various potential remediation scenarios. The primary goal of developing the remedial risk scenarios was to devise a remediation approach that would maximize risk

[23] The term "herbivorous" refers to mammals or birds with a plant-based diet; "insectivorous" refers to mammals or birds with an insect-based diet; "omnivorous" refers to mammals or birds with a varied diet of both plants and animals; "carnivorous" refers to mammals or birds with a meat-based diet.

reduction within known and potential breeding habitat for the California Tiger Salamander (CTS) along with preservation of high-quality habitat to be used in remedial decision-making (Army, 2012).

Feasibility Study Addendum

The FS Addendum (MACTEC, 2008) for the Site 39 Ranges presents the revisions to the remedial units (originally identified in the Basewide RI Sites ROD) based on additional investigations for contaminated soils and the ERA completed at Site 39 since the time the Basewide RI Sites ROD was prepared. The purpose of this FS Addendum was to summarize the results of the Comprehensive BRA and ERA for contaminated soils present at Site 39, and identify the revised remedial units based on those results for which the original preferred remedial alternative of "On-site Placement at the OU 2 Landfill Beneath a Cap" was to be implemented, as identified in the Basewide RI Sites ROD. The results of the Comprehensive BRA, ERA, and FS Addendum were used to guide risk management and remedial decision-making for these habitat reserve ranges during the preparation of a ROD Amendment to address ecological risks and the additional volume of contaminated soil that required remediation (Army, 2012).

7.3.2 Remedial Actions

The Basewide RI Sites ROD (Army, 1997) includes details concerning the RAOs and soil remedy for Site 39. One RAO for soil was for protection of groundwater, to remediate TPH in soil to a concentration of 500 mg/kg or less. A second RAO addressed lead, cyclotrimethylene trinitramine (RDX), and beryllium, and specified removal of soil containing these chemicals above health-based levels of concern and risk-based target cleanup levels of 1,860 mg/kg for lead, 0.5 mg/kg for RDX, and 2.8 mg/kg for beryllium in surface soil. A third RAO was the removal of spent ammunition, because it is a source of lead in soil.

Several investigations occurred prior to the development of the Comprehensive BRA, including the Basewide RI/FS, several pilot studies, and additional characterization and remediation of areas within the Impact Area where reuse was modified from habitat reserve to development. The portion of the Site 39 Inland Ranges addressed in the ROD Amendment is comprised of approximately 6,830 acres designated as habitat reserve in the HMP and Related Requirements within the 8,000-acre Impact Area. This portion of the Impact Area is restricted from future residential development. The remaining 1,170-acre portion of the Impact Area occurs within designated development areas where remedial actions have been completed, or no further action was recommended based on the results of the Comprehensive BRA. Remedial actions in the development portions of several ranges (Ranges 18, 19, 21, 24, 25 and 46) have been completed since 1999 based on the results of the characterization activities completed (Army 2009).

Groundwater

No groundwater remedial unit was defined for Site 39 because (1) the vertical extent of contamination is limited to shallow soil, (2) the depth to groundwater beneath Site 39 is estimated to range from 60 to 180 feet bgs, (3) the presence of potential contaminants (antimony and nitrates) in groundwater has not been confirmed, and (4) groundwater data from monitoring wells in the area indicated that there is little potential for contamination of groundwater as a result of site activities.

Initial Soil Remedial Units

Before 2007, soils were removed from several ranges/HAs (Ranges 21, 24, 25, and 46; the Seaside parcels of Ranges 18 and 19) that had soil containing lead exceeding the human health-based level of 1,860 mg/kg, as defined in the Basewide RI Sites ROD (Army, 1997). For the explosive ordnance target areas, the distribution of lead with concentrations at or above the ROD's cleanup level defined the remedial units, based on the original FS (HLA, 1994). For the small arms ranges, chemical data for lead in soil and the distribution of lead above the cleanup level was believed to correspond to the distribution of spent ammunition based on the Site 3 investigation. Because the conditions at the small arms ranges were similar to Site 3, the same model for site characterization was applied to these ranges.

Remedial actions were conducted through July 2013 at 18 of the HAs within the Site 39 Inland Ranges in accordance with the Remedial Action Work Plan (RAWP) (Shaw, 2009). Approximately 150,000 cy of soil have been excavated at the HAs identified in the FS Addendum (MACTEC, 2008). The activities were summarized in the December 2014 *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (ITSI Gilbane/CB&I Federal Services LLC [CB&I], 2014). The Remedial Action Completion Report concluded that the remedial action objectives presented in the 2009 RAWP were achieved for each HA and that no further action is required for the HAs.

As munitions responses are completed within the Impact Area MRA, the Army will continue to conduct characterization of metals and explosives in soil within the Site 39 Inland Ranges in accordance with the *Final Quality Assurance Project Plan, Volume 1, Appendix B, Soil Sampling, Basewide Range Assessment, Former Fort Ord, California* (KEMRON, 2016).

Soils Remediation Completed under the ROD Amendment

The ROD Amendment addressed ecological risks, established revised cleanup levels, identified a significantly larger volume of soil for remediation, confirmed that the landfill is still the best location to place the contaminated soil, eliminated the need to conduct a post-remediation risk assessment, and eliminated the need for institutional controls related to the chemical contamination. Soils from 18 HAs in Site 39 were addressed in the ROD Amendment. The ROD Amendment specified remedial excavation of soil containing concentrations above the new cleanup levels developed to be protective of ecological receptors, which included the range-wide weighted average of 225 mg/kg for lead. The remedy (Army, 2009) also included special considerations to minimize destruction of high quality habitat, including potential CTS reproductive habitat (KEMRON, 2017).

Site 39 ranges are divided into habitat areas that will be managed as habitat by the BLM and development ranges (or portions of ranges) that are located adjacent to developed areas and could be developed for residential use in the future. Site 39 habitat areas and development areas are discussed separately below.

Site 39 Habitat Areas

The selected remedy in the ROD Amendment (Army, 2009) specified: "Remediation to Range-Wide Weighted Average for Lead and Explosive Compounds, with Special Considerations for Ecological Receptors." This included excavation of soil with lead concentrations above a range-wide weighted average of 225 mg/kg for the habitat areas of Site 39. Areas and extents of excavations were selected to ensure only a moderate amount of disturbance to critical habitat, including habitat for rare, threatened, and endangered species. To determine the range-wide weighted average for each remediation area, areas containing soil confirmation samples with concentrations of lead that exceeded the cleanup levels were identified for each area containing low, medium, and high-quality habitat, and the analytical results within these areas were then averaged. According to the RAWP, the total volume of contaminated soil planned for excavation was approximately 125,000 cy (including the spent bullets). Proposed excavation depths ranged from approximately 1 to 2 feet bgs over the estimated remediation area of approximately 53 acres. The lead cleanup level established to protect ecological receptors also is protective of human health, because it is lower than the human health-based level of concern identified in the Basewide RI Sites ROD for use of the area as a habitat reserve (based on risks to a habitat management worker and site visitor). The 225 mg/kg level also is lower than the current EPA Regional Screening Level (RSL) of 400 mg/kg for lead. The recent DTSC change to the blood-lead level limits applies to a child resident receptor. Residential criteria are not applicable to the habitat areas of Site 39, because residential uses are not proposed. Therefore, 225 mg/kg remains an appropriate lead cleanup level for the Site 39 habitat areas which encompass a majority of the Site 39 acreage.

Site 39 Development Areas

Site 39 development HAs have been separated from the habitat HAs due to the difference in future uses. Development HAs were evaluated using a cleanup level of 400 mg/kg, based on EPA guidance for residential

uses. Of the development HAs, only one range exceeded the cleanup level of 400 mg/kg; HA-21D. HA-21D was subsequently evaluated based on the 95 percent UCL of the mean. The calculated 95 percent UCL for HA-21D (38.74 mg/kg) is less than 400 mg/kg. All of the development HAs were found to have a remaining lead concentration of less than 80 mg/kg, except for HA-18D and HA-23D. These two ranges were further evaluated based on comments received on the January 2014 *Draft Technical Memorandum* (ITSI Gilbane, 2014). Excavation activities at HA-18D were initiated in 1999 to remove soil containing accumulated spent ammunition and residual lead from within areas identified for remediation. Confirmation samples from HA-18D were collected to confirm that the remediation goal of 400 mg/kg set in the August 2002 *Draft Final Sampling and Analysis Plan Characterization and Remediation Confirmation, Site 39, Ranges 18 and 19, Former Fort Ord, California* (IT, 2002) was met. All in-place results for HA-18D were below the cleanup level of 400 mg/kg. A series of residential grid 95 percent UCL lead concentrations from within the development area had concentrations that ranged from 14.5 to 768.2 mg/kg. In addition, the UCL for HA-18D was calculated at 99.4 mg/kg. Incremental samples were collected at HA-23D in September 2016 and January 2016 in accordance with the November 2015 *Final Historical Area (HA) 23D Sampling Work Plan, Former Fort Ord, California* (ITSI Gilbane, 2015). The 95 percent UCL lead concentration ranged from 40.5 mg/kg to 378 mg/kg. In addition, a development-wide 95 percent UCL for HA-23D was calculated at 174.7 mg/kg. The values at HA-18D and HA-23D are below the 400 mg/kg cleanup level established for the project, which the Army considers protective of human health. It is recognized that DTSC and EPA have commented that the cleanup level for lead at the development areas should be the DTSC 80 mg/kg screening level. This screening level is based on the OEHHA benchmark change in blood lead concentration criteria and the DTSC methodology for calculating risk-based soil preliminary remediation goals. Additional discussion between the regulatory agencies and the Army regarding the lead cleanup level is currently ongoing. A protectiveness determination for human health at HA-18D and HA-23D should be deferred until further information is obtained upon the conclusion of the discussion between the regulatory agencies and the Army.

7.3.2.1 Remedy Selection

Basewide RI Sites ROD

The following four remedial alternatives were evaluated in the original Feasibility Study (FS) (HLA, 1994).

- Alternative 1: No action
- Alternative 2: Institutional controls
- Alternative 3: Excavation and onsite disposal
- Alternative 4: Excavation and offsite disposal

Alternative 3 of the initial FS (HLA, 1994) was the originally selected remedy and guided remediation of sites remediated under the Basewide RI Sites ROD (Army, 1997) (Ranges 21, 24, 25, and 46; the Seaside parcels of Ranges 18 and 19 were remediated to support the reuse plan which identified development in these areas).

ROD Amendment

The ROD Amendment addressed ecological risks, established revised cleanup levels, identified a significantly larger volume of soil for remediation, confirmed that the landfill is still the best location to place the contaminated soil, eliminated the need to conduct a post-remediation risk assessment, and eliminated the need for institutional controls related to the chemical contamination. Soils from 18 HAs in Site 39 were addressed in the ROD Amendment. The ROD Amendment specified remedial excavation of soil containing concentrations above the new cleanup levels for lead of 225 mg/kg developed to be protective of ecological receptors. The remedy also included special considerations to minimize destruction of high quality habitats (Army, 2009).

As previously mentioned, a larger volume of soil requiring remediation in Site 39 was identified in the ROD Amendment (Army, 2009). While the remedial technology (Excavation and Onsite Placement at the Fort Ord

Landfills Beneath a Cap) remained the same, the selected remedy identified in the Basewide RI Sites ROD was revised in the ROD Amendment to include ecological cleanup levels, the soil volumes identified based on the results of the Comprehensive BRA, ERA, and FS Addendum for the Site 39 Inland Ranges that were to be placed at the Fort Ord Landfills.

The four remedial alternatives considered for the Site 39 Inland Ranges in the ROD Amendment include:

- Remedial Alternative 1 – No Action.
- Remedial Alternative 2 – Remediation to Human Health Based Levels of Concern for Lead and Constituents of Explosives.
- Remedial Alternative 3 – Remediation to a Range-Wide Weighted Average for Lead and Constituents of Explosives, With Special Considerations for Ecological Receptors.
- Remedial Alternative 4 – Remediation to the Fort Ord Background Level for Lead and Non-Detectable for Constituents of Explosives.

Remedial Alternative 3 – "Remediation to Range-Wide Weighted Average for Lead and Constituents of Explosives, With Special Considerations for Ecological Receptors" was selected in the ROD Amendment. This alternative includes:

- Excavation of soil containing concentrations above the following ERA cleanup levels: a range-wide weighted average of 225 mg/kg for lead, and for constituents of explosives of 5.9 mg/kg for trinitrotoluene (TNT), 3.1 mg/kg for RDX, and 2.7 mg/kg for cyclotetramethylene tetranitramine (HMX). These cleanup levels are designed to be protective of ecological receptors, and take into account the HMP and related requirements by incorporating special considerations to minimize destruction of potential CTS reproductive habitat and high quality habitat. These cleanup levels also are protective of human health, because they are lower than human health-based levels of concern identified in the Basewide RI Sites ROD for reuse of the areas as a habitat reserve (based upon risks to a habitat management worker and site visitor).
    - Special considerations for ranges near ponds which may provide reproductive habitat for the CTS (Ranges 28, 37 and 39/40), where all sample locations with lead concentrations above 225 mg/kg will be removed, and the range-wide weighted averages for constituents of explosives will be 0.59 mg/kg for TNT, 2.4 mg/kg for RDX, and 2.7 mg/kg for HMX.
    - Special consideration for ranges with large areas of very high quality chaparral habitat (Range 19) that include remediation of the target and firing lanes and all areas with greater than 10 percent spent small arms bullets distribution.
    - The approximate range-wide weighted average concentrations of lead that will remain on site under the selected remedy vary from 50 to 190 mg/kg, except for Range 19, which would result in a range wide weighted average of 355 mg/kg.
- Excavation of approximately 125,000 cy of soil and spent bullets based on current data to depths ranging from approximately 1 to 2 feet bgs over a total estimated remediation area of approximately 53 acres, resulting in a moderate amount of disturbance to the sensitive habitat including rare, threatened, and endangered species.
- The Army will continue to conduct characterization of metals and constituents of explosives in soil within the Site 39 Inland Ranges that are associated with former military munitions range uses, as munitions responses are completed within the Impact Area MRA. If there is evidence that military munitions recovered from the subsurface have degraded and released constituents of explosives or metals into soils, these specific locations will be evaluated to determine if additional sampling or remediation for constituents of explosives or metals is necessary.

- Placement of the excavated soil and spent bullets within Fort Ord Landfills (Area E cell) above the existing geomembrane cover as described in Appendix B of the FS Addendum (MACTEC, 2008). Approximately 150,000 cy of soil were excavated from an approximate area of 64 acres. Excavated soil included 122,000 cy in accordance with the proposed volume identified in the Site 39 Remedial Design/Remedial Action (RD/RA) Work Plan (Shaw, 2009), 2,000 cy from HA-38, and 26,000 cy of additional excavation required to meet the RAOs. Excavation depths ranged from 1 to 5 feet. A new cover consisting of a low permeability geomembrane and vegetative layer was placed over the foundation layer.

After remediation is completed under this alternative, no institutional controls (e.g., access management measures or land use restrictions) will be required related to residual chemical contamination in soil, based on the results of the Comprehensive BRA, ERA, and FS Addendum completed after the Basewide RI Sites ROD was signed in 1997. Details associated with implementation of the range-specific remedial approaches identified in the selected remedy were provided in the RAWP that was prepared for the Site 39 Inland Ranges (Shaw, 2009).

A description of re-vegetation and restoration efforts associated with the post-remediation cleanup is included in the September 2009 *Final Habitat Restoration Plan, Site 39 Inland Ranges, Former Fort Ord, California* (HRP; Duffy/Shaw, 2009). Habitat and wetland monitoring procedures were conducted in accordance with the September 2006 *Draft Wetland Monitoring and Restoration Plan, Former Fort Ord* (Burleson, 2006), and the March 2009 *Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord* (Burleson, 2009), and the April 2015 update *Revisions of Protocol for Conducting Vegetation Monitoring for Compliance with the Installation-Wide Multispecies Habitat Management Plan, Former Fort Ord* (Tetra Tech, 2015). Results of monitoring will be documented in annual reports submitted to the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game. Range-specific details regarding vegetation regrowth monitoring and restoration activities are described in detail in the HRP, including an assessment of the restoration potential for each range, and identify the specific HMP species that occur.

7.3.2.2 Remedy Implementation

The remedial alternative implemented at the Site 39 Inland Ranges based on the ROD Amendment was "Remediation to a Range-Wide Weighted Average for Lead and Explosive Compounds, with Special Considerations for Ecological Receptors." The rationale for this approach was to minimize the removal of very high quality habitat and to aid in post-remediation habitat restoration efforts, with special considerations for ecological receptors.

The HAs included in the Site 39 Inland Ranges remedial action under the ROD Amendment are slated as habitat reserve areas, a low-intensity land use. The remediation approach reduces the removal of very high quality habitat and aids in post-remediation habitat restoration efforts by leaving "islands" of very high quality habitat within the remediation areas to establish a vegetative base for re-growth. Most HAs were excavated to achieve a range-wide weighted average for the remaining lead concentration not to exceed 225 mg/kg. Some HAs were excavated to achieve range-wide weighted averages of 5.9 mg/kg for TNT, 3.1 mg/kg for RDX, and 2.7 mg/kg for HMX. Other HAs required special considerations for ecological receptors. At these HAs, all lead concentrations exceeding 225 mg/kg were removed, and soil containing explosives compounds was remediated to alternative range-wide weighted averages of 0.59 mg/kg for TNT, 2.4 mg/kg for RDX, and 2.7 mg/kg for HMX.

Confirmation samples were collected from excavation areas to confirm that remediation goals were met. Samples were analyzed for lead using EPA Method 6010B, for explosives constituents (TNT, RDX, and HMX) using EPA Method 8330A, and/or total petroleum hydrocarbons using EPA Method 8015M. The

confirmation sampling schemes were based on historical range use, the mode in which the ranges were operated, and the observed patterns of contamination. Bias sample locations were identified by the Army and were collected from random locations after excavation, from sidewalls, or from disturbed areas. The remedial action completed at the Site 39 Inland Ranges meets the RAOs established in the Basewide RI Sites ROD and the ROD Amendment for removal of soil contaminated with lead and/or explosives constituents. Approximately 150,000 cy of soil were excavated from an area of approximately 64 acres. Excavated soil included 122,000 cy in accordance with the proposed volume identified in the Site 39 RD/RA Work Plan and 28,000 cy of additional excavation required to meet the RAOs. Depth of soil excavation ranged from 1 to 5 feet depending on the depth of soil contamination.

The remedial actions at each HA differed depending on the contaminant (lead or explosives), habitat quality, and special ecological considerations as follows:

- HAs-18H, -22H, -23H, -26H, -27, -27A, -29, -34, -38, and -43: Excavated to a range-wide weighted average of 225 mg/kg or less for lead.
- HA-19H: Excavated the target and firing lanes and all areas with greater than 10 percent spent small arms bullets cover and not on individual lead concentration. The approach was to leave "islands" of very high quality habitat within the remediation areas to establish a vegetative base for re-growth. The post-remediation range-wide weighted average is 355 mg/kg.
- HA-33: Excavated to range-wide weighted averages or less of 5.9 mg/kg for TNT, 3.1 mg/kg for RDX, and 2.7 mg/kg for HMX.
- HAs-44 and -48: Excavated to range-wide weighted averages or less of 225 mg/kg for lead, 5.9 mg/kg for TNT, 3.1 mg/kg for RDX, and 2.7 mg/kg for HMX.
- HAs-28, -37, and -39/40/40A: Excavated by removing all areas with lead concentrations at or greater than 225 mg/kg for lead. These HAs were near ponds that may provide breeding habitats for the CTS.
- HA-36: Excavated to alternative range-wide weighted averages of 0.59 mg/kg for TNT, 2.4 mg/kg for RDX, and 2.7 mg/kg for HMX. This HA was near a pond that may provide breeding habitats for the CTS.

Approximately 150,000 cy of soil was excavated from an area of about 64 acres and transported via on-road trucks to Area E of the Fort Ord Landfills for final disposition. Soil was spread in thin lifts by a dozer and/or a loader. A UXO Technician inspected the soil as it was being off-loaded at the Fort Ord Landfills; no explosive hazards were noted. Excavated soil included 122,000 cy in accordance with the proposed volume identified in the Site 39 RD/RA Work Plan (Shaw, 2009), 2,000 cy from HA-38, and 26,000 cy of additional excavation required to meet the RAOs. Remediation of all soil remediation areas specifically identified in the ROD Amendment has been completed; these actions (and remediation of subsequently identified, additional HAs noted above) are described in the December 2014 *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (ITSI Gilbane/CB&I, 2014). In accordance with the ROD Amendment (Army, 2009), investigation and characterization of HAs in the Site 39 Inland Ranges is ongoing. The Army will perform remediation in additional HAs found to have soil contamination following the requirements of the ROD Amendment.

7.3.2.3 System Operations and Maintenance

There are currently no O&M activities required for Site 39 based on the chemical contamination.

7.3.3 Progress Since the Last Five-Year Review

Following the requirements of the ROD Amendment, investigation and characterization was conducted at HA-38 after the munitions response was completed in 2011. HA-38 was not identified in the Final FS Addendum (MACTEC, 2008) for remediation. However, the remediation approach followed the requirements of the FS Addendum based on similar HAs (e.g., HA-18). The remedial action completed at the Site 39 Inland Ranges meets the RAOs established in the Basewide RI Sites ROD and the ROD Amendment for removal of soil contaminated with lead and/or explosives constituents. Details associated with implementation of the range-specific remedial approaches were provided in the December 2009 *Remedial Design/Remedial Action Work Plan, Site 39 Inland Ranges Remediation and OU 2 Landfills, Area E Construction* (Shaw, 2009) prepared for the Site 39 Inland Ranges.

Approximately 150,000 cy of soil through July 2013 have been excavated at the HAs identified in the FS Addendum (MACTEC, 2008). The activities were summarized in the December 2014 *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (ITSI Gilbane/CB&I, 2014). The Remedial Action Completion Report concluded that the remedial action objectives presented in the 2009 RD/RA Work Plan were achieved for each HA and that no further action is required for the HAs. As munitions responses are completed within the Impact Area MRA, the Army will continue to conduct characterization of metals and explosives in soil within the Site 39 Inland Ranges in accordance with the June 2016 *Final Quality Assurance Project Plan, Volume 1, Appendix B, Soil Sampling, Basewide Range Assessment, Former Fort Ord, California* (KEMRON, 2016).

A summary of significant activities and associated documentation of corrective actions completed since the 3rd Five-Year Review is presented in the table below.

Significant Activities Completed During the 4th Five-Year Review Period	
Document/Activity	**Date**
Field Work Variance No. 08-005, modifies Appendix O of the *Final Remedial Design/Remedial Action Work Plan for HA-38, Site 39 Inland Ranges Remediation and OU2 Landfills, Area E Construction, Former Fort Ord, California* (ITSI Gilbane, 2012)	1/04/2012
Field Work Variance No. 08-004 modifies the *Final Remedial Design/Remedial Action Work Plan, Site 39 Inland Ranges Remediation and OU2 Landfills, Area E Construction, Former Fort Ord, California* (ITSI Gilbane, 2012a)	5/15/2012
HA-37 Phase II Excavation by Using Armored Equipment	5/16/2012-6/13/2012 2/10/2012-11/9/2012
HA-38 Soil Remediation Activities	3/12/2012-1/14/2013
FWV No. 08-006 to FWV No. 08-001 (HA-37 SSWP) issued; remaining excavation areas to be mechanically screened	2/20/2013
Field Work Variance No. 08-006 amends the *Addendum to the Site Specific Work Plan Historical Area 37 Remedial Action, Site 39 Inland Ranges* (HA-37 SSWP Addendum) - See Other Field Work Variances under *Final Remedial Design/Remedial Action Work Plan, Site 39 Inland Ranges Remediation and OU 2 Landfills, Area E Construction, Former Fort Ord, California* (ITSI Gilbane, 2013)	2/20/2013
HA-37 Phase II Remediation Continued Using "Mechanical Screening Method"	2/26/2013-3/04/2013
Final Technical Memorandum, Basewide Range Assessment, Units 4, 11, and 12, Former Fort Ord, California (ITSI Gilbane, 2014)	5/14/2014
Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California (ITSI Gilbane/CB&I, 2014)	12/11/2014
Final Technical Memorandum, Basewide Range Assessment Investigation, Unit 6, Former Fort Ord, California (Gilbane, 2015)	1/30/2015

Significant Activities Completed During the 4th Five-Year Review Period	
Document/Activity	**Date**
Final Historical Area (HA)-23D Sampling Work Plan, Former Fort Ord, California (ITSI Gilbane, 2015)	11/15/2015
Final Quality Assurance Project Plan Former Fort Ord, California, Volume I, Appendix B, Soil Sampling, Basewide Range Assessment (KEMRON, 2016)	6/21/2016
Addendum to the Final Units 1, 2, 3, 7, 10, and 33 and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan, Fort Ord, California (KEMRON, 2016a)	7/28/2016
Final Units 1, 2, 3, 7, 33, and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan, Fort Ord, California (Gilbane, 2015a)	2/08/2016
Revised HA-23D Sampling Results	8/31/2016
Final Technical Memorandum Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, California (KEMRON, 2017)	2/28/2017

The following table presents the excavated soil volumes and post-excavation lead concentration for Site 39 areas remediated during this review period (i.e., HA-34, HA-37, and HA-38).

HA-34, HA-37, HA-38 Soil Volumes and Post-Excavation Lead in Soil			
Site	**Excavated Soil Volume[1]**	**ROD Lead Cleanup Standard[2]**	**Post-Excavation Lead in Soil**
HA-34	29,330	225 mg/kg	Range-wide weighted average: 217 mg/kg
HA-37	33,670	225 mg/kg[3]	Average remaining concentration: 31 mg/kg
HA-38	2,214	225 mg/kg	Average remaining concentration: 71 mg/kg

Notes:
1 -Soil volume in cy
2 - Lead concentration in milligrams per kilogram
3 - All confirmation samples were required to be less than 225 mg/kg at HAs close to high-quality habitat.
ROD Amendment lead cleanup standard: 225 mg/kg

The only RACR completed during this Five-Year Review reporting period is the December 2014 *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve* (ITSI Gilbane/CB&I, 2014). There are currently no parts of Site 39 that are known to require a RACR. The Army has not evaluated the entire Site 39 because of remaining vegetation and MEC removal that is required. Any samples that have been found to be above the cleanup level (225 mg/kg in the habitat area) are pending further sampling in adjacent areas that are not ready to be sampled.

The last soil excavation activity at HA-18D is described in the February 2005 *Draft Final Remedial Action Confirmation Report, Site 39, Ranges 18 and 19, Basewide Remediation Sites, Former Fort Ord, California* (Shaw, 2005). The result of that work was evaluated in the *Post-Remediation Health Risk Assessment (PRHRA) for chemical contamination at Seaside transfer Parcels 1 through 4* (Seaside Risk Assessment; Shaw/MACTEC, 2008).

The 3rd Five-Year Review Report recommended an evaluation of the protectiveness for 17 lead-impacted sites at the Former Fort Ord based on the change in 2007 to the OEHHA child-specific benchmark health guidance value. A *Technical Memorandum, Evaluation of Lead at Selected Sites, Former Fort Ord, California* was prepared to evaluate of the protectiveness for the 17 lead-impact sites and submitted for agencies' review. Comments received from the agencies questioned whether the five samples collected at HA-23D were

sufficient to characterize the site and whether HA-18D and HA-23D are still protective. The Army agreed and collected additional data using incremental sampling for evaluation of the protectiveness at HA-23D. The Army evaluated all data collected at HA-18D and HA-23D against the OEHHA screening level in the February 2017 *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites* (Lead Tech Memo) and concluded that all 17 lead-impacted sites are still protective (KEMRON, 2017).

7.3.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 Five-Year Review Report (Army, 2012) for Site 39 stated that:

> "The Site 39 remedy is protective of the environment. However, a protectiveness determination for human health should be deferred until further information is obtained. Further information will be obtained by evaluating the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness of the human health-based cleanup levels for Site 39. It is expected that this evaluation will be completed by December 31, 2013 and, at that time, a protectiveness determination for human health will be made."

7.3.3.2 Status of the 2012 Five-Year Review Issues and Recommendations

The 3rd Five-Year Review Report recommended an evaluation be conducted of the protectiveness of 17 lead-impacted sites at Fort Ord, including areas contained within Site 39. This evaluation was needed as a result of a change (since the 2007 Five-Year Review Report was issued) in the OEHHA guidance value for blood-lead levels (Cal/EPA, 2007) and also as a result of changes in the DTSC methodology for calculating heath risk (DTSC, 2011).

In response to these changes, the Army has reevaluated the protectiveness of 17 lead-impacted sites including Site 39. The lead reevaluation is documented in the Lead Tech Memo (KEMRON, 2017). Additional information is provided in Section 7.3.4.2 Data Review.

7.3.4 Site 39 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities have been performed for Fort Ord, using a basewide approach and are detailed in Sections 4.1 and 4.2. Document review, data review, site inspection, and interviews, if applicable, have been conducted on a site-by-site basis, described in the following subsections.

7.3.4.1 Document Review

A list of relevant documents reviewed as part of this evaluation is presented in Appendix A. These documents were reviewed as part of the 4th Five-Year Review process to evaluate activities completed during this reporting period.

7.3.4.2 Data Review

To evaluate the lead-impacted sites, the in-place post-remediation confirmation soil sample results were compiled, and the lead concentrations were compared to the default screening level for each site. Additionally for some sites, the 95 percent UCL values of the post-remediation confirmation soil sample results are calculated and compared to the default screening level.

The lead cleanup value used for Site 39 was 1,860 mg/kg initially for human health. Cleanup in the development parcels were compared to the RSL of 400 mg/kg in the post-remediation human health risk

assessment (Shaw/MACTEC, 2008). The FS Addendum established a cleanup value of 225 mg/kg for ecological receptors in the habitat sites in the NRMA.

The recent OEHHA benchmark change in blood lead concentrations applies to a child resident receptor. Residential criteria are not applicable to the habitat areas of Site 39, because residential uses are not proposed. Therefore, 225 mg/kg remains an appropriate lead cleanup level for the Site 39 habitat areas which encompass a majority of the Site 39 acreage. All of the development HAs were found to have a remaining lead concentration of less than 80 mg/kg, except for HA-18D and HA-23D. These two ranges were further evaluated based on comments received on the Draft Lead Tech Memo. Excavation activities at HA-18D were initiated in 1999 to remove soil containing accumulated spent ammunition and residual lead from within areas identified for remediation. Additional samples were collected at HA-23D to provide additional data for evaluation. The UCL for HA-18D was calculated at 99.4 mg/kg and a development-wide 95 percent UCL for HA-23D was calculated at 174.7 mg/kg. These concentrations are below the 400 mg/kg cleanup level established for the site, indicating that the remedy is protective of human health (KEMRON, 2017).

7.3.4.3 Site Inspection and Interviews

A site inspection was performed on July 13, 2016, by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to assess the overall condition of the remedy as it relates to effectiveness. Mr. Larry Friend (On-site Senior Manager, Gilbane) was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. Detailed inspection forms and site photographs are included in Appendix B.

7.3.5 Technical Assessment

7.3.5.1 Question A

Is the remedy functioning as intended by the decision document?

Yes. The remedy is functioning as intended. (The Basewide RI Sites ROD provides for the protection of human receptors, and the ROD Amendment provides for the protection of ecological receptors).

7.3.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes. Exposure assumptions, toxicity data, and cleanup levels have changed since the Basewide RI Sites ROD. However, the RAOs which were intended to protect human health (Basewide RI Sites ROD) and ecological receptors (ROD Amendment) remain protective. The cleanup goals stipulated in the ROD Amendment are lower than those in the Basewide RI Sites ROD making it more protective to human health.

One soil RAO was to remediate TPH in soil to a concentration of 500 mg/kg or less for protection of groundwater. A second RAO addressed lead, RDX, and beryllium, and specified removal of soil containing these chemicals above health-based levels of concern and risk-based target cleanup levels of 1,860 mg/kg for lead, 0.5 mg/kg for RDX, and 2.8 mg/kg for beryllium in surface soil. A third RAO was to remove spent ammunition, because it is a source of lead in soil. No groundwater remedial unit was defined for Site 39. For more information see Section 7.3.2 Remedial Actions.

The most prevalent contamination of interest at Site 39 is residual lead in soil. The updated remedial alternative implemented at the Site 39 Inland Ranges was "Remediation to a Range-Wide Weighted Average for Lead and Explosive Compounds, with Special Considerations for Ecological Receptors" (ROD

Amendment). The rationale for this approach was to minimize the removal of very high quality habitat and to aid in post-remediation habitat restoration efforts by leaving "islands" of very high quality habitat within the remediation areas to establish a vegetative base for re-growth, with special considerations for ecological receptors.

The post-remediation samples at the development parcels are less than the current EPA RSL for lead of 400 mg/kg.

7.3.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No. The remedy is protective of human health (Basewide RI Sites ROD) and the environment. The revised soil cleanup levels developed and applied to protect ecological receptors are protective of the environment (ROD Amendment).

The lead cleanup level established to protect ecological receptors also is protective of human health, because it is lower than the human health-based level identified in the Basewide RI Sites ROD for use of the area as a habitat reserve (based on risks to a habitat management worker and site visitor). The 225 mg/kg level also is lower than the current RSL of 400 mg/kg. The recent OEHHA benchmark change in blood lead concentration applies to a child resident receptor. Residential criteria are not applicable to the habitat areas, because residential uses are not proposed. Therefore, 225 mg/kg remains an appropriate lead cleanup level for the habitat areas which encompass a majority of the Site.

All of the development HAs were found to have a remaining lead concentration of less than 80 mg/kg, except for HA-18D and HA-23D. These two ranges were further evaluated based on comments received on the draft version of the Lead Tech Memo. Excavation activities at HA-18D were initiated in 1999 to remove soil containing spent ammunition and residual lead from within areas identified for remediation. Incremental sampling was conducted at HA-23D to collect additional data for evaluation. The UCL for HA-18D was calculated at 99.4 mg/kg and a development-wide 95 percent UCL for HA-23D was calculated at 174.7 mg/kg. These values are below the lead RSL of 400 mg/kg and are protective of human health.

The Basewide RI Sites ROD is also serving to protect human adult receptors. Based on the Lead Tech Memo, the development parcels are still protective.

7.3.6 Issues

There are no issues affecting the protectiveness of the remedy at Site 39. While the additional evaluation shows that all of the development HAs remain protective of human health, DTSC and EPA still have concerns with the lead concentrations exceeding the DTSC soil screening level of 80 mg/kg at HA-18D and HA-23D. However, DTSC's screening level for lead of 80 mg/kg is for screening purposes only and is not a promulgated cleanup standard or an ARAR. All development parcels have lead concentrations below the established site-specific cleanup goal of 400 mg/kg, and the Army has performed due diligence in determining that this goal is still protective of human health. While the Army has ongoing discussions with the agencies as to how the 80 mg/kg screening level may apply at former Fort Ord, there are no issues affecting the protectiveness of the remedy at Site 39.

7.3.7 Recommendations and Follow-Up Actions

The remedy is functioning as intended, and no follow-up actions are recommended.

7.3.8 Protectiveness Statement

Protective. The overall remedy at Site 39 is protective of human health and the environment. The long-term protectiveness at sites HA-18D and HA-23D for potential future residential development is being further evaluated as indicated below.

The Army will continue evaluating data in a timely manner following MEC removal to determine whether characterization sampling is required. If there is evidence of explosives or metals in soils, the June 2016 *Final Quality Assurance Project Plan, Volume 1, Appendix B, Soil Sampling, Basewide Range Assessment, Former Fort Ord, California* (KEMRON, 2016) will be implemented with Agency input and concurrence, and remedial actions subsequently will be planned and implemented, as needed.

The Site 39 remedial actions performed for the development ranges are protective of current and future site users, for all HAs except HA-18D and HA-23D. At this time, sites HA-18D and HA-23-D are only protective as long as there is no residential development on these parcels. Further information will be obtained upon the conclusion of discussions between the regulatory agencies and the Army about the effect of the changes in the OEHHA benchmark change in blood lead concentration and the DTSC methodology for calculating risk-based soil preliminary remediation goals on the protectiveness of the human health-based cleanup levels. It is expected that these discussions will be completed by December 31, 2017 and, at that time, a determination of what further actions, if any, will need to take place to ensure long term protectiveness for potential future residential use scenarios.

7.4 Site 33

7.4.1 Site 33 Background

The selected remedies for the basewide RI sites, including Site 33, are described in the January 1997 *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California* (Army, 1997). Site 33 includes the golf course maintenance area, which consists of a pesticide mixing area, an unpaved surface drainage area, and a former pesticide storage area. The golf course was established in the early 1950s, and pesticides and herbicides have been used regularly since operations began. Pesticides, herbicides, and metals were detected in soil at concentrations below the PRGs set for reuse of this site.

The Human Health Risk Assessment for soil at Site 33 evaluated risk to a golf course maintenance worker from exposure to contaminants of potential concern (COPCs) detected at the site. Based on the assessment, adverse human health effects are not expected for the proposed reuse. A quantitative ERA also was performed (HLA, 1995). Ecological impacts were evaluated by collecting plants and animals and measuring chemical concentrations of COPCs in their tissues. Results of the ecological evaluation indicated that tissue concentrations in prey were not likely to produce adverse effects in animal populations, nor would tissue concentrations in plants within the surrounding habitat be adversely effected.

The Site 33 property was transferred to the City of Seaside in September 2004 under FOST 6 (Parcel F2.7.2; see Table 1). A deed restriction was implemented at the time of the land transfer to restrict the land use to non-residential.

7.4.2 Remedial Actions

The RAO for Site 33 is to maintain a deed restriction allowing only uses other than residential (Army, 1997).

7.4.2.1 Remedy Selection

A deed restriction on the property prohibiting residential use is the selected remedy for Site 33.

7.4.2.2 Remedy Implementation

The remedial action for the site was to maintain restrictions in the deed to ensure nonresidential uses.

7.4.2.3 System Operations and Maintenance

There are no system operations and maintenance requirements. Periodic reviews of the deed are necessary to ensure the restrictions remain consistent with ROD. The Deed was evaluated as part of this review and the restrictions remain unchanged. The site should remain subject to five-year reviews until such time as the site conditions change and the new conditions are demonstrated to be protective of human health and the environment.

7.4.3 Progress Since the last Five-Year Review

The LUCs (prohibition against residential use) for Site 33 are still in place. There has been no change in the non-residential use status of the site during the last five years. The site remains a golf course maintenance area.

7.4.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012) stated that:

> "The Site 33 remedy is protective of human health and the environment and, in the interim, potential exposure pathways that could result in unacceptable risks are being controlled."

7.4.3.2 Status of 2012 Five-Year Review Issues and Recommendations

There were no unresolved issues for Site 33 in the 2012 Five-Year Review (Army 2012). Recommendations for the site were to maintain deed restrictions preventing residential use of the property.

7.4.4 Site 33 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities have been performed for Fort Ord, using a basewide approach and are detailed in Sections 4.1 and 4.2. Document review, data review, site inspection, and interviews, if applicable, have been conducted on a site-by-site basis, described in the following subsections.

7.4.4.1 Document Review

A list of relevant documents reviewed as part of this evaluation is included in the Site 33 section of the reference list (see Appendix A, Site 33).

7.4.4.2 Data Review

No new sampling data have been generated during the previous Five-Year Review reporting period.

Appendix A of the September 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume I-VI - Site 33* (HLA, 1995) stated that no ARARs were presented for Site 33 because it is a no action site; therefore, no review of the ARARs was needed for this Five-Year Review.

7.4.4.3 Site Inspection and Interviews

A site inspection was performed on July 14, 2016, by Mr. Paul Fluck and Mr. Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to verify the current use of the site. The MMRP Manager for Fort Ord, Mr. David Eisen, was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. For more information on the interview and site inspection, see Appendix B, Field Documentation of Site Inspections and Interviews.

Field observations verified that the site continues to be used as a golf course maintenance area. There is a fence around the area; access is limited to the gate, which was open on the date of inspection. No signs to prohibit/control entry were observed. The Bayonet/Blackhorse Golf Course groundskeepers are currently using the site as an equipment washout work area. It was visually confirmed on the date of inspection that only industrial and maintenance uses were occurring, and it was verified that there were no residential uses at the site.

7.4.5 Technical Assessment

7.4.5.1 Question A

Is the remedy functioning as intended by the decision document?

The remedy is functioning as intended by maintaining deed restrictions to protect human health and the environment.

7.4.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Although the exposure assumptions and RAO remain valid, the toxicity data and cleanup levels are no longer valid. Maximum soil concentrations of site related metals, herbicides, and pesticides in the September 1996 *Draft Final Site Characterization Site 33 – Golf Course*, Plates 4, 5, and 6 (HLA, 1996) were compared to EPA May 2016, Industrial Soil RSL. All metals (except for lead), all herbicides, and all pesticides did not exceed an HQ of 1, or were within the acceptable cancer risk range of $1x10^{-4}$ to $1x10^{-6}$. The maximum soil lead concentration of 85.5 mg/kg was less than the EPA residential screening level of 400 mg/kg (and less than 800 mg/kg for commercial/industrial use, which is applicable Site 33's continued use as a golf course) (KEMRON, 2017).

The RAO for Site 33 is to maintain a deed restriction allowing only uses other than residential. For more information see Section 7.4.2 Remedial Actions.

7.4.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that could call the protectiveness of the remedy into question.

7.4.6 Issues

There are no issues affecting the protectiveness of the remedy at Site 33.

7.4.7 Recommendations and Follow-Up Actions

There are no recommendations or follow-up actions identified for this site.

7.4.8 Protectiveness Statement

Protective. The remedy at Site 33 is protective of human health and the environment.

The remedy is protective and is consistent with the designated uses for the property. Potential exposure pathways that could result in unacceptable risks are being controlled by the LUCs.

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8.0 SITE 3 ROD

This section presents background information on Site 3. This site has completed remediation, met RAOs and fulfilled the necessary documentation process. This section also provides a summary of remedial actions and a technical assessment of the actions taken, identifies any issues related to the protectiveness of the remedy, and presents recommendations and follow-up actions, if any, to address issues identified during the review. This section also provides a statement regarding the protectiveness of the remedy.

8.1 Site 3 Background

Site 3, the Beach Trainfire Ranges, extends approximately 3.2 miles along the coastline of Monterey Bay at the western boundary of Fort Ord (Plate 2) and was used for small-arms training beginning in the 1940s. In general, trainees fired small-arms weapons from firing lines in the eastern portion of the site toward targets spaced at various intervals to the west. Spent ammunition[24] accumulated on the east-facing (leeward) sides of the sand dunes that formed the "backstops" for the targets. Site 3 includes four contiguous parcels totaling 979.46 acres transferred in September 2006 to the Department of Interior and conveyed to the State of California, Department of Parks and Recreation (DPR) for use as a public park and public recreation area. These lands currently include open space, hiking trails, and ancillary facilities; campgrounds are planned for the future. The excavation of contaminated soil (Army, 1997) on this site is complete. The post-remediation ERA and HHRA were also completed (HLA, 1998, and IT, 2000, respectively). Additionally, the Army has completed a proposed plan, public participation process, and ROD (Army, 2005) addressing ecological risks at this site, as described in Sections 8.2.2 and 8.3.2. Site 3 is also known as MRS-22 (discussed in Section 12.0 of this report, which addresses MEC-related issues).

8.2 Remedial Actions

The RAOs for the protection of human health at Site 3 are to reduce potential adverse health effects associated with non-carcinogenic, site-related chemicals by remediation to health-based levels of concern (Army, 1997).

8.2.1 Remedy Selection

A human health-based level of concern of 1,860 mg/kg was developed for lead in soil for Site 3. Concentrations of lead above 1,860 mg/kg occurred mainly in areas where greater than 10 percent of the surface was covered by spent ammunition. Although some areas with moderate bullet distribution contain lead above the human health-based level of concern, the ERA recommended remediation only in areas of heavy bullet distribution to minimize impacts to the sensitive ecological habitat. Therefore, the SRU for Site 3 is defined by those areas of heavy bullet distribution (greater than 10 percent surface coverage by bullets).

The following alternative remedies were evaluated, as summarized in the Interim ROD (Army, 1997):

- Alternative 1: No Further Action
- Alternative 2: Excavation, screening and soil treatment
- Alternative 3: Excavation, screening and on-site disposal

[24] For the purpose of the Site 3 investigation and remedial actions, spent ammunition refers to individual cartridge casings from an artillery piece or firearm in which the propellant (powder) has been ignited and vaporized (fired), and all that remains is the casing that contained the powder.

Alternative 3 was the selected remedy and consisted of mechanical and hand excavation of soil in areas with greater than 10 percent coverage of spent ammunition, followed by mechanical separation using screens and gravity-feed separation techniques.

8.2.2 Remedy Implementation

The Army has completed the remedial action at Site 3 in accordance with CERCLA and the Site 3 Interim ROD (Army, 1997). The remedial action included excavation of soil contaminated with lead and associated spent ammunition. Approximately 162,800 cy of impacted soil were removed from Site 3, of which approximately 129,200 cy were transported to the screening plant for separation of spent ammunition from soil. The remaining 33,600 cy, composed of approximately 26,700 cy of vegetation and 6,900 cy of soil from over-excavated areas (containing little spent ammunition), were not screened and were used as general fill at the OU 2 Landfill, Cell E. Of the screened material, approximately 42,000 cy were used for the foundation layer at Cell E; 49,200 cy were used for the foundation layer at Cell F; and 38,000 cy were used as general fill at Cell E. Approximately 719,000 pounds of spent ammunition recovered from the screening operations were recycled and reclaimed at an off-site facility.

After excavation, confirmation soil samples were collected, and the dunes were re-contoured to provide a more natural appearance. All final confirmation samples had reported lead concentrations of less than 1,860 mg/kg and, therefore, met the human health-based cleanup level of 1,860 mg/kg for lead, as defined in the ROD. The post-remediation HHRA stated that unacceptable human health risks and hazards are considered unlikely to be associated with future recreational, commercial, or residential development of Site 3 under the exposure conditions evaluated (IT, 2000). The post-remediation ERA concluded that significant risks to herbivorous birds and carnivorous/omnivorous mammals from exposure to residual chemicals remaining in the soil at Site 3 are not expected (HLA, 1998). Potentially significant risks were identified for two "hot spot" areas where chemical concentrations in soil were elevated. However, significant risks to populations of small mammals and plants from exposure to residual chemicals in soil are not expected. The soil remediation resulted in the site being available for unrestricted reuse.

The Site 3 Interim ROD (Army, 1997) was subsequently finalized as part of the March 2005 *Record of Decision, No Further Action Related to Munitions and Explosives of Concern-Track 1 Sites*; *No Further Remedial Action with Monitoring for Ecological Risks from Chemical Contamination at Site 3 (MRS-22)* (Army, 2005). The Interim ROD deferred evaluation of ecological risks, which are addressed in this ROD. The 2005 ROD stipulates that Site 3 is protective of ecological receptors and that no further action is necessary and ecological monitoring will be conducted to confirm the results of the ecological risk assessments/evaluations conducted in the 1990's (HLA, 1995, 1998; IT, 2000). The ROD also requires this data be evaluated during five-year reviews to assess the need for continued ecological monitoring and to ensure the decision remains protective to the environment. Ecological data was collected annually during the period of this Five-Year Review. Additional information is provided in Section 8.4.2 Data Review.

The area of former Site 3 is now a state park called Ford Ord Dunes State Park. The Army has agreed that, provided the California State Parks and Recreation staff collect spent bullets and notify the Army, the Army would either recycle the material or properly dispose of it through the Army's hazardous waste disposal process.

8.2.3 System Operations and Maintenance

There are presently no O&M requirements identified for Site 3.

8.3 Progress Since the last Five-Year Review

8.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012) stated that:

> "The Site 3 remedy is protective of the environment. However, a protectiveness determination for human health should be deferred until further information is obtained. Further information will be obtained by evaluating the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness of the human health-based cleanup levels for Site 3. It is expected that this evaluation will be completed by December 31, 2013 and, at that time, a protectiveness determination for human health will be made."
>
> "Additional monitoring is being conducted to confirm that the remedy continues to be protective of ecological receptors, and will be evaluated in the next Five-Year Review."

8.3.2 Status of 2012 Five-Year Review Issues and Recommendations

Reevaluation of Lead

The 2012 Five-Year Review Report noted the remedy is functioning as intended, however; changes to the OEHHA health guidance value for lead in blood and the methodology used to calculate the human health-based cleanup levels may affect protectiveness of human health. The 2012 Five-Year Review Report recommended that the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness be reevaluated (Army, 2012).

Issues from Previous Review	***Recommendations/ Follow-up Actions***	***Responsible Party***	***Milestone Date***	***Action Taken and Outcome***	***Date of Action***
Changes in OEHHA health guidance and DTSC methodology for calculating heath risk.	Reevaluate protectiveness using the updated OEHHA health guidance and DTSC methodology for calculating heath risk.	Army	December 31, 2013	The Army reevaluated the protectiveness of the remedy and found that the site is protective of human health as long as the land use controls and site access restrictions remain in effect. Additional information is provided in Section 8.4.2.	November 2013[1] August 2016[2] February 2017[3]

Notes:
1) *Draft Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (ITSI Gilbane, 2013)
2) *Draft Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (KEMRON, 2016)
3) *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California.* (KEMRON, 2017)

Ecological Monitoring

Since the last Five-Year Review Report (Army, 2012) was issued, annual monitoring specified under the June 2008 *Final Habitat Restoration And Monitoring Plan Non-Remediated Areas, Fort Ord Dunes State Park (Formerly Site 3)* has occurred (Shaw, 2008). The data collected was used to evaluate the need for continued

future monitoring, and to be reported upon during five-year reviews. The results of ecological monitoring suggest other factors than residual lead may have been responsible for buckwheat die-offs in the previous monitoring periods. The monitoring results are discussed in Section 8.4.2.

8.4 Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities performed for Fort Ord, using a basewide approach, are detailed in Sections 4.1 and 4.2. Relevant documents and data have been reviewed on a site-by-site basis and are described in the following subsections.

8.4.1 Document Review

The following documents, some of which were released since issuance of the last Five-Year Review Report, were examined for the current Five-Year Review:

- October 1995, *Basewide Remedial Investigation/Feasibility Study, Former Fort Ord, California, Volume II - Remedial Investigation, Site 3* (HLA, 1995).
- January 1997, *Interim Record of Decision, Site 3 Beach Trainfire Ranges, Fort Ord, California* (Army, 1997).
- August 2000, *Final Remedial Action Confirmation Report and Post-Remediation Risk Assessment, Site 3 Remedial Action, Basewide Remedial Investigation Sites, Fort Ord, California*. (IT, 2000).
- January 2011, *2010 Draft Final Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park*. (California State Parks, 2011).
- April 2012, *2011 Final Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park*. (California State Parks, 2012).
- November 2012, *2012 Draft Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park.* (California State Parks, 2012a).
- June 2014, *2013 Final Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park.* (California State Parks, 2014).
- April 2016, *2015 Annual Biological Monitoring Report, Fort Ord Dunes State Park, Former Fort Ord, California*. (Chenega Support Services [Chenega], 2016a).
- September 2016, *Final 2016 Annual Biological Monitoring Report, Fort Ord Dunes State Park, Former Fort Ord, California*. (Chenega, 2016b).
- February 2017, *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*. (KEMRON, 2017).

8.4.2 Data Review

Reevaluation of Lead

In response to changes to the OEHHA health guidance value for lead in blood and the new methodology used to calculate the human health-based cleanup levels (Cal/EPA, 2007 and 2009; DTSC, 2011), the Army has reevaluated the lead data. The human health-based lead cleanup value of 1,860 mg/kg used for Site 3 was negotiated by the Army as a value less than the LeadSpread modeled cleanup value. Two exposure assumptions were evaluated – the average exposure scenario was based on inhalation of dust by a recreational receptor and the reasonable maximum exposure scenario was developed for inhalation, ingestion, and dermal

contact by recreational receptors assuming overnight camping; however, the cleanup was constrained to preserve high quality habitat with the expectation of limited human access to the property (KEMRON, 2017).

Based on the lead concentrations for the left-in-place samples remaining at the Site, the soil does not meet the industrial use criterion for lead (320 mg/kg). Ranges 5 and 7 have concentrations of lead ranging from 519 to 24,000 mg/kg. Some lead, in the form of bullet slugs, may remain on portions of the Site at levels inconsistent with residential and other sensitive uses (KEMRON, 2017).

The land use assumed in the ROD and currently in place is for limited access State Park use. Environmental access restrictions on land use at the Site are documented in the November 2007 *Memorandum of Understanding and Land Use Covenant between DTSC and the California Department of Parks and Recreation* (MOU; DTSC, 2007).

Accumulations of lead bullets may continue to become visible in the future as a result of wind and erosion. To address this lead contamination, the covenant restricts groundwater use and prohibits residential, day care, hospital, school, and campground uses of the Restricted Property. The MOU further stipulates annual reporting requirements, handling requirements for lead bullets uncovered in the future, soil management (i.e., restrictions on removal of soil from the site), and training requirements for possible, but not expected, encounters of incidental munitions or explosives of concern. In accordance with the general plan for the park, DPR intends to adopt measures to assure public and employee safety by restricting public access within dune habitat areas to designated trails and public use areas. These measures will protect biological resources, preserve and maintain habitat and special status species, and concurrently limit user access to the bullet-impacted areas where lead concentrations in soil may be elevated (KEMRON, 2017).

The land use restrictions apply to approximately 858 acres of the total 980 acres of the Beach Ranges at the former Fort Ord (referred to as the "Restricted Property"). The remaining approximately 122 acres of the Site consist of two unrestricted use areas that are not subject to the LUCs. These areas have no record or evidence of being used as firing ranges (KEMRON, 2017).

The LUCs and the access restrictions in effect at Site 3 are protective of human health and there is no evidence of any impacts to human health or the environment in the "Unrestricted Property" areas of Site 3 (KEMRON, 2017).

Ecological Monitoring

Post-remediation sampling at Site 3 (Arcadis, 2007) was conducted in January 2007 to gather data to evaluate post-remediation conditions and potential impacts to ecological receptors from exposure to residual concentrations of antimony, copper, and lead in the soil. The sampling was intended to fulfill the 2005 ROD (Army, 2005) requirement for ecological monitoring to confirm the results of the previous evaluations. The sampling was conducted in accordance with the November 2006 *Draft Final Post-Remediation Ecological Habitat Sampling and Analysis Plan* (Shaw/MACTEC, 2006).

In June 2008, the Army issued the *Final Habitat Restoration and Monitoring Plan, Non-Remediated Areas, Fort Ord Dunes State Park (Formerly Site 3), Former Fort Ord, California* (Shaw, 2008). The plan outlines the strategy and methods to be used by the DPR during restoration and monitoring of approximately two acres of non-remediated areas at Site 3. Restoration and monitoring were conducted in two one-acre areas to further evaluate potential impacts to ecological receptors from exposure to residual metals within non-remediated areas. The approach specified in this plan is based on the restoration methods described in the May 2000 *Habitat Restoration and Monitoring Plan for Lead Remediation Area on the Future Fort Ord Dunes State Park* (California State Parks, 2000). The plan specifies annual ecological monitoring and reporting.

Ecological monitoring has focused on the percentage of the ground that is covered with native plants, along with measurement of a variety of plant health parameters, such as plant height and the number of stems,

leaves, and flowers. Beginning in 2010, annual monitoring was conducted at these sites to measure plant health and habitat characteristics (California State Parks, 2011, 2012, 2012a, and 2014). After 5 years of monitoring, all of the success criteria stipulated in the June 2008 *Final Habitat Restoration and Monitoring Plan, Non-Remediated Areas, Fort Ord Dunes State Park (Formerly Site 3), Former Fort Ord, California* (Shaw, 2008) have been met, except for buckwheat survivorship and the difference in the number of leaves and peduncle lengths between the restoration and the reference sites. These differences may likely have been due to the ongoing drought and high level of herbivory (California State Parks, 2014). California Department of Fish and Wildlife (CDFW) expressed concern about the unexplained die off of the Seacliff buckwheat, and the Army decided to conduct additional monitoring of buckwheat plants to determine if there are differences between buckwheat survivorship in non-remediated and reference areas that could be attributed to remaining metal in the soil (Chenega, 2016a).

Seacliff buckwheat survivorship monitoring at the restoration sites was conducted during the annual surveys (California State Parks, 2011, 2012, 2012a, and 2014). In 2009, one year after initial planting, the buckwheat survivorship in Site A was 90 percent and 85 percent at Site B (California State Parks, 2011). In 2012, a downward trend in the percentage of the ground that is covered with buckwheat plants was observed at Site B. In 2013, one year after additional planting of 198 buckwheat plants at Site B, the buckwheat survivorship was only 3 percent.

The survivorship monitoring methodology utilized in the Army's additional buckwheat monitoring (Chenega, 2016b) differed from the previous surveys in that it was specifically designed to compare survivorship of buckwheat plants between the non-remediated restoration areas and the remediated reference areas. Previous buckwheat survivorship monitoring was conducted only at the non-remediated restoration sites, and it was impossible to determine if the low survivorship at Site B differed from the adjacent remediated areas. Thus, the cause of the buckwheat die-off and low survivorship could not be determined. A power analysis was conducted in order to determine how many Seacliff buckwheat plants would need to be monitored in order to be able to detect a difference in survivorship that could be attributed to geographical location. It was estimated that around 100 plants should be monitored for survivorship.

Out of 50 marked buckwheat plants in the remediated area, 46 were alive a year later. In the non-remediated areas, out of a total of 49 plants, 48 were alive at the time of survey. The difference in survivorship between these two populations is not statistically significant ($p = 0.202$) (Chenega, 2016b). The results of buckwheat survivorship analysis showed relative high buckwheat survivorship in remediated and non-remediated areas during the last year (92 percent and 98 percent, respectively), and did not indicate a statistically significant difference between the survivorship rates in both populations. If residual lead in the non-remediated contributed to buckwheat mortality, it would have been expected that the survivorship rate would be higher in the remediated area. The fact that the opposite situation was observed (four dead plants in remediated area as compared to one in non-remediated area) suggests that other factors may have been responsible for the buckwheat die-off observed at Site B during 2012 and 2013 buckwheat survivorship monitoring (California State Parks, 2012a and 2014).

It is impossible to determine the causes of buckwheat die-off at the restoration sites in previous years as possible environmental predictive variables were not measured. While areas with localized higher lead concentrations may be present in the non-remediated areas, there is no evidence that low buckwheat survivorship at Site B in the previous years was caused by higher residual lead concentrations in the soil (Chenega, 2016b).

Results from the monitoring showed high survivorship of seacliff buckwheat at both remediated and non-remediated sites during the 2015/2016 monitoring season. The differences in survivorship between the two populations were not statistically significant, but survivorship was 6 percent higher in the non-remediated area. The results suggest other factors than residual lead may have been responsible for buckwheat die-offs in the

previous monitoring periods. Based on this information, no additional monitoring is recommended (Chenega, 2016b). Federal and state agencies have concurred with this recommendation

8.4.3 Site Inspections and Interviews

A visual site inspection was performed on July 14, 2016, to verify the general condition of vegetation at the site and to ensure the site use and land-use controls were in place and working properly. The site is a limited access state park. There was no evidence of vandalism, and the site vegetation appeared to be in good condition. It was noted that gates restrict vehicle access at the site and barrier wire indicates where public entry is allowed. Trails are marked. Markers are in place indicating areas closed to the public, protecting revegetation from damage. The on-site Biologist for the Army was interviewed: Mr. Bart Kowalski (Chenega Global Services). Additional information about the site inspection and interview is provided in Appendix B, Field Documentation of Site Inspections and Interviews.

8.5 Technical Assessment

8.5.1 Question A

Is the remedy functioning as intended by the decision document?

Yes, as documented in the November 2007 *Fort Ord Dunes State Park Memorandum of Understanding and Land Use Covenant* (DTSC, 2007), the remedy is functioning as intended. Land use is defined as a limited access State Park, which restricts groundwater use and prohibits residential, day care, hospital, school, and campground uses of the restricted State Park property. The land use restrictions apply to approximately 858 acres of the total 980 acres of the Beach Ranges. Public and employee safety will be implemented by restricting public access within dune habitat areas to designated trails and public use areas. The remaining approximately 122 acres of the State Park consist of two unrestricted use areas that are not subject to the LUCs. These areas had no record or evidence of use as firing ranges and are planned for use as a campground and other park visitor activities.

Yes, the September 2016 *Final 2016 Annual Biological Monitoring Report, Fort Ord Dune State Park, Former Fort Ord, California* (Chenega, 2016b) documents the high survivorship at both remediated and non-remediated sites during the 2015/2016 monitoring season, and that no further monitoring is recommended. Federal and state agencies have concurred with this recommendation.

8.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, since the land use restrictions remedy was instituted in 2007, to specifically address the residual contamination and protect State Park visitors, all relevant exposure assumptions, toxicity data, cleanup levels and RAOs are still valid.

The RAOs for Site 3 are the protection of human health, specifically to reduce potential adverse health effects associated with non-carcinogenic, site-related chemicals by remediation to health-based levels of concern. For more information see Section 8.2 Remedial Actions.

8.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No. The LUCs defined in 2007 will establish and assure the continued protection of visitors and staff at the Fort Ord Dunes State Park. Extensive ecological monitoring has indicated there are no adverse ecological impacts at the site.

8.6 Issues

There are no issues affecting the protectiveness of the remedy at Site 3.

8.7 Recommendations and Follow-Up Actions

None: the established limited access State Park remedy will continue to function as intended. Based on the results of this Five-Year Review, this site will be included in future Five-Year Reviews until such time as all land-use controls have been removed.

8.8 Protectiveness Statement

Protective. The remedy at Site 3 is protective of human health and the environment.

Ecological monitoring indicates no adverse ecological impacts at the site. The LUCs and access restrictions in effect for the State Park continue to provide human health protection.

9.0 INTERIM ACTION SITES ROD

This section presents background information on the IA Sites ROD; a group of sites that have completed remediation, met RAOs, and fulfilled the necessary documentation process. This section also provides a summary of remedial actions and a technical assessment of the actions taken, identifies any issues related to the protectiveness of the remedy, and presents recommendations and follow-up actions, if any, to address issues identified during the review. This section also provides a statement regarding the protectiveness of the remedy.

9.1 Interim Action Sites Background

The IA sites are those sites with a limited volume and extent of contaminated soil and, as a result, the soils were excavated as interim actions. A ROD for the IA sites (*Interim Action Record of Decision* (IAROD), *Contaminated Surface Soil Remediation, Fort Ord, California*) was signed in March 1994 (Army, 1994). The IAROD was based on the IA feasibility study (HLA, 1993) and proposed plan (Army, 1993). The IAROD established the following criteria that a site must meet to qualify as an IA site and described the approval process for implementing IAs:

- Contaminated soil generally consists of sand and/or silty sand from fine to medium grain size
- Groundwater is relatively deep (typically more than 60 feet bgs)
- Contaminated soil is of limited extent, generally 500 to 5,500 cy
- Contaminated soil to be excavated is not more than 25 feet bgs
- Contamination is generally a result of routine operations
- Chemicals in the contaminated soil are likely to be petroleum hydrocarbons, solvents, oils, metals and pesticides

The cleanup goals and approach for these sites were consistent with those presented for the OUs and RI sites at Fort Ord. The Army plans to issue a ROD to finalize the IAROD which, as indicated in the IAROD, will address final cleanup levels and the necessity for any additional actions. As remedial actions are planned to continue through 2020, the Army has not developed a schedule for this ROD, but will prepare the document after all remedial work is completed.

For each proposed IA site, the process began with a site characterization investigation and report.

The regulatory agencies reviewed the reports and approved them after their comments were adequately addressed. If a site met the IAROD criteria, an IA approval memorandum was submitted for regulatory agency approval. The public was notified that an approval memorandum was submitted. Once the approval memorandum was approved, public notice of the proposed action was provided two weeks before work began. The IA was then implemented, and a confirmation report was prepared upon its completion. If the report was approved, the site was included in the IAROD process. If the confirmation report was not approved, it was resubmitted after additional action was taken to address agency concerns. If it was determined that the contamination was too extensive to be remediated under the IAROD criteria, then the site was advanced to the RI sites category. An RI/FS report would then be prepared for the site and it would be included in the Basewide RI Sites ROD.

No new IA sites have been identified during this Five-Year Review period. However, the Issues, Recommendations, and Follow-up Actions sections of the 3rd Five-Year Review Report identified changes to the OEHHA health guidance value for lead in blood and changes to the methodology used to calculate the

human health-based cleanup levels. The 3rd Five-Year Review Report recommended that these sites be reevaluated to determine if the changes effected the protectiveness of the remedy. This reevaluation has been conducted and is described in the following sections.

9.2 Remedial Actions

The Interim RAOs, as stated in the IAROD (Army 1994) include: (1) the reduction of risks to human health from long-term exposure to contaminated soil, and (2) the protection of groundwater at each IA area.

9.2.1 Remedy Selection

The following two remedial alternatives were evaluated for the IA Sites.

- Alternative 1: No Action
- Alternative 2: Excavation, soil treatment, recycling, and/or disposal

Selected Remedy

Alternative 2 was the selected remedy for the IA Sites. This remedy includes excavating, treating, recycling, and/or disposing of contaminated soil from IA areas, and backfilling the areas with clean soil. Locations of the sites are shown on Plate 2.

9.2.2 Remedy Implementation

Twenty-one IAROD sites have been completed and received regulatory agency approval and the confirmation reports received agency concurrence for NFA. The sites are organized by Five-Year Review reporting period along with the dates of final disposition for each site.

Completed IAROD Sites					
IA Site Name	**Date of Approval Memorandum**	**Date of Confirmation Report**	**USEPA Concurrence Date**	**DTSC Concurrence Date**	**RWQCB Concurrence Date**
Concurrence Prior to 9/2001 (1st Five-Year Review)					
Site 14-707th Maintenance Facility	March 1995	2-12-96	3-7-96	2-11-98 & 7-17-03	NA
Site 15 – Directorate of Engineering and Housing (DEH) Yard	March 1995	8-13-96	4-7-97	NA	9-25-96
Site 20 – South Parade Ground and 3800 and 519th Motor Pools	May 1995	7-1-96	7-28-97	3-12-98	NA
Site 22 – 4400/4500 Block Motor Pool West	March 1995	5-22-96	9-19-96	6-8-98	NA
Site 24 – Old DEH Yard	February 1996	1-23-97	4-14-97	3-12-98	NA
Site 36 – FAAF Sewage Treatment Plant	March 1997	6-20-97	7-22-97	7-23-98	NA
Site 40 – FAAF Helicopter Defueling Area	November 1997	1-2-97	1-31-97	7-23-98	5-10-01 re: Freon 113, Report 12-15-00)
OF-34 and OF-35	August 1996	6-20-97	7-23-97	7-23-98	NA

Completed IAROD Sites					
IA Site Name	**Date of Approval Memorandum**	**Date of Confirmation Report**	**USEPA Concurrence Date**	**DTSC Concurrence Date**	**RWQCB Concurrence Date**
Concurrence Between August 2002 and September 2007 (2nd Five-Year Review)					
Site 1 – The Ord Village Sewage Treatment Plant	May 1997	12-10-97	4-6-98	4-11-05	NA
Site 8 – Range 49, Molotov Cocktail Range	May 1994	8-26-96	4-14-97	10-20-06	10-3-96
Site 10 – Burn Pit	April 1995	8-30-96	5-4-95	6-27-07	10-3-96
Site 21 – 4400/4500 Block Motor Pool East	February 1995	7-10-96	4-14-97	10-20-06	NA
Site 30 – Driver Training Area	March 1995	2-20-96	4-14-97	10-23-02	NA
Site 32 – East Garrison Sewage Treatment Plant	April 1997	3-5-98	3-19-98	10-23-02	NA
Site 34 – FAAF Fueling Facility	February 1994	9-8-98	2-5-02	10-23-02	NA
Site 39A – East Garrison Ranges	April 2005	3-9-06	5-25-06	4-17-06	NA
Site 41 – Crescent Bluff Fire Drill Area	February 1996	2-4-97	4-14-97	3-10-06	NA
Outfall OF-15	March 1995	9-3-98	3-16-05	4-11-05	NA
Concurrence Between August 2007 and September 2012 (3rd Five-Year Review)					
Site 6 – Range 39, Abandoned Car Dump	February 1995	1-10-97	1-31-97	6-27-07	NA
Site 34B – Former Burn Pit, FAAF Defueling Area	February 1995	9-22-03	1-10-12	6-27-07	NA
Site 39B – Inter-Garrison Training Area, HA-161	March 2009	3-24-11	1-6-11	12-31-10	NA
Note: Refer to Appendix A, References for titles, authors, dates, and the administrative record numbers for the confirmation reports and regulatory concurrence letters.					

9.2.3 System Operations and Maintenance

There are no operations and maintenance requirements under the IAROD.

9.3 Progress Since the Last Five-Year Review

No new IA sites were identified during the period of this review.

9.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 Five-Year Review Report (Army, 2012) for the IA sites stated that:

> "The IA sites' remedy is protective of human health and the environment. However, a protectiveness determination for human health should be deferred for those IA sites with lead impacted soil until further information is obtained. Further information will be obtained by evaluating the effect of the changes in the OEHHA health guidance value for lead in blood and the DTSC methodology for calculating heath risk on the protectiveness of the human health-based cleanup levels for the IA sites

with lead contamination in soil. It is expected that this evaluation will be completed by December 31, 2013 and, at that time, a protectiveness determination for human health will be made."

9.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The recommended evaluation of protectiveness at lead sites began in 2013. The Army submitted the *Draft Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, California* in November 2013. Regulatory Agency and stakeholder comments have been addressed and the draft Lead Tech Memo has been revised to the February 2017 *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California* (KEMRON, 2017).

9.4 IA Sites Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities performed for Fort Ord, using a basewide approach, are detailed in Sections 4.1 and 4.2. Document and data review have been conducted on a site-by-site basis and are described in the following subsections.

9.4.1 Document Review

The principal document reviewed to assess the continued effectiveness of the remedy was the February 2017 *Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California* (KEMRON, 2017). Other documents reviewed are shown in the IAROD section of the reference list (Appendix A).

9.4.2 Data Review

No new sampling data have been generated since the previous Five-Year Review.

9.4.3 Site Inspection and Interviews

Site inspections and interviews were not necessary as the site remedies are complete, sites are available for unrestricted use, and the Army received agency concurrence on the completion reports. Furthermore, the evaluation of protectiveness using the 2009 OEHHA screening levels identified no unacceptable risk.

9.5 Technical Assessment

9.5.1 Question A

Is the remedy functioning as intended by the decision document?

Yes. The Army has completed the remedial actions at the IA sites in accordance with CERCLA and the IAROD, and met the objectives defined in the ROD. Therefore, the remedy is functioning as intended.

9.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Yes. The exposure assumptions used at the time of remedy selection are still valid. The toxicity data and cleanup levels have been updated. The current EPA residential soil lead cleanup concentration of 400 mg/kg was met and RAOs used at the time of remedy selection are health protective.

The Interim RAOs, as stated in the IAROD (Army, 1994), include: (1) the reduction of risks to human health from long-term exposure to contaminated soil, and (2) the protection of groundwater at each IA area. For more information see Section 9.2 Remedial Actions.

IAROD Sites
Maximum Lead Concentration Remaining in Site Soil

Site Name	Maximum Lead Concentration Remaining In Site Soil[1 and 2]
Site 8 – Range 49, Molotov Cocktail Range	39 mg/kg
Site 10 – Burn Pit	8.8 mg/kg
Site 20 – South Parade Ground and 3800 and 519th Motor Pools	2.5 mg/kg
Site 21 – 4400/4500 Block Motor Pool East	26.1 mg/kg
Site 22 – 4400/4500 Block Motor Pool West	14.4 mg/kg
Site 34 – FAAF Fueling Facility	3.30 mg/kg
Site 34B – Former Burn Pit, FAAF Defueling Area	76.3 mg/kg
Site 36 – FAAF Sewage Treatment Plant	48.8 mg/kg
Site 39A – East Garrison Ranges	223 mg/kg (95 percent UCL for Site 39A lead in soil is 79.3 mg/kg) [4]
Site 39B – Inter-Garrison Training Site	6.8 mg/kg
Site 39B – Inter-Garrison Training Area, HA-161	7.36 mg/kg[3]
Site 40 – FAAF Helicopter Defueling Area	27.1 mg/kg
Site 41 – Crescent Bluff Fire Drill Area	27.8 mg/kg
Outfall OF-15	59.6 mg/kg
OF-34 and OF-35	2.3 mg/kg

Notes:

1) Maximum concentration left in place after remediation based on confirmation sampling.
2) mg/kg - milligrams/kilogram
3) Previously reported maximum lead concentration of 149 mg/kg has been confirmed as a removed sample.
4) The ProUCL calculation is found in Attachment 2 of the *Final Technical Memorandum, Evaluation of Lead Concentrations at Former Fort Ord, Monterey County, California* (KEMRON, 2017).
5) Backup data including site, site sample locations, and associated data tables are found in Attachment 3 of the *Final Technical Memorandum, Evaluation of Lead Concentrations at Former Fort Ord, Monterey County, California* (KEMRON, 2017).

9.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No. The current EPA residential soil lead cleanup concentration of 400 mg/kg was met and remains health protective.

9.6 Issues

There are no issues affecting the protectiveness of the remedy at the IA Sites.

9.7 Recommendations and Follow-Up Actions

The IA sites' remedy is functioning as intended. The maximum lead concentrations shown in the above table are all below 400 mg/kg and, therefore, require no further evaluations and can be eliminated from future five-year reviews.

However, pursuant to the declaration section of the IAROD (Army 1994):

> "The statutory preference for remedies that employ treatment that reduce toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be fully addressed in the final basewide Record of Decision (ROD)."

9.8 Protectiveness Statement

Protective. The remedy for the IA sites is protective of human health and the environment.

Regulatory concurrence of the confirmation reports and the results of the reevaluation of lead at the fourteen lead-impacted sites clarifies that the remedy has performed as intended, RAOs have been achieved, and the remedy remains protective of human health and the environment.

10.0 OPERABLE UNIT CARBON TETRACHLORIDE PLUME (OUCTP) ROD

This section presents background information on the OUCTP; summarizes remedial actions; provides a technical assessment of the remedial activities performed at this site to date; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies.

10.1 OUCTP Background

Carbon tetrachloride (CT) was originally identified in groundwater in 1992 as part of the basewide groundwater monitoring activities. The results from the initial investigation of CT were presented in the November 1999 *Draft Final Carbon Tetrachloride Investigation Report* (HLA, 1999). Subsequent investigation activities and studies of OUCTP were conducted as part of the April 2006 *Final Operable Unit Carbon Tetrachloride Plume Groundwater Remedial Investigation/Feasibility Study, Former Fort Ord, California* (MACTEC, 2006).

Groundwater contamination issues at OUCTP concern the upper three groundwater aquifers that are described in the August 1995 *Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation Introduction and Basewide Hydrogeologic Characterization* (HLA, 1995). Concentrations of CT and other VOCs were discovered in these three aquifers during groundwater monitoring associated with OU 2. None of these three aquifers within the OUCTP are used as a direct source for drinking water; however, the Lower 180-Foot Aquifer outside of the OUCTP boundary is a significant source of potable water for the former Fort Ord and the City of Marina (Army, 2008).

The apparent former source of the CT was located in the vicinity of what is now Lexington Court, a residential area in the northern portion of the former Fort Ord (MACTEC, 2006). Site investigations indicated that CT was present in groundwater within the A-Aquifer, Upper 180-Foot Aquifer, and Lower 180-Foot Aquifer. Elevated concentrations of CT in soil vapor also were identified in the vicinity of the apparent source area, but have been remediated as part of a soil vapor extraction pilot study, as described in Sections 10.2.2 and 10.4.2.2 (Shaw, 2006). Subsequent to the soil vapor extraction pilot study, the concentrations and apparent mass of CT remaining in vadose zone soil appear insufficient to contribute further to significant A-Aquifer contamination (MACTEC, 2006). This is further supported by groundwater monitoring data which confirms that there has been no observed recurrence of the groundwater plume in the source area (Ahtna, 2016).

Based on the results of the investigations performed at the site, the Final ROD (Army, 2008) established the remedial criteria to be implemented for site restoration. Between 2006 and 2008, an enhanced in situ bioremediation (EISB) pilot study was completed in the A-Aquifer of the OUCTP to enhance the natural attenuation of the plume. The pilot study confirmed the effectiveness of this approach and full implementation of active EISB at five deployment areas within the A-Aquifer was completed between September 2009 and June 2012. For more information on the pilot study, see the August 2009 *Final Operable Unit Carbon Tetrachloride Plume Enhanced in situ Bioremediation Pilot Study Completion Report* (Shaw, 2009). The EISB remedial action has proven to be effective in reducing groundwater contamination in the previously treated areas of the A-Aquifer; however, CT concentrations continue to increase in the groundwater divide area and show continued migration to the north towards the Marina Municipal Airport. Therefore, an additional EISB remedial action has been implemented (Deployment Area 3A) in this area, as described in the July 2016 *Final Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan Addendum* (Ahtna, 2016e), see Plate 8. Long-term monitoring is continuing as part of the remedial action to evaluate changes in contaminant concentrations and groundwater geochemistry over time and compare site conditions to the model predictions to ensure remediation is progressing as designed.

Remedial actions for the Upper 180-Foot Aquifer included installation of one extraction well (EW-OU2-09-180) to extract groundwater from the downgradient edge of the plume in that aquifer to remove contaminant mass and to minimize further impact to the Lower 180-Foot Aquifer by capturing the contaminated groundwater before it reaches the area of vertical communication through the Intermediate 180-Foot Aquitard. Installation of the extraction well was completed on July 29, 2010 and evaluation of performance was documented in the September 2012 *Final Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Remedial Action Construction Completion Report* (Shaw, 2012a). Effluent from extraction well EW-OU2-09-180 is processed by the OU 2 groundwater treatment system and performance of extraction well EW-OU2-09-180 continues to be evaluated regularly in quarterly OU 2 GWTS reports.

Property overlying and surrounding OUCTP is within the "Prohibition Zone" of the "Special Groundwater Protection Zone." County Ordinance No. 04011 (Monterey County Code Title 15, Chapter 15.08.140) prohibits construction of water wells within the Prohibition Zone. See Plates 2 and 4 for the current (as of July 2016) Prohibition and Consultation Zones and Plate 3 for the Prohibition and Consultation Zones that were in effect in 2012.

10.2 Remedial Actions

The RAOs and the remedy for OUCTP are described in the ROD for this site (Army, 2008). The primary RAO for OUCTP groundwater impacted by VOCs is to comply with ARARs such as federal and state laws and regulations. There is no unacceptable human health risk that has been demonstrated since the exposure pathway for contaminated groundwater is not complete. Restricting access to contaminated groundwater and remediating the contaminated groundwater are both needed to assure that the pathway does not become complete. Groundwater at OUCTP is designated as drinking water, industrial water, and agricultural water source under the Basin Plan, but is not currently used for these purposes. Achievement of the RAOs will restore the uses of groundwater within and adjacent to OUCTP. Aquifer cleanup levels for CT and several other VOCs were developed based on (1) an assessment of ARARs including federal and state MCLs for groundwater; and (2) the results of the HHRA (MACTEC, 2006).

10.2.1 Remedy Selection

The following four alternatives were evaluated in the OUCTP Feasibility Study Report (MACTEC, 2006).

- Alternative 1: No Action with Monitoring.
- Alternative 2: In Situ Enhanced Biodegradation (A-Aquifer); Groundwater Extraction and Treatment within the OU 2 Groundwater Treatment and Extraction System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).
- Alternative 3: In Situ Permeable Reactive Barrier (A-Aquifer); Groundwater Extraction and Treatment within the OU 2 Groundwater Treatment and Extraction System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).
- Alternative 4: Groundwater Extraction and Treatment (A-Aquifer); Groundwater Extraction and Treatment within the OU 2 Groundwater Treatment and Extraction System (Upper 180-Foot Aquifer); Monitored Natural Attenuation with Wellhead Treatment Contingency (Lower 180-Foot Aquifer).

Alternative 2 was the selected remedy, and the ROD includes the following components in addition to those specified above:

- Monitoring of up to 30 additional wells for 30 years.
- All aquifers - Institutional controls, such as deed restrictions, local ordinances (Monterey County Ordinance No. 04011) and regulations (Monterey County Code Title 15, Chapter 15.08) to prevent

access to or use of the groundwater within the OUCTP area for any purpose until cleanup levels are met, and to maintain the integrity of any current or future remedial or monitoring system including monitoring, extraction, and injection wells.

The ROD also specifies the COCs for each of the affected aquifers, as follows:

- A-Aquifer: CT, TCE, PCE, 1,1- DCE, chloroform, 1,2-DCE, methylene chloride, and VC
- Upper 180 Foot-Aquifer: CT
- Lower 180 Foot-Aquifer: CT and 1,2-DCA.

10.2.2 Remedy Implementation

An EISB Pilot Study was conducted to evaluate methods of distributing substrate within the A-Aquifer and to evaluate the effectiveness of large-scale implementation of EISB at the site. The pilot study included the installation of 15 extraction wells and 7 injection wells to recirculate groundwater and distribute the substrate (sodium lactate) in the subsurface. The well layout was defined by a preliminary substrate distribution model. A tracer test was conducted following system construction to evaluate the flow conditions between the injection and extraction wells. The data from well installation and hydrogeologic testing were used to refine the substrate distribution model and develop system extraction and injection rates as well as substrate injection rates. Approximately 7,000 gallons of sodium lactate were injected into the subsurface and distributed using the groundwater recirculation system. Groundwater monitoring (from separate monitoring wells located within the pilot study area and from the extraction well effluents) was conducted to monitor substrate distribution, the development of reducing conditions due to bioactivity, and biodegradation of CT. The EISB Pilot Study was completed on July 24, 2008, and the results are presented in the August 2009 *Final Operable Unit Carbon Tetrachloride Plume, Enhanced in situ Bioremediation Pilot Study Completion Report* (Shaw, 2009). The remedial design for full-scale implementation, based on the results of the EISB Pilot Study and focused on creating a subsurface environment to enhance reductive dechlorination, was implemented between September 2009 and June 2012 at five deployment areas within the A-Aquifer.

The A-Aquifer remedial action focused the EISB treatment on two treatment areas within the OUCTP. These treatment areas included the upper plume (source area) and the middle plume (high concentration area). Three separate deployments within the source area (Treatment Area 1) treated residual contaminants introduced into the groundwater prior to the source removal. Two separate deployments within the middle-plume (Treatment Area 2) treated the area that historically exhibited the highest CT concentrations. The treatment areas are shown on Plate 8. A total of six deployments of EISB (Pilot Study, Deployment Areas 1A, 1B, 1C, 2A, and 2B) were conducted within the source and the middle plume areas (Ahtna, 2012).

Extraction well EW-OU2-09-180 was installed in 2010 (Ahtna, 2016f) to extract groundwater from the downgradient edge of the plume in the Upper 180-Foot Aquifer to remove contaminant mass and to minimize further impact to the Lower 180-Foot Aquifer by capturing the contaminated groundwater before it reaches the area of vertical communication through the Intermediate 180-Foot Aquitard. Piping connections to tie the new extraction well into the OU 2 treatment system was completed in September 2011, aquifer testing associated with system startup was completed, and the well became fully operational.

10.2.3 System Operations and Maintenance

Operation and maintenance cost have been incurred since completion of remedial actions in 2012. Cost for operation and maintenance during this Five-Year Review reporting period is presented in Table below.

OUCTP O&M Cost	
Year	**Cost**
2012	$478K
2013	$478K
2014	$595K
2015	$1,079K*
2016	$674K

* The Army 2008 *Record of Decision, Operable Unit Carbon Tetrachloride Plume, Former Fort Ord, California* estimates an operation and maintenance cost range of $560,000 to $786,000 (Army, 2008). Actual costs are in general agreement with the estimated range. The higher costs seen in 2015 are associated with the installation of eight additional monitoring wells, groundwater sampling and analysis, and evaluations to refine CT plume in the A-Aquifer (Ahtna, 2016).

Additional information on routine O&M activities is found in Appendix B Site Inspections and the following documents:

- Routine O&M activities related to the A-Aquifer remedy are described in the July 2016 *Final Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan Addendum, Former Fort Ord, California* (Ahtna, 2016e).
- Routine O&M activities related to the Upper 180-Foot Aquifer remedy are described in the August 2009 *Final Operations and Maintenance Manual, Volume I, Operable Unit 2 (OU 2) Groundwater Remedy, Former Fort Ord, California* (Ahtna, 2009).
- Routine O&M activities related to the Lower 180-Foot Aquifer remedy are described in the March 2016 *Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix A, Final Revision 4, Groundwater Remedies and Monitoring at Operable Unit 2, Sites 2 and 12, and Operable Unit Carbon Tetrachloride Plume* (Ahtna, 2016b).

Current O&M procedures appear consistent with approved O&M plans and are effective in maintaining both short- and long-term operations.

10.3 Progress Since the Last Five-Year Review

The A-Aquifer EISB deployments and Upper 180-Foot Aquifer extraction well EW-OU2-09-180 were completed and operational during the transitional timeframe of the 3rd and 4th Five-Year Review reporting periods. Comprehensive monitoring and evaluation of remedial action performance has been completed quarterly and/or annually since 2011. Groundwater samples are analyzed for OUCTP COCs, by a Department of Defense Environmental (DoD) Laboratory Accreditation Program (ELAP) certified laboratory, and analytical results are compared to their ACLs, as presented in the February 2008 *Record of Decision, Operable Unit Carbon Tetrachloride Groundwater Study, Former Fort Ord, California* (Army, 2008) to assess site cleanup progress. A description of remediation progress for each of the aquifers impacted by OUCTP follows.

A-Aquifer

Quarterly groundwater monitoring has continued since the completion of EISB implementation in Treatment Areas 1 and 2. Within each deployment area, conditions have generally demonstrated a return to baseline Dissolved Oxygen (DO) and oxidation-reduction potential (ORP) levels as untreated groundwater enters the area. Conditions in downgradient wells are more favorable (as indicated by lower DO and ORP values) for EISB. Groundwater analytical data indicated that EISB treatment has reduced CT concentrations in the OUCTP A-Aquifer source area to below the ACL in Deployment Areas 1A and 1B, and CT concentrations in Deployment Area 1C have been reduced to levels near the ACL (Ahtna, 2016). In Deployment Area 2A, CT concentrations in wells appear to be generally returning to baseline conditions as untreated water enters the

area, while CT concentrations in Deployment Area 2B wells have generally shown recent decreases, suggesting that EISB effects to groundwater in this area are still occurring (ITSI Gilbane, 2012). Review and analysis of groundwater analytical results for selected wells in the vicinity of the north and northeastern portions of the plume and evaluation of CT trends was completed and used to support the placement of eight new monitoring wells at OUCTP in 2015.

In June 2015, eight new OUCTP A-Aquifer groundwater monitoring wells were installed to delineate the CT plume in the southeastern portion of the estimated plume near the groundwater divide where groundwater elevation data indicate flow components toward the Marina Municipal Airport and the OU 1 areas. The results of groundwater monitoring includes a recommendation for additional EISB deployment due to the CT plume migrating further east and north than previously defined and the potential for further migration.

The baseline monitoring results for the eight new monitoring wells, in combination with groundwater data collected during the Second Quarter 2015 groundwater monitoring event, indicate the CT plume migrated further to the east of the groundwater divide and north into the FONR than previously defined (Ahtna, 2016). This plume migration was confirmed in subsequent groundwater monitoring events (Ahtna, 2016c, 2016d, and 2016f).

Evaluation of groundwater conditions in the A-Aquifer are reported in the January 2016 *Final Operable Unit Carbon Tetrachloride Plume Evaluation Technical Memorandum, A-Aquifer* (Ahtna 2016). This evaluation concluded that groundwater elevation contours in the area of the divide suggest the CT plume could continue to migrate to the north toward the Marina Municipal Airport and the OU 1 area if left unabated. There is no evidence previous EISB deployments have affected or will affect CT concentrations in the divide area. The existing EISB deployment areas are all west of the divide and cross-gradient or downgradient of the divide area, and some of the highest concentrations of CT in the A-Aquifer were observed in the divide area during the baseline and Second Quarter 2015 groundwater monitoring events. An additional EISB remedial action is planned for this area and is described in detail in the July 2016 *Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan Addendum* (Ahtna, 2016e).

Upper 180-Foot Aquifer

The Upper 180-Foot Aquifer groundwater remedy has been in operation since September 2011 (Ahtna, 2016f) and includes one groundwater extraction well (EW-OU2-09-180) connected to the OU 2 GWTS where extracted groundwater is treated with GAC, as described in the OU 2 Quarterly and Annual Reports. The first confirmed detection of CT in well EW-OU2-09-180 was observed in the Third Quarter 2014 groundwater monitoring event, with intermittent detections at concentrations below the ACL since then, demonstrating the relative inefficiency of this well. The flow rate for well EW-OU2-09-180 has historically been relatively low, but has improved over the last three years, averaging 46 gpm as of September 2016. However, groundwater model simulations completed for the OUCTP RI/FS Report (MACTEC, 2006) and OUCTP Remedial Design (Shaw, 2010) indicate flow rates of 100 gpm or greater would be necessary to remove most of the mass of CT from the Upper 180-Foot Aquifer and intercept CT prior to its downward migration to the Lower 180-Foot Aquifer.

Lower 180-Foot Aquifer

The remedy for the Lower 180-Foot Aquifer is monitored natural attenuation with a contingency for wellhead treatment of groundwater being extracted from potable water supply wells if CT associated with OUCTP is detected at concentrations above its ACL. The contingency procedure is described in the August 2009 *Final Operable Unit Carbon Tetrachloride Plume, Enhanced In Situ Bioremediation Pilot Study Completion Report, Former Fort Ord, California, Revision 0* (Shaw, 2009). Recovery well EW-OU2-09-180 was installed during the previous Five-Year Review period with the objective of extracting groundwater from the downgradient edge of the western plume of the Upper 180-Foot Aquifer to remove contaminant mass and to capture the CT groundwater plume before it reaches the area of vertical communication through the Intermediate 180-Foot

Aquitard to minimize further impact to the Lower 180-Foot Aquifer. Groundwater monitoring continues to evaluate the effectiveness of this remedy.

10.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 Five-Year Review Report (Army, 2012) states the following regarding the protectiveness of the OUCTP remedy:

> "The OUCTP remedy is expected to be protective of human health and the environment upon completion and, in the interim, potential exposure pathways that could result in unacceptable risks are being controlled. Specific controls include groundwater prohibitions provided by Chapter 15.08 of Title 15, Monterey County Code, deed restrictions, and the CRUP."

10.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The 2012 Five-Year Review Report did not identify any issues that affect the protectiveness of the OUCTP remedy. The report did acknowledge that implementation of the site remedy is in progress and no specific follow-up actions were recommended other than those taking place as part of the implementation and optimization process. Specifically, the following recommended actions were discussed:

A-Aquifer

Continued monitoring will provide data to evaluate the overall effectiveness of the remedy and indicate whether opportunities for optimization exist, such as whether injection of additional substrate would significantly reduce the cost of the remedy by shortening the duration of treatment or subsequent monitoring. Groundwater monitoring of the A-Aquifer has continued since the completion of the 3rd Five-Year Review Report.

Upper 180-Foot Aquifer

Performance monitoring and groundwater modeling will be used to evaluate the effects of well pumping on plume capture and remediation, and to ascertain whether the OUCTP remedy in the Upper 180-Foot Aquifer is fully addressed. Groundwater monitoring of the Upper 180-Foot Aquifer has continued since the completion of the 3rd Five-Year Review Report.

Lower 180-Foot Aquifer

Continued monitoring and groundwater modeling will be used to evaluate the progress of natural attenuation in the Lower 180-Foot Aquifer and the overall effectiveness of the selected remedy. Groundwater monitoring of the Lower 180-Foot Aquifer has continued since the completion of the 3rd Five-Year Review Report.

10.4 OUCTP Sites Five-Year Review Process

This Five-Year Review was performed in accordance with EPA Guidance (EPA, 2001) and with the process described in Section 4.0 of this document. The administrative and community involvement activities performed for Fort Ord, using a basewide approach, are detailed in Sections 4.1 and 4.2. Document and data review have been conducted on a site-by-site basis and are described in the following subsections.

10.4.1 Document Review

Documents reviewed in this evaluation included the ROD, the previous Five-Year Review Report, quarterly and annual groundwater monitoring reports, plume evaluation reports, data summary reports, system operations reports, construction completion reports, and other documents included in the administrative record.

A list of the references reviewed during completion of this 4th Five-Year Review Report is presented in Appendix A.

10.4.2 Data Review

During this 4th Five-Year Review, analytical data from groundwater monitoring of the A-Aquifer, Upper 180-Foot Aquifer, and Lower 180-Foot Aquifer were evaluated to determine current site conditions and data trends that have occurred during this review period.

10.4.2.1 Groundwater

A-Aquifer Groundwater

Quarterly and annual groundwater monitoring has occurred since the completion of the last Five-Year Review. For monitoring well identification numbers and locations, refer to Figure 11.2 of the March 2016 *Final Operable Unit Carbon Tetrachloride Plume Second Quarter 2016 Groundwater Monitoring Report, Former Fort Ord, California* (Ahtna, 2016c).

Groundwater Monitoring October 2011 through September 2012

The up-gradient extent of the CT plume continued to decrease during the annual monitoring period in response to ongoing EISB activity. Laboratory analytical data and EISB substrate transport modeling indicate that CT concentrations decreased to below the laboratory detection limit or the 0.5 ug/L ACL (Ahtna, 2013) across much of the plume area south of Reservation Road. CT concentrations in the downgradient portion of the plume were consistent with previous trends. The highest CT concentration during the annual monitoring period was measured in EISB Deployment Area 2A well EW-BW-124-A (15.6 ug/L, March 2012). Chloroform, which is a breakdown product of CT, exceeded its 2.0 ug/L ACL (Army, 2008) in the same sample from well EW-BW-124-A, and is the only other COC detection to exceed its ACL in the OUCTP A-Aquifer. In the downgradient portion of the plume, the highest CT concentration was measured in well MW-BW-66-A (9.1 ug/L, December 2011). Concentrations of COCs in the OUCTP A-Aquifer do not exhibit significant seasonal fluctuation. In addition to the routine sampling schedule, samples were also collected quarterly from the uppermost stations of select monitoring wells located within the City of Marina to evaluate the presence of CT near the groundwater/vadose zone interface of the A-Aquifer. Consistent with previous data, CT concentrations in the uppermost stations exceeded the 0.5 ug/L ACL in five wells (MW-BW-49-A, MW-BW-65-A, MW-BW-77-A, MW-BW-78-A, and MW-BW-80-A) during the annual monitoring period with values ranging up to 0.98 ug/L.

Groundwater Monitoring October 2012 through September 2013

CT concentrations in samples collected from wells MW-BW-27-A and EW-BW-155-A, which had contained some of the highest concentrations in samples from the Aquifer in Fourth Quarter 2012 and First Quarter 2013, showed a substantial decline in CT concentrations in the Second and Third quarters of the monitoring period. CT concentrations in the northeast area of the plume, which had increased following the EISB treatments, appear to have stabilized as expected (Shaw, 2012), and concentrations in samples collected from northeastern-most monitoring well MW-BW-58-A remained at or below the ACL throughout the annual period. CT concentrations in the downgradient portion of the plume were generally consistent with previous trends.

The highest CT concentration during the annual monitoring period was measured in EISB Deployment Area 2B well EW-BW-155-A (15.6 ug/L, February 2013). This represented a historic high CT concentration for this well. Chloroform concentrations exceeded the 2.0 ug/L ACL (Army, 2008) in samples collected from wells EW-BW-155-A and MW-BW-27-A during the annual monitoring period. Chloroform (CT breakdown product) appeared to have a significant correlation with higher CT concentrations in samples from the wells in

the fourth and first quarters of the annual monitoring period. Chloroform was the only other COC detected in samples from the OUCTP A-Aquifer in concentrations that exceed its ACL. COC concentrations in the OUCTP A-Aquifer do not exhibit significant seasonal fluctuation. The extent of CT concentrations in excess of the ACL has decreased substantially in the EISB Deployment and EISB Pilot Study Areas.

In addition to the routine sampling schedule, samples were also collected quarterly from the uppermost stations of select monitoring wells located within the City of Marina to evaluate the presence of CT near the groundwater/vadose zone interface of the A-Aquifer. CT concentrations in samples collected from the uppermost stations exceeded the 0.5 ug/L ACL in three wells (MW-BW-49-A, MW-BW-77-A, and MW-BW-80-A) during the annual monitoring period with values ranging up to 0.94 ug/L. In contrast with the previous annual monitoring period, CT concentrations in samples collected from the uppermost stations in monitoring wells MW-BW-65-A and MW-BW-78-A did not exceed the ACL during the current annual monitoring period (Ahtna, 2014).

Groundwater Monitoring October 2013 through September 2014

CT was detected above the ACL in the OUCTP A-Aquifer during the Third Quarter 2014 sampling event (Ahtna, 2015b). The other seven COCs were either detected below their ACLs or not detected in the OUCTP A-Aquifer. CT was detected at a concentration of 6.4 ug/L at monitoring well EW-BW-124-A. In addition, there were 30 locations with detections of CT above the ACL. Chloroform was detected at a concentration of 1.1 ug/L at monitoring wells EW-BW-124, MW-BW-31-A, and MW-BW-50-A. All chloroform detections are below the ACL. 1,1-DCE was detected at a concentration of 0.36 ug/L at monitoring well MW-BW-50-A. 1,1-DCE was not detected in groundwater samples collected from any other monitoring wells. PCE was detected in groundwater collected from five monitoring wells, with the highest yielding a concentration of 0.83 ug/L at monitoring well MW-BW-50-A. All detections of PCE were below the ACL. TCE was detected at a concentration of 2.2 ug/L at monitoring well EW-BW-124-A. All detections of TCE were below the ACL. 1,2-DCE, methylene chloride, and VC were not present above detection limits in any monitoring well (Ahtna, 2015a).

During the reporting period, the highest CT concentration was at well EW-BW-124-A with a concentration of 8.1 ug/L in the First Quarter 2014. This monitoring well is located south of Reservation Road in EISB Deployment Area 2A and has had declining concentrations of CT since 2012.

The extent of the CT plume during the reporting period has remained relatively stable and has not increased in size nor migrated in any direction; however, CT was detected above the ACL at well MW-BW-74-A (west of the main CT plume in the City of Marina) for the first time in the Third Quarter 2014, though CT has been on an increasing trend in this well. The CT trend within the A-Aquifer presents a high degree of variation, suggesting a degree of instability within the plume (Ahtna, 2015b).

Groundwater Monitoring October 2014 to September 2015

The Fourth Quarter 2014 groundwater monitoring event involved collecting samples from 52 OUCTP A-Aquifer sampling locations from December 15 through December 18, 2014; December 22, 2014; and on January 6, 2015. CT and chloroform exceeded their respective ACLs during this period. Three of the eight OUCTP A-Aquifer COCs were detected: 1,2-DCE, PCE, and TCE, but concentrations were below their respective ACLs. The other three OUCTP A-Aquifer COCs (1,1-DCE, methylene chloride, and VC) were not detected in the OUCTP A-Aquifer monitoring wells in the Fourth Quarter 2014. DO and ORP levels are generally returning to baseline conditions as untreated groundwater enters the area. Pilot Study Area monitoring wells EISB-EW-03 and EISB-EW-12 have relatively low DO compared to other Pilot Study Area wells. DO at all Pilot Study parameter wells has increased slightly compared to previous quarters. Concentrations of CT in wells in the Pilot Study Area are generally below the ACL except for the northeastern section and one well in the southwestern section. Downgradient of the Pilot Study Area within the City of

Marina, six wells have concentrations of CT above the ACL. The two EISB wells from Deployment Area 1A (EW-BW-92-A and EW-BW-93-A) are monitored for COCs and water quality parameters annually; therefore, no Fourth Quarter 2014 water quality data were collected. However, other monitoring wells in the 1A and downgradient area show CT concentrations below the ACL. CT concentrations in Deployment Area 1B wells and downgradient are below the ACL. Monitoring well EW-BW-101-A DO concentrations have increased during the Fourth Quarter compared to previous quarters. Deployment Area 1C well EW-BW-109-A has concentrations of CT above the ACL. DO is relatively low in wells EW-BW-112-A and EW-BW-159-A, but increased slightly since the previous two quarters at well EW-BW-159-A. DO is relatively low in Deployment Area 2A wells EW-BW-135-A and EW-BW-144-A compared to the other wells monitored for water quality parameters. Area 2A has two wells with CT concentrations above the ACL (EW-BW-124-A and MW-BW-26-A) at the northwestern and southeastern ends of the area, but the CT plume is discontinuous and CT is not detected in the central 2A area. DOis relatively low in Deployment Area 2B well EW-BW-149-A and has decreased slightly at well EWBW- 150-A compared to previous quarters. Three wells in Area 2B have CT concentrations above the ACL (MW-B-14-A, MW-BW-15-A, and MW-BW-60-A) located in the southeastern section of the plume.

The Fourth Quarter 2015 groundwater monitoring event involved collecting samples from 55 OUCTP A-Aquifer sampling locations. Two of the eight OUCTP A-Aquifer COCs (CT and chloroform) had an ACL exceedance during the Fourth Quarter 2015 sampling event. Three additional OUCTP A-Aquifer COCs were detected (1,2-DCE, PCE, and TCE), but were below their ACLs. The other three OUCTP A-Aquifer COCs (1,1-DCE; methylene chloride; and VC) were not detected in the OUCTP A-Aquifer monitoring wells in the Fourth Quarter 2015.

The table below presents a summary of groundwater field parameters for the Fourth Quarter 2015 monitoring event. Pilot Study Area monitoring wells EISB-EW-03 and EISB-EW-12 yielded relatively low DO concentrations. DO levels at the three Pilot Study parameter wells were similar to DO levels from the Third Quarter 2015 (Ahtna, 2016).

Concentrations of CT in wells in the Pilot Study Area were generally below the ACL except for the northeastern section. Downgradient of the Pilot Study Area, within the City of Marina, six wells had concentrations of CT above the ACL. The two EISB wells from Deployment Area 1A (EW-BW-92-A and EW-BW-93-A) are monitored for COCs and water quality parameters annually; therefore, no Fourth Quarter 2015 water quality data were collected. One monitoring well (MW-BW-71-A) in the 1A Area has a CT concentration below the ACL. Deployment Area 1B CT concentrations in wells EW-BW-97-A and EW-BW-101-A are below the ACL. Area 1B ORP concentrations were similar to the Second and Third Quarters 2015 (Ahtna, 2016).

Deployment Area 1C DO and ORP levels at wells EW-BW-112-A, EW-BW-119-A, and EW-BW-159-A were similar to the Third Quarter 2015 (Ahtna, 2016), with the exception of well EW-BW-112-A where ORP decreased compared to the Third Quarter 2015. One monitoring well in the 1C Area, EW-BW-109-A, has a CT concentration above the ACL. Deployment Area 2A DO and ORP levels at wells EW-BW-124-A, EW-BW-135-A, and EW-BW-144-A were similar to the Second and Third Quarter 2015 (Ahtna, 2016), with the exception of well EW-BW-135-A, where ORP levels decreased in the Fourth Quarter 2015. Area 2A has two wells with CT concentrations above the ACL (EW-BW-124-A and MW-BW-26-A) at the northwestern and southeastern ends of the area, but the CT plume is discontinuous and CT is not detected in the central 2A area Deployment Area 2B. DO concentrations at wells EW-BW-149, EW-BW-150, and EW-BW-155-A were similar to Third Quarter 2015.

Summary of Groundwater Field Parameters, Fourth Quarter 2015									
Monitoring Well	Probe Depth (feet BTOC)	Area	Date	DO (mg/L)	ORP (mV)	pH	Spec Cond (uS/cm)	Temp (°C)	Turbidity (NTU)
EISB-EW-03	67	Pilot Study	14-Dec-15	0.44	64	6.11	437	16.3	13
EISB-EW-12	72	Pilot Study	14-Dec-15	0.56	126.2	6.41	501	16.86	10.1
EISB-EW-15	66.5	Pilot Study	14-Dec-15	1.31	106.3	6.62	455	16.69	3.6
EW-BW-97-A	107	1B	16-Dec-15	1.74	101.6	6.37	714	16.6	31
EW-BW-101-A	107	1B	16-Dec-15	2.39	183.5	6.85	520	16.87	14.4
EW-BW-112-A	86	1C	16-Dec-15	0.51	57.9	6.53	748	16.57	22.7
EW-BW-119-A	95	1C	16-Dec-15	0.6	136.5	6.37	864	17.12	5.1
EW-BW-159-A	96	1C	16-Dec-15	0.74	130.2	6.29	389	16.91	11.9
EW-BW-124-A	93.5	2A	16-Dec-15	0.58	158.7	6.32	880	16.75	6
EW-BW-135-A	85.5	2A	16-Dec-15	0.61	-42.7	6.55	936	16.91	1.8
EW-BW-144-A	125	2A	16-Dec-15	0.73	70.5	6.26	738	16.94	807.9
EW-BW-149-A	103	2B	14-Dec-15	0.75	60.1	6.3	862	16.61	0.7
EW-BW-150-A	114	2B	14-Dec-15	1.35	95.9	6.63	635	17.16	14.1
EW-BW-155-A	88	2B	14-Dec-15	1.17	134.9	6.02	1,305	16.5	805.4

Notes:
BTOC: below top of casing
NTU: nephelometric turbidity units
ORP: oxidation/reduction potential
°C: degrees celsius
mg/L: milligrams per liter
Spec Cond: specific conductivity
DO: dissolved oxygen
mV: millivolts
uS/cm: microsiemens per centimeter
* Wells in EISB Deployment Area 1A are monitored annually in accordance with the *Groundwater Quality Assurance Project Plan* (Ahtna, 2015)

Three wells in Area 2B have CT concentrations above the ACL (MW-B-14-A, MW-BW-15-A, MW-BW-60-A, and EW-BW-132-A). The following table shows the maximum detected concentrations of COCs during the Fourth Quarter 2015.

A-Aquifer Maximum Detected Concentrations Fourth Quarter 2015									
Monitoring Well	Date	CT	Chloroform	1,1 DCE	1,2-DCE	MC	PCE	TCE	VC
EW-BW-124-A	16-Dec-15	2.3	1.5	<0.25 U	<0.50 U	<1.0 U	0.16 J	**1.9**	<0.050 U
EW-BW-135-A	16-Dec-15	<0.25 U	<0.25 U	<0.25 U	**0.28 J**	<1.0 U	<0.25 U	1.2	<0.050 U
MW-BW-31	14-Dec-15	1.3	**23.7**	<0.25 U	<0.50 U	<1.0 U	<0.25 U	0.29 J	<0.050 U
MW-BW-32-A	14-Dec-15	**7.3**	0.59	<0.25 U	<0.50 U	<1.0 U	<0.25 U	0.45 J	<0.050 U
MW-BW-71-A	16-Dec-15	0.32 J	0.22 J	<0.25 U	<0.50 U	<1.0 U	**0.24 J**	0.19 J	<0.050 U

Notes:
All results in micrograms per liter (ug/L)
J - estimated result below the Limit of Quantification (LOQ)
U - result not detected at or above the Limit of Detection (LOD)
Bold - maximum detected concentration

Groundwater Monitoring October 2015 through June 2016

Results of the Second Quarter 2016 groundwater monitoring event determined that two of the eight OUCTP A-Aquifer COCs (CT and chloroform) had an ACL exceedance. Four additional OUCTP A-Aquifer COCs were detected (1,2-DCE; PCE; TCE; and VC), but were below their ACLs. The other two OUCTP A-Aquifer COCs (1,1-DCE and methylene chloride) were not detected in the OUCTP A-Aquifer monitoring wells during the reporting period. Long-term monitoring and EISB post-treatment monitoring during this period confirm that CT concentrations within and downgradient of the Pilot Study Area within the city of Marina, generally increased since the First Quarter 2016 event (Ahtna, 2016f) with nine wells in the area above the CT ACL. The one EISB well sampled from Deployment Area 1A yielded a CT result below the ACL, which is consistent with the results obtained from the First Quarter 2016 sampling. Groundwater samples collected from Deployment Area 1B wells yielded one sample over the ACL for CT in the First Quarter of 2016 and no samples in excess of the ACL in Second Quarter 2016 sampling. There were two detections of CT in the Deployment Area 1C with one of the detections above the ACL at well EW-BW-109-A. These detections are similar to First Quarter 2016 results. There were three detections of CT in Deployment Area 2A (in wells EW-BW- 124-A, MW-BW-17-A, and MW-BW-26-A), which were above the ACL. This represents an increase since the First Quarter 2016 results when there were two detections above the ACL. Groundwater collected from five of the monitoring wells in Deployment Area 2B had detections of CT, with two of the detections above the ACL at wells MWB- 14-A and MW-BW-60-A (Ahtna, 2016f). This is consistent with results from the First Quarter 2016 monitoring event. The distribution of CT in the A-Aquifer for the Second Quarter 2016 monitoring event is shown on Plate 4.

Upper 180-Foot Aquifer

Groundwater Monitoring October 2011 through September 2012

CT concentrations in excess of the 0.5 ug/L ACL (Army, 2008) comprise an elongated CT plume in the Upper 180-Foot Aquifer. CT concentrations at the up gradient and downgradient ends of the plume reached, or were near, historical maximums during the annual monitoring period. The highest CT concentration was measured in well MW-OU2-64-180 (7.6 ug/L, September 2012) at the downgradient edge of the plume. Historical maximums were measured in samples from MP-BW-46-170 (4.1 ug/L, June 2012) at the up gradient end of the plume and MP-BW-41-231 (2.8 ug/L, September 2012) at the downgradient end. CT was not detected in extraction well EW-OU2-09-180, which entered the monitoring program in December 2011. CT is the only COC established for OUCTP in Upper 180-Foot Aquifer. Concentrations in the OUCTP Upper 180-Foot Aquifer do not exhibit consistent seasonal fluctuations with the exception of well MW-OU2-30-180, where concentrations typically peak in December (Ahtna, 2013).

Groundwater Monitoring October 2012 through September 2013

CT concentrations at the upgradient and downgradient ends of the plume increased relative to those measured in samples during the previous annual monitoring period. The highest CT concentration and a historical maximum was measured in well MW-OU2-64-180 (7.8 ug/L, September 2013) at the downgradient edge of the plume. A historical maximum was also measured in a sample from well MP-BW-46-170 (4.8 ug/L, September 2013) at the upgradient end of the plume. CT was not detected in extraction well EW-OU2-09-180. CT is the only COC established for OUCTP in Upper 180-Foot Aquifer. Seasonal fluctuation in CT concentrations varies across OUCTP in the Upper 180-Foot Aquifer. CT concentrations in samples from wells MW-BW-52-180 and MW-OU2-30-180 typically peak in December and March, respectively. CT concentrations in well MW-BW-51-180 generally peak in the summer and reach minimum values during December (Ahtna, 2014).

Groundwater Monitoring October 2013 through September 2014

The highest CT detection for the Third Quarter 2014 was at well MW-OU2-64-180 with a CT concentration of 8.0 ug/L. The highest CT detection for the reporting period was from well MW-OU2-64-180 with a CT

concentration of 10.2 ug/L in the Fourth Quarter 2013. CT was detected at well EW-OU2-09-180 for the first time in the Third Quarter 2014 sampling event at 0.16 ug/L.

Well MW-BW-52-180, located in the northern section of the CT Upper 180-Foot Aquifer plume, has had an overall declining CT concentration trend since 2004; however, well MW-OU2-64- 180, located near well EW-OU2-09-180, has had an overall increasing CT concentration trend since 2004. This may be due to a narrow groundwater capture zone for well EW-OU2-09-180 (Ahtna, 2015b).

Groundwater Monitoring October 2015 through June 2016

The maximum detected CT concentration for the OUCTP Upper 180-Foot Aquifer during the reporting period was 6.9 ug/L at well MW-OU2-64-180, which is located in the southern CT plume, during the First Quarter 2016 groundwater monitoring event in March 2016. This is comparable to the Fourth Quarter 2015 (Ahtna, 2016a) detection of CT in this well (5.7 ug/L); however, by the Second Quarter 2016 groundwater monitoring event in June 2016, the concentration of CT decreased to 4.3 ug/L. No sample was collected from well EW-OU2-09-180 in the Fourth Quarter 2015 groundwater monitoring event due to pump failure; however, the pump was replaced and samples were collected from this extraction well in the First and Second Quarter 2016 groundwater monitoring events. CT was not detected in the sample collected from well EW-OU2-09-180 in the First Quarter 2016 groundwater monitoring event, but was detected in the Second Quarter 2016 at 0.12 ug/L. The distribution of CT in the Upper 180-Foot Aquifer for the Second Quarter 2016 monitoring event is shown on Plate 4.

Lower 180-Foot Aquifer

Groundwater Monitoring October 2011 through September 2012

Concentrations of CT in excess of the 0.5 ug/L ACL (Army, 2008) comprise a northern and a southern plume in the OUCTP Lower 180-Foot Aquifer, apparently emanating from two distinct vertical conduits. CT concentrations in the northern plume are generally consistent with previous trends. CT in the southern plume where concentrations have been increasing since their installation.

The highest CT concentration in the northern plume during the annual monitoring period was detected in a sample from well MP-BW-31-292 (1.6 ug/L, March 2012) at the up-gradient edge of the plume. The highest CT concentrations in the southern plume were consistently detected in samples from well MP-BW-49-316 (1.5 ug/L, June 2012). Well MP-BW-49-316 was the only well in the southern plume in which CT concentrations exceeded the ACL at the beginning of the annual monitoring period. CT concentrations downgradient increased to above the ACL in wells MW-OU2- 69-180 and MP-BW-50-339, in March 2012 and June 2012, respectively. Supply wells FO-29, FO-30, and FO-31 are located downgradient of the southern OUCTP plume in the Lower 180-Foot Aquifer; however, CT has not been detected in the supply wells to date. CT concentrations in the OUCTP Lower 180-Foot Aquifer do not exhibit consistent seasonal fluctuation.

1-2-DCA is the only other COC established for OUCTP in the Lower 180-Foot Aquifer and is not consistently detected in any well. The 1,2-DCA concentrations detected in the December 2011 and March 2012 samples from well MP-BW-39-350 slightly exceeded the 0.5 ug/L ACL (Army, 2008). These sporadic low detections in multi-port wells beyond the extent of the plumes have historically been attributed to the sensitivity of the Westbay sampling method and off gassing from the well materials. In December 2011, an estimated (i.e., below the laboratory method detection limit) TCE concentration of 0.4 ug/L was reported in a sample from the Airfield well in the northern plume, from a vertical sampling station that is not routinely monitored because CT is not detected at that depth. TCE was not detected in a subsequent June 2012 sample from the same station and the result is considered anomalous.

In the northern plume, CT concentrations decreased significantly through 2009 and have remained stable or continued to decrease slowly since. CT concentrations measured during the annual monitoring period did not

exceed three times the ACL, and most were no greater than twice the ACL. The current areal extent of the plume is similar in length, but narrower than the extent in December 2001. In the southern plume, CT concentrations have been generally stable historically, and rarely have exceeded twice the ACL. CT concentrations during the annual monitoring period exhibited increasing trends in two multi-port wells installed in January 2011 (MP-BW-49-316 and MP-BW-50-339), but did not exceed three times the ACL. Preliminary data collected during the December 2012 monitoring event indicate CT concentrations in these multi-port wells decreased, and may indicate that concentrations there have stabilized. CT is not detected in the supply wells, and concentrations in samples from wells MW-BW-04-180 and MP-BW-51-405, immediately upgradient, are below the ACL and appear stable. The current areal extent of the southern plume is similar to the extent in December 2001, but is shifted eastward reflecting decreased concentrations in well MW-OU2-66-180 and the data from the new multi-port wells.

Groundwater Monitoring October 2012 through September 2013

Concentrations of CT in excess of the 0.5 ug/L ACL (Army, 2008) comprise a northern and a southern plume in the OUCTP Lower 180-Foot Aquifer, apparently emanating from two distinct vertical conduits. CT concentrations in the northern plume were consistent with previous decreasing trends, such that the eastern end of the plume has become discontinuous. CT concentrations in the southern plume were generally consistent with previous measurements.

The highest CT concentration in the northern plume during the annual monitoring period was detected in a sample from well MP-BW-31-292 (1.2 ug/L, March 2013), where concentrations fluctuate and tend to peak in March. CT concentrations in samples from downgradient well MP-BW-35-312 remained below the ACL throughout the annual monitoring period, resulting in western and eastern portions of the plume. The eastern (downgradient) portion of the plume is represented by samples from wells MP-BW-52-323 and MP-BW-52-312, where the CT concentration did not exceed the ACL in June 2013.

The highest CT concentrations in the southern plume during the annual monitoring period were detected in samples from well MP-BW-49-316 (1.4 ug/L, June 2013). CT concentrations consistently met or exceeded the ACL in samples from wells MP-BW-49-316 and MW-OU2-69-180 throughout the annual monitoring period. Supply wells FO-29, FO-30, and FO-31 are located downgradient of the southern OUCTP plume in the Lower 180-Foot Aquifer; however, CT has not been detected in the supply wells to date. CT concentrations in the southern plume do not exhibit consistent seasonal fluctuation.

Other than CT, 1,2-DCA is the only other COC identified for OUCTP in the Lower 180-Foot Aquifer and is not consistently detected in any well. 1,2-DCA concentrations did not exceeded the 0.5 ug/L ACL (Army, 2008) in samples from any OUCTP Lower 180-Foot Aquifer well during the annual monitoring period.

Groundwater Monitoring October 2013 through September 2014

The Lower 180-Foot Aquifer COC 1,2-DCA was not detected in the OUCTP Lower 180-Foot Aquifer during the reporting period. The highest CT concentration detected in the Lower 180- Foot Aquifer for the Third Quarter 2014 was 2.6 ug/L at well MP-BW-49-316. This well is located in the southern CT plume area and has shown an increasing CT concentration trend overall since installation in 2011. The Airfield well, located in the northern plume area, has had variable CT concentrations over time, but appears to show an overall declining trend. The Mini-Storage well, a privately owned well, also located in the northern CT plume has exhibited an overall decreasing trend since monitoring began in 2000.

Groundwater Monitoring October 2015 through June 2016

Groundwater monitoring completed during the Fourth Quarter of 2015 included the collection of samples from 23 OUCTP Lower 180-Foot Aquifer sampling locations. CT and 1,2-DCA are the only COCs for the OUCTP Lower 180-Foot Aquifer. Although TCE concentrations are monitored to evaluate for potential impacts to

downgradient Fort Ord supply wells FO-29, FO-30, and FO-31, TCE is not a COC for the Lower 180-Foot Aquifer.

The maximum CT concentration for the OUCTP Lower 180-Foot Aquifer in the Fourth Quarter 2015 was 0.94 ug/L at the Airfield sample located on the western OUCTP contour. Three locations were above the CT ACL during the reporting period. 1,2-DCA was not detected in any of the sampled locations during the reporting period. There is no ACL for TCE in the Lower 180-Foot Aquifer; however, detected concentrations of TCE are compared to the state and federal MCL of 5.0 ug/L for TCE. The maximum TCE detection was 6.8 ug/L at well MW-OU2-82-180, which is located in the Abrams Drive housing area south of Old County Road. This is the only OUCTP Lower 180-Foot Aquifer sample location with TCE above the MCL.

The maximum CT concentration for the OUCTP Lower 180-Foot Aquifer during the Second Quarter 2016 reporting period was 1.8 ug/L at well MP-BW-49-316 located on the western side of the southern CT plume, which is a slight increase since the First Quarter 2016. The Airfield well was the only other location with a detection of CT above its ACL during the reporting period (0.73 ug/L) which is similar to the First Quarter 2016 (Ahtna, 2016d) results. The COC 1,2-DCA was not detected in any of the sampled locations during the reporting period. There is no ACL for TCE in the Lower 180-Foot Aquifer; however, detected concentrations of TCE are compared to its state and federal MCL of 5.0 ug/L. The maximum TCE detection was 5.8 ug/L at well MW-OU2-82-180, located south of the main CT plume area. This is the only OUCTP Lower 180-Foot Aquifer sample location where TCE was detected at a concentration above the MCL (Ahtna, 2016f). The distribution of CT and TCE in the Lower 180-Foot Aquifer for the Second Quarter 2016 monitoring event is shown on Plate 4.

10.4.2.2 Soil Vapor

Soil vapor was assessed during the 2012 Five-Year Review. The results of this assessment determined that soil vapor did not pose a significant risk to human health and the environment (Army, 2012).

10.4.3 Site Inspection and Interviews

A site inspection was performed on July 12, 2016, by Mr. Paul Fluck and Ronald Jackson (Mobile District-Corps of Engineers, Geologists) to assess the overall condition of the remedy as it relates to effectiveness including physical condition of the site, site security and access controls. Mr. Derek Lieberman (Ahtna Program Manager) was interviewed on the same day as the inspection to provide information on the site's operational activities and to help facilitate the site inspection. Detailed inspection forms and site photographs are included in Appendix B. For the OUCTP remedy, the inspection focused on the groundwater monitoring locations and proposed area for planned upcoming EISB remedial action and system deployment.

10.5 Technical Assessment

10.5.1 Question A

Is the remedy functioning as intended by the decision document?

Yes. The exposure pathway for contaminated groundwater is not complete. Access to groundwater has been restricted through the implementation of land use controls. Groundwater at OUCTP is designated as drinking water, industrial water, and agricultural water under the Basin Plan, but is not currently used for those purposes. Achievement of the RAOs will restore the groundwater within and adjacent to the OUCTP to its intended purposes.

10.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Yes. Though several EPA human health risk assessment-based exposure assumptions and associated toxicity data have changed since the 2008 ROD, the potential use of OUCTP groundwater as tapwater, industrial water and agricultural water remains valid. The Aquifer Cleanup Levels identified in the ROD were based on California OEHHA MCLs which remain unchanged. Restricting access to contaminated groundwater and remediating the contaminated groundwater are the RAOs used during remedy selection and are still valid. The groundwater RAOs are based on MCLs, meaning the recent changes to the toxicity values for PCE and TCE are not directly relevant to the protectiveness of the remedy.

The primary RAO for OUCTP groundwater impacted by VOCs is to comply with ARARs such as federal and state laws and regulations. There is no unacceptable human health risk that has been demonstrated since the exposure pathway for contaminated groundwater is not complete. For more information see Section 10.2 Remedial Actions.

Soil vapor associated with OU 2 was assessed as part of the 3rd Five-Year Review. The OUCTP COCs were included in this assessment. The Johnson and Ettinger Model for subsurface vapor intrusion was used to predict indoor air concentrations based on VOC concentrations in groundwater. The results show that, except for PCE and TCE, the predicted indoor air concentrations have cancer risks and hazard quotients that do not exceed 1×10^{-6} and the threshold level of 1, respectively. The estimated cancer risks based on the ACLs for PCE and TCE are 1×10^{-6} and 1×10^{-6}, respectively. The cumulative cancer risk is 4×10^{-6} and is within EPA's risk management range of 1×10^{-6} to 1×10^{-4}. The cumulative hazard index is 0.3, which is less than the threshold level of 1. Therefore, the ACLs for groundwater COCs are health-protective of indoor air exposures and remain valid.

10.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No. The remedy is protective of human health and the environment. Potential exposure pathways that could cause unacceptable risks are currently controlled. Control includes groundwater use prohibitions, deed restrictions and the CRUP.

10.6 Issues

There are no issues affecting the protectiveness of the remedy at OUCTP.

10.7 Recommendations and Follow-Up Actions

The following proposed monitoring and remediation modifications are recommended to improve performance, reduce costs, and increase the likelihood of achieving cleanup goals.

A- Aquifer

Two new monitoring wells are recommended to further delineate the A-Aquifer CT plume, as described below and shown in Figure 34 of the February 2017 *Draft Operable Unit 2 , Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report* (Ahtna, 2017).

- In between wells MW-BW-36-A and MW-BW-89-A to define the CT plume to the north.

- In between wells MW-BW-89-A and MW-BW-90-A to define the CT plume to the north near the groundwater divide.

Upper 180-Foot Aquifer

Up to three new monitoring wells are recommended to delineate the Upper 180-Foot Aquifer CT plume to the east between the existing monitoring well network and Reservation Road. Additionally, a new OUCTP Upper 180-Foot Aquifer extraction well is recommended to enhance containment and control of the OUCTP in the Upper 180-Foot Aquifer in accordance with the OUCTP ROD (Army, 2008).

Lower 180-Foot Aquifer

TCE has been detected in the Lower 180-Foot Aquifer intermittently above the MCL since 2004 and concentrations have recently increased above the MCL in well MW-OU2-82-180; therefore, two new monitoring wells are recommended to further delineate the Lower 180-Foot Aquifer TCE plume, as described below.

- Upgradient of well MW-OU2-82-180 and adjacent to existing well MW-OU2-28-400 to delineate TCE in the Lower 180-Foot Aquifer.
- Downgradient of well MW-OU2-82-180 and south of well MW-OU2-72-180.

TCE is not currently monitored in the Upper 180-Foot Aquifer in the OUCTP because it is not a COC; however, it is recommended that existing TCE data for the Upper 180-Foot Aquifer in the OUCTP and OU 2 be reviewed and evaluated for a probable source of TCE to the Lower 180-Foot Aquifer.

Well Decommissioning

The following four monitoring wells are recommended for decommissioning at OUCTP in the Upper 180-Foot Aquifer.

1. MW-BW-20-180: sampling no longer conducted and water levels unnecessary.
2. MW-BW-22-180: sampling no longer conducted and water levels unnecessary.
3. MW-BW-26-180: sampling no longer conducted and water levels unnecessary.
4. MW-BW-29-180: sampling no longer conducted and water levels unnecessary.

Additional EISB Deployment Area

The January 2016 *Final Operable Unit Carbon Tetrachloride Plume Evaluation Technical Memorandum, A-Aquifer* (Ahtna, 2016) determined the A-Aquifer CT plume had migrated further to the east of the groundwater divide and north into the FONR than previously defined. This conclusion was confirmed in subsequent groundwater monitoring events. Accordingly, the A-Aquifer Evaluation Technical Memorandum recommended an additional EISB deployment area (identified as Deployment 3A on Plate 8) to be constructed in the area of the groundwater divide north of Reservation Road and west of Imjin Parkway. Extraction and injection wells would be configured similar to those used in previous EISB deployment areas and screened across the entire saturated zone (i.e., groundwater from the top of the water table down to the Salinas Valley Aquitard will receive EISB treatment). Based on existing monitoring wells and the configuration of the proposed deployment area, no additional monitoring wells were recommended for this area. Modeling of substrate distribution in the proposed deployment area, as described in Section 4.0 of the January 2016 *A-Aquifer Evaluation Technical Memorandum* (Ahtna, 2016) and Section 2.4.2 of the July 2016 *Remedial Action Work Plan Addendum* (Ahtna, 2016e) indicates EISB treatment of groundwater migrating through the groundwater divide area should minimize further migration of the CT plume under the FONR and north toward the Marina Municipal Airport. The additional EISB deployment area recommended in the A-Aquifer Evaluation Technical Memorandum is under construction in accordance with the July 2016 *Remedial Action Work Plan Addendum* (Ahtna, 2016e) as EISB Deployment Area 3A.

Substrate distribution in EISB Deployment Area 3A was modeled using the Fort Ord Groundwater Model (MODFLOW) and Analytical Element Method at a hydraulic conductivity value of 20 feet per day for the A-Aquifer. The modeling results indicate that substrate will still be sufficiently distributed across the deployment area to achieve RAOs.

The design and implementation of in EISB Deployment Area 3A will include the following monitoring phases:

- Baseline Sampling and Analysis
- Performance (Treatment) Monitoring
- Performance (Post-Treatment) Monitoring
- Long-Term Monitoring

Baseline sampling and analysis will precede the injection of substrate for the EISB system deployment. Performance monitoring will be conducted at the deployment area during the substrate injection to evaluate its distribution and to monitor changes in groundwater chemistry associated with the EISB. Post-treatment monitoring is required to assess the impact of the EISB treatments on the attenuation of contaminants, assess potential rebound of COCs in the treatment areas, and to ensure groundwater ACLs are met. Long-term monitoring, conducted in accordance with the Groundwater QAPP, as part of the Basewide groundwater monitoring program (GWMP), will allow for evaluation of the overall impact of remedial efforts in the OUCTP A-Aquifer and evaluation of concentrations of COCs to ensure that they remain below ACLs for a sufficient period of time to support site closure in accordance with the decision criteria in the Groundwater QAPP (Ahtna, 2016b). The GWMP will incorporate pre-existing wells and selected injection and extraction wells installed during the remediation process. Post-treatment and long-term monitoring will be conducted concurrently, following performance monitoring. Once substrate injection is initiated, groundwater samples will be collected weekly within the deployment area from onsite monitoring wells and extraction wells to screen for alkalinity and measure water quality parameters. Groundwater samples will also be collected monthly within the deployment area from onsite monitoring wells and extraction wells and analyzed for VOC concentrations by EPA Method 8260-SIM. Long-term performance monitoring will be conducted as described in the Groundwater QAPP (Ahtna, 2016b). DO and ORP will also be measured to evaluate whether these parameters are indicative of aquifer conditions associated with EISB treatment in Deployment Area 3A.

The effectiveness of the remediation program for the A-Aquifer will ultimately be measured by reduction of the extent and concentrations of COCs. Modifications to the treatment system array may be required during installation as the remediation system is implemented. The process system configurations will be constantly reevaluated to optimize system operations and maintenance requirements. System effectiveness, hydrogeologic conditions, and current trends in plume concentrations will be factored into the reevaluation. Trend analysis, contaminant mass-flux, and localized groundwater modeling will be used to evaluate progress and optimize operations and maintenance. In accordance with the ROD (Army, 2008), natural attenuation indicator data (e.g., water quality parameter measurements and VOC concentrations) collected during baseline and performance monitoring will be analyzed to gauge the level of enhanced biodegradation within the aquifer and determine the need for a second substrate injection, and estimate the time between the first and second injection events at Deployment Area 3A. Generally, should natural attenuation indicator data show EISB has been insufficient in Deployment Area 3A (e.g., insufficient distribution of substrate, lack of reducing conditions, or insufficient reduction in COC concentrations), then a second substrate injection and optimization of the EISB system will be evaluated. The Groundwater QAPP (Ahtna, 2016b) is revised and updated annually; therefore, the next revision, which is scheduled to occur after baseline monitoring at Deployment Area 3A, may incorporate a specific analytic approach for determining the need for a second substrate injection.

Recommendations proposed in this Five-Year Review Report are based on information available as of September 2016.

10.8 Protectiveness Statement

Will be Protective. The remedy at OUCTP is expected to be protective of human health and the environment upon completion. In the interim, ongoing remedial activities and groundwater use prohibitions continue to adequately address all exposure pathways that could result in unacceptable risks.

Specific controls include groundwater prohibitions provided by Chapter 15.08 of Title 15, Monterey County Code, deed restrictions, and the CRUP.

11.0 TRACK 0 ROD

Per the 3rd Five-Year Review Report (Army, 2012), the Track 0 ROD's No Action remedy (Army, 2002) is protective of human health and the environment, and the Track 0 areas, which have no physical or documented evidence of military munitions-related training, meet the UU/UE criteria. As stated in the 3rd Five-Year Review Report, Track 0 was not required to be included in this 4th Five-Year Review or in future reviews.

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12.0 TRACK 1 ROD

This section presents background information on the Track 1 ROD regarding MR; provides a summary of remedial actions, and a technical assessment of the actions taken at these sites; identifies any issues related to the protectiveness of the remedy based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedy. A glossary of MMRP terms is provided in Appendix D.

12.1 Background

The *Record of Decision, No Further Action Related to Munitions and Explosives of Concern – Track 1 Sites, No Further Action with Monitoring for Ecological Risks from Chemical Contamination at Site 3 (MRS-22), Former Fort Ord, California* (Track 1 ROD) was signed in April 2005 (Army, 2005a). The Track 1 ROD is based on the Track 1 OE RI/FS Report (MACTEC, 2004). The ROD addresses 21 Track 1 MRSs that were suspected to have been used for training with military munitions, but no further response action is required based on remedial investigation. The ROD defines the criteria that additional sites must meet to qualify as NFA sites and describes the approval process. Track 1 NFA sites at Fort Ord are categorized into one of the following three categories:

- Category 1 Sites: There is no evidence to indicate military munitions were used at the site, i.e., suspected training did not occur; or
- Category 2 Sites: The site was used for training, but the military munitions items used do not pose an explosive hazard, i.e., training did not involve explosive items; or
- Category 3 Sites: The site was used for training with military munitions, but military munitions items that potentially remain as a result of that training do not pose an unacceptable risk based on site-specific evaluations conducted in the Track 1 OE RI/FS Report. For this category of sites, field investigations identified evidence of past training involving military munitions, but the training at these sites involved only the use of practice and/or pyrotechnic items that are not designed to cause injury. In the unlikely event that a live item of the type previously observed at the site is found, it is not expected that the item would function by casual contact (i.e., inadvertent and unintentional contact).

For the purposes of this ROD and the basewide MMRP at the former Fort Ord, MEC does not include small arms ammunition (.50 caliber and below).

The 21 Track 1 sites are listed below; locations of the sites are illustrated on Plate 9.

- MRS-1 - Flame Thrower Range
- MRS-5 - South of East Garrison
- MRS-6 - Mine and Booby Trap Training Area
- MRS-13A - Practice Mortar Range
- MRS-20 - Recoilless Rifle Training Range
- MRS-22 (Site 3) - Beach Trainfire Ranges
- MRS-24B - Practice Hand Grenade Range
- MRS-24D - Booby Traps
- MRS-24E - Practice Rifle Grenade Range

- MRS-27X - Training Site 24
- MRS-27Y - Training Site 25
- MRS-32A - Oil Well Road Training Area
- MRS-32B - Oil Well Road Training Area II
- MRS-39 - Mine and Booby Trap Area
- MRS-49 - Former Rifle Grenade Range
- MRS-59A - Unnamed
- MRS-62 - Laguna Seca Open Space
- MRS-63 - Canyon Training Area
- MRS-66 - Signal Corps Small Arms
- MRS-69 - Unnamed
- MRS-70 - Unnamed

12.2 Remedial Actions

The selected remedy for the Track 1 MRSs is NFA.

Even though no actionable risk was identified through the RI process, in the interest of safety, reasonable and prudent precautions should be taken when conducting intrusive operations at the Track 1 sites. The Army recommended that construction personnel involved in intrusive operations at specific MRSs/areas attend the Army's munitions recognition and safety training. MRSs are shown on Plate 9.

The Track 1 ROD also presented a "*No Further Action with Monitoring for Ecological Risks from Chemical Contamination*" for Site 3 (MRS-22), the former Beach Trainfire Ranges. An Interim ROD for Site 3 (Army, 1997) identified excavation of metals-contaminated soil and spent ammunition present at the site as the selected remedy for Site 3. The 2005 Track 1 ROD is the final ROD for Site 3. The remedial action at Site 3 is described in Section 8.0 of this Five-Year Review Report.

12.2.1 Remedy Selection

The Track 1 ROD addresses identified potential munitions sites that contain no actionable risks; therefore, no remedial action is necessary for the Track 1 sites. The selected remedy for the Track 1 sites is NFA, which allows for unrestricted reuse. An MEC safety education program was recommended and is implemented through the MRS security program. During the five-year review process, the Army will assess whether the education program should continue. If information indicates that no MEC items have been found in the course of development or redevelopment of the site, it is expected that the education program may, with the concurrence of the regulatory agencies, be discontinued, subject to reinstatement if a MEC item is encountered in the future. In the future, should any munitions-related item be reported within any of the areas addressed in the Track 1 ROD, the Army will take appropriate action and submit a plan for appropriate follow-on action to EPA and DTSC within 90 days of the discovery.

In addition, a "Plug-In" process can be used for documenting NFA determinations for areas not included in the original Track 1 ROD that meet the Track 1 criteria based on the ongoing MR RI/FS program.

12.2.2 Remedy Implementation

The selected remedy for the Track 1 sites is NFA, which allows for unrestricted reuse.

Subsequent to the signing of the ROD, additional areas have been identified as Track 1 sites and were documented through submittal of Approval Memoranda as part of the Track 1 Plug-In process. With the receipt of written concurrence from USEPA, and acknowledgement from the DTSC, these memoranda serve as the decision documents stating that no further action regarding munitions response is required.

The following three Track 1 Plug-In Approval Memoranda were finalized between 2002 and 2007, as reported in the 2nd Five-Year Review Report:

- *Track 1 Plug-In Approval Memorandum, MRS-6 Expansion Area, Former Fort Ord, California* (Army, 2005b).
- *Track 1 Plug-In Approval Memorandum, East Garrison Areas 2 and 4 NE, Former Fort Ord, California* (Army, 2006a).
- *Track 1 Plug-In Approval Memorandum, Multiple Sites, Groups 1 – 5, Former Fort Ord* (Army, 2006b).

The following Track 1 Plug-In Approval Memorandum was finalized in 2010, as reported in the 3rd Five-Year Review Report.

- *Track 1 Plug-In Approval Memorandum, County North Munitions Response Area, Former Fort Ord* (Army, 2010).

Since the 3rd Five-Year Review Report was issued, the following three Track 1 Approval Memoranda have been finalized:

- *Track 1 Plug-in Approval Memorandum, BLM-Headquarters and MRS-35, Former Fort Ord, California* (Army, 2011a).
- *Track 1 Plug-in Approval Memorandum, MRS-24A, MRS-24C, and Parcel E20c.1, Former Fort Ord, California* (Army, 2011b).
- *Track 1 Plug-in Approval Memorandum BLM Area A, Former Fort Ord, California* (Army, 2012a).

The MRS Security Program for the former Fort Ord munitions sites includes the Army's recommendation for the munitions recognition and safety training program noted in Section 12.2.1. Notices regarding the Army's recommendation for munitions recognition and safety training were included in transfer documents for parcels containing Track 1 MRSs. For properties that had been transferred at the time the Track 1 ROD was signed, owners of those properties were notified about the training program in August 2005. Information about munitions recognition and safety training sessions that have been provided to the public is reported in the MRS Security Program annual reports (Fort Ord BRAC, 2012, 2013, 2014, 2015, and 2016).

For Track 1 MRSs during the calendar years 2011, 2012, 2013, 2014, and 2015:

- No training was requested from individuals or entities specifically identified as Track 1 parcel owners or their representatives.
- No notice of intrusive actions on Track 1 parcels was received.
- No MEC incidents were reported on Track 1 parcels.

Information about MEC incidents (reports of munitions encounters) at the former Fort Ord is reported regularly to the MR BCT.

12.2.2.1 ESCA Track 1 Remedy Implementation

The ESCA County North MRA has been approved as a Track 1 Plug-In based on the Army's Track 1 ROD Plug-In Approval Memorandum, concluding that no further action related to MEC is recommended under the ESCA RP (ESCA RP Team, 2010). The ESCA County North MRA meets the Track 1 criteria. MRS-27E, MRS-45, MRS-57, and the portion of MRS-59B and MRS-59:MRS-27F within the County North MRA meet the Track 1, Category 3 criteria because historical research and field investigations indicated past training involving military munitions at these sites involved only the use of practice and pyrotechnic items that are not designed to cause injury.

The following ESCA Track 1 Plug-In Memorandum was submitted prior to, and reported in, the 3rd Five-Year Review Report:

- *Track 1 Plug-In Approval Memorandum, County North Munitions Response Area, Former Fort Ord, California* (Army, 2010).

No additional ESCA properties have been identified as Track 1 sites since the 3rd Five-Year Review Report was issued.

For ESCA Track 1 MRSs during the calendar years 2012, 2013, 2014, 2015, and 2016:

- No training was requested from individuals or entities specifically identified as ESCA Track 1 parcel owners or their representatives.
- No MEC incidents were reported on ESCA Track 1 parcels.

Per the conditions of the ESCA, FORA or its successor will provide munitions recognition and safety training as described in the Track 1 ROD to those wishing to conduct intrusive activities on the County North MRA. FORA will request notice from future landowners of planned intrusive activities, and in turn will provide munitions recognition and safety training to construction personnel prior to the start of intrusive work.

12.2.3 System Operations and Maintenance

No operations or maintenance are necessary for the selected remedy.

12.2.4 Property Transfer

As of September 30, 2016, a total of 2,267 acres within 36 parcels have been transferred. These parcels contain all or part of the areas that are addressed in the Track 1 ROD and subsequent Approval Memoranda. No new parcels were transferred during the review period. Some areas of the approved Track 1 sites had already been transferred prior to the NFA decision, or are located within parcels retained by the Army.

ESCA Track 1 Property Transfer

Since the 3rd Five-Year Review Report was issued, 506 acres of ESCA Track 1 property within four parcels that contain all or part of the Track 1 sites that are addressed in the ESCA Track 1 Plug-In Memorandum (Army, 2010) have been transferred by FORA to the County of Monterey. Consistent with the Track 1 process, the MEC-related land use restrictions were removed from the deeds.

12.3 Progress Since the Last Five-Year Review

12.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012b) stated that:

> "The Track 1 remedy is protective of human health and the environment."

12.3.2 Status of the 2012 Five-Year Review Issues and Recommendations

There were no issues affecting the protectiveness of the NFA remedy for Track 1 sites listed in the 2012 Five-Year Review Report; therefore, there were no recommendations or follow-up actions.

12.4 Five-Year Review Process

12.4.1 Document Review

Documents reviewed in this evaluation included, but were not limited to, the Track 1 RI/FS Report and ROD, the Track 1 Plug-in Approval Memoranda, MRS Security Program Annual Reports and the property transfer deeds. A complete list of references is included in the Track 1 section of the reference list (see Appendix A).

12.4.2 Data Review

Since the last Five-Year Review Report was issued, three additional Plug-in Approval Memoranda were generated (see Section 12.2.2). A list of MEC incidents (reports of munitions encounters) at the former Fort Ord during the review period is provided at Table 5. There were no incidents in Track 1 sites during the reporting period.

12.4.3 Site Inspection and Interviews

Site inspections and interviews were not conducted for the Track 1 ROD sites because these sites meet the criteria for NFA.

12.5 Technical Assessment

12.5.1 Question A

Is the remedy functioning as intended by the decision document?

The selected remedy for the Track 1 sites was NFA.

The Army and FORA offer munitions recognition and safety training, provide training when requested, provide outreach to the community, and monitor for MEC incidents. No training was requested from individuals or entities specifically identified as Track 1 parcel recipients or their representatives. No notice of intrusive actions on Track 1 parcels was received. No MEC incidents were reported on Track 1 parcels. Therefore, the selected remedy is functioning as intended by the ROD and remains protective.

12.5.2 Question B

Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Track 1 sites were suspected to have been used for military munitions-related activities (i.e., training), but based on the results of a remedial investigation, no further action is required. The assumptions made during the remedy selection are consistent with current site conditions and remain unchanged. No changes to site conditions have occurred that would affect the remedy performance. Therefore, the selected NFA remedy is still valid.

12.5.3 Question C

Has any information come to light that could call into question the protectiveness of the remedy?

No new information has been identified that could call the protectiveness of the remedy into question.

12.6 Issues

There are no issues affecting the protectiveness of the remedy at the Track 1 sites.

12.7 Recommendations and Follow-Up Actions

Because there are no issues affecting the protectiveness of the remedy and the remedy is functioning as intended, there are no recommendations or follow-up actions.

The NFA remedy allows for unrestricted use. Therefore, it is not necessary to continue to review the Track 1 sites in future five-year reviews. The Army will continue to offer the munitions recognition and safety training to construction personnel involved in intrusive operations at the Track 1 sites. The Army also maintains a program to collect, and report to the regulatory agencies, any munitions-related items found within the Track 1 sites. In the event these safety programs are discontinued in the future, the Track 1 sites will be reviewed under the five-year review process.

12.8 Protectiveness Statement

Protective. The remedy at the Track 1 sites is protective of human health and the environment.

The NFA remedy allows for unrestricted use; therefore, Track 1 sites will be eliminated from future five-year reviews.

13.0 PARKER FLATS MUNITIONS RESPONSE AREA, TRACK 2 ROD

This section presents background information on the Parker Flats MRA, Track 2 MR ROD (Parker Flats ROD); provides a summary of remedial actions; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. A glossary of MMRP terms is provided in Appendix D.

13.1 Parker Flats Munitions Response Area Background

Track 2 sites are those sites where MEC was found and an MEC removal was conducted. The Track 2 site known as the Parker Flats MRA contains all or portions of several MRSs that were believed to have been used for military training with military munitions.

The *Record of Decision, Parker Flats Munitions Response Area Track 2 Munitions Response Site, Former Fort Ord, California*, was signed on August 26, 2008 (Army, 2008). The Parker Flats MRA is approximately 758 acres in size and is located in the central part of the former Fort Ord between the former Fort Ord Main Garrison and the historical Impact Area.

The Parker Flats MRA includes all or portions of 13 MRSs as shown on Plate 9 (MRS-3, MRS- 04B, MRS-13B, MRS-27A, MRS-27B, MRS-27G, MRS-37, MRS-40, MRS-50/50EXP, MRS-52, MRS-53/53EXP, MRS-54EDC, and MRS-55 [including portions of MRS-27A and MRS-27B]), many of which were used for live-fire training (e.g., artillery, mortar) and other training that may have included the use of military munitions. The northern portion of the Parker Flats MRA consists entirely of MRS-13B (Practice Mortar Range), and is separated from the southern portion of the Parker Flats MRA. The southern portion of the Parker Flats MRA includes the remaining MRSs. The 13 MRSs were investigated and MEC removals were completed by the Army's munitions response contractors.

The Army's Track 2 Parker Flats MRA was investigated, and all MEC items detected were removed. These removal actions included Quality Control and Quality Assurance requirements that evaluated the adequacy of the removal action. The munitions response was designed to address MEC to a depth of four feet bgs; however, all anomalies (i.e., ferromagnetic material), even those deeper than four feet, were investigated and all MEC items encountered were removed. Although not expected, it is possible that some MEC may not have been detected and might remain present. For the Track 2 Parker Flats MRA, 'removal to four feet bgs' should be understood to include the investigation of all detected anomalies to the depth of detection, regardless of their depth bgs. Because a future land user (e.g., worker, resident, or visitor) may encounter MEC at the Parker Flats MRA, the Army conducted the Parker Flats MRA RI/FS to evaluate remedial alternatives to address this potential risk.

Munitions constituents were addressed as part of the HTW RI/FS program. No restrictions related to munitions constituents in soil were recommended following completion of a literature review, site reconnaissance, and soil sampling (MACTEC, 2006).

The majority of the Track 2 Parker Flats MRA is included in the ESCA, and is referred to as "the Parker Flats MRA Phase I" under the ESCA Remediation Program.

13.1.1 ESCA Parker Flats MRA Phase I

Under the ESCA, FORA is responsible for implementation of the Parker Flats MRA Track 2 ROD except for Parcels F2.6, L2.4.1, and L2.3. The parcels subject to the ESCA were transferred to FORA in 2009.

Ground-Disturbing or Intrusive Activities

Portions of Parcels E18.1.1 and E18.1.2 have been developed as the California Central Coast Veterans Cemetery (CCCVC). Parcels E19a.5 and L32.1 and portions of Parcels E19a.1, E19a.3, and E19a.4 remain undeveloped. The CCCVC project property was transferred from FORA to the State of California after site closure. The UXO construction monitoring contractor Weston Solutions, Inc., provided munitions recognition and safety training to workers in June 2014 and June and July 2015 in support of the CCCVC project. Ground-disturbing or intrusive activities were conducted within Parcels E18.1.1 and E18.1.2 during development of the CCCVC.

One MEC incident was reported for the Parker Flats MRA Phase I parcels during the October 2011 through September 2016 reporting period. In July 2015, a 40-millimeter (mm) high explosive (HE) projectile, model unknown, MEC item was discovered during UXO construction monitoring for the CCCVC project. A verification survey was conducted by Weston Solutions, Inc., using analog and all-metal detection instruments, within a 75-foot radius to the north, south, and west, and within a 60-foot radius to the east of the location where the MEC item was encountered. Eight near-surface non-ferrous MD items related to the 40mm M781 practice projectile were recovered and no MEC or discarded military munitions were encountered during the verification survey. In response to the discovery, FORA prepared and submitted to the EPA and DTSC an assessment of the probability of encountering additional MEC at the site. FORA concluded that, based on the data and evidence reviewed, the discovery was an isolated incidence and the probability of encountering additional MEC at the CCCVC site remains low. The EPA, DTSC, and the Army concurred with FORA's conclusion. FORA concluded that the 40mm projectile discovery confirms that the risk for construction work remains the same as identified in the Track 2 ROD. FORA recommended that the same procedures in the approved RD/RA Land Use Control Implementation (LUCI) O&M Plan and associated construction support plan should be followed with a heightened awareness and continued use of both analog and all-metal type detection instruments. FORA further concluded that the procedures adopted and employed to address the contingency of such discovery demonstrate that the remedy is effective.

13.2 Remedial Actions

The primary RAOs for the Track 2 Parker Flats MRA reuse areas, based on EPA RI/FS Guidance (EPA, 1988), are to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs."

13.2.1 Remedy Selection

MEC removal actions have been completed at the Parker Flats MRA, significantly reducing the risks to human health and the environment. However, there is a potential for MEC to remain in the site because detection technologies may not detect all MEC present and some areas contain barriers (e.g., pavement, buildings) that, while providing protection against any MEC potentially present, preclude the use of detection technologies.

To manage the risk to future land users from MEC that potentially remain in the property, the Army evaluated the following three remedial alternatives for the Parker Flats MRA reuse areas in the Parker Flats MRA FS (Volume III; MACTEC, 2006):

- Alternative 1: No Further Action
- Alternative 2: Land Use Controls
- Alternative 3: Additional MEC Remediation

The Track 2 Parker Flats MRA RI/FS identified two areas (i.e., "California State University [CSU] Expansion Area" and "MRS-13B Habitat Reserve Area") (approximately 2 acres) that are not included in the Track 2

Parker Flats MRA ROD. These areas are being addressed in separate decision documents. The CSU Expansion Area is included in the ESCA Group 2 ROD, and the MRS-13B Habitat Reserve Area is included in the ESCA draft Group 1 RI/FS. Of the 758 acres comprising the Parker Flats MRA that was evaluated in the RI/FS, the reuse areas included in the ROD total approximately 756 acres. All of the proposed reuse scenarios could result in ground disturbing or intrusive activities (e.g., during construction/excavation).

Selected Remedy

On August 26, 2008, the Army and the EPA, in consultation with the DTSC, recorded the final decision in the Track 2 Parker Flats MRA ROD documenting the selected remedial alternative of LUCs for managing the risk to future land users from MEC that potentially remain in the Parker Flats MRA.

The selected remedy includes the following LUCs:

1) Munitions recognition and safety training for workers that will conduct ground disturbing or intrusive activities;
2) Construction monitoring during ground disturbing or intrusive activities; and
3) Restrictions against residential use.

Based on the RI/FS, it is the Army's position that the additional layer of protection from a residential use restriction is not necessary for the Parker Flats MRA; however, in consideration of regulatory input, the selected remedy includes a LUC prohibiting residential use. For the purpose of the Parker Flats MRA ROD, residential use includes, but not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12. Any proposal for residential development in the Parker Flats MRA will be subject to regulatory review. It should be noted that, per the *Fort Ord Base Reuse Plan* (FORA, 1997), only the "development reserve" within the northern portion of MRS-50EXP and the southeastern portion of MRS-13B (approximately 36 acres total) could include residential development as a potential future use. While the Army does not consider California laws and regulations concerning Land Use Covenants to be potential ARARs, after the Parker Flats MRA ROD is signed, the Army will enter into State Land Use Covenants (i.e., CRUPs) that document the land use restrictions selected as part of the remedy. For the parcels subject to the ESCA, the Army entered into a State CRUP at the time the property was transferred.

In addition, long-term management measures comprising a federal deed restriction, CRUPs, annual monitoring and reporting, and five-year review reporting will be implemented for all reuse areas within the Parker Flats MRA Phase I.

13.2.2 Remedy Implementation

Parcels E19a.5 and L32.1 and portions of Parcels E18.1.1, E18.1.2, E19a.1, E19a.3, and E19a.4 were transferred by the Army to FORA in May 2009 as part of the ESCA. FORA classifies this area of the Parker Flats MRA as 'Phase I' (discussed in Section 13.2.2.1).

Implementation of the selected remedy for Parcels F2.6, L2.4.1, and L2.3 is the Army's responsibility. The Army has prepared an RD/RA Work Plan for the implementation of the LUCs for these parcels (*Final Remedial Design/Remedial Action Work Plan, Parker Flats Munitions Response Area, Former Fort Ord, California, Revision 1* [MACTEC/Shaw, 2009]).

In a letter dated July 27, 2009, EPA determined that all remedial actions have been implemented and completed at the Track 2 Parker Flats MRA (EPA, 2009).

LUC monitoring of Parcels F2.6, L2.4.1, and L2.3 were conducted by the Army since 2009. Parcels L2.4.1 and L2.3 remain unused. Parcel F2.6 remains used by U.S. Army Garrison, POM for light industrial and municipal purposes. No evidence of ground-disturbing activity (e.g. new construction or redevelopment) or residential use was detected, as documented in the various *Reports of Annual Monitoring of Land Use Controls* (Army, 2012a, 2013, 2014, 2015, and 2016).

The following information regarding MEC incidents and safety training at the Track 2 Parker Flats MRA was available from the *Fort Ord MRS Security Program Annual Reports* for calendar years 2011, 2012, 2013, 2014, and 2015 (Fort Ord BRAC, 2012, 2013, 2014, 2015, and 2016).

- No training was requested from individuals or entities specifically identified as Track 2 Parker Flats MRA parcel recipients or their representatives.
- No requests were made for construction support.
- No notice of intrusive actions on Track 2 Parker Flats MRA parcels was received.
- No MEC incidents were reported on Track 2 Parker Flats MRA parcels.

The results of monitoring described above indicate that the land uses in the subject parcels are consistent with the LUCs that were selected in the Track 2 Parker Flats MRA ROD.

For the FOST 11 parcels (L2.3 and L2.4.1), deeds for transferring property will contain a notice that includes: a statement notifying future property owners that MEC were found and removed from the property; information for the future property owners describing the selected remedy; and an outline of the appropriate procedures to be followed in the event that MEC are encountered. The restrictions will be documented in the federal deeds, will be recorded with the county recorder's office, and will run with the land in perpetuity unless modified in the future. For Parcel F2.6, the Army (BRAC) informed the POM regarding the MR remedy and the fact that, although not expected, the potential remains that some MEC are present within the parcel in a March 2010 Memorandum (Army, 2010).

13.2.2.1 ESCA Parker Flats MRA Phase I

The Phase I area of the Parker Flats MRA, including Parcels E19a.5 and L32.1 and portions of Parcels E18.1.1, E18.1.2, E19a.1, E19a.3, and E19a.4, were transferred by the Army to FORA in May 2009 as part of the ESCA. FORA prepared the *Final Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, Parker Flats Munitions Response Area Phase I, Former Fort Ord, Monterey County, California* (RD/RA LUCI O&M Plan; ESCA RP Team, 2009) for the implementation of the of the selected remedy (LUCs) for these parcels. The LUCs described in the ROD and RD/RA LUCI O&M Plan include requirements for: (1) munitions recognition and safety training for workers that will conduct ground-disturbing or intrusive activities, (2) construction monitoring for ground-disturbing or intrusive activities to address MEC that potentially remains in the subsurface, and (3) restrictions against residential use to preclude residential development or modification to residential restrictions without approval by EPA in coordination with DTSC. Implementation of the selected remedy is the responsibility of FORA, or its successor.

The RD/RA LUCI O&M Plan was reviewed and approved by the EPA in July, 2009. Based on review of the RD/RA Work Plan, RD/RA LUCI O&M Plan, and relevant deeds, and supporting documentation, the EPA determined that all remedial actions have been implemented and completed at the Parker Flats MRA Phase I. The completion of the remedial actions was documented in a letter from the EPA to the Army dated July 27, 2009 (EPA, 2009).

Per the Track 2 ROD, any proposal for residential development will be subject to regulatory review. A residential quality assurance process was conducted concurrently at the Parker Flats MRA Phase I and Phase II area and is summarized in Sections 19.1.1, Residential Quality Assurance, and 19.1.3, Parker Flats MRA Phase II. The *Revised Draft Residential Protocol Implementation Technical Report, Parker Flats Munitions Response Area Phase II, Former Fort Ord, Monterey County, California* (ESCA RP Team, 2016) presents the results of the residential quality assurance activities and provides additional documentation to support modifying the existing DTSC CRUPs to remove the residential use restrictions from the designated future residential use portions of the Parker Flats MRA Phase I. Portions of the Parker Flats MRA Phase I have been transferred from FORA to Monterey County and to MPC; however, the areas designated for residential use have not yet been transferred from FORA. A Parker Flats MRA Phase I Explanation of Significant Difference is currently being developed by FORA, and in coordination with the EPA and DTSC, on behalf of the Army, to support removal of the residential use restriction.

13.2.3 System Operations and Maintenance

O&M associated with implementation, inspections, and reporting of the LUCs are the responsibilities of the Army and FORA.

Annual monitoring and reporting was performed by the Army for the Track 2 Parker Flats MRA Parcels F2.6, L2.4.1, and L2.3.

No ground-disturbing or intrusive activities requiring munitions recognition and safety training for workers were conducted within Parcels F2.6, L2.4.1, and L2.3 during the reporting period. No construction monitoring for ground-disturbing or intrusive activities was required. Therefore, no costs associated with these activities have been incurred.

13.2.3.1 ESCA Parker Flats MRA Phase I

The Parker Flats MRA Phase I property has been transferred to MPC, the City of Seaside, and the County of Monterey for non-residential development and/or habitat reserve as identified in the Base Reuse Plan (FORA, 1997) and Track 2 ROD (Army, 2008). The designated uses stated in the Base Reuse Plan (FORA, 1997) and the Track 2 ROD (Army, 2008) include residences, business park/light industrial offices/research and development, and a Veterans Cemetery. The first phase of the CCCVC development, located at 2900 Parker Flats Road, Seaside, California, was completed in September 2016.

The actions stated in the RD/RA LUCI O&M Plan remain applicable to the Parker Flats MRA Phase I area subsequent to FORA transferring the property, until determined by the Army, DTSC, and EPA that one or more of the LUCs is no longer needed. Local jurisdictions will continue to perform annual LUC monitoring and FORA (or its approved successor) will continue to compile and submit the reports to the Army, EPA, and DTSC in compliance with reporting requirements as stated in the RD/RA LUCI O&M Plan.

Annual LUC inspections, including review of records from the local building and planning departments, and review of local 911 records of MEC observations and responses, have been conducted by Monterey County to confirm continued compliance with the LUC objectives. Inspections for fiscal years 2011-2012, 2012-2013, 2013-2014, and 2014-2015 were reported by Monterey County to FORA for Parker Flats MRA Phase I, which includes Parcels E19a.5 and L32.1 and portions of Parcels E18.1.1, E18.1.2, E19a.1, E19a.3, and E19a.4. Annual LUC inspections indicated no compliance issues with regard to the LUC objectives. The results of the annual monitoring activities were reported to the EPA, DTSC, and the Army by FORA (FORA, 2015a, 2015b, and 2015c). The results of monitoring indicate that the land uses in the subject parcels are consistent with the LUCs that were selected in the Track 2 ROD. Actual costs associated with LUC inspections and reporting conducted by Monterey County are not available for comparison.

During the October 2011 through September 2016 reporting period, munitions recognition and safety training was conducted for workers involved in ground-disturbing or intrusive activities within portions of Parcels E18.1.1 and E18.1.2 during development of the CCCVC. A grading/construction permit was issued by the City of Seaside for the CCCVC project and a State approved UXO Construction Support Plan was in place.

FORA prepared an assessment of the probability of encountering additional MEC at the CCCVC site in response to the response to the discovery of a 40mm projectile. The cost for FORA's preparation and submittal of the assessment was approximately $18,500. This cost can be used as a guide for estimating costs of MEC assessments by FORA, if additional incidental MEC is encountered.

13.2.4 Property Transfer

As of September, 30, 2016, a total of 698 acres have been transferred. These acreages partially or wholly occupy seven parcels that are part of the Parker Flats MRA Track 2 ROD. The Parcels E19a.5 and L32.1 and portions of Parcels E18.1.1, E18.1.2, E19a.1, E19a.3, and E19a.4 were transferred by the Army to FORA in May 2009 as part of the ESCA. FORA classifies this area of the Parker Flats MRA as 'Phase I.' Portions of these parcels were subsequently transferred from FORA to MPC, City of Seaside and the County of Monterey.

Parcels L2.3 and L2.4.1 are in the process of being transferred.

Parcel F2.6 will continue to be Army property and will be used for maintenance and support for the Ord Military Community, which is part of the U.S. Army Garrison POM.

13.3 Progress Since the Last Five-Year Review

This section includes the protectiveness determinations and statements from the last Five-Year Review Report, as well as the recommendations from the last Five-Year Review Report, and the current status of those recommendations.

13.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012b) for the Parker Flats MRA stated that:

> "The remedy for the Parker Flats MRA is protective of human health and the environment. All exposure pathways that could result in unacceptable risks are being controlled."

13.3.2 Status of 2012 Five-Year Review Issues and Recommendations

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
For the July 2007 to June 2008 reporting period, some property owners (e.g., Monterey County, Monterey City, MPC) did not report completion of visual site inspections to FORA. DTSC requested that property owners complete visual site inspections as part of their annual reporting.	There were no specific recommendations or follow-up actions.	Not Applicable	Not Applicable	Not Applicable	During the 4th Five-Year Review reporting period, annual LUC inspections required by the MOA have been completed and reported to FORA.

13.4 Parker Flats Munitions Response Area Five-Year Review Process

13.4.1 Document Review

Documents reviewed for this evaluation included, but were not limited to, the MRS Security Program Annual Reports, and Annual Monitoring of Land Use Control Reports. The references are listed in Appendix A.

13.4.2 Data Review

Data from the Land Use Covenant Annual Reports, MRS Security Program Annual Reports, and Annual Monitoring of Land Use Control Reports was reviewed to assess the effectiveness of the remedy. The results indicate that the land uses in the subject parcels are consistent with the land use controls that were selected in the Track 2 Parker Flats MRA ROD.

13.4.3 Site Inspection and Interviews

Site inspections and interviews were not conducted for the Track 2 Parker Flats MRA site because the MRA is inspected annually for compliance with the LUCs.

13.5 Technical Assessment

13.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Parcels F2.6, L2.4.1, and L2.3

Based on the review of the annual reports, the Track 2 Parker Flats MRA remedy is functioning as intended

ESCA Parker Flats MRA Phase I Parcels

For the parcels subject to the ESCA, the current remedy meets the RAOs specified in the ROD.

13.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

Parcels F2.6, L2.4.1, and L2.3

There have been no changes in the assumptions, toxicity data, cleanup levels or RAOs used at the time of the remedy selection for the Track 2 Parker Flats MRA. The primary RAOs for the Track 2 Parker Flats MRA reuse areas remain valid. These RAOs are: (1) to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and (2) "Compliance with ARARs."

ESCA Parker Flats MRA Phase I Parcels

For the parcels subject to the ESCA, the exposure and toxicity criteria used to evaluate human health risks are still valid. Land use assumptions made at the time of the remedy selection continue to be appropriate for the Parker Flats MRA Phase I area; therefore, LUCs included in the remedy selection continue to be effective.

13.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

No new information has been identified that could call the protectiveness of the remedy into question.

13.6 Issues

Parcels F2.6, L2.4.1, and L2.3

There are no unresolved issues in relation to parcels F2.6, L2.3, and L2.4.1 that have been identified in regard to the protectiveness of human health and the environment.

ESCA Parker Flats MRA Phase I Parcels

An issue regarding visual site inspections was identified in the 3rd Five-Year Review Report. For the July 2007 to June 2008 reporting period, some property owners (e g. Monterey County, Monterey City, MPC) did not report completion of visual site inspections to FORA. DTSC requested that property owners complete visual site inspections as part of their annual reporting. During the 4th Five-Year Review reporting period, annual LUC inspections have been completed and reported to FORA by the ESCA property jurisdictions (FORA, 2015a, 2015b, and 2015c).

No new issues affecting the protectiveness of the remedy at Parker Flats MRA Phase I have been identified.

13.7 Recommendations and Follow-Up Actions

Parcels F2.6, L2.4.1, and L2.3

Based on the results of the inspections and monitoring conducted during this review period, as documented in the annual reports, there have been no reports of soil disturbance or intrusive activities due to property development since the last review period. Therefore, there have been no MEC encounters for evaluation to determine whether construction monitoring should be discontinued. The munitions recognition and safety training and construction monitoring program will continue to be implemented, subject to evaluation during future five-year reviews, or as appropriate.

ESCA Parker Flats MRA Phase I Parcels

The LUCs described in the Track 2 ROD will continue to be implemented, subject to evaluation during future five-year reviews, or as appropriate. During the next review period, the Army, in consultation with EPA and

DTSC, should review MEC-related data collected during the property's development to determine whether munitions recognition and safety training and construction monitoring should continue. If further evaluation indicates that the LUCs are no longer necessary, the program may be discontinued with regulatory approval.

13.8 Protectiveness Statement

Protective. The remedy at the Track 2 Parker Flats MRA is protective of human health and the environment.

Remedial actions have been completed at the MRA. Furthermore, protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.

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14.0 INTERIM ACTION SITES MUNITIONS RESPONSE ROD

This section presents background information on the IA Sites MR ROD; provides a summary of the remedial actions; a technical assessment of the actions taken; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. A glossary of MMRP terms is provided in Appendix D.

14.1 Interim Action Sites Munitions Response Background

The *Record of Decision, Interim Action for Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California* (Army, 2002) was signed by EPA in September 2002 and addresses sites where MEC with sensitive fuzes are present on the ground surface in close proximity to residential neighborhoods and schools with a history of trespassing incidents. As the lead agency at the former Fort Ord, the Army concluded in early 2002 that an interim action was appropriate to protect the public from three high-risk MRSs at the former Fort Ord: Ranges 43-48, Range 30A, and MRS-16 (previously referred to as OE-16).

Ranges 43-48 cover approximately 499 acres to the south of Eucalyptus Road in the southcentral portion of the former Fort Ord (Plate 9). The majority of the site (approximately 473 acres) is designated as habitat reserve and will remain undeveloped. A limited portion of the site (approximately 25 acres) is designated for development. Vegetation at Ranges 43-48 consists mainly of Central Maritime Chaparral (CMC) with some grassland areas.

MRS-16 includes approximately 80 acres of undeveloped land located immediately north of the former Fort Ord Impact Area, between Eucalyptus Road and Parker Flats Road and bounded by Watkins Gate Road to the east. MRS-16 is approximately one mile from a residential neighborhood (Fitch Park) on the former Fort Ord, adjacent to the Impact Area MRA and land that has been transferred to BLM. The immediately adjacent BLM land is open to the public for activities such as hiking, biking, jogging, and horseback riding. MRS-16 is a World War II (WWII)-era rocket range, and is identified as a "bazooka practice" area on Fort Ord Training Facilities maps dating from 1945 and 1946. MRS-16 is primarily left in its natural state, and support facilities associated with training that occurred at the site (e.g. access roads, observation towers, targets, trenches, bunkers, etc.) have been removed. Prior to the IA, MRS-16 was enclosed by a 6-foot-high chain link fence and was posted with signs warning of the dangers associated with unexploded ordnance, and access was restricted to authorized personnel only. As a result of completion of the IA in 2009, the boundary fence around MRS-16 was removed. For administrative purposes, the boundaries for MRS-16 were established in the IA Sites MR ROD (Army, 2002) at existing paved roads, when present.

Range 30A includes approximately 388 acres located in the southeastern portion of the Impact Area MRA, approximately 1,500 feet north of South Boundary Road and to the west of Barloy Canyon Road. Range 30A was identified as an IA site based on the presence of 40mm HE projectiles. Its future reuse is designated as habitat reserve. Range 30A is categorized as a firing range where personnel were trained in the use of live ammunition. The MRA is fenced and posted with signs warning of the dangers associated with MEC.

14.2 Remedial Actions

The interim RAOs for Ranges 43-48, MRS-16, and Range 30A are to reduce risks to human health and the environment associated with ordnance and explosives and to comply with the ARARs.

14.2.1 Remedy Selection

Remedial alternatives were evaluated in the *Final Interim Action OE RI/FS for Ranges 43-48, Range 30A, Site OE-16* (Harding ESE, 2002). The rationale for the selected remedies are documented in the *Record of Decision, Interim Action for Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California* (Army, 2002). The selected remedies for the IA sites are: (1) vegetation clearance via prescribed burning, (2) MEC remedial action via surface and subsurface MEC removal, and (3) detonation of MEC with engineering controls. A three-tiered approach was used to evaluate the following alternatives for each remedial action:

Vegetation Clearance Alternatives

- No Action (as required by CERCLA as a baseline for comparison).
- Prescribed burning.
- Mechanical cutting methods.
- Manual cutting methods.

MEC Remedial Action Alternatives

- No Action with existing site security measures (as required by CERCLA as a baseline for comparison).
- Enhanced site security measures.
- Surface and subsurface MEC removal.

MEC Detonation Alternatives

- No Action (as required by CERCLA as a baseline for comparison).
- Detonation with engineering controls.
- Detonation chamber and detonation with engineering controls.

Selected Remedies

The IA MR ROD selected prescribed burning, surface and subsurface MEC removal, and detonation with engineering controls as the interim remedy for each of the IA sites. The selected remedy is described below.

Prescribed burning will include:

- Preparation of a prescribed burn plan outlining the objectives of the prescribed burn; the prescribed burn area; the range of environmental conditions under which the prescribed burn will be conducted; the manpower and equipment resources required to ignite, manage, and contain the fire; a smoke management plan; and establishment of communication procedures for the fire crew and to the public and other affected agencies.
- Site preparation, including removal of debris; establishment and maintenance of primary, secondary, and tertiary containment lines, staging areas, and escape routes; and protection of existing structures by removing nearby vegetation and applying fire suppressant foam or demolishing and removing the structures.
- Conducting the prescribed burn within the window of environmental conditions established in the prescribed burn plan.
- Conducting the prescribed burn in a manner to ensure the fire is fully contained and does not escape the perimeter of the prescribed burn area.
- Offering voluntary temporary relocation for any Monterey County resident who wishes to relocate during a prescribed burn.

- Conducting air monitoring during the prescribed burns; data will be used to further evaluate the effectiveness of prescribed burning as a vegetation clearance alternative.

Surface and subsurface MEC removal will consist of identification of MEC (by conducting a visual search and operating detection equipment), and remediation of any MEC found/detected on the ground surface of the site and in the subsurface to depths determined in the site-specific work plan. Subsurface MEC removal depths will be determined based on: (1) the type of MEC, (2) the typical depth at which the MEC type is found, (3) planned reuse of specific areas within the IA site, and (4) the capabilities of the geophysical detection equipment selected as best suited for site conditions by the MEC site geophysicist.

MEC detonation with engineering controls will consist of applying additional detonating charges to single or consolidated MEC items, and applying engineering controls (covering the MEC with tamped dirt, sandbags, contained water, or other materials) prior to detonation to reduce the blast and any associated fragmentation, emissions, or noise.

14.2.2 Remedy Implementation

Ranges 43-48

A prescribed burn at MRS-Ranges 43-48 was scheduled for November 2002, but was postponed due to unfavorable weather conditions. In October 2003, the required meteorological and fire conditions materialized and the prescribed burn was conducted. The prescribed burn cleared most of the maritime chaparral vegetation covering the site, revealing thousands of MEC items previously hidden by the thick brush. The prescribed burn also jumped the primary containment line and burned approximately 1,000 additional acres south and southwest of Ranges 43-48, referred to as the Watkins Gate Burn Area.

In accordance with the IA MR ROD, surface and subsurface removal were conducted on the approximately 500-acre Ranges 43-48 site from November 2003 to December 2005. Surface removal was completed over the entire site. Subsurface removal was conducted to the maximum capability of the technologies and instruments used over those portions of the site that could be completed within the environmental, funding, and time constraints of the contract.

The subsurface MEC remediation was not completed in approximately 228 acres of MRS Ranges 43-48. Ranges 44, 47, and 48 include the majority of the Special Case Areas (SCAs). These ranges were designated as SCAs because heavy metallic debris left over from training activities prevented the Schonstedt magnetometers from detecting individual anomalies, which potentially represent MEC in the subsurface. Removing the metallic clutter to complete the subsurface MEC removal would require an intensive effort such as scraping and sifting, and exceeded the time and funding available to the contract at that time. Working with the constraints, completion of subsurface remediation was prioritized in portions of the site in a manner that best enhanced public and personnel safety and land reuse. Lower priority areas where subsurface remediation was not completed were designated as non-completed areas (NCAs). Designated SCAs and NCAs within Ranges 43-48 are described in detail in the *Final MRS Ranges 43-48 Interim Action Technical Information Paper, Former Fort Ord, California* (Parsons, 2007).

The southern portion of MRS-Ranges 43-48, including some of the SCAs and NCAs, was included within the boundaries of the Impact Area MRA. The evaluation of remedial alternatives in the Track 3 Impact Area MRA RI/FS doubles as the follow-on evaluation of this portion of the Ranges 43-48 Interim Action site. The final remedy selected in the Track 3 ROD is consistent with objectives of the interim actions taken at the Ranges 43-48 site. Therefore, the remedy selected in the Track 3 ROD (Army, 2008) also serves as the final remedy for the southern portion of Ranges 43-48. The selected remedy is addressed under the Track 3 ROD for implementation (see Section 15).

The northern portion of MRS-Ranges-43-48 interim action site was transferred to FORA as part of the ESCA. See Section 14.2.2.1 and Plate 9.

Range 30A

An interim remedial action to address MEC at Range 30A was addressed in the IA MR Sites ROD (Army, 2002). However, the interim remedial action was not conducted at this site. The site contains and is surrounded by areas of healthy CMC vegetation that is highly flammable and has not been burned. The implementation of the IA in Range 30A was suspended due to the high wildfire risk associated with prescribed burning in this part of the Impact Area MRA. Under the IA program, the site would be surrounded by a 45-foot primary fuel break and burned in one large prescribed burn. Drawing from the lessons learned from the prescribed burn conducted for Ranges 43-48, the Army determined that remedial actions in the vicinity of Range 30A in the Impact Area MRA should be sequenced so that the area between Range 30A and the Base boundary is burned and cleaned up first, thus creating a larger fuel break in the process, before action is initiated in Range 30A. The final remedy for Range 30A was evaluated as part of the Track 3 MR RI/FS. The remedy selected in the Track 3 ROD (Army, 2008), as described in Section 15, provides for MEC removal to depth in selected areas, including areas of high-density metallic clutter associated with military munitions with sensitive fuzes–a type of area specifically suspected to exist in Range 30A. Therefore, the selected final remedy is consistent with the objectives of the IA Sites MR ROD.

MRS-16

In October 2006, a prescribed burn was conducted at MRS-16 as part of the IA MR ROD selected remedy to protect the public from the threat posed by the MEC known to exist on the site. The prescribed burn was performed to remove vegetation to provide a safer environment for conducting MEC removal, for habitat management, and for fire fuel reduction (*Draft Final Prescribed Burn 2006, MRS-16 After Action Report, Former Fort Ord, Monterey County, California* [POM Fire Department, 2007]).

Following the prescribed burn, MEC remedial action was completed on approximately 80 acres of MRS-16. The work was performed in accordance with the *Final Work Plan, MRS-16 Munitions and Explosives of Concern Removal, Former Fort Ord, California* (Final Work Plan; Shaw, 2006), and with the IA Sites MR ROD (Army, 2002).

During the course of MEC removal operations at MRS-16, an area exhibiting very high density of subsurface anomalies was delineated from DGM results. This area consists of 24 grids equating to approximately 5.4 acres. Subsurface removal was not completed in the 24 grids identified from DGM as high density or "saturated" areas. For this area, MEC may remain below the surface and it is possible that a receptor could encounter an MEC item. Following the completion of the IA at MRS-16, post-removal exposure risk to receptors was evaluated. Based on the evaluation, it is considered that MEC are likely to be present in the subsurface of the "saturated area." Some of the MEC likely to be recovered in the "saturated area" are considered to be sensitive. A two-strand barbed wire fence has been constructed around the "saturated area" along existing roads for convenience and government property signs have been placed. The purpose of this fence is to delineate the area in which subsurface removal was not completed. Any intrusive activities within the "saturated area" should be accompanied by UXO support. The requirement for UXO support during intrusive activities has been coordinated with BLM and the regulatory agencies (Shaw, 2009).

In the remaining areas of MRS-16 (the majority of the site), surface and subsurface MEC remediation is complete, and the perimeter 6-foot chain-link fence has been removed, as described in the *Final MRS-16 Munitions and Explosives of Concern Remedial Action Report, Former Fort Ord, California* (Shaw, 2009).

To complete the CERCLA process, the Army evaluated remedial alternatives to address the potential residual risks present in MRS-16 in the *Final, Revision 2, Track 2 Munitions Response Remedial Investigation/Feasibility Study, BLM Area B and MRS-16, Former Fort Ord, California* (Gilbane, 2015) and

documented the remediation decision in the *Final Record of Decision, Track 2, Bureau of Land Management Area B and Munitions Response Site 16* (Army, 2017). See Section 18.

14.2.2.1 ESCA Interim Action Ranges MRA

The ESCA IA Ranges MRA is located within the northern portion of MRS-Ranges 43-48. In 2009, a 40mm HE projectile was found on the ground surface in the Range 47 SCA by FORA during site reconnaissance. In addition, the Army found a 40mm HE projectile in the Range 44 SCA in 2010 during a soil remediation project. The discovery of these 40mm projectiles indicated a potential for sensitively-fuzed munitions to remain within the Range 44 and Range 47 SCAs on MRS-Ranges 43-48. Therefore, the IA Ranges MRA was evaluated for additional interim actions necessary to meet the objectives of the IA Sites MR ROD (Army, 2002) and support a final remedial action decision for the area.

A Design Study and resulting additional remedial actions, referred to by FORA as the "Phase II Interim Action," at the IA Ranges MRA have been completed and results are presented in the *Final Interim Action Ranges MRA Interim Remedial Action Completion Report* (ESCA RP Team, 2015a). Design Study and Phase II Interim Action activities were performed in accordance with the *Phase II Interim Action Work Plan, Interim Action Ranges Munitions Response Area, Former Fort Ord, Monterey County, California* (Phase II Interim Action Work Plan; ESCA RP Team, 2011) and associated field variance forms. The activities completed during the Design Study and Phase II Interim Action began in February 2011 and were completed in March 2013. Approximately 36 acres of SCAs and approximately 9 acres of NCAs within MRS-Ranges 43-48 are located within the boundaries of the IA Ranges MRA. FORA completed the Design Study in Range 44 SCA, Range 47 SCA, and Central Area NCAs, and the interim remedial action in Range 47 SCA. Two additional SCAs (Range 45 Trench SCA and a small portion of the Fenceline SCA) are also located within the IA Ranges MRA; however, these areas were not included in the Phase II Interim Action completed by FORA. To facilitate completion of the Design Study, the Range 44 SCA and Central Area NCAs were divided into northern and southern portions referred to by FORA as "Range 44 SCA (North)" and "Range 44 SCA (South) and Central Area NCAs". Additionally, one grid of the Central Area NCAs located adjacent to Range 47 SCA was combined with the Range 47 SCA.

The activities performed during the Design Study and Phase II Interim Action at the IA Ranges MRA are summarized below.

Range 44 SCA (North)

A Design Study, as described in the *Phase II Interim Action Work Plan* and associated field variance forms (ESCA RP Team, 2011), was completed for Range 44 SCA (North). The decision regarding the extent and approach for conducting the Design Study was made in consultation with the EPA, DTSC, and the Army. The Design Study included an analog-assisted near-surface investigation of transects in the northern portion of Range 44 SCA. No sensitively-fuzed MEC were recovered during the analog-assisted near-surface investigation. A digital geophysical mapping (DGM) survey and target investigation was conducted in the transects resulting in recovery of MD items associated with a sensitively-fuzed munitions. The extent of the subsurface sensitively-fuzed munitions could not be determined without collection of additional data; therefore, DGM survey activities were expanded to include the remainder of the northern portion of Range 44 SCA (excluding the HA-44 Remediation Area). The expanded survey activities are referred to by FORA as the "Design Study Expansion."

Design Study Expansion activities included an analog-assisted near-surface investigation followed by a DGM survey and target investigation conducted in Range 44 SCA (North). Eight areas where the soil contained a high density of small metallic debris were excavated and sifted. Items (MEC and MD) recovered during soil sift operations in the Design Study Expansion area were related to sensitively-fuzed munitions. One sensitively-fuzed MEC item (projectile, 40mm, practice, M407A1) was found. A second DGM survey and

target investigation was conducted in the northernmost grids because of the high density of anomalies remaining and evidence of use of sensitively-fuzed munitions. The DGM survey and target investigation in the southernmost grids did not show evidence for sensitively-fuzed munitions. Based on professional judgment and data collected during the Design Study Expansion, target investigation results were sufficient to determine that there is no evidence of sensitively-fuzed munitions target areas within the southernmost grids.

Following the second DGM survey and target investigation, a transect verification DGM survey and target investigation was performed to determine if additional DGM surveys and target investigations were necessary. The survey was performed over approximately 16 percent of Range 44 SCA (North). The transect verification DGM survey and target investigation resulted in no evidence for sensitively-fuzed items to remain in Range 44 SCA (North); however, a single non-sensitively-fuzed MEC item was recovered in an area that had a high density of anomalies remaining following the two DGM surveys and target investigations. Therefore, a final verification DGM survey was conducted in Range 44 SCA (North) where the single non-sensitively-fuzed MEC item was recovered. No sensitively-fuzed MEC were recovered during the final verification DGM survey. The results of the DGM surveys, target investigation, soil sifting, and verification DGM survey investigation conducted during the Design Study Expansion activities indicated a lack of evidence for intact sensitively-fuzed MEC to remain in Range 44 SCA (North).

Range 44 SCA (South) and Central Area NCAs

As reported in the 3rd Five-Year Review Report, a Design Study was completed, in accordance with the *Phase II Interim Action Work Plan* and associated field variance forms (ESCA RP Team, 2011), in July 2011 for Range 44 SCA (South) and Central Area NCAs. Due to the lack of evidence for sensitively-fuzed items to remain in the southern portion of the Range 44 SCA and Central Area NCAs, completion of the interim remedial action was not warranted for these areas.

Range 47 SCA

A Design Study, as described in the *Phase II Interim Action Work Plan* and associated field variance forms (ESCA RP Team, 2011), was completed for the Range 47 SCA. The results of the Design Study indicated that an interim remedial action was necessary. The decision regarding the extent and approach for conducting an interim remedial action was made in consultation with the EPA, DTSC, and the Army. The Phase II Interim Action, which began in October 2011 and was completed in September 2012, has been conducted in accordance with the procedures described in the *Phase II Interim Action Work Plan* and associated field variance forms (ESCA RP Team, 2011). The interim remedial action for the Range 47 SCA included excavation and sifting of approximately 37,000 cy of soil and a DGM survey and target investigation across the entire Range 47 SCA with the exception of a sloped escarpment, which was not accessible with DGM equipment. The interim remedial action for the sloped escarpment included an analog survey and anomaly investigation. As part of a quality control corrective action, soil excavation and soil sifting was performed in verification polygons in Range 47 SCA. Following soil excavation and sifting of the verification survey polygons, a verification DGM survey and target investigation was performed over the Range 47 SCA, with the exception of the sloped escarpment, to complete the corrective action and the interim remedial action.

Habitat Restoration

FORA performed habitat restoration activities in the habitat parcels affected by interim action activities between October 2012 and December 2015. The *Final Phase II Interim Action Work Plan Addendum, Habitat Restoration Plan, Interim Action Ranges Munitions Response Area. Former Fort Ord, California* (Habitat Restoration Plan; ESCA RP Team, 2013) was prepared to describe the activities to be undertaken to restore the natural resources in habitat parcels that were affected by the MEC remedial activities. The Habitat Restoration Plan includes restoration requirements outlined in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (USACE, 1997) and in Biological Opinions (USFWS, 1999, 2002, 2005, 2007, and 2015) issued by U.S. Fish and Wildlife Service.

Construction and implementation of the restoration areas has been completed and restoration systems are in place, operational and functioning. Operation and maintenance to support the long-term success of restoration at the site is being implemented through a post-installation adaptive management process to evaluate and manage the restoration areas as described in the Habitat Restoration Plan (ESCA RP Team, 2013). All habitat restoration performance criteria have been met in the Range 47 SCA; however, weed mitigation will continue until determined to be no longer necessary. Areas requiring ongoing monitoring until performance targets are met include North Range 44 small-scale excavation areas and South Range 44 (vegetation cutting and small-scale excavation areas) for percent native vegetation coverage only. Habitat monitoring will continue in these areas until 7-year prescribed performance criteria are met (ESCA RP Team, 2016).

Focused Feasibility Study and Preferred Alternative

The results and findings from the Design Study and Phase II Interim Action were included in the *Final Focused Feasibility Study, Interim Action Ranges Munitions Response Area* (IA Ranges MRA FFS; ESCA RP Team, 2015b) to support the final remedial action decision-making process, in accordance with CERCLA. The IA Ranges MRA FFS has been used in the development of the *Superfund Proposed Plan: Remedial Action is Proposed for Interim Action Ranges Munitions Response Area, Focused Feasibility Study, Former Fort Ord, Monterey County, California,* issued in March 2016 (Army, 2016). A 30-day public comment period for the Proposed Plan was held from March 16, 2016, to April 14, 2016.

The following three remedial alternatives were evaluated in the IA Ranges MRA FFS to mitigate and manage risks from MEC that could still be present in the IA Ranges MRA.

- Alternative 1: No Further Action
- Alternative 2: Land Use Controls
- Alternative 3: Addition Subsurface MEC Remediation

Alternative 2, Land Use Controls, was identified as the preferred alternative in the IA Ranges MRA FFS. This alternative assumes that LUCs without additional MEC remediation on any portion of the IA Ranges MRA would be implemented to address potential MEC risks for intrusive reuse. The LUCs include requirements for: (1) munitions recognition and safety training for people that will conduct ground-disturbing or intrusive activities, (2) construction support for ground-disturbing or intrusive activities to address MEC that potentially remains in the subsurface, and (3) restrictions prohibiting residential use.

Based on the IA Ranges MRA FFS, and the associated Proposed Plan, the *Record of Decision, Interim Action Ranges Munitions Response Area, Former Fort Ord, California* (Army, 2017) was signed on January 18, 2017. Implementation of the selected LUC remedy will be further described in a LUC Implementation Plan (LUCIP) O&M Plan that will be developed by FORA under the ESCA.

14.2.3 System Operations and Maintenance

No annual post-remediation O&M costs have been incurred. The southern portion of MRS-Ranges 43-48 and Range 30A are now part of the Track 3 Impact Area MRA where remedial action is underway, as discussed in Section 15. The MRS-16 remedy does not include any operating systems that require a formal O&M plan and selection of the final remedy is pending (see Section 18).

14.2.3.1 ESCA Interim Action Ranges MRA

During the review period, the IA Ranges MRA was under an interim ROD. Due to the presence of SCAs and NCAs, site security measures (fences, signs, perimeter controls, etc.) in place at MRS-Ranges 43-48 provide

continuing protection until such time that the implementation of the final remedy under the IA Ranges MRA ROD, or subsequent property transfer, modifies site security requirements.

Seven MEC incidents were reported for the IA Ranges MRA during the October 2011 through September 2016 reporting period and are summarized below.

- March 10, 2014 – During erosion monitoring, an ESCA habitat worker reported nine 40mm casings in Range 45. An ESCA UXO Technician responded and determined the items to be expended 40mm, grenade casings, model unknown MD. The items were disposed as MD for recycle.
- July 10, 2014 – During vegetation monitoring, an ESCA habitat worker reported a rocket motor in HA-44. A USACE MEC safety specialist responded and determined the item to be a triethylaluminum rocket, expended. The item was disposed as MD for recycle.
- December 12, 2014 – During erosion monitoring, an ESCA habitat worker reported multiple 40mm items in Range 45. An ESCA UXO Technician responded and determined the items to be 21 40mm, projectile, practice M407A1 MD and four 40mm, cartridge case, practice M407A1 MD (empty casing projectile removed). The items were disposed as MD for recycle.
- December 1, 2015 – During erosion monitoring, an ESCA habitat worker reported multiple 40mm items in Range 45. An ESCA UXO Technician responded and determined the items to be 10 40mm, cartridge case, practice M407A1 MD and one 40mm, projectile, model unknown, ogive MD. The items were placed in ESCA RP MD storage and will be disposed for recycle.
- December 15, 2015 – During erosion monitoring, an ESCA UXO Technician reported, identified, and recovered one 40mm, cartridge case, M407A1 MD in Range 45. The item was placed in ESCA RP MD storage and will be disposed for recycle.
- January 7, 2016 – During erosion monitoring, an ESCA habitat worker reported multiple 40mm items in Range 45. An ESCA UXO Technician responded and determined the items to be eight 40mm, cartridge case, practice M407A1 MD. The items were placed in ESCA RP MD storage and will be disposed for recycle.
- January 12, 2016 – During erosion monitoring, an ESCA UXO Technician reported and identified one 35mm, rocket, subcaliber, practice M73 MEC in Range 45. FORA and local law enforcement were contacted to address the MEC item. The item was countercharged in place and rendered safe on February 8, 2016, by the Monterey County Sheriff.

All reported MEC incidents were initiated using the appropriate reporting systems and the items were disposed of in accordance with explosives safety standards and MRS Security Program guidance.

During the October 2011 through September 2016 reporting period, munitions recognition and safety training was conducted for workers involved in ground-disturbing or intrusive activities during habitat restoration activities at the IA Ranges MRA. No ground-disturbing activities other than those related to the Design Study and Phase II Interim Action were conducted at the MRA.

14.2.4 Property Transfer

As of September, 30, 2016, a total of 227 acres have been transferred. These acreages wholly occupy five parcels that comprise the IA Ranges MRA. Parcels E38 through E42 were transferred by the Army to FORA in 2009 as part of the ESCA.

The southern portion of MRS-Ranges 43-48 and Range 30A was included in the Impact Area MRA Track 3 ROD (Section 15). A final ROD for MRS-16 is in progress (Section 18). The underlying properties are currently identified to transfer to BLM when all remedial actions are completed.

14.3 Progress Since the Last Five-Year Review

This section includes the protectiveness determinations and statements from the last Five-Year Review Report, as well as the recommendations from the last Five-Year Review Report, and the current status of those recommendations.

14.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012) for the IA MRSs stated:

> "The IA MR Sites remedy is expected to be protective of human health and the environment upon completion. In the interim, potential exposure pathways that could result in unacceptable risks are being controlled."

14.3.2 Status of 2012 Five-Year Review Issues and Recommendations

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
A final ROD is still needed for MRS-16 to complete the CERCLA process.	Complete and sign a final ROD for MRS-16 following the CERCLA process.	Army	12/31/15	RI/FS complete; ROD signed; See Section 18	May 2017
For the northern portion of Ranges 43-48, MEC remediation has not been completed at this time.	Complete and sign a final ROD for the ESCA IA Ranges MRA following the CERCLA process.	Army and FORA in accordance with the ESCA, AOC, and FFA Amendment No. 1	12/31/14	ROD signed	January 2017

14.4 Interim Action Sites Munitions Response Five-Year Review Process

14.4.1 Document Review

Documents reviewed in this evaluation are listed in Appendix A and include, but are not limited to, the following: the IA Sites RI/FS (Harding ESE, 2002), the IA Sites MR ROD (Army, 2002), the MRS-Ranges 43-48 IA Technical Information Paper (Parsons, 2004 and 2007), the Track 3 ROD (Army, 2008), the MRS-16 MEC Removal Work Plan, (Shaw, 2006), the MRS-16 MEC Remedial Action Completion Report (Shaw, 2009), the Phase II Interim Action Work Plan (ESCA RP Team, 2011), its addendum, and associated field variance forms.

14.4.2 Data Review

Data from the RI/FS Report, RODs, and other documents listed in Appendix A were reviewed to assess the effectiveness of the remedy at the IA Sites.

14.4.3 Site Inspection and Interviews

A site inspection was conducted at MRS-16 on August 26, 2016 to assess the effectiveness of the access management measures in place for the short term. The site was observed to be in good condition. There is a

fence within MRS-16 consisting of two strands of barbed wire. The fence is not specifically designed to address trespassing; it is intended to provide delineation for BLM regarding intrusive activities within the fenced area and to prevent any inadvertent occurrence of intrusive activities without pre-coordination with the Army.

The Site Inspection Documentation and photographs are presented in Appendix B.

14.5 Technical Assessment

The Technical Assessment for MRS-16 follows.

14.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

MRS-16

Yes. The completed interim remedial action addressed the imminent risk from MEC at MRS-16. To complete the CERCLA process the Army evaluated remedial alternatives to address the potential residual risks. A final ROD was signed on May 3, 2017.

ESCA Interim Action Ranges

The remedial action selected in the IA Sites MR ROD included surface and subsurface MEC removal for the area of the IA Ranges MRA. Implementation of the interim remedial actions has been completed. A Proposed Plan identifying a preferred remedial alternative of LUCs without additional MEC remediation was issued in support of a final remedial action decision for the MRA. A final ROD for the ESCA IA Ranges MRA was signed on January 18, 2017. The selected remedy will provide protection for human health and the environment through implementation of LUCs to mitigate the risk from MEC that potentially remains present in the IA Ranges MRA.

14.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

As noted in Section 14.2, the interim RAOs for Ranges 43-48, MRS-16, and Range 30A are to reduce risks to human health and the environment associated with ordnance and explosives and to comply with the ARARs.

MRS-16

There have been no changes in the assumptions, toxicity data, cleanup levels, or RAOs.

ESCA Interim Action Ranges

For the IA Ranges MRA, the exposure and toxicity criteria used to evaluate human health risks for the IA Sites MR ROD are still valid. Land use assumptions made at the time of the remedy selection continue to be appropriate. A Design Study and Phase II Interim Action have been completed to meet the RAOs stated in the IA Sites MR ROD. To support the final remedial action decision-making process for the MRA, the results of the interim remedial actions were included in the IA Ranges MRA FFS (ESCA RP Team, 2015b). A final ROD for the ESCA IA Ranges MRA was signed on January 18, 2017.

14.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

MRS-16

No new information has been identified that could call the short term protectiveness of the interim remedy into question.

ESCA Interim Action Ranges

No new information has been identified that could call into question the protectiveness of the interim remedy. A final ROD for the ESCA IA Ranges MRA was signed on January 18, 2017.

14.6 Issues

There are no issues affecting the protectiveness of the IA Sites MR ROD remedy.

14.7 Recommendations and Follow-Up Actions

No recommendations or follow-up actions are needed for the IA Sites for this Five-Year Review. A final remedy has been selected for Ranges 43-48 South and Range 30A in the Track 3 ROD (see Section 15) and for MRS-16 in the final ROD for BLM Area B and MRS-16 (see Section 18).

Recommendations and Follow-Up Actions for the ESCA IA Ranges MRA are to implement the final remedies. The ROD for the ESCA IA Ranges MRA was signed on January 18, 2017 (Army 2017b).

Recommendation/Follow-up Actions	*Implementing Party*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness? (Y/N)*	
				Current	*Future*
Complete RD/RA, LUCIP/OMP, or similar document for the IA Ranges MRA, following the CERCLA process	FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	September 2017	Y	Y

14.8 Protectiveness Statement

Protective. The remedy for the IA MRSs is protective of human health and the environment. The selection of final remedies for the three Interim Action sites, Ranges 43-48, Range 30A, and MRS-16, has completed the interim action program under the 2002 IA Sites MR ROD. The Interim Action MR Sites will not be reviewed again in future Five-Year Reviews.

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15.0 IMPACT AREA MUNITIONS RESPONSE AREA, TRACK 3 ROD

This section presents background information on the Impact Area MRA, Track 3 MRA ROD; provides a summary of remedial actions; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. A glossary of MMRP terms is provided in Appendix D.

15.1 Impact Area Munitions Response Area Background

The Impact Area MRA is a Track 3 site. Track 3 includes areas at the former Fort Ord where MEC is known or suspected to be present, but MEC investigations have not yet been completed at the time the MR RI/FS program was initiated. The Impact Area MRA contains all of MRS-BLM and the southern portion of MRS-Ranges 43-48 (Range 30A is part of MRS-BLM). The Impact Area MRA consists of the 6,560-acre portion of the 8,000-acre historical Impact Area that is entirely within the natural resources management area described in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (USACE, 1997) and is designated as a habitat reserve in FORA Base Reuse Plan. The historical Impact Area is an area bounded by Eucalyptus Road to the north, General Jim Moore Boulevard to the west, South Boundary Road to the south, and Barloy Canyon Road to the east. Residential and commercial properties are located within one mile of the Impact Area MRA (Plate 9).

Former land use included live-fire training with military munitions. Multiple firing ranges operated within the historical Impact Area, and weapon firing generally was directed toward the center of the historical Impact Area. Training activities at the Impact Area MRA ceased after the closure of Fort Ord in 1994. Over the years, munitions used during training activities within the Impact Area MRA included hand grenades, mortars, rockets, mines, artillery projectiles, and small arms.

The Impact Area MRA is currently identified for transfer to the BLM and is to be managed as a "habitat reserve" by BLM in the future. The Impact Area MRA is covered by dense vegetation, and the dominant plant community is CMC. This plant community is host to several threatened or endangered species and many other rare species identified by the State of California and federal government.

The Impact Area MRA is fenced, warning signs are posted, and access is controlled by the Army. The perimeter of the historical Impact Area is patrolled to detect and prevent trespassing.

The Impact Area MRA is currently undeveloped. While the remedial action is ongoing, habitat management activities such as invasive weed and erosion control are implemented on a routine basis. Other activities include ecological monitoring, such as plant and animal studies. These activities are conducted under the supervision of the Army and require specific training and may require UXO escort. No accidents involving MEC have occurred during these ongoing activities.

Based on the data collected during previous investigations, MEC is known or suspected to be present. Therefore, there is a potential for a future land user (e.g., habitat monitor, habitat worker, or visitor) to encounter MEC at the Impact Area MRA. Accordingly, the Army conducted the Impact Area MRA RI/FS (MACTEC, 2007), which evaluated remedial alternatives to address the potential risk from MEC at the Impact Area MRA to future land users. The Track 3 ROD (Army, 2008) was signed in 2008 and remedy implementation is underway.

The Impact Area MRA evaluated in the Track 3 MR RI/FS Report includes two areas previously evaluated in the Interim Action program: the southern portion of MRS-Ranges 43-48 and Range 30A. The 2002 IA Sites

MR ROD is described in Section 14. The Track 3 Impact Area MRA ROD, described herein, is the final ROD for both the southern portion of MRS-Ranges 43-48 and Range 30A.

15.2 Remedial Actions

The Track 3 Impact Area MRA ROD was signed in April 2008. The primary RAOs for the Impact Area MRA, based on EPA RI/FS Guidance (EPA, 1988), are to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs."

15.2.1 Remedy Selection

The selected remedy addresses the explosives safety risks posed by the presence of MEC at the Impact Area MRA. Based on many years of site experience, the presence of MEC in the Impact Area MRA does not appear to be a concern in terms of explosive safety risks to ecological receptors. Potential human health and ecological risks related to any soil contamination from small arms and military munitions ranges are being addressed under the *Comprehensive Basewide Range Assessment Report, Revision 2* (Shaw, 2012) program and the Site 39 ROD amendment, as further described in Section 7.3.

The Army evaluated four remedial alternatives described below that could potentially mitigate and manage risks from any MEC that could still be present in the Impact Area MRA.

- Alternative 1: No Further Action
- Alternative 2: Technology-aided Surface MEC Remediation and Land Use Controls
- Alternative 3: Subsurface MEC Remediation and Land Use Controls
- Alternative 4: Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls.

The Track 3 Impact Area MRA ROD selected Alternative 4 as the final remedy to address MEC risks at the portion of the historical Impact Area that is currently designated for transfer to BLM as Habitat Reserve in the *Fort Ord Base Reuse Plan* (FORA, 1997), as well as the HMP (USACE, 1997). The planned response action for this MRA will be the final remedy for protection of human health and the environment regarding explosive safety risks posed by MEC.

The selected remedy - Technology-Aided Surface MEC Remediation, Subsurface MEC Remediation in Selected Areas, and LUCs - includes the components listed below.

- Planned prescribed burning in a series of small burns to clear vegetation and provide access to conduct MEC removals, up to 800 acres per year.
- Technology-aided surface removal throughout the entire Impact Area MRA.
- Subsurface removal in selected areas. These areas include: (1) regularly maintained fuel breaks and access roads essential to habitat management activities; (2) a 100-foot-wide (minimum) safety buffer area along the habitat side of the development border of the Impact Area MRA that will act as an additional safety zone for subsurface activity and enhance firefighters' ability to fight wildfires from the border-buffer area; and (3) in other limited areas that may require subsurface removal for specific purposes to support the reuse (e.g., proposed future landowner habitat restoration areas).
- Digital mapping to provide a record of remaining anomalies and to assist future property users in identifying areas with specific MEC safety support requirements (e.g., on-site construction support) for ground-disturbing or intrusive activities.

- Implementation of LUCs: munitions recognition and safety training; construction support for ground-disturbing or intrusive activities and UXO-qualified personnel support; access management measures including regular security patrols and maintaining a perimeter fence (a four-strand barbed wire fence with concertina wire in some portions) and signs; helicopter support for select future habitat management prescribed burns; weed abatement support; land use restrictions, including the prohibition of unrestricted land use.
- Post-remediation habitat monitoring within the areas of subsurface removal or other disturbances (e.g., mechanical clearance of vegetation) to collect data on species and habitats described in the HMP (USACE, 1997), and to perform mapping, data management and evaluation, and reporting; and habitat restoration as needed.

At the completion of the remedial action, including the initial implementation of LUCs, the following long-term management measures will be implemented: a land transfer document that outlines any land use restrictions, such as prohibition of unrestricted land use; annual monitoring and reporting; and five-year review reporting required under CERCLA.

The HMP allows a maximum of 800 acres to be burned per year within habitat reserve containing CMC and contiguous areas must not exceed 400 acres unless approved by the USFWS. In order to accomplish the remedial action, the Impact Area MRA has been segmented into units based on existing fuel breaks and roads.

Site-specific work plans will be developed for each phase of the work in units or groups of units and they will outline planned vegetation clearance methods (e.g., prescribed burning), surface and subsurface removal methodologies, and habitat monitoring protocols. In accordance with the *Army Memorandum for Record - Minor Change to the Selected Remedy, Fort Ord Track 3 Impact Area MRA* (Army, 2011), in locations where prescribed burning is too difficult to implement (i.e., where conditions preclude the Army's ability to conduct a safe prescribed burn), the vegetation will be cut. The subsurface remediation areas are identified and confirmed during the development of RAWP and the technical memorandum following the completion of surface removal and DGM in the units.

The property will not be transferred until all MEC remedial actions have been completed.

The remedial action within the Impact Area MRA is expected to take several years. Prior to property transfer and during the implementation of the remedial action, the Army will provide munitions recognition and safety training as needed; UXO-qualified personnel support for intrusive work or escort as needed; and site security and access management (maintain gates, fences, and signs). These activities will be reported to the regulatory agencies as part of the MRS Security Program annual reports.

At the completion of the remedial action, the Army will evaluate the work completed to date against planned reuse activities and the suitability of the selected LUCs. The Army, in coordination with the future landowner and the regulatory agencies, will develop a detailed LUC implementation plan that will be available at the time the property is to be transferred.

LUCs will be maintained until EPA and DTSC concur that, from an explosives safety perspective, the site is protective of human health and the environment regarding explosives safety risks posed by MEC. This decision will be based on:

1) Post-remediation site evaluation incorporating new information (e.g., geophysical mapping); and/or
2) Where clearance to depth has adequately addressed potential of MEC remaining in soil.

15.2.2 Remedy Implementation

The *Final Work Plan, Remedial Design (RD)/Remedial Action (RA) Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California* (USACE, 2009) is intended to describe the implementation of the selected remedial actions identified in the ROD for MEC in the Impact Area MRA by specifying the general requirements to accomplish prescribed burning/vegetation removal, technology-aided surface MEC remediation, and limited subsurface MEC remediation. The RD/RA Work Plan also discussed implementation of munitions recognition and safety training, construction support, and access management, prior to property transfer and during the implementation of the remedial action.

Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soil	Yes	Munitions Recognition and Safety Training Construction Support/UXO-Qualified Personnel Support Helicopter Support for Selected Future Habitat Management Prescribed Burns Weed Abatement Support Access management Prohibited Reuses and Activities or Restrictions	F1.13 F1.13.1 F1.7.4	Overall protection of human health	Track 3 RD/RA Work Plan (USACE, 2009)

In order to accomplish the remedial action, the Impact Area MRA has been segmented into units utilizing existing fuel breaks and roads to achieve a defensible size burn. Vegetation cutting that is needed to conduct the remedial action has been coordinated with USFWS, in accordance with the requirements of the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California* (USFWS, 2015). Consistent with the requirements in the Biological Opinion, the Army has been conducting baseline and follow-up habitat monitoring.

During the years that Fort Ord was an active installation, the Army commonly placed retired military equipment and vehicles on the Impact Area ranges as targets for range training activities. When this equipment was used for range practice, it was standard procedure to remove any radioluminescent components that contained radium. However, in some cases (perhaps in earlier years) the radium dials were not removed from the vehicles prior to their use as targets. To allow for the completion of surface removal in the units in the Impact Area MRA, the Army removed 15 armored personnel carriers (APCs) containing some remaining radioluminescent components. All radium sources (radium-painted toggle switches, instrument dials or gauges, and associated panels) and any associated radium contamination (loose or removable radioactive contamination such as radium paint flakes, dust, etc.) were removed from the APCs during the period of May 2012 through March 2013 and properly disposed of. Upon the completion of the final radiological surveys to confirm that no residual radium contamination was present in the vehicles above release limits, the APCs were

declared suitable for free-release for unrestricted use (ITSI Gilbane, 2013b). The former targets were removed from the units and surface removal was subsequently completed in the affected grids.

Each remedial action will involve individual units within the MRA and will be identified in a site-specific work plan approved by the agencies. The site-specific work plans will identify features that correspond to the specific unit, such as historical use, known ranges, most probable munitions, and pertinent site conditions.

Remedial actions listed as completed in the previous Five-Year Review Report include Units 18 and 22; 14 and 19; and 15, 21, 32, and 34. A description and discussions of the details of the work completed in these units are presented in:

- *Final MRS-BLM Units 18 and 22 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (Shaw, 2011a)
- *Final MRS-BLM Units 14 and 19 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (Shaw, 2011b)
- *Final MRS-BLM Units 15, 21, 32, and 34 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (ITSI Gilbane, 2013a)

During the period of this Five-Year Review, remedial actions were completed in the Watkins Gate Burn Area (WGBA); Units 1, 2, and 3; 4, 11, and 12; 5A and 9; 6, 7, 10, and 33; and are on-going in Units 23, 25, 31, and 28. These and other activities conducted at the Impact Area MRA are briefly described below.

MRS-BLM Watkins Gate Burn Area

WGBA is located in the northwestern section of the Impact Area MRA and totals approximately 1,072 acres. Approximately 1,000 acres within the WGBA were unintentionally burned during a prescribed burn conducted on MRS Ranges 43-48 in October 2003. The fire cleared the dense maritime chaparral vegetation covering the WGBA, and a surface removal was conducted in the burned area as a time-critical removal action (TCRA) (Parsons, 2006). An approximately 8-acre area west of Evolution Road and south of Broadway Road that also burned in 2003 was addressed as part of the Unit 14 removal action. Three areas within the WGBA were not burned. One of the three areas was designated as Unit 14A and included in the remedial action conducted in Unit 14.

Remedial action (vegetation removal, surface removal, and DGM) at WGBA is complete. The *MRS-BLM Watkins Gate Burn Area, MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (KEMRON, 2015a) details the remedial action. Surface removal and DGM survey occurred in all grids within the WGBA as part of the remedial action in the unburned areas. Additionally, the remedial action completed in the portion of the WGBA that was unintentionally burned in October 2003 was evaluated.

Remedial action objectives have been met for the whole of the WGBA and no additional remediation was recommended in the TM (KEMRON, 2015a).

MRS-BLM Units 4, 11, and 12

Unit 4 is located in the south-central portion of the Impact Area MRA, adjacent to the southern boundary and totals approximately 145 acres. Units 11 and 12 are centrally located in the Impact Area MRA, Unit 11 totals approximately 273 acres, and Unit 12 totals approximately 203 acres. Approximately 15 acres of Unit 23 were included in this remedial action as containment lines for the planned prescribed burn of Units 11 and 12. The units were masticated in their entirety with prescribed burning being planned in the future. Prescribed burns initially planned in 2011 at Units 11 and 12 were cancelled due to the discovery of large MEC items on the ground surface during burn preparation activities (ITSI Gilbane, 2014).

Remedial action (vegetation removal, surface removal, DGM, and subsurface removal in select areas) at Units 4, 11, and 12 is complete. The *Final MRS-BLM Units 4, 11 and 12, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (ITSI Gilbane, 2014) details the remedial action. Surface removal and DGM survey occurred in all grids within Units 4, 11, and 12 as part of the remedial action, with the exception of the areas inaccessible to DGM survey due to the presence of a large stand of oak trees (approximately 8 acres within the Unit 12 boundary). Subsurface removal to the depth of instrument detection was completed within the 100-foot buffer in Unit 4.

The completion of the surface removal resulted in several UXO items containing sensitive fuzes being located and removed from Units 11 and 12. The DGM survey indicated high density subsurface anomalies in most of these locations. These areas will be monitored with enhanced procedures during annual surface area monitoring and be further evaluated. Additional subsurface removal will be conducted in areas selected in coordination with BLM and identified in the TM (ITSI Gilbane, 2014).

In addition to the remedial action described above, a MEC risk reduction was also completed at Units 11 and 12. USACE safety personnel determined that removal of 155mm projectiles, 8-inch projectiles, and larger MEC items to one and two foot depths within Units 11 and 12 was required to reduce the high-impact risk during future prescribed burning. MEC items classified as 155mm projectiles, 8-inch projectiles, or larger were removed to 1-foot depth in the interior of Units 11 and 12 (436 feet or more from the perimeter of the 45-foot wide fuel break) and 2-foot depth in the outer zone of each prescribed burn area (within 436 feet of the perimeter of the 45-foot wide fuel break) (KEMRON, 2016c). The Army attempted to burn Units 11 and 12 during the 2015-2016 burn season; however, the required combination of weather conditions and other factors did not occur, and the burns were postponed to 2017.

MRS-BLM Units 6, 7, 10, and 33

Unit 6 is located in the western portion of the Impact Area MRA, adjacent to the southern boundary. Units 7, 10, and 33 are located in the southwestern portion of the Impact Area MRA. Unit 6 totals approximately 73 acres; Unit 7 totals approximately 341 acres; Unit 10 totals approximately 327 acres; and Unit 33 totals approximately 124 acres. The prescribed burns within Units 7 and 10 were conducted in October 2013. Unit 33 was unintentionally burned during the prescribed burn of Unit 7. Remedial action activities in Unit 33 were included as part of the field work following the unintended burning. Vegetation in Unit 6 was masticated in its entirety.

Remedial action (vegetation removal, surface removal, DGM, and subsurface removal in select areas) at Units 6, 7, 10, and 33 is complete. The *Draft Final, MRS-BLM Units 6, 7, 10, and 33, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (KEMRON, 2015b) details the remedial action. Surface removal and DGM survey occurred in all grids within Units 6, 7, 10, and 33. Subsurface removal to the depth of instrument detection was completed within the 100-foot buffer in Unit 6.

MRS-BLM Units 1, 2, and 3

Units 1, 2, and 3 are located in the southwestern section of the Impact Area MRA. Unit 1 totals approximately 125 acres, Unit 2 totals approximately 166 acres, and Unit 3 totals approximately 142 acres. Vegetation in Units 1, 2, and 3 were masticated in their entirety.

Surface removal and DGM at Units 1, 2, and 3 are complete. The *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2016a) details the remedial action. Surface removal and DGM survey occurred in all grids within Units 1, 2, and 3 as part of the remedial action with the exception of 24 grids in Unit 2 including target boxes, soil backstops, and military targets that precluded the completion of surface removal and DGM survey until BRA evaluation could be completed.

The technical memorandum recommended limited subsurface anomaly investigation/removal within a small portion of Unit 3, completion of field work in the 24 grids, and subsurface removal in identified areas (e.g., temporary fuel breaks and administrative access areas) that support planned reuse by the BLM.

MRS-BLM Units 5A and 9

Units 5A and 9 are located in the southeastern section of the Impact Area MRA. Unit 5A totals approximately 30 acres and Unit 9 totals approximately 68 acres. Units 5A and 9 were masticated in their entirety.

Vegetation removal, surface removal, and DGM in Units 5A and 9 are complete. The *MRS-BLM Units 5A and 9, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2016f) details the remedial action. Surface removal and DGM survey occurred in all grids within Units 5A and 9 as part of the remedial action; however, certain areas were inaccessible to DGM survey due to the presence of a significant stand of oak trees in the eastern portion of the unit (approximately 9 acres of Unit 9 were not surveyed). Subsurface removal to the depth of instrument detection was completed within the 100-foot buffer in Units 5A and 9.

Subsurface MEC remediation was recommended for fuel breaks for use by BLM in Units 5A and 9 (KEMRON, 2016f).

MRS-BLM Unit 23

A Site-Specific Work Plan (SSWP) was prepared for a MEC remedial action at MRS-BLM Unit 23 (KEMRON, 2015c). Unit 23 is 388 acres and is centrally located in the Impact Area MRA. The same large MEC items that precluded prescribed burning in Units 11 and 12 were found in Unit 23; therefore, it was masticated in its entirety. Once MEC removals have been conducted and the vegetation has grown sufficiently to carry a fire, prescribed burning will be conducted in Unit 23 to stimulate the recovery of the rare species. As of September 30, 2016, vegetation removal and surface removal were complete. The DGM survey was in progress. The field work was subsequently completed in October 2016. The *MRS-BLM Unit 23, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2017) was issued in December 2016 and details the remedial action. The Technical Memorandum recommends an evaluation to address munitions with sensitive fuzes, limited subsurface removal to address large projectiles at shallow depths to support future prescribed burning, and limited subsurface removal to address future ground-disturbing activities associated with habitat restoration or erosion control.

MRS-BLM Unit 28

A SSWP was prepared for a MEC remedial action at MRS-BLM Unit 28 (KEMRON, 2016b). Unit 28 is 107 acres and is located in the northeastern portion of the Impact Area MRA. The MOUT Site abuts Unit 28 to the southeast. Prescribed burning is not planned at Unit 28 due to the shape, size, and terrain of the unit. Therefore, vegetation within Unit 28 was removed manually and mechanically. Vegetation clearance could not be conducted in portions of the unit where it was unsafe for manual crews and/or UXO teams and/or where site conditions could exacerbate erosion potential that could destabilize the soil surface. As of September 30, 2016, vegetation removal was complete and surface removal and DGM survey were in progress.

MRS-BLM Units 25 and 31

Unit 25 is 95 acres and is located in the southeastern portion of the MRA, within the MRS-BLM. Unit 31 is 103 acres and lies to the southwest of Unit 25. A SSWP was prepared for a MEC remedial action at MRS-BLM Units 25 and 31 (KEMRON, 2016d). In addition, a Prescribed Burn Plan for Units 25 and 31 was prepared (POM Fire Department, 2016) for implementation. Steep and difficult terrain existed in portions of the containment area in Unit 25 (approximately 8 acres). Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain and surface removal was not conducted. The terrain issues precluded the firefighters' ability to control the fire from the perimeter of the unit. Therefore, vegetation in Unit 25 was masticated to conduct the remedial action as documented in the field work variance for the site-specific work

plan (KEMRON, 2016e). The planned prescribed burn in Unit 31 did not occur in 2016. The required combination of weather conditions and other factors did not occur, and the burn was postponed to 2017. As of September 30, 2016, vegetation cutting in Unit 25 (except the areas of difficult terrain) was complete, and surface removal and DGM were in progress; in Unit 31, preparation of prescribed burn containment areas was in progress.

Non-Burn Areas

Non-Burn Areas are permanent fuel breaks, designated 100-foot buffer zones, and areas identified as those dominated by non-CMC vegetation types. The overall scope work in "Non-Burn Areas" includes vegetation clearance, technology-aided surface and/or subsurface MEC removal in selected areas, and DGM in an approximate area of up to 509 acres located within the Impact Area MRA. Work is being conducted in accordance with the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord, California* (Shaw E&I, 2010).

The Non-Burn Areas were subdivided into three groups.

- Group 1 provides a 100-foot buffer area between the habitat and development border around the BLM compound (Parcel F1.12), around the MOUT site (Parcel F1.7.2), and the western Impact Area MRA boundary. MEC remedial actions for Group 1 include vegetation clearance, technology-aided surface removal, and subsurface removal. Remediation for the 100-foot buffer is complete (Army, 2015).
- Group 2 includes 45-foot wide permanent fuel breaks within the MRA. The MEC remedial action for Group 2 includes subsurface removal. Permanent fuel breaks have generally had technology-aided surface removal and subsurface removal.
    - Subgroup 2A includes fuel breaks that have undergone subsurface removal.
    - Subgroup 2B includes fuel breaks that require subsurface removal.
- Group 3 entails technology-aided surface removal across approximately 365 acres of grasslands, CMC, Oak Woodland, and wetland areas. MEC remedial actions for Group 3 include vegetation clearance, technology-aided surface removal, and DGM.

15.2.3 System Operations and Maintenance

The operations and maintenance activities at the Impact Area MRA involve annual monitoring and reporting regarding MEC finds and changes in site conditions that could increase the possibility of finding MEC exposed due to erosion over time. As part of the Track 3 remedy, area walks and safety and security monitoring have been performed for the purpose of monitoring the status of MRSs with completed surface remediation since 2009. Data collected during area walks, worker observations, and incident reports for 2011 through 2015 are documented in the monitoring reports reviewed as part of this Five-Year Review (Fort Ord BRAC, 2011a, 2012b, 2013b, 2014b, and 2016a).

Areas monitored in 2012 included the Ranges 43 - 48 South; WGBA; Units 14 and 19; Units 15, 21, 32, and 34; Units 18 and 22; and HA-34. No MEC was identified; however, multiple MEC-like MD (inert/expended, but visually similar to MEC) and MD items were observed and removed.

Areas monitored in 2013 and 2014 included the Ranges 43 - 48 South; WGBA; Units 4, 11, and 12; Units 14 and 19; Units 15, 21, 32, and 34; Units 18 and 22; and HA-34. No MEC was identified; however, multiple MEC-like MD (inert/expended, but visually similar to MEC) and MD items were observed and removed.

Areas monitored in 2015 included the Ranges 43 – 48 South; WGBA; Units 4, 11, and 12; Units 14 and 19; Units 15, 21, 32, and 34; Units 18 and 22; and HA-34; and Units 6, 7, 10, and 33. One MEC item was identified during the area walk of Unit 18 and three MEC items were identified in Unit 19. Multiple MD items

and suspected MEC (inert/expended) items were also observed during the walks and were subsequently removed.

It was recommended that the areas except WGBA continue in the annual monitoring program until the surface has stabilized, the vegetation has become re-established, and no MEC incidents have been reported for consecutive years. The Track 3 surface monitoring of the WGBA was recommended for reduction in scope on the basis of surface monitoring observations to include only roads and trails that remain accessible by foot and a 63-acre northeast portion that yielded 33 MEC items in 2014 (Fort Ord BRAC, 2016a).

Annual monitoring and reporting were also performed as part of the MRS Security Program by the Army and the results of the monitoring activities were reported to the regulatory agencies annually. Annual reports for 2011 through 2015 were reviewed as part of the Five-Year Review (Fort Ord BRAC, 2012a, 2013a, 2014a, 2015, and 2016b). Based on incidents of finding munitions-related items and discoveries of trespasses, corrective action recommendations were made in each of the annual reports for subsequent implementation.

MEC Incidents (reports of munitions encounters):

- There were eight MEC incidents within the Impact Area MRA reported in 2011. All reports were determined to be MD.
- There were nine MEC incidents within the Impact Area MRA reported in 2012. One incident was determined to be MEC (one UXO item in HA-34, Unit 17); eight incidents were determined to be MD.
- There were nine MEC incidents within the Impact Area MRA reported in 2013. All nine incidents were determined to be MD.
- There were 15 MEC incidents within the Impact Area MRA reported in 2014. One incident was determined to be MEC (UXO) and 14 incidents were determined to be MD.
- There were seven MEC incidents within the Impact Area MRA (53 items) reported in 2015. Two incidents were determined to be MEC (UXO) and the remainder of incidents were determined to be MD.

All reported MEC incidents were initiated using appropriate reporting systems and all items were disposed of in accordance with explosives safety standards and MRS Security Program guidance.

Trespass Incidents:

- There were no trespass incidents and two reports of evidence of trespass incidents reported in 2011 on the restricted MRSs of the former Fort Ord.
- There was one trespass incident and three reports of evidence of trespass incidents reported in 2012 in the restricted Impact Area MRA of the former Fort Ord. The trespass incident resulted in two adult males being escorted from the MRA and concertina wire was placed around the tree limb that was used as access to discourage climbing. (These incidents generally involved damage to fences, gates, or locks, which are repaired. In all instances the POM Police are notified.)
- There were five trespass incidents and four reports of evidence of trespass incidents reported in 2013 on the restricted MRSs of the former Fort Ord. All trespass incidents are considered to involve access from Eucalyptus Road (public access route). Two trespass incidents involved a response by POM Police. No citations were issued. Three trespass incidents are considered directly or indirectly linked to the MOUT Site as an attraction.
- There was one trespass incident and three reports of evidence of trespass incidents reported in 2014 on the restricted Impact Area MRA of the former Fort Ord. The trespass incident resulted in a citation.

All evidence trespass incidents involved access from Impossible Canyon Road South Gate (vicinity of Wolf Hill).

- There was one trespass incident and three reports of evidence of trespass incidents reported in 2015 on the restricted Impact Area MRA of the former Fort Ord.

Trespass incident data identified in the reports indicate the most common trespassing evidence is foot or bicycle/motorcycle tracks and/or the dislodging of one or more of the wires of the Impact Area MRA perimeter fence. The most prevalent locations for evidence of trespass is the Impact Area MRA fence line near or adjacent to the MOUT site and fuel breaks intersecting with the perimeter fence (Fort Ord BRAC, 2012a, 2013a, 2014a, 2015, and 2016b).

Remedial actions are on-going in the Impact Area MRA and no post-remediation O&M costs have been incurred.

15.2.4 Property Transfer

The Impact Area MRA is identified for transfer to the BLM as a habitat reserve. The property will be transferred after all MEC removals are completed.

15.3 Progress Since the Last Five-Year Review

This section includes the protectiveness determinations and statements from the last Five-Year Review Report, as well as the recommendations from the last Five-Year Review Report, and the current status of those recommendations.

15.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012) for the Track 3 Impact Area MRA stated:

> "The remedial action within the Track 3 Impact Area MRA is expected to be protective of human health and the environment upon completion and, in the interim, exposure pathways that could result in unacceptable risks are being controlled. The protectiveness will be reevaluated in the next Five-Year Review to be published September 25, 2017."

15.3.2 Status of 2012 Five-Year Review Issues and Recommendations

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Although decreasing in frequency, there have been incidents of trespassing and fence damage during the review period.	Because of the extensive size and attractiveness of the site, trespassing incidents are expected; but the frequency of incidents is being managed through the upkeep of the fencing, signs, and gates, frequent inspection and reporting of incidents, and the conduct of public education programs.	Army	Not Applicable	No specific follow-up action was recommended in the 2012 Five-Year Review. The Army has continued the site security and public education programs.	Not Applicable

15.4 Impact Area Munitions Response Area Five-Year Review Process

15.4.1 Document Review

Documents reviewed in this evaluation included the Track 3 ROD, RD/RA Work Plan, site-specific Work Plans, site-specific Remedial Action Reports, and MRS Security Program and Surface Area Monitoring annual reports for the years since the last Five-Year Review. The references are listed in Appendix A.

15.4.2 Data Review

Data from the MRS Security Program and Surface Area Monitoring annual reports was reviewed to assess the effectiveness of the remedy at Track 3. Trespass incident data support previously identified trends and is not indicative of a new trend. The occurrence of MEC incidents involving surface MD in areas where a surface MEC remediation was completed is considered a continuing trend.

15.4.3 Site Inspection and Interviews

A visual site inspection was performed on August 3, 4, and 10, 2016 around the perimeter of the Impact Area. The presence of fences around site boundaries was documented. Some portions of fence are affected by overgrown vegetation that is obscuring the warning signs. However, areas of overgrown vegetation do not compromise the integrity of the fence. Dense vegetation combined with the fence is considered (and continues to be demonstrated as) a suitable barrier to trespass. Fence and signage monitoring and maintenance are documented in the MRS Security Program annual reports.

Signs that have deteriorated are replaced as noticed during inspections. A copy of the Site Inspection Form and associated photographs are presented in Appendix B, Field Documentation of Site Inspections and Interviews.

15.5 Technical Assessment

15.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

The selected remedy has been conducted at several of the Impact Area MRA Units and the remediation of the remainder of the units is planned to be conducted in the next several years. In the areas where the remedy has been implemented, it has functioned as intended. However, as part of the work in these areas, the Army had identified places where they were not able to conduct surface removal due to difficult terrain and technological limitations. The Army will work with the regulatory agencies to determine if these areas need to be documented as a change to the selected remedy under the CERCLA process.

15.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

There have been no changes in the assumptions, toxicity data, or cleanup levels used at the time of the remedy selection. The primary RAOs for the Track 3 Impact Area MRA remain valid. These primary RAOs are: (1) to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and (2) "Compliance with ARARs."

15.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

There has been no new information identified that could call into question the protectiveness of the remedy.

15.6 Issues

There are no issues affecting the protectiveness of the Impact Area MRA remedy.

15.7 Recommendations and Follow-Up Actions

Recommendations for the Impact Area MRA are to continue implementation of the MRS Security Program.

15.8 Protectiveness Statement

Will be Protective. The remedy for the Track 3 Impact Area MRA is expected to be protective of human health and the environment upon completion. In the interim, ongoing remedial activities, along with access controls, adequately address all exposure pathways that could result in unacceptable risks.

Specific controls include: security patrols; munitions recognition and safety training for authorized personnel; fencing, gate, and signage upkeep; and annual monitoring.

16.0 DEL REY OAKS MUNITIONS RESPONSE AREA, TRACK 2 ROD

This section presents background information on the DRO MRA, Track 2 ROD (DRO MRA ROD); provides a summary of remedial actions; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. A glossary of MMRP terms is provided in Appendix D.

16.1 Del Rey Oaks Munitions Response Area Background

The DRO MRA is a Track 2 site. Track 2 sites are those sites where MEC was found and an MEC removal was conducted. The *Record of Decision, Del Rey Oaks Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California* (Army, 2008) documents the selected remedy for the site.

The DRO MRA consists of approximately 324 acres of land in the southwestern portion of the former Fort Ord. The DRO MRA, as depicted on Plate 9, includes all or portions of three MRSs, identified as MRS-15 DRO 01, MRS-15 DRO 02, and a portion of MRS-43.

The entire area that comprises the DRO MRA was investigated through MEC sampling, and several removal actions were conducted. These included a road clearance, a fuel-break removal action, Impact Area grid sampling, GridStats/SiteStats sampling, remediation activities, non-time critical removal action, eastern boundary removal, berm removal, and machine gun link removal (USA, 2000, 2001a, 2001b, 2001c, 2001d, 2001e, 2001f; Parsons, 2003). The individual investigations and removals may have only covered a portion of the DRO MRA; however, after the above actions were completed, 100 percent of the DRO MRA was surveyed by one or more geophysical instruments and all detected MEC was removed. The sampling and removal actions were designed to address MEC to depths of four feet bgs; however, all anomalies, even those deeper than four feet bgs, were investigated and resolved, and all detected MEC was removed within the DRO MRA.

The City of Del Rey Oaks and FORA requested early transfer of the DRO MRA. The Army conducted a munitions response, developed the FOSET (Army, 2004), and transferred the property in 2005 under early transfer authority with EPA and the Governor's concurrence. The FOSET stated that the DRO MRA had been cleared of all dangerous and/or explosive material reasonably possible to detect and that no further munitions response actions were recommended (Army, 2004). The Army's assessment indicated that, with the exception of the approximate 2.5-acre Range 26 berm area consisting of 11 MEC removal grids (hereinafter referred to as the "11-Grid Area" [Plate 9]), the property could be transferred with no restriction on land use. However, the Army agreed to enter into a CRUP with DTSC, with which the City of Del Rey Oaks agreed. The Covenant excluded the following types of use for the entire DRO MRA: residential use, day care facilities that do not have measures to prevent contact with soil, schools for persons under 21 years of age, and hospitals (other than veterinary hospitals). Pursuant to an agreement with DTSC, the City of Del Rey Oaks has adopted City Ordinance 259, also known as the "Excavation Ordinance," that addresses the potential explosive safety risks posed by MEC, particularly UXO, by requiring permits for certain soil movement or excavation activities. The requirements of the ordinance are codified in the municipal code at Chapter 15.48. The 11-Grid Area (which encompasses portions of Parcels E29a and E29b.1; see Plate 9) has been transferred with restrictions requiring that the Army provide additional construction support for intrusive activities that penetrate to depths greater than 4 feet bgs. The RI/FS Report was developed after the property was transferred; the ROD was signed in 2008.

The DTSC and the entities owning property on the former Fort Ord entered into a *Memorandum of Agreement (MOA) Concerning Monitoring and Reporting on Environmental Restrictions on the Former Fort Ord, Monterey County* (DTSC, 2008a), which is between FORA, Monterey County, the Cities of Seaside,

Monterey, Del Rey Oaks, and Marina; CSUMB; UCSC; MPC; and the DTSC. The MOA was finalized on February 27, 2008 and lists the requirements for reporting on the implementation of the LUCs placed on the various parcels at the former Fort Ord.

The site is currently undeveloped. Identified reuse includes a visitor serving area, a business park, light industrial, and office park. The specific reuse of the visitor serving area was not identified; however, intended reuses reportedly include a golf course, lodging, and retail. Since the time the property was transferred, residential use also is being considered based on a proposed zoning change by the City of Del Rey Oaks that would allow residential development in the DRO MRA.

16.2 Remedial Actions

The primary RAOs for the DRO MRA, based on EPA RI/FS guidance (EPA, 1988), are to achieve the EPA threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs."

16.2.1 Remedy Selection

MEC removal actions have been completed at the Del Rey Oaks MRA reuse areas, significantly reducing the risks to human health and the environment. MEC are not expected to be encountered within the MRA. However, it is possible that some MEC may not have been detected and potentially remains, thus presenting a risk at the DRO MRA. The Army conducted the DRO MRA RI/FS to evaluate remedial alternatives to address potential risk to a future land user (e.g., worker, resident, or visitor). For the identified reuse-specific receptors (recreational user, indoor worker, outdoor maintenance worker, construction worker, and adult/child resident), the overall MEC risk was low (MACTEC, 2007).

The risks associated with chemical hazards were addressed as part of the Basewide Range Assessment, which is a component of the HTW RI/FS program. No restrictions related to munitions constituents in soil were recommended following completion of a literature review, site reconnaissance, and soil sampling (Shaw, 2012).

Because munitions response has been completed, LUCs were considered in the development of response alternatives for managing the risk from MEC that potentially remain at the MRA.

Selected Remedy

The Army evaluated three remedial alternatives to address risks from any MEC that potentially remains in the DRO MRA during development, and in the future following development and reuse of the area.

- Alternative 1: No Further Action
- Alternative 2: Conditions on Soil Disturbance Activities to Minimize MEC Exposure
- Alternative 3: Conditions on Soil Disturbance Activities to Minimize MEC Exposure and Residential Use Restrictions Including Contingency to Address Proposed Change in Site Reuse

Although the Army determined that there are no potential federal or California ARARs that relate to LUCs at the DRO MRA, LUCs will be implemented in a manner consistent with applicable federal and state guidance. While the Army does not consider California laws and regulations concerning LUCs to be potential ARARs, the Army entered into a state CRUP at the time the property was transferred.

Remedial Alternative 3 (Conditions on Soil Disturbance Activities to Minimize MEC Exposure and Residential Use Restrictions including Contingency to Address Proposed Change in Site Reuse) was selected

as the remedy for the *Final Record of Decision, Del Rey Oaks Munitions Response Area Track 2 Munitions Response Site, Former Fort Ord, California* (Army, 2008). The specific components of the selected remedy include:

- **Munitions Recognition and Safety Training**: Reasonable and prudent precautions should be taken when conducting ground-disturbing or intrusive operations. The Army will provide munitions recognition and safety training, upon request, for any person who will be conducting such activities in the DRO MRA. Munitions recognition and safety training is required for people conducting ground-disturbing or intrusive soil disturbance activities within the 11-Grid Area at depths exceeding 4 feet bgs.
- **Construction Support in the 11-Grid Area**: The Army will provide construction support by UXO-qualified personnel within the 11-Grid Area during soil excavation or movement at depths exceeding 4 feet bgs.
- **Site-Wide Construction Support**: Although the Army does not believe that construction support throughout the entire MRA is necessary based on the results of the DRO MRA RI and Risk Assessment, the City of Del Rey Oaks agreed to implement this requirement, at its expense, through establishment and maintenance of a city ordinance. The City of Del Rey Oaks will provide site-wide construction support by UXO-qualified personnel in compliance with the Excavation Ordinance throughout the remainder of the MRA, as defined in the 2004 Agreement between the City of Del Rey Oaks and DTSC ("the Del Rey Oaks – DTSC Agreement"). Under the agreement, construction support is required for activities that disturb more than 10 cy of soil.
- **Use Restrictions**: A residential use restriction was in effect for the DRO MRA when the property was transferred. The restriction will be modified as follows: the residential use restriction for the central portion of the DRO MRA is no longer required; and the residential use restriction for the remainder (northern and southern portions) of the MRA will be modified to allow for residential use, as appropriate, once DTSC has verified that Residential Protocol (DTSC, 2008b) has been successfully implemented. Any proposal for residential development in the DRO MRA where this restriction applies will be subject to regulatory review. For the purpose of the ROD and the RD/RA Work Plan, residential use includes, but is not limited to, residences, day care facilities that do not have measures to prevent contact with soil, schools for persons under 21 years of age, and hospitals (other than veterinary hospitals).

These above LUC measures are intended to limit the risk associated with MEC that may remain at the DRO MRA.

The performance objectives for the LUCs that are selected as part of the remedy are the following:

- **Munitions recognition and safety training:** (1) to ensure that current land users conducting ground-disturbing or intrusive activities are educated about the possibility of encountering MEC, and (2) to ensure that land users involved in ground-disturbing or intrusive activities stop the activity if MEC are encountered and report the encounter to the appropriate authority. It should be noted that, pursuant to the Del Rey Oaks–DTSC Agreement, no soil disturbance may begin until the Army safety training, or equivalent, has been provided to all construction workers involved in soil disturbance.
- **Construction support:** to ensure that projects where ground-disturbing or intrusive activities will be conducted are coordinated with UXO-qualified personnel so that discoveries of potential MEC are handled appropriately.
- **Restrictions against residential use:** to prevent residential development on the DRO MRA until modifications to residential restrictions are approved by DTSC, with an opportunity to comment by EPA and the Army.

The Army and the City of Del Rey Oaks will maintain these LUCs until EPA and DTSC concur that the site is protective of human health and environment without construction support and munitions recognition and safety training on the basis of: (1) further site evaluation incorporating new information (e.g. limited geophysical mapping, site development); and/or (2) where, using construction support, it is determined that the depth of soil disturbance related to development activities is sufficient to address the uncertainty of MEC remaining in soil, and any MEC found as part of the development are removed.

As part of the five-year review process, the Army or its representatives will evaluate the effectiveness of each of the conditions on soil disturbance activities. If MEC have not been encountered during development, redevelopment, or reuse of an area, the conditions may, with regulatory approval, be modified or terminated.

The regulatory agencies identified the Residential Protocol as a suitable mechanism to terminate the residential use restriction once DTSC has verified successful implementation of the Residential Protocol, which will confirm that the subject area is suitable for residential use. During development activities by the property owner, initial grading of the top layer of soil would be followed by a geophysical investigation, as described in DTSC's Residential Protocol, to confirm that MEC are not present in those areas. Because residential reuse was not part of the designated use at the time the property was transferred from the Army, any costs associated with changing the reuse by implementing this or any other activity will be the reuser's responsibility.

16.2.2 Remedy Implementation

A *Draft Final Remedial Design/Remedial Action Work Plan, Del Rey Oaks Munitions Response Area, Former Fort Ord Del Rey Oaks, California* (ARCADIS, 2010) has been prepared by the City of Del Rey Oaks (the current property owner) as a result of the selection of LUCs as a component of the remedy in accordance with the ROD. The purpose of the RD/RA Work Plan is to provide information on how the remedy selected in the ROD (Army, 2008) will be implemented and maintained. The City of Del Rey Oaks submitted a Draft Final RD/RA Work Plan version to the agencies for review on July 28, 2010; the document was considered final as of September 16, 2010. The RD/RA Work Plan presents the LUC objectives as described in the ROD and describes remedy implementation actions to be performed in accordance with the ROD to ensure the LUC objectives are met.

In a letter dated August 20, 2010, EPA determined that all remedial actions have been implemented and completed at the Track 2 DRO MRA (EPA, 2010).

For the Track 2 Del Rey Oaks ROD, MRA parcels that were transferred to the City of Del Rey Oaks, FORA received Land Use Covenant Annual Reports completed by City of Del Rey Oaks for the reporting periods July 1, 2012 to June 30, 2014 and July 1, 2014 to June 30, 2015 (FORA; 2014 and 2015). The reports were submitted by FORA (on behalf of the jurisdiction) pursuant to the requirements within the land use covenants and MOA (DTSC, 2008a), to the DTSC. The annual reports summarize an annual inspection and compliance with general use and soil restrictions.

The following information for the DRO MRA was available from the *MRS Site Security Program Annual Reports* for calendar years 2011, 2012, 2013, 2014, and 2015 (Fort Ord BRC; 2012, 2013, 2014, 2015, and 2016).

- No training was requested from individuals or entities specifically identified as Track 2 Del Rey Oaks parcel recipients or their representatives.
- No notice was received of intrusive actions on Track 2 Del Rey Oaks parcels.
- No MEC incidents were reported on Del Rey Oaks parcels.

No proposals for residential development in the DRO MRA were received. Since the time the property was transferred, a partial termination of the CRUP environmental restriction was granted by the DTSC pursuant to a request made by the City of Del Rey Oaks. On September 17, 2012, the City of Del Rey Oaks and DTSC agreed to *Amendment No. 1 and Partial Termination of Covenant to Restrict Use of Property Environmental Restriction* (City of Del Rey Oaks, 2012) to be consistent with the selected remedy. The partial termination applies to 105 acres in the central portion of the DRO MRA. All other provisions of the covenant remain in full force and effect for the remainder of the property.

16.2.3 System Operations and Maintenance

Long-term management measures comprising a deed notice, CRUPs, annual monitoring and reporting, and five-year review reporting are in effect for the DRO MRA to: (1) warn property owners of potential MEC risks associated with intrusive activities, (2) monitor and report any MEC-related data during development or reuse, and (3) assess and manage information regarding the continued protectiveness of these alternatives over time. No costs associated with these activities have been incurred by the Army during the review period.

16.2.4 Property Transfer

The City of Del Rey Oaks and FORA requested early transfer of the DRO MRA. The property was transferred in 2005 with concurrence from EPA and the Governor.

16.3 Progress Since the Last Five-Year Review

This section includes the protectiveness determinations and statements from the last Five-Year Review Report, as well as the recommendations from the last Five-Year Review Report, and the current status of those recommendations.

16.3.1 2012 Five-Year Review Protectiveness Statement

The protectiveness statement from the 2012 Five-Year Review Report (Army, 2012) for the Track 3 Impact Area MRA stated:

> "The remedy for the DRO MRA is protective of human health and the environment."

16.3.2 Status of 2012 Five-Year Review Issues and Recommendations

There were no recommendations or follow-up actions reported in the 2012 Five-Year Review Report.

16.4 Del Rey Oaks Munitions Response Area Five-Year Review Process

16.4.1 Document Review

Documents reviewed for this evaluation included, but were not limited to, the *Amendment No. 1 and Partial Termination of Covenant to Restrict Use of Property Environmental Restriction* (City of Del Rey Oaks, 2012), Land Use Covenant Annual Reports, and MRS Security Program Annual Reports. The annual reports generated by the city summarize annual inspections and compliance with general use and soil restrictions. DTSC has reviewed and approved the reports. The references are listed in Appendix A.

16.4.2 Data Review

Data from the Land Use Covenant Annual Reports and MRS Security Program Annual Reports was reviewed to assess the effectiveness of the remedy. The results indicate that the land uses in the subject parcels are consistent with the land use controls that were selected in the DRO MRA ROD.

16.4.3 Site Inspection and Interviews

Site inspections and interviews were not conducted for the DRO MRA site because there were no issues identified and the remedy is protective of human health and the environment. LUCs are maintained by the property owner.

16.5 Technical Assessment

16.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Based on the review of the annual reports, the DRO MRA site is determined to remain safe from any MEC that might be left at the site.

The selected remedy discussed in the Track 2 DRO MRA ROD document provides protection for human health and the environment through implementation of LUCs. The LUCs are functioning as intended to mitigate the risk from MEC that could potentially remain.

LUCs will be maintained by the City of Del Rey Oaks (owner) to protect subsequent landowners and future users conducting ground-disturbing or intrusive activities on the property. If residential development is proposed for the remaining area of the DRO MRA where the ROD residential restriction continues to apply, the plans will be subject to regulatory review.

16.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

There have been no changes in the assumptions, toxicity data, or cleanup levels used at the time of the remedy selection. The primary RAOs for the Track 2 DRO MRA reuse areas remain valid. These primary RAOs are: (1) to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and (2) "Compliance with ARARs."

16.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

No new information has been identified that could call the protectiveness of the remedy into question.

16.6 Issues

There are no issues affecting the protectiveness of the Track 2 DRO remedy.

16.7 Recommendations and Follow-Up Actions

No modifications to the LUCs are required based on the results of the inspections and monitoring conducted during this review period.

16.8 Protectiveness Statement

Protective. The remedy at the DRO MRA is protective of human health and the environment.

Remedial actions have been completed at the MRA. Furthermore, protectiveness is assured by long-term management measures including: implementing, monitoring, and enforcing the selected LUCs.

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17.0 MRS-34 ROD

This section presents background information on MRS-34; provides a summary of remedial actions; identifies any issues related to the protectiveness of the remedy based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review. A glossary of MMRP terms is provided in Appendix D.

17.1 MRS-34 Background

MRS-34 is a 70.5-acre site located in the northwestern portion of the former Fort Ord north of Reservation Road in the vicinity of what was formerly the FAAF and is now the Marina Municipal Airport.

The site was designated as a development parcel in accordance with the Fort Ord Base Reuse Plan developed by FORA (Reuse Plan; FORA, 1997) and the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (USACE, 1997). The site was transferred to the City of Marina in 2001, and currently the site remains undeveloped other than the presence of unpaved access roads.

Based on the archives search, reports, MRS-34 may have included a bazooka and rifle grenade practice range at the area now designated MRS-34 between 1946 and 1954. Removal actions for MEC were performed between 1994 and 1999 in which all detected MEC on and below ground surface were removed. The Army performed an RI and a Risk Assessment (ITSI, 2012) to evaluate and address potential risk to subsequent site users, and concluded that, based on the completed MEC removal actions, future user risk is at the lowest level for a former Fort Ord MRS. The subsequent *Final Record of Decision, Track 2 Munitions Response Site 34, Former Fritzsche Army Airfield, Former Fort Ord, California* (Army, 2015) selected no further action at MRS-34 regarding MEC.

17.2 Remedial Actions

The selected remedy for MRS-34 (FAAF) is NFA.

While not required as part of the remedy, reasonable and prudent precautions should be taken when conducting intrusive operations in this area. Such measures could include training personnel involved in intrusive operations at the former Fort Ord in munitions recognition and safety training to increase their awareness of and ability to identify suspected MEC items.

17.2.1 Remedy Selection

As described in the RI report (ITSI, 2012), the presence of a range was first identified in historical records which were included in the Archives Search process. These searches included reviews of historical maps and other documents, as well as interviews with then-current and former Fort Ord personnel (USACE, Huntsville Division, 1993, 1994, 1997). Based on the results of historical literature review, site investigations, and munitions removal actions, the site appears to have been used for anti-tank training and practice rifle grenade training, which included firing of shoulder-launched projectiles, such as practice rifle grenades and 2.36-inch rockets. These uses occurred in the 1940s and possibly into the 1950s. Expended hand-deployed smoke grenades and small arms debris also were identified, indicating that training activity for those items also occurred at the site.

Removal actions and geophysical studies performed between 1994 and 1999 were designed to identify and remove MEC items that presented potential safety hazards to future site users. Subsequent evaluation of the MEC removal actions and geophysical studies was described in the RI and Risk Assessment (ITSI, 2012). The RI concluded that the potential MEC safety hazards were removed and that MEC are not expected to be

present at the site, and the potential risk has been reduced to the lowest level achievable for a former Fort Ord MRS.

The ROD (Army, 2015) specified that no further action related to MEC is necessary at MRS-34 because no known MEC item is present and MEC is not expected to be present at the site. Therefore, no further action is required. Remedial activity is complete, and subsequent five-year reviews are not required.

Ground disturbing or intrusive activities may occur as part of future development and reuse. While not required as part of the remedy, reasonable and prudent precautions are recommended when conducting ground disturbing or intrusive operations in this area. Such measures could include munitions recognition and safety training for personnel involved in intrusive operations at the former Fort Ord to increase their awareness of, and ability to identify, suspected MEC items.

17.2.2 Property Transfer

The FAAF property, including the 70.5-acre MRS-34 parcel, the airfield, and associated structures, was transferred to the City of Marina in 2001 under CERCLA provisions for a FOSET (Army, 2000), as requested by the City to expedite reuse and provide potential stimulus to the local economy.

17.3 Progress Since the Last Five-Year Review

MRS-34 was discussed in the 3rd Five-Year Review Report (in Section 22 – Status of Other Investigations; Army, 2012). The Final MRS-34 ROD (Army, 2015), signed by the Army, EPA, and DTSC, specified that no further action is necessary at MRS-34.

17.4 Recommendations and Follow-Up Actions

No follow-up actions are indicated for MRS-34. There are no use restrictions specified in the ROD, and no changes to protectiveness requirements are applicable. Based on the NFA status specified in the ROD, no subsequent five-year reviews are necessary for the site.

18.0 BLM AREA B AND MRS-16

This section presents background information on BLM Area B and MRS-16; provides the status of the investigation at the sites; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding protectiveness during the investigation. A glossary of MMRP terms is provided in Appendix D.

18.1 BLM Area B and MRS-16 Background

BLM Area B and MRS-16 were evaluated as Track 2 sites. Track 2 sites are those sites where MEC was found and a MEC removal was conducted. The *Final Revision 2, Track 2 Remedial Investigation/Feasibility Study, BLM Area B and MRS-16* (BLM Area B and MRS-16 RI/FS; Gilbane, 2015) provides a comprehensive evaluation of BLM Area B and MRS-16 with regard to potential MEC risks consistent with the CERCLA process. MRS-16 was previously addressed through the IA Sites MR ROD (Army, 2002) (see Section 14), and has been included in the BLM Area B and MRS-16 RI/FS to facilitate completion of the CERCLA documentation process.

BLM Area B and MRS-16, as depicted on Plate 9, are located in the central portion of the former Fort Ord. BLM Area B comprises 1,597 acres and is located north and east of the historical Impact Area. MRS-16 is located along the southern boundary of BLM Area B and is approximately 81 acres. Both BLM Area B and MRS-16 are designated as habitat reserve and are within the Fort Ord National Monument. The majority of the property within BLM Area B was transferred to BLM in 1996, as described in a *Memorandum of Understanding Between the U.S. Army and U.S. Department of the Interior, Bureau of Land Management* (Army, 1995) and the *Letter of Transfer, Portion of Former Fort Ord, from the Department of the Army to the Department of the Interior* (Army, 1996). The portion of BLM Area B that was transferred to BLM is currently open to public access, for recreational uses such as hiking, bicycling, and horseback riding. These uses have been supported safely with past and current measures including munitions responses and public explosives safety information and education. The Army and BLM have been and will continue to coordinate actions to promote MEC safety on an ongoing basis. Specific measures include signs/notices, MEC incident reporting procedures, and munitions recognition and safety training.

Investigations and removal actions performed to date have identified historical use of BLM Area B and MRS-16 for various close combat and weapons training purposes, including use of machine guns, mortars, and shoulder-launched projectiles. Depending on the types of known or suspected military training and associated military munitions uses, field investigations included visual site walks, sampling, transect investigations, and removal actions. Data from these munitions responses were evaluated in the RI/FS.

18.2 Status of Remedial Investigation/Feasibility Study/ROD

Investigations and removal actions have been completed at BLM Area B and MRS-16. To evaluate the potential presence of MEC, BLM Area B was subdivided into eight sub-areas based on historical training uses and the quality, types, and depths of previous munitions responses conducted in the respective areas. Based on the history of previous military training and the review of munitions responses conducted, the potential for some remaining MEC risks were identified, and evaluated in the risk assessment.

Remedial alternatives were evaluated in The BLM Area B and MRS-16 RI/FS (Gilbane, 2015).

Four remedial alternatives were evaluated:

- Alternative 1: No further action
- Alternative 2: LUCs

- Alternative 3: Technology-aided surface removal, with subsurface removal in selected areas, and LUCs
- Alternative 4: Subsurface removal.

The Proposed Plan for BLM Area B and MRS-16 (Army, 2015) was made available for a 30-day public comment period from April 8, 2015 to May 8, 2015. The Proposed Plan presented the preferred alternatives of Alternative 2 (LUCs) for MRS-16 and BLM Area B sub-areas B-1, B-2, B-3A, B-4, B-5, and B-6; and Alternative 3 (Technology-aided Surface Removal, with Subsurface Removal in Selected Areas, and LUCs) for BLM Area B sub-areas B-2A and B-3. The final ROD was signed on May 3, 2017 (Army, 2017). There are no issues affecting the protectiveness of the selected remedy. Implementation of the selected remedy will be described in the BLM Area B and MRS-16 RD/RA Work Plan.

18.3 Recommendations and Follow-up Actions

Recommendations and Follow-Up Actions for BLM Area B and MRS-16 are listed in the following table:

Recommendation/ Follow-up Actions	*Implementing Party*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness? (Y/N)*	
				Current	*Future*
Develop RD/RA Work Plan for implementation of the selected remedy	Army	EPA/State	October 2017	Y	Y

18.4 Protectiveness Statement

Will be Protective. The remedy for BLM Area B and MRS-16 is expected to be protective of human health and the environment upon implementation.

Current public uses of established roads and trails in BLM Area B are being supported with past and current measures, including munitions responses and public information and education. Based on the information presented in the RI/FS, it is not likely that public users on roads and trails authorized for public uses would encounter an MEC item. The BLM Area B and MRS-16 RI/FS was finalized in 2015; the Army has completed a 30-day public comment period for the Proposed Plan (Army, 2015) for the proposed remedy. The final ROD was signed on May 2017.

19.0 ESCA GROUP 1 AREAS

This section provides background information on and status of the ESCA Group 1 Areas and presents recommendations and follow-up actions, if needed, to address any issues identified during the review.

The ESCA Group 1 Areas include the Seaside and Parker Flats MRAs. The Parker Flats MRA has been further divided into two areas by FORA: Parker Flats Phase I and Parker Flats Phase II. The Army has finalized a ROD for the Parker Flats MRA Phase I area (Army, 2008). Therefore, the Parker Flats MRA Phase I area is addressed in Section 13.0, Parker Flats MRA Track 2 ROD, of this report.

This section presents background information on the *Draft Group 1 Remedial Investigation/Feasibility Study, Seaside and Parker Flats (Phase II) Munitions Response Areas, Former Fort Ord, Monterey County, California* (Draft Group 1 RI/FS Report; ESCA RP Team, 2015a). The Draft Group 1 RI/FS Report is based on the evaluation of previous work conducted for the Group 1 MRAs in accordance with the *Final Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside and Parker Flats (Phase II) Munitions Response Areas, Former Fort Ord, Monterey County, California* (Group 1 RI/FS Work Plan; ESCA RP Team, 2008b). A glossary of MMRP terms is provided in Appendix D.

19.1 ESCA Group 1 Background

The Draft Group 1 RI/FS Report was submitted in December 2015 (ESCA RP Team, 2015a). As of September 30, 2016, the draft final version of the Group 1 RI/FS Report is in progress and is being prepared in accordance with the Group 1 RI/FS Work Plan (ESCA RP Team, 2008b) and review comments to the Draft Group 1 RI/FS Report. The Group 1 RI/FS Report was finalized on May 4, 2017. Future land uses for Group 1 as indicated in the *Fort Ord Base Reuse Plan* (FORA, 1997) include: residential and non-residential areas in the Seaside MRA; and residential, non-residential, and habitat reserve areas in the Parker Flats MRA Phase II. The following sections provide a description of the residential quality assurance process applied at each MRA and a summary of the background and response actions for each of the two MRAs. The Group 1 RI/FS Report will be used in the development of the Proposed Plan, and subsequently the remedy selection for the Seaside MRA and the Parker Flats MRA Phase II that will be documented in a Group 1 ROD.

19.1.1 Residential Quality Assurance

Volume 2 of the Draft Group 1 RI/FS Work Plan includes a Residential Quality Assurance (RQA) Pilot Study work plan. The regulatory agencies expressed concern regarding the residual risk that may remain after MEC removals have taken place, particularly in areas that are slated for residential development (i.e., unrestricted land use). In an effort to satisfy regulatory concerns, a conceptual process was developed, herein referred to as the ESCA Residential Quality Assurance Process ("the ESCA RQA Process"), to allow the regulators to gain comfort with the acceptability of a parcel, where MEC removal was conducted, for residential use (and other sensitive uses). As specified in the ESCA, FORA and their response contractor developed an RQA Pilot Study which included recommending areas for inclusion in the study and developing success criteria to be used by EPA and DTSC to determine if and when the ESCA RQA Process would be applied to other designated residential parcels covered by the ESCA.

The approach for the RQA Pilot Study was presented in the Group 1 RI/FS Work Plan. The specifics of the RQA process as implemented during the RQA Pilot Study are described in the *Residential Quality Assurance Pilot Study Modification White Paper*, which was provided to the EPA, DTSC, and the Army in December 2008 for review and the *Residential Protocol Implementation Technical Report* (ESCA RP Team, 2017a). The test areas, located in portions of the designated future residential reuse areas of the Seaside MRA and CSUMB Off-Campus MRA, were selected based on the MEC and MD recovered in the areas during previous removal

actions and the historical uses of the areas. Areas with no evidence of concern were included in the test areas to further evaluate the effectiveness of the ESCA RQA Process.

After EPA and DTSC reviewed the results of applying the ESCA RQA Process to the RQA Pilot Study areas, they concurred (in a July 5, 2011 letter), that the process is consistent with the protocol outlined in Section 2.1.8, Technical Requirements and Remediation Services, of the ESCA. The EPA and DTSC agreed that the ESCA RQA Process met the established success criteria goals jointly developed with the regulatory agencies and the Army. The EPA determined and DTSC concurred, that the ESCA RQA Process adds value and material risk reduction, and that the process implementation should be confirmed through an RQA Implementation Phase, referred to as the RQA Implementation Study. The approach to the RQA Implementation Study was provided in the *Residential Quality Assurance Pilot Study Work Plan Addendum, ESCA RQA Process Implementation Study, Seaside and California State University Monterey Bay Off-Campus Munitions Response Areas, Former Fort Ord, Monterey County, California* (RQA Pilot Study Work Plan), dated February 3, 2011, and submitted under Field Variance Form No. G1WP-004, which was an addendum to the Group 1 RI/FS Work Plan and associated Volume 2 Appendix F: RQA Pilot Study Work Plan (ESCA RP Team, 2008b).

The RQA Implementation Study was completed on the portions of the Seaside MRA and Parker Flats MRA (including Phase I and Phase II areas) identified for potential future residential reuse where MEC investigations and removal actions had previously been completed. The RQA data and results were collected as part of the CERCLA remedial investigation and are documented in field variance forms, which were submitted as addenda to the Group 1 RI/FS Work Plan (ESCA RP Team, 2008b). Results of the ESCA RQA Process were evaluated under the DTSC's Residential Protocol issued in March 2008 (DTSC, 2008). FORA issued the *Revised Draft Residential Protocol Implementation Technical Report, Seaside Munitions Response Area, Former Fort Ord, Monterey County, California* (Revised Draft Seaside RPI Technical Report; ESCA RP Team, 2015b) and the *Revised Draft Residential Protocol Implementation Technical Report, Parker Flats Munitions Response Area Phase II, Former Fort Ord, Monterey County, California* (Revised Draft Parker Flats RPI Technical Report; ESCA RP Team, 2016) using the data collected during the ESCA RQA Pilot Study and Implementation Study in the designated future residential reuse areas of the Seaside MRA and Parker Flats MRA. The reports also support modifying the existing DTSC CRUPs to remove the residential use restrictions from these portions of the Seaside MRA and Parker Flats MRA. Detailed information is presented in this report including the results, evaluation, and assessment of munitions response actions performed within the designated future residential reuse areas to assess the quality and reliability of the data and effectiveness of the previous MEC investigations and removal actions. As of September 30, 2016, the Draft Final Residential Protocol Implementation Technical Reports are in progress and are being prepared with consideration of review comments to the Revised Draft Seaside RPI Technical Report and Revised Draft Parker Flats RPI Technical Report.

The data collected during the RQA Pilot Study and RQA Implementation Study has been included in the Draft Group 1 RI/FS Report to support the Army's Group 1 ROD. The ESCA RQA Process applied to the Seaside MRA and Parker Flats MRA is further described in the sections below.

The ESCA RQA Process as applied in the CSUMB Off-Campus MRA and Future East Garrison MRA are discussed further in Sections 20.1, ESCA Group 2 Background, and 22.1, ESCA Group 4 Background, respectively.

19.1.2 Seaside MRA

Physical Characteristics

The Seaside MRA is located in the southwestern portion of the former Fort Ord, bordered by the City of Seaside to the west, the historical impact area to the east, Eucalyptus Road to the north, and additional former

Fort Ord property to the south. The Seaside MRA is wholly contained within the jurisdictional boundaries of the City of Seaside, encompasses approximately 423 acres, and contains the following four Parcels: E23.1, E23.2, E24, and E34.

History of Contamination

The Seaside MRA, located in the westernmost part of the 8,000-acre former multi-range area, is along the western perimeter of the historical impact area. The Seaside MRA contained former firing points and former targets associated with small arms ammunition training, non-firing target range training, mortar and anti-tank training, and booby trap training. Based on the Draft Group 1 RI/FS Report, the MRA appears to have been used for various types of training in the vicinity of known firing ranges.

Response Actions

Investigations and removal actions have been conducted by the Army on the Seaside MRA (the four MRSs in the Seaside MRA are referred to as: MRS-15SEA.1 through MRS-15SEA.4) during Phase I Removal Actions. A TCRA and a Non-Time-Critical Removal Action (NTCRA) were conducted on the Seaside MRA with the exception of approximately 35 acres identified as SCA and a narrow area outside the western boundaries of MRSs to the west of the former alignment of General Jim Moore Boulevard.

To complete the Army's NTCRA on the 35 acres of SCAs, the Phase II Seaside MRA removal action was completed by FORA. The anomalies that represented potential MEC were intrusively investigated and removed, except in a few areas where anomalies could not be adequately investigated due to physical obstructions and/or equipment interference. Field activities and removal action findings were presented in the *Final Technical Information Paper, Phase II Seaside Munitions Response Area Outside Roadway Alignment and Utility Corridor, Former Fort Ord, Monterey County, California* (ESCA RP Team, 2011) and the *Final Technical Information Paper, Phase II Seaside Munitions Response Area Roadway Alignment and Utility Corridor, Former Fort Ord, Monterey County, California* (ESCA RP Team, 2008a). Data from both Final Technical Information Papers have been included in the Draft Group 1 RI/FS Report to support the Army's Group 1 ROD. Upon completion of the NTCRA in the Seaside MRA, FORA, in consultation with the EPA and DTSC, determined that further evaluation under the RQA process was needed for the future residential reuse areas.

ESCA Residential Quality Assurance Process

The ESCA RQA Process was applied to the future residential reuse portions of the Seaside MRA, as described in Section 19.1.1, Residential Quality Assurance. A Level 1 Initial Evaluation, consisting of a detailed data evaluation, was conducted for the future residential reuse portions of the MRA. Based on the results of the evaluation, FORA, in consultation with the EPA and DTSC, determined that approximately 245.7 acres of the Seaside MRA designated for residential reuse were recommended as acceptable for residential reuse with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures. Approximately 30.8 acres in five portions of the MRA designated for residential reuse were recommended for further assessment during the RQA Pilot Study Implementation Phase using a Level 2 Baseline DGM Survey.

The Level 2 Baseline DGM Survey was conducted over approximately 30.8 acres designated for residential reuse in the Seaside MRA. Based on the results of the Level 2 Baseline DGM Survey, approximately 30.3 acres designated for residential reuse were recommended as acceptable for residential use with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures. The remaining approximately 0.5 acre designated for residential reuse was recommended for further assessment under a Level 3 Soil Scrape and Post-Scrape DGM Survey.

The Level 3 Soil Scrape and Post-Scrape DGM Survey was completed over two grids located in the southern portion of the Seaside MRA designated future residential reuse area. Following the soil scrape and post-scrape DGM survey, a verification DGM survey was conducted over the two soil scrape grids and four grids where Level 2 activities were conducted. Based on the results of the Level 3 activities, the remaining portions of the designated future residential reuse area were recommended as acceptable for residential use with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures.

Results of the ESCA RQA Process applied at the Seaside MRA were evaluated under the DTSC's Residential Protocol (DTSC, 2008). FORA issued the Revised Draft Seaside RPI Technical Report (ESCA RP Team, 2015b) using the data collected during the ESCA RQA Pilot Study and Implementation Study in the designated future residential reuse area of the MRA. The report also supports modifying the existing DTSC CRUP to remove the residential use restrictions from these portions of the Seaside MRA.

The results and findings from the initial and final response actions and the ESCA RQA Process field operations were used in developing the Group 1 RI/FS Report to support the final remedial action decision-making process, in accordance with CERCLA and a data-driven evaluation of the residential use restriction for the Seaside MRA.

During the review of the *Residential Protocol Implementation Technical Report* (ESCA RP Team, 2016) for the Seaside MRA, the DTSC indicated that a Level 2 Baseline DGM Survey is required to be conducted by FORA in an approximately 46-acre portion of MRS-15SEA 01 to support modification of the residential use restrictions included in the State CRUP (Field Variance Form No. G1WP-012, ESCA RP Team, 2017a). As of June 30, 2017, the field work was complete and the development of a supplemental report was pending.

Basis for Taking Action

Characterization of the nature and extent of MEC remaining in the Seaside MRA was necessary in order to complete the Group 1 RI/FS Report in which remediation alternatives will be evaluated for the Group 1 MRAs pursuant to the CERCLA.

Ground-Disturbing or Intrusive Activities

The Monterey Regional Water Pollution Control Agency (MRWPCA) completed installation of a groundwater monitoring well at the Seaside MRA on the south side of Eucalyptus Road, approximately 1,800 feet from General Jim Moore Boulevard, in December 2013. A use permit was issued for the project by the City of Seaside. A Right of Entry permit was issued by FORA and FORA provided munitions recognition and safety training for workers involved in ground-disturbing or intrusive activities. On-call UXO construction support was also provided through FORA.

As of September 30, 2016, the Aquifer Storage Recovery (ASR) Phase I Improvements, Santa Margarita Well Site project, is in progress by the Monterey Peninsula Water Management District (MPWMD) in an approximately 1.09-acre portion of the Seaside MRA. A Right of Entry permit was issued by FORA for the project in April 2013 and munitions recognition and safety training was provided by FORA in December 2013 and December 2014 for workers involved in ground-disturbing or intrusive activities. The ASR Phase I Improvements included soil disturbing activities to connect various pipes between existing well sites and pump stations. The MPWMD received a conditional permit from the City of Seaside for the project. On-call UXO construction support was provided through FORA. Additional ground-disturbing or intrusive activities related to the ASR Phase I improvements are anticipated.

As of September 30, 2016, the Terminal Reservoir Project is in progress by the California American Water Company (CalAm) in the south-central portion of the Seaside MRA, east of General Jim Moore Boulevard, on the north side of Watkins Gate Road. The project includes installation of two water storage tanks on an

the north side of Watkins Gate Road. The project includes installation of two water storage tanks on an approximately 1.8-acre concrete pad; however, only soil borings have been conducted to date. A Right of Entry permit was issued by FORA for the project and munitions recognition and safety training was provided by FORA in March 2014 for workers involved in ground-disturbing or intrusive activities. FORA provided anomaly avoidance construction support for the soil boring activities. Additional ground-disturbing or intrusive activities related to the CalAm Terminal Reservoir are anticipated.

As of September 30, 2016, the Pure Water Monterey Groundwater Replenishment Project is in progress by the MRWPCA in the Seaside MRA to the southeast of the intersection of General Jim Moore Boulevard and Eucalyptus Road (ESCA Parcels E23.1, E23.2, and E34). The project includes installation of wells, pipelines, and a percolation basin. The MRWPCA received a conditional permit from the City of Seaside for the project. A Right of Entry permit was issued by FORA for the project in August 2016 and munitions recognition and safety training was provided by FORA in August 2016 for workers involved in ground-disturbing or intrusive activities related to soil borings. Additional munitions recognition and safety training and anomaly avoidance construction support is scheduled for 2016. Additional ground-disturbing or intrusive activities related to the Pure Water Project are anticipated.

19.1.3 Parker Flats MRA Phase II

Physical Characteristics

The Parker Flats MRA is located in the central portion of the former Fort Ord, bordered by the CSUMB Off-Campus MRA (formerly referred to as the CSUMB MRA) and the County North MRA (formerly referred to as the Development North MRA) to the north, the IA Ranges MRA to the south, CSUMB campus property to the west, and additional former Fort Ord property to the east and southeast. The Parker Flats MRA is contained within the jurisdictional boundaries of the City of Seaside and the County of Monterey. The Parker Flats MRA (Phase I and Phase II areas) encompasses approximately 1,172 acres and fully contains Parcels E18.1.1, E18.1.2, E18.1.3, E18.4, E19a.1, E19a.2, E19a.5, E20c.2, E21b.3, L20.18, L23.2, and L32.1, and portions of Parcels E19a.3 and E19a.4. The area completed under the Phase I activities was approximately 698 acres; the remaining approximately 474 acres were included under the Phase II activities.

History of Contamination

Based on the Draft Group 1 RI/FS Report, the historical use of the Parker Flats MRA Phase II area was predominantly for training maneuvers including the use of practice hand grenades. In addition, a southern portion of the Parker Flats MRA Phase II appears to have been used for practice hand grenade, projectile and mortar training.

Response Actions

The Army has completed investigations over a total of 698 acres in the Parker Flats MRA during Phase I activities. The anomalies that represented potential MEC were intrusively investigated and removed, except in areas where anomalies could not be adequately investigated due to physical obstructions and/or equipment interference. It was determined that additional data should be collected and that further evaluation under the RQA process was needed in order to fully characterize the MRA and to support the final remedial action decision-making process for the Parker Flats MRA Phase II.

Parker Flats MRA Phase II MEC remedial investigations were conducted by FORA to address data gaps, uncertainties, and/or open regulatory issues identified during previous removal actions. Approximately 426 acres of the Parker Flats MRA Phase II were investigated. A DGM survey and target investigation was conducted for the accessible areas of the designated future residential and non-residential development areas; unpaved roads and trails, including 5-foot buffer area within the habitat reserve area. Analog to depth of detection was conducted for areas not accessible to digital geophysical survey for the designated future residential and non-residential development areas. Analog instrument–aided surface and near-surface

investigation was conducted for the habitat reserve area. Analog and digital detection instruments were used over the Parker Flats MRA Phase II to locate subsurface anomalies, and detected anomalies representing potential MEC were resolved (ESCA RP Team, 2013).

Additionally, DGM survey and target investigation was conducted by FORA under Eucalyptus Road in Parcel E20c.2 and a portion of Eucalyptus Road in Parcel L20.18 during construction support for the Eucalyptus Roadway Extension Corridor project in June 2011 (ESCA RP Team, 2015a).

ESCA Residential Quality Assurance Process

The ESCA RQA Process was applied to the future residential reuse portions of the Parker Flats MRA (Phase I and Phase II areas), as described in Section 19.1.1, Residential Quality Assurance. A Level 1 Initial Evaluation, consisting of a detailed data evaluation, was conducted for the future residential reuse portions of the MRA. Based on the results of the evaluation, FORA, in consultation with the EPA and DTSC, determined that approximately 170 acres of the Parker Fats MRA (including Phase I and Phase II areas) designated for residential reuse were recommended as acceptable for residential reuse with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures. Three portions of the MRA (including Phase I and Phase II areas), totaling approximately 12 acres, designated for residential reuse were recommended for further assessment during the RQA Pilot Study Implementation Phase using a Level 2 Baseline DGM Survey.

The Level 2 Baseline DGM Survey was completed over approximately 12 acres designated for residential reuse in the Parker Flats MRA. Based on the results of the Level 2 Baseline DGM Survey, the remaining portions of the designated future residential reuse area within the Parker Flats MRA (Phase I and Phase II areas) were recommended as acceptable for residential use with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures.

Results of the ESCA RQA Process applied at the Parker Flats MRA were evaluated under the DTSC's Residential Protocol (DTSC, 2008). FORA issued the Revised Draft Parker Flats RPI Technical Report (ESCA RP Team, 2016) using the data collected during the ESCA RQA Implementation Study in the designated future residential reuse area of the MRA. The report also supports modifying the existing DTSC CRUPs to remove the residential use restrictions from these portions of the Parker Flats MRA.

The results and findings from the initial and final response actions and ESCA RQA Process field operations were used in developing the Group 1 RI/FS Report to support the final remedial action decision-making process, in accordance with CERCLA and a data-driven evaluation of the residential use restriction for the Parker Flats MRA Phase II.

Basis for Taking Action

Characterization of the nature and extent of MEC remaining in the Parker Flats MRA Phase II was necessary in order to complete the Group 1 RI/FS Report in which remediation alternatives will be evaluated for the Group 1 MRAs pursuant to the CERCLA.

19.2 Status of Remedial Investigation/Feasibility Study/ROD

Investigations and removal actions have been completed at the Group 1 MRAs, and the Group 1 RI/FS Report was finalized on May 4, 2017 (ESCA RP Team, 2017b). The Group 1 RI/FS Report will be used in the development of the Proposed Plan, and subsequently the remedy selection for the Seaside MRA and Parker Flats MRA Phase II that will be documented in a Group 1 ROD. Implementation of the selected remedy will

be described in further detail in the RD/RA Plan, LUCIP/Operation and Maintenance Plan (OMP), or similar document.

19.3 Recommendations and Follow-Up Actions

Recommendations and Follow-Up Actions for the Seaside MRA and Parker Flats MRA Phase II are listed in the following table:

Recommendation/ Follow-up Actions	*Implementing Party*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness? (Y/N)*	
				Current	*Future*
Complete, sign a ROD following the CERCLA process	The Army and FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	August 2018	Y	Y
Complete RD/RA, LUCIP/OMP, or similar document following the CERCLA process	FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	September 2018	Y	Y

19.4 Protectiveness Statement:

The preferred alternative for the ESCA Group 1 Areas is expected to be protective of human health and the environment upon implementation. Investigations and removal actions have been completed at the Group 1 MRAs. Land use restrictions are in place, which are intended to be protective of human health and the environment in the short term. These restrictions are contained in two places: 1) the State CRUP entered into by DTSC and the Army, and 2) the Federal deed transferring the property to FORA. In order for the remedy to be protective in the long term, the following action needs to be taken: completion of Group 1 ROD.

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20.0 ESCA GROUP 2 ROD

This section presents background information on the *Record of Decision, Group 2 California State University Monterey Bay Off-Campus Munitions Response Area, Former Fort Ord, California* (Group 2 ROD; Army, 2015); provides a summary of remedial actions and a technical assessment of the actions taken at the site; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. The Group 2 ROD was finalized in February 2015 (Army, 2015) and is based on the *Final Group 2 Remedial Investigation/Feasibility Study, California State University Monterey Bay Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California* (Group 2 RI/FS Report; ESCA RP Team, 2013) issued in February 2013.

The ESCA Group 2 Areas originally included the CSUMB Off-Campus MRA and the County North MRA (formerly referred to as the Development North MRA). The Army determined that no further munitions response was necessary for the County North MRA. As documented in the Track 1 Plug-In Approval Memorandum (Army, 2010), this MRA was identified as a Track 1 area after the Track 1 ROD was signed. The County North MRA is addressed in Sections 12.2.1, 12.2.2, and 12.2.3 of this report. Therefore, Group 2 only consists of the CSUMB Off-Campus MRA. A glossary of MMRP terms is provided in Appendix D.

20.1 ESCA Group 2 ROD Background

The CSUMB Off-Campus MRA includes, as indicated in the *Fort Ord Base Reuse Plan* (FORA, 1997), two planned reuses: approximately 49 acres for residential (CSUMB campus housing) and approximately 284 acres for non-residential (CSUMB open space park). The background of the MRA, response actions, and ESCA RQA Process completed at the MRA are summarized below. These investigations and removal actions conducted within the CSUMB Off-Campus MRA were focused on addressing explosive hazards.

Physical Characteristics

The CSUMB Off-Campus MRA is located in the north-central portion of the former Fort Ord, bordered by Inter-Garrison Road to the north, the County North MRA to the east and southeast, the Parker Flats MRA to the south, and 8th Avenue and CSUMB campus property to the west and southwest. The CSUMB Off-Campus MRA encompasses approximately 332.6 acres and is composed mostly of MRS-31, which includes four smaller MRSs: MRS-04C, MRS-07, MRS-08, and MRS-18. The remainder of the MRA consists of MRS-13C and a portion of MRS-13B.

History of Contamination

Based on the results documented in the Group 2 RI/FS Report, the MRA was used for chemical, biological, and radiological (CBR) training (MRS-04C); mine and booby trap training (MRS-07 and MRS-08); practice mortar training (MRS-13B and MRS-13C); minefield practice area (MRS-18); and troop maneuvers, confidence course, and land navigation training (MRS-31). Recovered MEC and MD also indicated that practice hand grenade training and practice rifle grenade training occurred in MRS-31.

Response Actions

Initial sampling was conducted within the CSUMB Off-Campus MRA in 1994 to determine if further action (removal) was necessary. Based on sampling results, 3- to 4-foot deep removal actions were conducted by the Army's contractors within the majority of the MRA from 1994 to 1995 and in 1997. The MEC and MD encountered within the MRA during the previous removal actions were consistent with the documented historical uses. The majority of these items were associated with practice and pyrotechnic munitions. Other MEC and MD not related to the training listed above were also found within the CSUMB Off-Campus MRA, but there was no evidence of a pattern of use indicating that training with these items occurred in the CSUMB

Off-Campus MRA. The remedial investigation completed for the CSUMB Off-Campus MRA indicated that the remedial actions conducted in the MRA successfully detected, excavated, and recovered the MEC items, removing the associated imminent safety hazard. Upon completion of the investigations and removal actions in the MRA, FORA, in consultation with the EPA and DTSC, determined that further evaluation under the RQA process was needed for the future residential reuse area.

ESCA Residential Quality Assurance Process

An RQA Pilot Study, as described in Section 19.1.1, Residential Quality Assurance, was conducted by FORA contractors in the approximately 49-acre designated future residential reuse area of the CSUMB Off-Campus MRA as an additional verification and quality assurance of prior MEC investigations and removal actions. The RQA data were collected in two phases. During the first phase of the RQA Pilot Study, a subsurface MEC removal was conducted in approximately 17 acres followed by a soil scrape and second subsurface MEC removal on approximately five of the 17 acres. During the second phase of the RQA Pilot Study, a detailed data evaluation was conducted on the approximately 49-acre area, and a verification site walk was conducted to support the data evaluation. The RQA Pilot Study activities included removal of detected MEC and MD from the designated future residential reuse area to the depth of detection and confirmed the results of previous MEC investigations and removal actions. Based on the RQA Process evaluation, including results of the RQA Pilot Study and RQA Implementation Study, FORA, in consultation with the EPA and DTSC, determined that the designated future residential reuse area in the CSUMB Off-Campus MRA was recommended as acceptable for future residential reuse with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures (ESCA RP Team, 2012 and 2013). DTSC has released the Residential Protocol (DTSC, 2008) that, when successfully implemented and approved by DTSC, would provide a basis to remove a State residential CRUP on munitions response sites (DTSC, 2014). FORA issued the *Final Residential Protocol Implementation Report, CSUMB Off-Campus MRA*, in October 2014 (ESCA RP Team, 2014) to provide data and conclusions to support the removal of the residential CRUP on the designated residential area. The DTSC amended the State CRUP (recorded in June 2016) to indicate that the residential use restriction is applicable only to non-residential reuse areas in the CSUMB Off-Campus MRA. The re-issued State CRUP was recorded with Monterey County.

Ground-Disturbing or Intrusive Activities

Pacific Gas and Electric performed soil borings and soil sampling at the CSUMB Off-Campus MRA in September and October 2015. A Right of Entry permit was issued by FORA for the project in September 2015 and munitions recognition and safety training was conducted for workers involved in ground-disturbing or intrusive activities. FORA provided anomaly avoidance construction support for the soil boring and sampling activities.

The 8th Avenue and Inter-Garrison Road Roundabout construction project is currently being conducted by CSUMB within the CSUMB Off-Campus MRA in the northwestern portion of Parcel S1.3.2 and two soil laydown areas in the northern portion of Parcel S1.3.2. A Right of Entry permit was issued by FORA for the project in October 2016. A construction support plan was prepared to ensure that MEC construction support requirements and activities for ground-disturbing and intrusive activities conducted within the CSUMB Off-Campus MRA boundaries during the roundabout construction project are performed in accordance with the Group 2 ROD (Army, 2015). The project site is located in Monterey County and subject to excavation permit requirements as identified in Monterey County Code Chapter 16.10. CSUMB received a conditional permit from Monterey County for the project. As of September 30, 2016, on-call construction support is being conducted during ground-disturbing and intrusive activities. Munitions recognition and safety training is being provided to construction workers conducting ground-disturbing and intrusive activities. Training events were conducted in October 2016 for workers involved in ground-disturbing or intrusive activities.

20.2 Remedial Actions

The following three remedial alternatives were developed and evaluated in the Group 2 Feasibility Study (Volume 3; ESCA RP Team, 2013) to address the risk from MEC for the future land users identified in the Group 2 Risk Assessment (Volume 2; ESCA RP Team, 2013):

- Alternative 1: No Further Action;
- Alternative 2: Land Use Controls; and
- Alternative 3: Additional Subsurface MEC Remediation.

20.2.1 Remedy Selection

Remedial Alternative 2 (Land Use Controls) was selected as the remedy to address MEC risks at the CSUMB Off-Campus MRA. The selected remedy includes LUCs because detection technologies may not detect all MEC present. The LUCs include requirements for: (1) munitions recognition and safety training for those people that conduct ground-disturbing or intrusive activities on the property; (2) construction support by UXO-qualified personnel for ground-disturbing or intrusive activities; and (3) restrictions prohibiting residential use in the designated future non-residential reuse area. For the purpose of this decision document, residential use includes, but is not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (Army, 2007). Any proposal for residential development in the designated non-residential reuse portion of the CSUMB Off-Campus MRA will be subject to regulatory agency and Army review and approval.

The remedial action objective developed for the protection of human health and the environment for CSUMB Off-Campus MRA is to prevent or reduce the potential for the CSUMB Off-Campus MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil.

20.2.2 Remedy Implementation

A *Draft Group 2 Land Use Controls Implementation Plan/Operation and Maintenance Plan, California State University Monterey Bay Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California* (Draft Group 2 LUCIP/OMP) was issued by FORA in May 2015 (ESCA RP Team, 2015) as a result of the selection of LUCs as a component of the remedy in accordance with the ROD. As of September 30, 2016, the Draft Final Group 2 LUCIP/OMP is in progress and is being prepared with consideration of review comments. The purpose of the Group 2 LUCIP/OMP is to provide information on how the remedy selected in the Group 2 ROD (Army, 2015) will be implemented and maintained. The Group 2 LUCIP/OMP presents the LUC objectives as described in the ROD and describes remedy implementation actions to be performed in accordance with the ROD to ensure the LUC objectives are met.

The munitions recognition and safety training requirement is currently being implemented through two channels: 1) annual notification to property owners, which includes a reminder of the munitions recognition and safety training requirement, information on how to obtain the training, and a copy of the Military Munitions 3Rs Explosives Safety Guide; and 2) as a condition for excavation permits under the County digging and excavation ordinance. To facilitate long-term implementation of training, an option for delivery of training via a web-based training platform is being provided by FORA.

Construction support is required for ground-disturbing or intrusive activities. For projects involving disturbance of 10 cy of soil or more, construction support is being implemented through a digging and excavation permitting process under the Monterey County digging and excavation ordinance. Projects

involving disturbance of less than 10 cy of soil do not require a digging and excavation permit, but may need to be coordinated with FORA, Army, EPA, and DTSC to ensure compliance with MEC safety requirements.

Residential use is currently prohibited within the designated future non-residential reuse area of the CSUMB Off-Campus MRA by deed restriction and the State CRUP. To ensure the residential use restriction is maintained, annual inspections of the CSUMB Off-Campus MRA is conducted, including review of property transfers and deed amendments, development activities, and changes in land use.

20.2.3 System Operations and Maintenance

As of September 30, 2016, the draft final version of the Group 2 LUCIP/OMP is in progress. The remedy implementation is in progress.

Annual LUC inspections conducted by CSUMB indicated no compliance issues with regard to the LUC objectives. The results of the annual monitoring activities were reported to the EPA, DTSC, and the Army by FORA (FORA, 2015a, 2015b, and 2015c). Actual costs associated with LUC inspections and reporting conducted by CSUMB are not available for comparison.

During the October 2011 through September 2016 reporting period, munitions recognition and safety training was conducted for workers involved in ground-disturbing or intrusive activities within the MRA for the Pacific Gas and Electric soil boring and soil sampling activities and the 8th Avenue and Inter-Garrison Road Roundabout construction project. A grading/construction permit was issued by the Monterey County for the project and a State approved UXO Construction Support Plan is in place.

No costs associated with implementation of the remedy have been incurred by FORA during the October 2011 through September 2016 reporting period.

20.3 Progress Since the Last Five-Year Review

20.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 protectiveness statement for the ESCA Group 2 Areas stated:

> "ESCA Group 2 Areas are undergoing investigation. Meanwhile, land use restrictions are in place, which are intended to be protective of human health and the environment in the short term. These restrictions are contained in two places: 1) the State Land Use Covenant entered into by DTSC and the Army, and 2) the Federal deed transferring the property to FORA. However, in order for the remedy to be protective in the long term, the following actions need to be taken: completion of Group 2 RI/FS and subsequent Group 2 ROD."

20.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The 2012 Five-Year Review Report presented no issues with the CSUMB Off-Campus MRA and recommended that the Group 2 RI/FS Report and ROD be finalized. The Group 2 RI/FS Report was finalized on February 18, 2013, and the Group 2 ROD was finalized on February 26, 2015.

Actions taken since the last Five-Year Review are summarized below:

Issues from Previous Review	*Recommendations/ Follow-up Actions*	*Implementing Party*	*Milestone Date*	*Action Taken and Outcome*	*Date of Action*
None identified	Complete and sign a final ROD following the CERCLA process	The Army and FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	12/31/2014	Group 2 ROD finalized	ROD – February 2015

20.4 ESCA Group 2 ROD Five-Year Review Process

20.4.1 Document Review

Documents reviewed in this evaluation included the previous Five-Year Review Report, annual LUC monitoring reports, MRS Security Program records, Final Residential Protocol Implementation Report, Group 2 RI/FS Report, Group 2 ROD, and Draft Group 2 LUCIP/OMP, as listed in the references in Appendix A.

20.4.2 Data Review

Since the last Five-Year Review Report was issued, the Final Residential Protocol Implementation Report, Group 2 RI/FS Report, Group 2 ROD, and Draft Group 2 LUCIP/OMP were developed. Data from the annual LUC monitoring reports and MRS Security Program records were reviewed.

20.4.3 Site Inspection and Interviews

A site inspection was performed at the CSUMB Off-Campus MRA on September 14, 2016, to verify the current uses of the site. A Five-Year Review Site Inspection Checklist was completed by the ESCA RP Team on behalf of FORA (Appendix B). The observations verified that the site continues to be undeveloped, with the exception of the 8th Avenue and Inter-Garrison Road Roundabout construction project in progress as of September 30, 2016, in the northwestern portion of Parcel S1.3.2 and two soil laydown areas in the northern portion of Parcel S1.3.2. Although access management measures are not a requirement of the Group 2 ROD, the existing signs and barricades were noted during the site inspection. Signs are in place along the MRA boundary on the south side of Inter-Garrison Road. Barricades and signs are in place along the western MRA boundary on the east side of 8th Avenue. The MRA is in good condition with good vegetation coverage. The site is predominantly vacant and there are no signs of inappropriate activity.

20.5 Technical Assessment

20.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Institutional controls (LUCs) are in place and are effectively preventing or reducing the potential for the CSUMB Off-Campus MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil. As of September 30, 2016, construction support is being conducted during the ground-disturbing activities in progress and munitions recognition and safety training is being provided to workers involved in ground-disturbing activities. The residential use restriction is in place and functioning for the designated future non-residential reuse area of the CSUMB Off-Campus MRA.

20.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

As noted in Section 20.2, the RAO for CSUMB Off-Campus MRA is to prevent or reduce the potential for the CSUMB Off-Campus MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil.

The exposure and toxicity criteria that were used for the risk evaluation remain valid.

20.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

No additional information has been identified that could call the protectiveness of the remedy into question.

20.6 Issues

Implementation of the site remedy is in progress. There are no issues affecting the protectiveness of the remedy for the CSUMB Off-Campus MRA.

20.7 Recommendations and Follow-Up Actions

Implementation of the site remedy is still in progress. Recommendations and Follow-Up Actions for the CSUMB Off-Campus MRA are summarized below.

Recommendation/ Follow-up Actions	***Implementing Party***	***Oversight Agency***	***Milestone Date***	***Affects Protectiveness? (Y/N)***	
				Current	***Future***
Complete LUCIP/OMP following the CERCLA process	FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	October 2017	Y	Y

20.8 Protectiveness Statement

Protective. The remedy for the ESCA Group 2 areas is protective of human health and the environment.

Potential exposure pathways that could result in unacceptable risks are being controlled.

21.0 ESCA GROUP 3 ROD

This section presents background information on the *Record of Decision, Group 3 Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, California* (Group 3 ROD; Army, 2014); provides a summary of remedial actions and a technical assessment of the actions taken at the site; identifies any issues related to the protectiveness of the remedies based on the review; presents recommendations and follow-up actions, if needed, to address any issues identified during the review; and provides a statement regarding the protectiveness of the site remedies. The Group 3 ROD was finalized in December 2014 and is based on the *Final Group 3 Remedial Investigation/Feasibility Study, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California* (Group 3 RI/FS Report; ESCA RP Team, 2012) issued in July 2012.

The ESCA Group 3 Areas include the DRO/Monterey MRA, the Laguna Seca Parking MRA, and the MOUT Site MRA. Originally, Group 3 also included the IA Ranges MRA. The IA Ranges MRA was removed from the ESCA Group 3 Areas for further evaluation, as agreed upon by FORA, the EPA, DTSC, and the Army, and is discussed in Sections 14.2.2 through 14.7 of this report. A glossary of MMRP terms is provided in Appendix D.

21.1 ESCA Group 3 ROD Background

The following sections provide a summary background and the planned reuse for each of the Group 3 MRAs. These investigations and removal actions conducted within the Group 3 MRAs were focused on addressing explosive hazards.

21.1.1 DRO/Monterey MRA

The DRO/Monterey MRA is located in the southwestern portion of the former Fort Ord and encompasses approximately 30 acres of undeveloped land and approximately 5.245 acres of the existing South Boundary Road and associated right-of-way. The DRO/Monterey MRA is comprised of two non-contiguous portions of MRS-43 and a portion of the South Boundary Road, which is not located within the boundaries of a MRS. Historical records and recovered MEC and MD indicate that MRS-43 was previously used for artillery training with 37mm projectiles.

The initial phase of the MEC removal action at the DRO/Monterey MRA was designed to address MEC present to a depth of up to 4 feet bgs. During this removal action, all detected anomalies (i.e., ferromagnetic material), even those deeper than 4 feet, were investigated with all detected MEC removed within the MRA. The next phase of the investigation was designed to address MEC to depth of detection. All anomalies detected during the removal actions were investigated or resolved, and all detected MEC items were removed or destroyed.

The Army's munitions response contractor conducted MEC removal actions across the entire MRA with the exception of a 50-foot wide strip of land on the northwest boundary of the MRA (in the habitat reserve area, Parcel L6.2) and the southern side of the road east of Parcel E29.1, which are both located outside of the MRS-43 boundary. The initial phase of the MEC removal action was conducted using analog instruments to depths of 4 feet bgs. The subsequent phase of the investigation was conducted using digital geophysical equipment to the depth of detection. While two small portions of the MRA have not been subjected to MEC removal actions, SiteStat/GridStat (SS/GS) investigation grids were either located partially within or immediately adjacent to the two areas. No MEC or MD items were recovered from the SS/GS investigation grids located within or immediately adjacent to these two areas. Therefore, it is expected that finding MEC in either of these two areas would not be likely.

The DRO/Monterey MRA is designated for habitat management and business park/light industrial and office/research and development reuse in the *Fort Ord Base Reuse Plan* (FORA, 1997). The westernmost portion of the MRA is designated for habitat reserve as a development buffer, and the easternmost portion of the MRA is designated for development. The northern boundary of the MRA, comprised of South Boundary Road and associated right of way, is designated for development.

Ground-Disturbing or Intrusive Activities

No ground-disturbing or intrusive activities have taken place on the DRO/Monterey MRA and no munitions recognition and safety training has been requested during the October 2011 through September 2016 reporting period for work performed in the MRA.

21.1.2 Laguna Seca Parking MRA

The Laguna Seca Parking MRA is located in the south-central portion of the former Fort Ord adjacent to the Laguna Seca Raceway and encompasses approximately 276 acres. The Laguna Seca Parking MRA includes four MRSs: MRS-14A, MRS-29, MRS-30, and MRS-47. Historical records and recovered MEC and MD indicate that these MRSs were previously used for artillery training, mortar training, troop training, and basic maneuvers.

The MEC removal actions completed at the Laguna Seca Parking MRA were designed to address MEC to a depth of 4 feet bgs in MRS-29, MRS-30, MRS-47, and central portion of MRS-14A, and to a depth of 1 foot bgs along the western and eastern slopes of MRS-14A. All anomalies, even those deeper than 4 feet in MRS-29, MRS-30, MRS-47, and central portion of MRS-14A, were investigated with all detected MEC encountered removed within the MRA.

MEC removal actions completed by the Army's munitions response contractors were conducted using analog instruments across the MRSs within the MRA. The MEC removal actions were conducted to a depth of 4 feet bgs with two exceptions: the MEC removal action was conducted to a depth of 1 foot bgs along the western and eastern slopes of MRS-14A; and MEC removal actions were not completed in two whole and four partial grids in MRS-14A due to terrain-related inaccessibility. Based upon the results of the MEC removal action conducted immediately surrounding these grids, it is not anticipated that MEC items posing a significant risk would remain in the six grids. The majority of MEC and MD encountered were consistent with the documented historical use of the MRA. Some items encountered along the western boundary of the MRA were likely the result of being adjacent to the historical impact area.

The Laguna Seca Parking MRA is designated for open space/recreation reuse in the Base Reuse Plan (FORA, 1997) and development with reserve areas or development with restrictions in the HMP (USACE, 1997). The northernmost and southernmost portions of the MRA will continue to be used for overflow parking during Laguna Seca Raceway events and includes parking, staging, and event-related roadway access along Barloy Canyon Road and South Boundary Road. The central portion of the MRA, including an open space/recreation reuse area and Highway 68 Bypass right of way, is designated for development with restrictions.

Ground-Disturbing or Intrusive Activities

Grading activities were performed by the Army in September 2016 in the Laguna Seca Parking MRA on roads in MRS-14A and on a section of road along the boundary of MRS-47 as part of site preparation for prescribed burns. The Army provided munitions recognition and safety training for workers involved in ground-disturbing activities, and on-call construction support. No other ground-disturbing or intrusive activities have taken place on the Laguna Seca Parking MRA and no other munitions recognition and safety training has been requested during the October 2011 through September 2016 reporting period for work performed in the MRA.

21.1.3 MOUT Site MRA

The MOUT Site MRA is located in the central portion of the former Fort Ord within the northeastern portion of the historical impact area and encompasses approximately 58 acres. The MRA consists of MRS-28 (the MOUT training area), which includes a mock city training area currently used for tactical training of military, federal, and local law enforcement and emergency services providers, and a portion of Barloy Canyon Road located along the eastern boundary of the historical impact area. The northern segment of the Barloy Canyon Road portion of the MOUT Site MRA passes through a former training site identified as MRS-27O. The southern portion of Barloy Canyon Road is bordered by MRS-14D to the east. The MRA also includes a portion of Barloy Canyon Road located outside of a MRS boundary.

Historical records and recovered MEC and MD indicate that the MOUT training area (MRS-28) was used for infantry training in an urban setting in addition to hand grenade training, firing point for rocket launcher training, hand-to-hand combat, combat pistol training, assault course, squad tactics, and night defense training. The Barloy Canyon Road portion of the MRA was maintained as a road and the overlapping MRS-27O was used for bivouac, troop maneuvers, and subcaliber artillery training.

The visual surface removal and field verification survey conducted in the MOUT Site MRA were designed to address MEC on the ground surface. Grid sampling investigations were conducted in a small percentage of the MRA to address MEC to depths of 4 feet bgs. During the grid sampling investigations, all anomalies (i.e., ferromagnetic material), even those deeper than 4 feet, were investigated with all detected MEC encountered removed within the MRA.

A grid sampling investigation and a SS/GS sampling investigation were conducted over a portion of MRS-28. During sampling, geophysical anomalies were intrusively investigated to a depth of up to 4 feet bgs. Following an accidental fire in the area, a visual surface TCRA was conducted over the majority of the MOUT Site MRA with the exception of a small area in the southwestern portion of MRS-28 and the southern portion of Barloy Canyon Road along the eastern side of the roadway. A site verification survey was performed in the southwestern portion of MRS-28 where the TCRA was not conducted (ESCA RP Team, 2012). A grid sampling investigation and 4-foot removal action were conducted in MRS-14D, adjacent and to the east of the southern portion of Barloy Canyon Road (USA, 2001). One sampling grid was located in the roadway Parcel L20.8 within the boundaries of the MOUT Site MRA.

The MOUT Site MRA is designated for school/university reuse in the Base Reuse Plan (FORA, 1997). The western portion of the MRA is designated as a training facility for tactical/law enforcement training and emergency service provider training by MPC. The roadway parcel, which includes a portion of Barloy Canyon Road, will continue to be used as a roadway for recreation and for transportation during raceway events, and will require maintenance and possibly utilities.

Ground-Disturbing or Intrusive Activities

No ground-disturbing or intrusive activities have taken place on the MOUT Site MRA and no munitions recognition and safety training has been requested during the October 2011 through September 2016 reporting period for work performed in the MRA.

21.2 Remedial Actions

The following four remedial alternatives were developed and evaluated in the Group 3 Feasibility Study (Volume 3; ESCA RP Team, 2012) to address the risk from MEC for the future land users identified in the Group 3 Risk Assessment (Volume 2; ESCA RP Team, 2012):

- Alternative 1: No Further Action;

- Alternative 2: Land Use Controls;
- Alternative 3: Additional Subsurface MEC Remediation; and
- Alternative 4: Additional Subsurface MEC Remediation in Selected Areas of the MRAs and Land Use Controls

21.2.1 Remedy Selection

Remedial Alternative 2 (Land Use Controls) was selected as the remedy to address MEC risks at the Group 3 MRAs. The selected remedy for the Group 3 MRAs includes LUCs because detection technologies may not detect all MEC present. The LUCs include requirements for: (1) munitions recognition and safety training for those people that conduct ground-disturbing or intrusive activities on the property; (2) construction support by UXO-qualified personnel for ground-disturbing or intrusive activities; and (3) restrictions prohibiting residential use. For the purpose of this decision document, residential use includes, but is not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (Army, 2007). Any proposal for residential development in the Group 3 MRAs will be subject to regulatory agency and Army review and approval; however, per FORA *Fort Ord Base Reuse Plan* (FORA, 1997), no residential reuse is planned for the Group 3 MRAs.

The remedial action objective developed for the protection of human health and the environment for the Group 3 MRAs is to prevent or reduce the potential for the Group 3 MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil.

21.2.2 Remedy Implementation

A *Draft Group 3 Land Use Controls Implementation Plan/Operation and Maintenance Plan, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California* (Draft Group 3 LUCIP/OMP) was issued by FORA in April 2015 (ESCA RP Team, 2015) as a result of the selection of LUCs as a component of the remedy in accordance with the ROD. As of September 30, 2016, the Draft Final Group 3 LUCIP/OMP is in progress and is being prepared with consideration of review comments. The purpose of the Group 3 LUCIP/OMP is to provide information on how the remedy selected in the Group 3 ROD (Army, 2014) will be implemented and maintained. The Group 3 LUCIP/OMP presents the LUC objectives as described in the ROD and describes remedy implementation actions to be performed in accordance with the ROD to ensure the LUC objectives are met.

The munitions recognition and safety training requirement is currently being implemented through two channels: 1) annual notification to property owners, which includes a reminder of the munitions recognition and safety training requirement, information on how to obtain the training, and a copy of the Military Munitions 3Rs Explosives Safety Guide; and 2) as a condition for excavation permits under the County and the Cities digging and excavation ordinances. To facilitate long-term implementation of training, an option for delivery of training via a web-based training platform is being provided by FORA.

Construction support is required for ground-disturbing or intrusive activities. For projects involving disturbance of 10 cy of soil or more, construction support is being implemented through a digging and excavation permitting process under the Monterey County and the Cities of Del Rey Oaks and Monterey digging and excavation ordinances. Projects involving disturbance of less than 10 cy of soil do not require a digging and excavation permit, but may need to be coordinated with FORA, Army, EPA, and DTSC to ensure compliance with MEC safety requirements.

Residential use is currently prohibited within the Group 3 MRAs by deed restrictions and State CRUPs. To ensure the residential use restriction is maintained, annual inspections of the Group 3 MRAs are conducted, including review of property transfers and deed amendments, development activities, and changes in land use.

21.2.3 System Operations and Maintenance

As of September 30, 2016, the draft final version of the Group 3 LUCIP/OMP is in progress. The remedy implementation is in progress.

Annual LUC inspections conducted by Monterey County, City of Del Rey Oaks, and City of Monterey indicated no compliance issues with regard to the LUC objectives. The results of the annual monitoring activities were reported to the EPA, DTSC, and the Army by FORA (FORA, 2015a, 2015b, and 2015c). Actual costs associated with LUC inspections and reporting conducted by the jurisdictions are not available for comparison.

During the October 2011 through September 2016 reporting period, no requests were received for munitions recognition and safety training and no ground-disturbing or intrusive activities were conducted at the Group 3 MRAs.

Two trespassing incidents were reported for the MOUT Site MRA:

- December 6, 2013: Four adults were observed on the site by a civilian contractor maintaining the MOUT Site. When interviewed by the observer, the subjects described gaining entry to the site through the impact area perimeter fence adjacent to Laguna Seca and walking through the impact area to the site. Army staff investigation did not identify an entry point on the described fence line. An inspection of the described fence line by California State Parks (adjacent property owner) staff found no likely point of entry. Additional inspections of the suspect fence line were implemented.
- September 15, 2015: Three adults and one juvenile exiting the impact area through a fence in MOUT Site area were reported by BLM Staff.

No costs associated with implementation of the remedy have been incurred by FORA during the October 2011 through September 2016 reporting period.

21.3 Progress Since the Last Five-Year Review

21.3.1 2012 Five-Year Review Protectiveness Statement

The 2012 protectiveness statement for the ESCA Group 3 Areas stated:

> "ESCA Group 3 Areas are undergoing investigation. Meanwhile, land use restrictions are in place, which are intended to be protective of human health and the environment in the short term. These restrictions are contained in two places: 1) the State Land Use Covenant entered into by DTSC and the Army, and 2) the Federal deed transferring the property to FORA. However, in order for the remedy to be protective in the long term, the following actions need to be taken: completion of Group 3 RI/FS and subsequent Group 3 ROD."

21.3.2 Status of 2012 Five-Year Review Issues and Recommendations

The 2012 Five-Year Review Report presented no issues with the ESCA Group 3 Areas and recommended that the Group 3 ROD be finalized. The Group 3 RI/FS Report was finalized on July 31, 2012, and the Group 3 ROD was finalized on November 25, 2014.

Actions taken since the last Five-Year Review are summarized below:

Issues from Previous Review	*Recommendations/ Follow-up Actions*	*Implementing Party*	*Milestone Date*	*Action Taken and Outcome*	*Date of Action*
None identified	Complete and sign a final ROD following the CERCLA process	The Army and FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	12/31/2014	Group 3 ROD finalized	ROD – November 2014

21.4 ESCA Group 3 ROD Five-Year Review Process

21.4.1 Document Review

Documents reviewed in this evaluation included the previous Five-Year Review Report, annual LUC monitoring reports, MRS Security Program records, Group 3 RI/FS Report, Group 3 ROD, and Draft Group 3 LUCIP/OMP, as listed in the references in Appendix A.

21.4.2 Data Review

Since the last Five-Year Review Report was issued, the Group 3 RI/FS Report, Group 3 ROD, and Draft Group 3 LUCIP/OMP were developed. Data from the annual LUC monitoring reports and MRS Security Program records were reviewed.

21.4.3 Site Inspection and Interviews

A site inspection was performed by the ESCA RP Team at the DRO/Monterey MRA on September 14, 2016, and at the Laguna Seca Parking MRA and MOUT Site MRA on October 17, 2016 with FORA, to verify the current uses of the sites. Five-Year Review Site Inspection Checklists were completed by the ESCA RP Team on behalf of FORA for each MRA (see Appendix B). Although access management measures are not a requirement of the Group 3 ROD, the existing signs and barricades were noted during site inspections.

The DRO/Monterey MRA continues to be undeveloped, with the exception of the portion of South Boundary Road included in the MRA. Fencing consists of two segments of four-strand barbed wire along northeast boundary, to the southwest of South Boundary Road. The MRA is in good condition with good vegetation coverage. The portion of South Boundary Road included in the MRA is in good condition. The MRA is vacant and there are no signs of inappropriate activity.

The Laguna Seca Parking MRA continues to be used for overflow parking during Laguna Seca Raceway events. Fencing, barricades, and gates are intact, including: locked gates and barricades across South Boundary Road restricting access to the MRA from the south; locked gates across Barloy Canyon Road at the intersection with Eucalyptus Road restricting access into the MRA from the north; locked gates across Barloy Canyon Road at Laguna Seca Raceway; and the western side of the MRA, along Barloy Canyon Road, is bounded by barbed-wire fencing. The eastern boundary of the MRA is not restricted by fencing. South Boundary Road and Barloy Canyon Road are not usually open to vehicle traffic; however, the roadways are opened to controlled vehicle traffic during events at the Laguna Seca Raceway. Warning and no trespassing signs are posted on the gates, barriers, and fencing. Dirt roads within MRA are intact with no signs of erosion. The site is in good condition with dirt roads intact and good vegetation coverage. Fuel breaks have been cut within the MRA. The site is vacant and there are no signs of inappropriate activity.

The MOUT Site MRA continues to be used for tactical training of military, federal, and local law enforcement and emergency services providers. Fencing, locked gate, signs, barbed wire, and concertina wire are in good condition on the gate to Impossible Canyon from Eucalyptus Road. No signs of erosion were observed on roads within the MRA. The MRA is in good condition and there are no signs of inappropriate activity.

21.5 Technical Assessment

21.5.1 Question A

Is the Remedy functioning as intended by the Decision Documents?

Institutional controls (LUCs) are in place and are effectively preventing or reducing the potential for the Group 3 MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil. The Army provided munitions recognition and safety training for workers involved in ground-disturbing activities, and on-call construction support, during grading on sections of roads at the Laguna Seca Parking MRA. The residential use restriction is in place and functioning for the Group 3 MRAs.

21.5.2 Question B

Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives used at the time of remedy selection still valid?

As noted in Section 21.2, the RAO developed for the Group 3 MRAs is to prevent or reduce the potential for the Group 3 MRA reuse receptors to come in direct contact with MEC items potentially remaining in subsurface soil.

The exposure and toxicity criteria that were used for the risk evaluation remain valid.

21.5.3 Question C

Has any other information come to light that could call into question the Protectiveness of the Remedy?

No additional information has been identified that could call the protectiveness of the remedy into question.

21.6 Issues

Implementation of the site remedy is in progress. There are no issues affecting the protectiveness of the remedy for the Group 3 MRAs.

21.7 Recommendations and Follow-Up Actions

Implementation of the site remedy is still in progress. Recommendations and Follow-Up Actions for the Group 3 MRAs are summarized below.

Recommendation/ Follow-up Actions	*Implementing Party*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness? (Y/N)*	
				Current	*Future*
Complete LUCIP/OMP following the CERCLA process	FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	October 2017	Y	Y

21.8 Protectiveness Statement

Protective. The remedy for the ESCA Group 3 areas is protective of human health and the environment.

Potential exposure pathways that could result in unacceptable risks are being controlled.

22.0 ESCA GROUP 4 AREAS

This section presents background information on and the status of the ESCA Group 4 Area and presents recommendations and follow-up actions, if needed, to address issues identified during the review.

The ESCA Group 4 Area includes the Future East Garrison MRA (previously referred to as East Garrison MRA). This section presents background information on the *Draft Group 4 RI/FS, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California* (Draft Group 4 RI/FS Report; ESCA RP Team, 2016a). The report is based on the evaluation of previous work conducted for the Future East Garrison MRA in accordance with the *Final Group 4 Remedial Investigation/Feasibility Study Work Plan, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California* (Group 4 RI/FS Work Plan; ESCA RP Team, 2010). A glossary of MMRP terms is provided in Appendix D.

22.1 ESCA Group 4 Background

The Draft Group 4 RI/FS Report was submitted in February 2016 (ESCA RP Team, 2016a). As of September 30, 2016, the Draft Final Group 4 RI/FS Report is in progress and is being prepared in accordance with the Group 4 RI/FS Work Plan (ESCA RP Team, 2010) and review comments to the Draft Group 4 RI/FS Report. The Group 4 RI/FS Report was finalized on June 21, 2017. Future land uses for the Future East Garrison MRA include residential reuse, development reuse with borderland interface, and habitat reserve reuse. A summary of the background and response actions conducted at the Future East Garrison MRA are provided below. The Group 4 RI/FS Report will be used in the development of the Proposed Plan, and subsequently the remedy selection for the Future East Garrison MRA that will be documented in a Group 4 ROD.

Physical Characteristics

The Future East Garrison MRA encompasses approximately 252 acres and fully contains Parcels E11b.6.1, E11b.7.1.1, E11b.8, and L20.19.1.1. The MRA includes all or portions of four MRSs: MRS-11, MRS-23, MRS-42, and MRS-42 EXP. In addition, small arms range fans extended into the northwestern portion of the MRA. The Future East Garrison MRA is wholly contained within the jurisdictional boundaries of Monterey County. The Future East Garrison MRA includes a former Ammunition Supply Point, Rocket Assembly Building, Office, Warehouses and other associated infrastructure.

History of Contamination

Initial use of the Future East Garrison MRA began in approximately 1917 when the U.S. government purchased more than 15,000 acres of land and designated it as an artillery range. Pre-World War II (WWII) munitions training occurred predominantly in the eastern portion of the Future East Garrison MRA before the known training configuration. Documentation of pre-WWII training activities at the former Fort Ord is limited; however, pre-WWII-era military munitions have been removed during previous response actions by the Army within the MRA. Based on the Draft Group 4 RI/FS Report, the site appears to have been used for troop training and maneuvers, rifle grenade training, hand grenade training, engineering and demolition operations/training and pre-WWII trainings.

Response Actions

The Army performed MEC sampling and removal actions from 1997 to 2005 at MRS-11, MRS-23, MRS-42 and MRS-42 EXP. The MEC removal action conducted in MRS-23 included a 4-foot removal action on 39 grids and partial grids. No additional MEC fieldwork was necessary for characterization of the MRS-23 area. Additional munitions responses as part of the remedial investigation were conducted by FORA and documented in the *Final Group 4 Remedial Investigation Technical Information Paper, Future East Garrison MRA, Former Fort Ord, Monterey County, California* (ESCA RP Team, 2016b). These munitions responses

resulted in completion of subsurface MEC removals to the depth of detection over the MRA, with exception of areas with no evidence of munitions use, including isolated areas with steep terrain, and under existing roadways, structures, paved and asphalt areas, and fences. Underground utility corridors were investigated to the depth of detection, but were left in place. Subsurface MEC removals were not completed in small portions of the area designated for habitat reserve.

ESCA Residential Quality Assurance Process

The ESCA RQA Process, as described in Section 19.1.1, Residential Quality Assurance, was conducted at the approximately 57-acre designated future residential reuse area of the Future East Garrison MRA. A Level 1 Initial Evaluation, consisting of a detailed data evaluation, was conducted for the future residential reuse portions of the MRA. Based on the results of the evaluation, FORA, in consultation with the EPA and DTSC, determined that approximately 57 acres of the Future East Garrison MRA designated for residential reuse were recommended as acceptable for residential reuse with appropriate institutional controls, such as applicability of the local Digging and Excavation on the Former Fort Ord Ordinance, future construction support related to munitions, and property transfer disclosures (ESCA RP Team, 2016b). DTSC has released the Residential Protocol (DTSC, 2008) that, when successfully implemented and approved by DTSC, would provide a basis to remove a State residential CRUP on munitions response sites (DTSC, 2014). FORA issued the *Revised Draft Residential Protocol Implementation Technical Report, Future East Garrison MRA*, in May 2016 (ESCA RP Team, 2016c) to provide data and conclusions to support the removal of the residential CRUP on the designated residential area.

The data collected during the ESCA RQA Process Level 1 Initial Evaluation has been included in the Draft Group 4 RI/FS Report to support the Army's Group 4 ROD.

MEC Incidents

One MEC incident was reported for the Future East Garrison MRA during the October 2011 through September 2016 reporting period. On April 24, 2014, an ESCA UXO contractor reported a grenade, smoke, M18 MD item in the habitat reserve portion of the MRA. An ESCA UXO contractor determined the item as Grenade, smoke, M18 expended. The item was disposed as MD for recycle. The reported MEC incident was initiated using the appropriate reporting systems and disposed of in accordance with explosives safety standards and MRS Security Program guidance

Basis for Taking Action

Characterization of the nature and extent of MEC remaining in the Future East Garrison MRA was necessary to complete the Group 4 RI/FS Report in which remediation alternatives will be evaluated for the Group 4 MRA pursuant to the CERCLA.

22.2 Status of Remedial Investigation/Feasibility Study/ROD

Investigations and removal actions have been completed at the Future East Garrison MRA, and the Group 4 RI/FS Report was finalized on June 21, 2017 (ESCA RP Team, 2017). The Group 4 RI/FS Report will be used in the development of the Proposed Plan, and subsequently the remedy selection for the Future East Garrison MRA that will be documented in a Group 4 ROD. Implementation of the selected remedy will be described in further detail in the RD/RA Plan, LUCIP/OMP, or similar document.

22.3 Recommendations and Follow-Up Actions

Recommendations and Follow-Up Actions for the Future East Garrison MRA are listed in the following table:

Recommendation/ Follow-up Actions	*Implementing Party*	*Oversight Agency*	*Milestone Date*	*Affects Protectiveness? (Y/N)*	
				Current	*Future*
Complete, sign a ROD following the CERCLA process	The Army and FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	September 2018	Y	Y
Complete RD/RA, LUCIP/OMP, or similar document following the CERCLA process	FORA in accordance with ESCA, AOC, and FFA Amendment No. 1	EPA/State in accordance with AOC and FFA Amendment No. 1	October 2018	Y	Y

22.4 Protectiveness Statement:

The preferred alternative for the ESCA Group 4 Areas is expected to be protective of human health and the environment upon implementation. Investigations and removal actions have been completed at the Group 4 MRA. Land use restrictions are in place, which are intended to be protective of human health and the environment in the short term. These restrictions are contained in two places: 1) the State CRUP entered into by DTSC and the Army, and 2) the Federal deed transferring the property to FORA. In order for the remedy to be protective in the long term, the following action needs to be taken: completion of Group 4 ROD.

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23.0 STATUS OF OTHER INVESTIGATIONS

This section provides background information and status reports on other investigations at Fort Ord not addressed under one of the RODs previously described.

23.1 Solid Waste Management Units

23.1.1 Background

In support of Fort Ord's RCRA Part B permit application, the Army Environmental Hygiene Agency identified 58 SWMUs in 1988. All but two of these 58 SWMUs were in areas investigated during the RI/FS process or were previously identified as OUs. In 1996, the Army identified 14 additional SWMUs. The August 1996 *Draft Field Investigation and Data Review, Solid Waste Management Units, Fort Ord, California* (HLA, 1996) recommended no additional sampling under the SWMU program.

A limited site visit to the SWMUs in 2001, as well as a review of previous visits and data reviews, also concluded that no investigative sampling was needed for the SWMU sites. The recommendation is documented in the July 2002 *Draft Final Field Investigation and Data Review, Solid Waste Management Units, Fort Ord, California* (Harding ESE, 2002).

All SWMUs except for FTO-055 were evaluated during the 3rd Five-Year Review and determined to require no additional investigation or consideration. Therefore, the only SWMU carried forward and evaluated during the 4th Five-Year Review is FTO-055.

23.1.2 Status Report

A review of the Administrative Record indicates that no remedial activities have been undertaken at the SWMU sites during this Five-Year review reporting period and many sites have been transferred and are no longer under Fort Ord BRAC control. SWMU FTO-055 is an active Army Reserve Center Motor Pool Temporary Container Storage facility. This was visually confirmed, from off-site locations, during the July 14, 2016, site inspection. Notwithstanding, there is no indication that current or past activities require this SWMU unit to be included in future five-year reviews.

23.2 Comprehensive Basewide Range Assessment

23.2.1 Background

The Comprehensive BRA was created to review all ranges that were being assessed under the various ongoing programs (e.g., Site 39, Site 39A, Site 39B, Site 3, East Garrison Ranges, etc.) The footprint of the Comprehensive BRA encompasses a different and larger area than the footprint of Site 39. This assessment was conducted to evaluate the potential presence of metals and/or explosive compounds in the soil at known or suspected small arms ranges, multi-use ranges, and military munitions training areas within the former Fort Ord. The Comprehensive BRA (MACTEC/Shaw, 2009) summarizes the status of the investigation for 221 known or suspected small-arms and multi-use training ranges. The areas are recognized as HAs, which were identified for investigation as part of the July 2001 *Basewide Range Assessment Work Plan* (Harding ESE/IT, 2001) and previous investigations performed as part of the June 1995 Basewide RI/FS (HLA, 1995).

The objectives of the Comprehensive BRA investigation activities were: (1) to identify which HAs could be eliminated from consideration for potential remediation related to metals and/or explosive compounds, and

(2) to identify sites that require additional investigation for potential chemical contamination, or should be considered for remediation related to metals and/or explosive compounds.

The Comprehensive BRA process involved five steps: (1) A review of historical documents, including historical training maps, historical aerial photographs, range control records, and military munitions after-action removal reports, (2) site reconnaissance and mapping, (3) limited soil sampling for screening purposes, (4) site characterization, and (5) remediation/habitat mapping. The first three steps are considered part of the preliminary assessment phase and the final two steps are considered part of the remediation phase.

23.2.2 Status Report

As of the completion of this Five-Year Review, remediation has been completed at 21 HAs, as documented in the April 2014 *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (ITSI Gilbane/CB&I, 2014). This report states that the remedial action objectives have been achieved for each of these HAs.

During the current Five-Year Review reporting period, Impact Area MRA Units 4, 6, 11, and 12 have been evaluated and it has been determined that no further investigation is needed. Key documents reviewed during the preparation of this Five-Year Review Report are shown below.

- *Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2* (Volume 1-3) (Shaw, 2012a).
- *Final Technical Memorandum, Basewide Range Assessment Investigation, Units 4, 11, and 12, Former Fort Ord, California* (ITSI Gilbane, 2014)
- *Final Technical Memorandum, Basewide Range Assessment Investigation, Unit 6, Former Fort Ord, California* (Gilbane, 2015).
- *Superfund Proposed Plan, Final Remedial Action is Proposed for Interim Action Ranges Munitions Response Area, Focused Feasibility Study, Former Fort Ord, Monterey County, California* (Army, 2016).
- *Final QAPP Former Fort Ord, California Volume I, Appendix B, Soil Sampling, Basewide Range Assessment* (KEMRON, 2016).

Additional information including the Administrative Record number for these documents is provided in Appendix A.

Evaluation of Unit 6 data indicates that only one former range (27A) was present within the area now comprising Unit 6. Areas of elevated lead concentrations within former Range 27A have been remediated to standards that are compliant with RAOs and thresholds specified in the Site 39 ROD Amendment. Therefore, no further remediation is needed at Unit 6 within the footprint of former Range 27A (Gilbane, 2015).

Evaluations were completed at Ranges 29, 30, 30A, 66, 68, and the Austin Anti-Tank Range during the current Five-Year Review reporting period and are documented in the January 2012 *Final Comprehensive Basewide Range Assessment Report, Revision 2* (Shaw, 2012a). The conclusions and recommendations of this document included the following:

Evidence of range use includes the presence of MEC and MD items found during surface removal activity and physical features associated with range use such as targets, soil mounds, craters, and other disturbed areas. The presence of suspect site features and types of MEC/MD found indicate that elevated concentrations of COC may potentially be present and soil sampling should be performed to evaluate concentrations of potential COCs at suspect locations. MEC removal technicians noted the absence of bullet accumulations. The site

reconnaissance performed as part of the BRA also found no evidence of small arms ammunition. Based on available data and site observations, it appears that historical uses within Unit 23 were related to use of larger munitions items. The evaluation identified the following conditions to be considered relative to Unit 23 metals status determination: Significant accumulations of lead were not identified in Unit 23. Based on available data and site observations, it appears that historical uses within Unit 23 were mainly related to use of larger munitions items. A total of 1,781 MEC items were recovered within Unit 23 to date including 37mm, 40mm, 60mm, 75mm, 76mm, 81mm, 105mm, 155mm, and 8-inch projectiles. The highest concentration of items was through the central portion of the site from the northwest to the southeast. Physical features typically associated with elevated concentrations of COCs or accumulations of materials potentially contributing to the presence of elevated COCs such as targets, firing points, soil mounds, craters, debris, and other suspect physical characteristics were identified throughout the unit.

The results for investigation of Units 4, 11, and 12 are reported in the May 2014 *Final Technical Memorandum Basewide Range Assessment Investigation, Units 4, 11, and 12, Former Fort Ord California* (ITSI Gilbane, 2014). Elevated concentrations of lead were identified at four locations (4-03, 4-04, 11-11, and 12-01), of which only three locations (4-03, 4-04, and 11-11) exhibited elevated lead concentrations in any step-out samples. Affected soil in all four locations appears to be of limited areal extent. Area-weighted-average lead concentrations were calculated for all four areas, and results for all four areas were below the established remediation thresholds that are considered protective of human health and the environment. A summary of findings for each unit are as follows:

Unit 4 - The areal extent of soil affected by lead is limited, and area-weighted-concentrations are within acceptable limits and/or potential adverse effects of potential remedial activity are estimated to be greater than potential benefits. Therefore, no further action regarding COCs in soil is recommended.

Unit 11 - With the exception of location 11-11, which will be further evaluated as part of Range 31-specific investigation, the distribution of elevated COCs in Unit 11 does not appear to be significant, and no further action regarding COCs in soil is recommended at this time.

Unit 12 - The areal extent of soil affected by lead is limited, and area-weighted-concentrations are within acceptable limits. Therefore, no further action regarding COCs in soil is recommended.

23.3 Remaining Areas

23.3.1 Background

Potential explosives safety hazards in other areas within the former Fort Ord are being evaluated through the remaining areas RI/FS program. A February 2010 *Final Remaining Remedial Investigation/Feasibility Study Areas Management Plan* (MACTEC/Shaw, 2010a) was developed to address the process for evaluating these remaining areas where MR activities and associated CERCLA documentation were not complete. The remaining RI/FS areas include both previously identified MRSs and some additional areas between existing MRSs. These areas are located to the east and north of the Impact Area MRA and were initially divided into nine geographic areas to facilitate the investigation process, as described in the management plan. The original nine areas are listed in the 3rd Five-Year Review Report (Army, 2012b). As discussed in that Five-Year Review Report, site assessment investigation was recommended and performed for six of the nine geographical areas as part of the RI.

The previously generated Technical Memoranda for various sites (MACTEC/Shaw, 2010b, 2010c, 2011a, and 2011b), subsequent field investigation activities, and associated *Site Assessment Data Reports* (Shaw, 2012b, 2012c, 2012d, and 2012e) provided the basis for the remaining areas to be addressed as either Track 1 or Track 2 sites. As described in Section 12.0, the Track 1 MRSs include those sites that were suspected to have been

used for military training with military munitions, but no further action is required based on the remedial investigation. Areas recommended for Track 1 are further evaluated in a Track 1 Approval Memorandum. Track 2 sites differ from Track 1 sites in that MEC was found, and an MEC removal was conducted. In addition, as part of the evaluation for Track 2 sites, an MEC risk assessment and an RI/FS Report are prepared.

The status of the investigation and documentation process under the Remaining RI/FS Areas Program for Munitions Response since the previous Five-Year Review Report was issued is described in the following section.

23.3.2 Status Report

Of the nine geographic areas listed in the 3rd Five-Year Review Report, one (MRS-34, also known as the FAAF Rocket Range) now has a final ROD (Army, 2015). MRS-34 is located in the northwestern portion of the former Fort Ord (Plate 9) in the vicinity of what was formerly the FAAF and is now the Marina Municipal Airport. MEC-related investigation and removal activities have been performed at this site. As described in detail in Section 17.0 of this 4th Five-Year Review Report, the MRS-34 ROD (Army, 2015) concluded that no further action related to MEC is necessary.

Based on the results of the site-specific evaluations, several areas were identified as eligible for Track 1 status. The area known "as BLM Headquarters and MRS-35" is centrally located along the northern boundary of the Impact Area MRA (Plate 9). Portions of two of the nine geographic areas were combined to create BLM Area A, located southeast of the Impact Area MRA (Plate 9). The area referred to as "Garrison South" is comprised of sites MRS-24A, MRS-24C, and Parcel E20C.1, and is located at the northwestern corner of the Impact Area MRA (Plate 9). As discussed in Section 12.0 of this 4th Five-Year Review Report, Approval Memoranda have been submitted for inclusion of these sites in the Track 1 ROD under the "Plug-in" process. The three Approval Memoranda for BLM-Headquarters and MRS-35 (Army, 2011a), for BLM Area A (Army, 2012a), and for MRS-24A, MRS-24C, and Parcel E20C.1 (Army, 2011b) have been accepted (written concurrence from USEPA, and acknowledgement from the DTSC have been received). These memoranda serve as the decision documents stating that no further action regarding munitions response is required.

Several areas located north and east of the Impact Area MRA were combined into BLM Area B and evaluated as a Track 2 site. The findings and current status of BLM Area B are detailed in Section 18.0 of this 4th Five-Year Review Report.

The remaining portions of the geographic areas have been combined to create BLM Area C (Plate 9). Based on the findings of the site assessments for these areas, BLM Area C is being evaluated under the Track 1 "Plug-in" process. The pertinent site assessments performed include:

- *Final Site Assessment Data Report, BLM East/Pre-1940 (Northern and Southern Portions), Former Fort Ord, California* (Shaw, 2012d).
- *Final Site Assessment Data Report, BLM North (Northern and Southern Portions), Former Fort Ord, California* (Shaw, 2012e).

24.0 NEXT FIVE-YEAR REVIEW

The next Five-Year Review Report will be submitted by September 25, 2022. The next review will include only those sites with ongoing remediation, sites that have not received final agency approval for closure prior to this report, and sites where institutional controls are in place to preclude unrestricted/residential use.

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TABLES

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Table 1
Parcels Transferred by Deed as of September 30, 2016
Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
E11a	148.41	Habitat Management	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E11a.1	7.34	Development / Road ROW	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E11b.1	24.54	Development / Mixed use-ac limit	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
E11b.2	41.57	Development / Mixed use-ac limit	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
E11b.3	6.16	sewer treatment facility / development mix	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
E11b.4	0.11	Water Tank 147	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
E11b.6.1 (ESCA Parcel)	47.82	Habitat Reserve	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E11b.6.2	17.96	Habitat Reserve	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	No	Yes: provided in the deed.
E11b.6.3	8.38	Habitat Reserve	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E11b.7.1.1 (ESCA Parcel)	129.87	Habitat Reserve	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction	No: remedy is not yet complete.
E11b.7.1.2	63.25	Habitat Reserve	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E11b.7.2	7.37	Habitat Reserve	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E11b.8 (ESCA Parcel)	67.69	Development / Mixed use ASP	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E15.1	49.25	ROW / retail	DACA05-9-02-587a	FOST 6 (Track 0)	5/27/03	4/21/04	No	Yes: provided in the deed.
E15.2	28.74	Open space	DACA05-9-05-576	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/25/06	No	Yes: provided in the deed.
E17	3.76	Lightfighter Lodge	DACA05-9-01-604	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	10/17/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-604 (entire parcel).
E18.1.1 (ESCA Parcel)	99.96	Veterans Cemetary	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Partial* Site Access Restriction (*Access restriction removed by Amendment No.1 to Deed No. DACA05-9-07-506 for Parker Flats Ph1 portion of parcel only.)	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-506 for Parker Flats Phase I portion of parcel only.
E18.1.2 (ESCA Parcel)	77.96	Veterans Cemetary	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Partial* Site Access Restriction (*Access restriction removed by Amendment No.1 to Deed No. DACA05-9-07-505 for Parker Flats Ph1 portion of parcel only.)	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-505 for Parker Flats Phase I portion of parcel only.
E18.1.3 (ESCA Parcel)	40.01	Housing future	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E18.2.1	4.13	ROW / Gigling Road	DACA05-9-05-530	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	7/25/06	No	Yes: provided in the deed.
E18.2.2	0.07	ROW / Gigling Road	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
E18.3	6.23	ROW / Normandy - Parker Flats	DACA05-9-05-530	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	7/25/06	No	Yes: provided in the deed.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
E18.4 (ESCA Parcel)	2.16	Water Tank	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E19a.1 (ESCA Parcel)	71.43	County Development	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Partial* Site Access Restriction (*Access restriction removed by Amendment No.1 to Deed No. DACA05-9-07-505 for Parker Flats Ph1 portion of parcel only.)	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-505 for Parker Flats Phase I portion of parcel only. The northern portion of E19a.1 the remedy is not yet complete.
E19a.2 (ESCA Parcel)	72.54	Habitat Reserve	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E19a.3 (ESCA Parcel)	302.64	Horse Park	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Partial*Residential Use Restriction Partial* Site Access Restriction (*Access restriction removed by Amendment No.1 to Deed No. DACA05-9-07-505 for Parker Flats Ph1 portion of parcel only. Access restriction and residential restriction removed by Amendment No. 2 to Deed No. DACA05-9-07-505 for County North portion of parcel only.)	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-505 for Parker Flats Phase I portion of parcel only, and in Amendment No. 2 to Deed No. DACA05-9-07-505 for County North MRA portion of parcel only
E19a.4 (ESCA Parcel)	372.27	Habitat Reserve / County	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Partial*Residential Use Restriction Partial* Site Access Restriction (*Access restriction removed by Amendment No.1 to Deed No. DACA05-9-07-505 for Parker Flats Ph1 portion of parcel only. Access restriction and residential restriction removed by Amendment No. 2 to Deed No. DACA05-9-07-505 for County North portion of parcel only.)	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-505 for Parker Flats Phase I portion of parcel only, and in Amendment No. 2 to Deed No. DACA05-9-07-505 for County North MRA portion of parcel only
E19a.5 (ESCA Parcel)	226.56	MPC EVOC	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction removed by Amendment No.1 to Deed No. DACA05-9-07-508 for entire parcel.	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-508 for Parker Flats Phase I area (entire parcel).
E20b	101.75	Stilwell Housing - DoD reacquired	DACA05-9-00-599	Preston and Stilwell Park	3/2/98	8/8/00	No	Yes: provided in the deed.
E20c.1.1.1	80.36	Housing future	DACA05-9-06-551	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E20c.1.2	0.27	Cable TV area	DACA05-9-05-530	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	7/25/06	No	Yes: provided in the deed.
E20c.1.3	10.28	ROW / Gen. Jim Moore Blvd.	DACA05-9-06-551	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E20c.2 (ESCA Parcel)	33.2	Housing Future	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E20c.2.1	25.36	Housing future	DACA05-9-05-576	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/25/06	No	Yes: provided in the deed.
E20c.2.2	2.3	Water Tanks / pumps	DACA05-9-05-530	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	7/25/06	No	Yes: provided in the deed.
E21b.3 (ESCA Parcel)	31.55	Housing Single Family Dwelling low density	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E23.1 (ESCA Parcel)	48.9	ROW / retail	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E23.2 (ESCA Parcel)	78.54	ROW / Housing future Singe Family Dwelling medium	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
E24 (ESCA Parcel)	198.21	ROW / Housing future Singe Family Dwelling medium	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E29.1 (ESCA Parcel)	22.48	Business Park / Light Industrial / Office Park	DACA05-9-07-501	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E29.2	11.88	Business Park / Light Industrial / Office Park	DACA05-9-06-553	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E29a	271.6	Visitor Center / business park	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E29a.1	4.66	Habitat Reserve Area	DACA05-9-06-552	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E29b.1	33.52	ROW / future Hwy 68 / habitat	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E29b.2	31.19	ROW / Business Park / Light Industrial / Office Park	DACA05-9-06-553	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
E29b.3	27.71	Business Park / Light Industrial / Office Park / R	DACA05-9-05-534	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/6/06	No	Yes: provided in the deed.
E29e	9.45	ROW / future Hwy 68 / Office Park / Research & Dev	DACA05-9-05-534	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/6/06	No	Yes: provided in the deed.
E2a	63.07	Development / Mixed use	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.1.1	25.28	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.1.2	1.66	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.2	6.05	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.3	34.74	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.4	2.36	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.1.5	12.08	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.2.1	71.44	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.2.2	0.38	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.2.3	4.33	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.2.4	7.54	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.2.5	1.54	2/12 Pump and Treat Facility	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.3.1.1	107.99	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2b.3.1.2	1.76	CID Building	DACA05-9-00-598	Building 1021	6/12/97	8/8/00	No	Yes: provided in the deed.
E2b.3.2	0.11	ROW / 8th Street	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.1	13.29	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.2	1.12	OU 2 Pump and Treat Facility	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.3.1	11.37	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.3.2	9.26	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.3.3	31.27	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.4.1.1	10.08	ROW / road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.4.1.2	1.28	ROW / road	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.4.2.1	13.39	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.4.2.2	2.14	Development / Mixed use	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
E2c.4.3	2.64	ROW / road	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
E2c.4.4	1.11	ROW / road	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
E2d.1	14.97	Development / Mixed use	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2d.2	5.45	ROW	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2d.3.1	25.2	Development / Mixed Use	DACA05-9-05-532	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/21/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E2d.3.2	21.6	Development / Mixed Use	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
E2e.1	6.1	ROW / 6th Avenue / 8th Street Road	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E2e.2	0.15	ROW / Intergarrison Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E31a	4.89	Business Park / Light Industrial / Office Park / R	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E31b	3.34	Businsess Park / Light Industrial / Office Park /	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E31c	3.92	Buiness Park / Light Industrial / Office Park / Re	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E34 (ESCA Parcel)	97.07	ROW / Housing future Singe Family Dwelling medium	DACA05-9-07-506	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E36	6.41	Business Park / Light Industrial / Office Park / R	DACA05-9-02-538	FOSET 4 (Del Rey Oaks Group)	7/28/04	12/28/05	Yes: Excavation Restriction Soil Disturbance Restriction Residential Use Restriction	Modification to deed in progress.
E37	2.35	ROW / Fremont	DACA05-9-02-554	Surplus II Area A	3/19/99	7/25/02	No	Yes: provided in the deed.
E38 (ESCA Parcel)	17.71	MPC Reserve	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/08	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E39 (ESCA Parcel)	161.69	MPC Reserve	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E4.1.1	153.5	Patton Housing - lower	DACA05-9-01-604	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	10/17/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-604 (entire parcel).
E4.1.2.1	9.63	Patton Housing - lower	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.1.2.2	26.24	Patton Housing - lower	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.1.2.3	0.99	ROW / Booker Street / Patton - lower	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.2	65.52	Patton Housing - upper	DACA05-9-01-604	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	10/17/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-604 (entire parcel).
E4.3.1.1 (portion)	178.21	Abrams Housing	DACA05-9-01-604	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	10/17/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-604 (entire parcel).
E4.3.1.2	1.22	Abrams Housing	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.3.2.1	42.31	Abrams Housing	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
E4.3.2.2	7.96	Lexington Court Housing	DACA05-9-07-503	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Groundwater Restriction Deed modification in progress to give CERCLA Warranty (groundwater restriction will remain). Not an ESCA parcel.	Pending: modification to deed in progress.
E4.4	93.6	Preston Housing	DACA05-9-00-560	Preston and Stilwell Park	3/2/98	8/8/00	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.4.1	4.78	Preston Park Housing North	DACA05-9-15-524	Preston and Stilwell Park	3/2/98	5/5/15[4]	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.5	3.8	Water treatment facility	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.6.1	25.08	ROW / middle Imjin Road	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.6.2	16.44	ROW / Imjin Road	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E4.7.1	6.16	ROW / Imjin Road - northeast	DACA05-9-07-503	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Groundwater Restriction Deed modification in progress to give CERCLA Warranty (groundwater restriction will remain). Not an ESCA parcel.	Pending: modification to deed in progress.
E4.7.2	3.99	ROW / Imjin Road	DACA05-9-09-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Groundwater Restriction Deed modification in progress to give CERCLA Warranty (groundwater restriction will remain). Not an ESCA parcel.	Pending: modification to deed in progress.
E40 (ESCA Parcel)	25.32	Range Extension	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E41 (ESCA Parcel)	9.14	MPC Habitat Reserve Wing	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E42 (ESCA Parcel)	12.79	MPC Habitat Reserve Wing	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
E5a.1	30.59	Development / Mixed Use	DACA05-9-07-503	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Groundwater Restriction Deed modification in progress to give CERCLA Warranty (groundwater restriction will remain). Not an ESCA parcel.	Pending: modification to deed in progress.
E5a.2	15.41	Development / Mixed Use	DACA05-9-05-532	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/21/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E5b	3.21	Development / Mixed use	DACA05-9-00-560	Preston and Stilwell Park	3/2/98	8/8/00	Yes: Groundwater Restriction	Yes: provided in the deed.
E8a.1.1.2	85.3	Landfill Shoe	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	Yes: Groundwater Restriction	Yes: provided in the deed.
E8a.1.2	21.22	Landfill	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E8a.1.3	2.68	Landfill	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E8a.1.4	30.32	Landfill	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
E8a.1.5	21.53	Landfill	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
F1.1.1	4943.29	BLM Parcel A	DACA05-9-95-618[2]	NA		10/18/96	No	NA for fed-fed parcel transfer[3]
F1.1.2	288.82	ROW / BLM Parcel A	DACA05-9-95-618[2]	NA		10/18/96	No	NA for fed-fed parcel transfer[3]
F1.1.3	775.62	BLM Parcel A	DACA05-9-95-618[2]	NA		10/18/96	No	NA for fed-fed parcel transfer[3]
F1.12	12.98	BLM Headquarters Parcel E	DACA05-9-95-618[2]	NA		10/18/96	No	NA for fed-fed parcel transfer[3]
F1.2	1191.19	BLM Parcel B	DACA05-9-95-618[2]	NA		10/18/96	No	NA for fed-fed parcel transfer[3]
F1.7.2 (ESCA Parcel)	51.25	BLM Parcel H / MOUT	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
F2.7.1	372.98	Golf courses	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
F2.7.2	2.17	Site 33	DACA05-9-04-534	FOST 6 (Track 0)	5/27/03	9/2/04	Yes: Residential Use Restriction	Yes: provided in the deed.
F2.7.3	3.06	North South Road path (Gen. Jim Moore Blvd.)	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
F6	6.1	Veterans Clinic	DACA05-9-94-607[2]	NA		6/23/98	No	NA for fed-fed parcel transfer[3]

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F7.1	1.49	Well 30 B	DACA05-9-06-535	UCSC Phase 1	6/15/94	3/2/11	Yes: Groundwater Restriction	Yes: provided in the deed.
F7.2	1.22	Well 31 C	DACA05-9-06-535	FOST 6 (Track 0)	5/27/03	3/2/11	Yes: Groundwater Restriction	Yes: provided in the deed.
L1.1	3.17	Law School / Surplus II	DACA05-9-02-589	FOST 6 (Track 0)	5/27/03	12/3/03	No	Yes: provided in the deed.
L1.2	0.55	Housing Single Family Dwelling	DACA05-9-97-611	Monterey College of Law	6/26/96	6/26/97	Yes: Groundwater Restriction	Yes: provided in the deed.
L11	2.29	Abrams Housing / Interim	DACA05-9-96-616	Interim, Inc	5/31/96	7/2/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L12.1	2.34	Abrams Housing / Peninsula Outreach	DACA05-9-98-618	Peninsula Outreach Buildings 6279, 6280	11/8/95	3/2/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L12.2.1	0.91	Housing VOQ (visiting officers quarters)	DACA05-9-99-617	Peninsula Outreach Buildings T-2814 to T-2817, T2836	4/29/96	1/22/99	Yes: Groundwater Restriction	Yes: provided in the deed.
L12.2.2	0.27	Housing VOQ (visiting officers quarters)	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L12.2.3	0.26	Housing VOQ (visiting officers quarters)	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L12.3	0.79	Warehouse Building 2434	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L13.1	8.61	ROW / Coe Avenue - south	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
L13.2	14.7	ROW / Monterey Road - south	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
L14	6.14	Childcare Center	DACA05-9-97-620	Children's Services International	10/24/96	8/13/97	Yes: Groundwater Restriction	Yes: provided in the deed.
L15.1	1.68	Building 4481 / Surplus II	DACA05-9-02-591	FOST 6 (Track 0)	5/27/03	9/30/04	No	Yes: provided in the deed.
L15.2	7.1	Abrams Housing / Housing Authority	DACA05-9-96-617	Housing Authority of Monterey County	5/31/96	7/3/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L15.3	1.45	Abrams Housing / Housing Authority	DACA05-9-96-617	Housing Authority of Monterey County	5/31/96	7/3/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L16	5.1	Red Cross buildings	DACA05-9-97-619	Goodwill Industries	3/7/97	11/26/97	Yes: Groundwater Restriction	Yes: provided in the deed.
L17.2	6.65	Preston Housing / Shelter Plus	DACA05-9-96-618	Shelter Plus	11/8/95	5/7/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L19.1	2.07	Golf C tank	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
L19.2	3.82	Gym Shea / field / Surplus II	DACA05-9-02-587a	FOST 6 (Track 0)	5/27/03	4/21/04	No	Yes: provided in the deed.
L19.3	1.23	Multisport fields / Surplus II	DACA05-9-02-587a	FOST 6 (Track 0)	5/27/03	4/21/04	No	Yes: provided in the deed.
L19.4	7.36	Building 4418, 4450 / field / Surplus II	DACA05-9-02-587a	FOST 6 (Track 0)	5/27/03	4/21/04	No	Yes: provided in the deed.
L2.1	4.54	Transit Center Building 2058	DACA05-9-01-603	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	3/25/03	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-603 (entire parcel).
L2.2.1	2.11	Park and Ride I	DACA05-9-02-592	FOST 6 (Track 0)	5/27/03	5/20/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L2.2.2	4.54	Park and Ride I	DACA05-9-06-556	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
L2.4.2	13.16	Maintenance Center / Surplus II	DACA05-9-01-603	FOSET 2 (Housing Areas and Former Garrison)	12/3/02	3/25/03	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-603 (entire parcel).
L2.4.3.1	1.5	Building 4448 / Surplus II	DACA05-9-01-603	FOSET 2 (Housing Areas and Former Garrison)	12/3/02	3/25/03	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-603 (entire parcel).
L2.4.3.2	0.12	Building 4448 / Surplus II	DACA05-9-01-603	FOSET 2 (Housing Areas and Former Garrison)	12/3/02	3/25/03	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-603 (entire parcel).
L20.10.1.1	16.98	ROW / Reservation Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.10.1.2	9.22	ROW / Reservation Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.10.2	5.21	ROW / Reservation Road - north	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.10.3	2.22	ROW / Reservation Road - north	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.11.1	31.19	ROW / Blanco Road	DACA05-9-00-598	Blanco Road	6/12/97	8/8/00	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.11.2	7.67	ROW / Blanco Road	DACA05-9-00-598	Blanco Road	6/12/97	8/8/00	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.12	2.49	ROW / York Road	DACA05-9-97-621	York Road	9/18/95	1/29/97	No	Yes: provided in the deed.
L20.13.1.1	2.9	ROW / Gen. Jim Moore Blvd	DACA-05-9-05-533	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
L20.13.1.2 (ESCA Parcel)	0.2	ROW / Gen. Jim Moore Blvd	DACA05-9-07-502	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.

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L20.13.2	0.98	ROW / South Boundary Road	DACA-05-9-05-533	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
L20.13.3.1 (ESCA Parcel)	4.84	ROW / South Boundary Road / Gen. Jim Moore Blvd.	DACA05-9-07-502	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.13.3.2	3.07	ROW / South Boundary Road / Gen. Jim Moore Blvd.	DACA-05-9-05-533	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
L20.13.4	1.62	ROW / South Boundary Road / future Hwy 68	DACA-05-9-05-533	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
L20.13.5	6.71	ROW / South Boundary Road / York Road	DACA05-9-05-584	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	10/23/06	No	Yes: provided in the deed.
L20.14.1.1	8.42	ROW / Intergarrison Road	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.14.1.2	7.76	ROW / Intergarrison Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.14.2	3.23	ROW / mid Intergarrison Road	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.15	20.05	Balloon Spur Track	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	No	Yes: provided in the deed.
L20.16.1	3.86	Railroad Spur Intermodal warehouses	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.16.2	10.55	Railroad Spur Intermodal Transportation	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.16.3	0.14	Railroad Spur Intermodal Transportation 8th Street	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.17.1	8.06	Maintenance Center Building 4900	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.17.2	8.26	Maintenance Center Park	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.18 (ESCA Parcel)	7.24	ROW / Eucalyptus Road	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.19.1.1 (ESCA Parcel)	6.43	ROW / Barloy Canyon Road	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.19.1.2	3.26	ROW / Barloy Canyon Road	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L20.19.2	0.55	ROW / Barloy Canyon Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.2.1 (ESCA Parcel)	252.66	Travel Camp	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Groundwater Restriction Site Access and Residential Restriction removed by Amendment No.2 to Deed No. DACA05-9-07-505 for entire parcel.	Yes: in Amendment No. 2 to Deed No. DACA05-9-07-505 for County North MRA (entire parcel).
L20.2.2	115.73	Travel Camp	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L20.2.3.1	29.03	Travel Camp	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L20.20	2.25	ROW / West Camp Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.21.1	2.58	ROW / Watkins Gate Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.21.2	1.84	ROW / Watkins Gate Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L20.22	2.41	ROW / Chapel Hill Road	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L20.3.1 (ESCA Parcel)	43.63	Wolf Hill	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Access Restriction	No: remedy is not yet complete.

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L20.3.2 (ESCA Parcel)	35.5	ROW / Wolf Hill	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.5.1 (ESCA Parcel)	131.36	Lookout Ridge	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.5.2 (ESCA Parcel)	54.53	ROW / Lookout Ridge	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.5.3 (ESCA Parcel)	9.69	Lookout Ridge	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.5.4 (ESCA Parcel)	0.51	South Boundary Park - part / part Turn 11	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.6	247.19	Laguna Seca Park	DACA05-9-05-575	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/6/06	No	Yes: provided in the deed.
L20.7.1	3.32	South Boundary Road - east	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
L20.7.2	7.18	South Boundary Road - east	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
L20.7.3	0.71	South Boundary Road - east	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
L20.7.4	1.23	South Boundary Road - east	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
L20.7.5	4.31	South Boundary Road - east	DACA05-9-05-529	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	10/18/06	No	Yes: provided in the deed.
L20.8 (ESCA Parcel)	7.25	Barloy Canyon Road - south	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L20.9	18.92	ROW / Reservation Road - south	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L21	1.56	Astronomy Center	DACA05-9-95-598	Monterey Institute for Research in Astronomy	3/13/96	3/22/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L22	1.15	Electrical Substation	DACA05-9-97-622	Pacific Gas & Electric Substation	10/28/95	3/27/97	No	Yes: provided in the deed.
L23.1.1	2.37	Satellite Campus	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.1.2	5.56	Satellite Campus	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.1.3	4.85	Satellite Campus	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.1.4	6.66	Satellite Campus	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.1.5	1.37	Satellite Campus	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.2 (ESCA Parcel)	10.59	Habitat / field study area	DACA05-9-07-508	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L23.3.1	54.42	Development / mixed use-ac limit	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L23.3.2.1	85.35	Development / mixed use-ac limit / historic district	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
L23.3.2.2	63.68	Development / mixed use-ac limit (Site 31)	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Excavation and Exposure of Soil Restriction Residential Use Restriction Exhibit B of the Quitclaim Deed includes a provision that requires compliance with the Habitat Management Plan which places some conditions on land use.	Yes: provided in Quitclaim Deed No. DACA05-9-06-549.
L23.3.3.1	57.63	Development / Mixed Use ac-limit (Site 39A)	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L23.3.3.2	31.62	Development / Mixed Use ac-limit	DACA05-9-06-549	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L23.4	0.96	Building 4885 - part	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L23.5.1	15.17	BOQ (bachelor officers quarters west)	DACA05-9-05-573	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/16/07	No	Yes: provided in the deed.
L23.5.2	14.53	BOQ (bachelor officers quarters east)	DACA05-9-06-557	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	3/2/11	No	Yes: provided in the deed.
L23.6	3.52	Legal Assistant School / Surplus II	DACA05-9-02-594	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L24	7.19	University Campus	DACA05-9-94-597	Golden Gate University	8/28/95	8/31/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L25	2.11	Coe Avenue Triangle	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
L27	52.11	Brostrom Housing	DACA05-9-98-577	FOST 7 (Brostrom Park 2002), FOST 6 (Track 0)	1/9/03	2/3/03	No	Yes: provided in the deed.
L28	23.88	Thorsen Village Housing	DACA05-9-98-530	Thorsen Village	9/26/96	7/17/99	No	Yes: provided in the deed.
L29	106.95	Hayes Housing	DACA05-9-02-554	Hayes Park	9/28/96	7/25/02	No	Yes: provided in the deed.
L3.1	5.39	York School South of South Boundary	DACA05-9-05-536	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/16/07	No	Yes: provided in the deed.
L3.2	101.2	York School cross country track and soccer field	DACA05-9-06-558	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	3/2/11	No	Yes: provided in the deed.
L30	5.24	AAFES gas station	DACA05-9-02-554	Surplus II Area A	3/19/99	7/25/02	No	Yes: provided in the deed.
L31	11.65	Development / mixed use / Surplus II	DACA05-9-05-576	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	7/25/06	No	Yes: provided in the deed.
L32.1 (ESCA Parcel)	2.95	Public facilities / institute / Surplus II	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction removed by Amendment No.1 to Deed No. DACA05-9-07-505 for entire parcel.	Yes: in Amendment No. 1 to Deed No. DACA05-9-07-505 for Parker Flats Phase I area (entire parcel).
L32.2.1	23.94	Campus addition / Surplus II	DACA05-9-02-587	FOST 6 (Track 0)	5/27/03	1/26/04	No	Yes: provided in the deed.
L32.2.2	9.29	Campus addition / Surplus II	DACA05-9-02-587	FOST 6 (Track 0)	5/27/03	1/26/04	No	Yes: provided in the deed.
L32.3	3.72	Campus addition / Surplus II	DACA05-9-02-587	FOST 6 (Track 0)	5/27/03	1/26/04	No	Yes: provided in the deed.
L32.4.1.1	38.4	Development mixed use / retail / Surplus II	DACA05-9-02-597	FOST 6 (Track 0)	5/27/03	12/15/04	No	Yes: provided in the deed.
L32.4.1.2	16.24	Development mixed use / retail / Surplus II	DACA05-9-01-605	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	10/17/02	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-01-605 (entire parcel).
L32.4.2	3.98	ROW / development / mixed use / Surplus II	DACA05-9-02-593	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
L33.1	48.28	Campus addition / Surplus II	DACA05-9-02-587	FOST 6 (Track 0)	5/27/03	1/26/03	No	Yes: provided in the deed.
L33.2	12.98	Campus addition / Surplus II	DACA05-9-02-587	FOST 6 (Track 0)	5/27/03	1/26/03	No	Yes: provided in the deed.
L34	1.73	Golf course well	DACA05-9-97-613	Golf Course Phase 1	11/26/96	1/15/97	No	Yes: provided in the deed.
L35.1	10.61	Corporation yard	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L35.2	1.71	Water Tank - future	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L35.3	0.1	Travel Camp Pump	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	No	Yes: provided in the deed.
L35.4	1.09	Travel Camp Tank	DACA05-9-06-554	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.

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Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
L35.5	0.92	Water Tank F	DACA05-9-05-531	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	12/8/05	Yes: Groundwater Restriction	Yes: provided in the deed.
L35.6	0.13	Skeet Field Tank	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	No	Yes: provided in the deed.
L35.7	0.1	Lift Station # 96	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	No	Yes: provided in the deed.
L35.8	0.14	Lift Station # 31	DACA05-9-02-596	FOST 6 (Track 0)	5/27/03	3/15/04	No	Yes: provided in the deed.
L37	4.19	Building 4419, 4420, 4421, 4423 / Surplus II	DACA05-9-00-569	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	5/16/02	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-08-528 (entire parcel).
L4.1	18.1	Park - future	DACA05-9-06-553	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L4.2	7.03	Park - future	DACA05-9-06-553	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L5.1	575.78	Municipal Airport	DACA05-9-95-617	FAAF Phase 1	8/11/95	8/11/95	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.1.1	60.12	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction Use Restriction	Modification to deed in progress.
L5.1.1.1	12	Resort Parcel	DACA05-9-00-586	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	11/8/01	Yes: Groundwater Restriction Use Restriction	Modification to deed in progress.
L5.1.10	0.22	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.11	130.32	Municipal Airport	DACA05-9-95-617	FAAF Phase 1	8/11/95	8/11/95	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.1.12	43.14	Municipal Airport	DACA05-9-95-617	FAAF Phase 1	8/11/95	8/11/95	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.1.2	0.03	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.3	0.11	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.4	6.17	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.5	0.56	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.6	0.23	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.7	0.23	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.8	6.34	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.1.9	0.44	Municipal Airport	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.10.1	8.51	Reservation Road NW	DACA05-9-07-503	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Groundwater Restriction Deed modification in progress to give CERCLA Warranty (groundwater restriction will remain). Not an ESCA parcel.	Pending: modification to deed in progress.
L5.10.2	12.55	Reservation Road N	DACA05-9-05-532	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/21/06	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.2	0.27	Municipal Airport / middle marker	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	Yes: Groundwater Restriction	No: Modification to deed in progress.
L5.3	0.27	Municipal Airport / outer marker	DACA05-9-98-574	FOSET 1 (Fritzsche Army Airfield Phase II)	8/1/00	10/5/01	No	No: Modification to deed in progress.
L5.4.1	5.69	Sports Center	DACA05-9-98-518	Marina Sports Center	6/16/97	5/8/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.4.2	13.4	Sports Center Expansion	DACA05-9-98-518	Marina Sports Center	6/16/97	5/8/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.4.3	1.63	Sports Center Expansion	DACA05-9-98-518	Marina Sports Center	6/16/97	5/8/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.5.1	3.46	Sports Tennis Center	DACA05-9-98-518	Marina Sports Center	6/16/97	5/8/98	No	Yes: provided in the deed.
L5.5.2	0.55	Sports Tennis Center	DACA05-9-98-518	Marina Sports Center	6/16/97	5/8/98	No	Yes: provided in the deed.

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USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
L5.6.1	22.54	Abrams Park	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.6.2	8.47	Marina Park offices	DACA05-9-05-577	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	3/13/06	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.7 (ESCA Parcel)	73.44	Park - future	DACA05-9-07-505	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Groundwater Restriction Site Access and Residential Restriction removed by Amendment No.2 to Deed No. DACA05-9-07-505 for entire parcel.	Yes: in Amendment No. 2 to Deed No. DACA05-9-07-505 for County North MRA (entire parcel).
L5.8.1	7.05	Maintenance Center Building 4885 Phase I	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.8.2	4.86	Maintenance Center Building 4885 Phase II	DACA05-9-02-586	FOST 6 (Track 0)	5/27/03	3/15/04	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.9.1.1	23.13	Equestrian Center	DACA05-9-97-610	Marina Equestrian	7/15/97	4/30/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.9.1.2	4.12	Equestrian Center	DACA05-9-97-610	Marina Equestrian	7/15/97	4/30/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L5.9.2	3.22	Equestrian Center tail	DACA05-9-06-550	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	Yes: Groundwater Restriction	Yes: provided in the deed.
L6.1	13.27	Frog Pond	DACA05-9-06-555	FOST 10 (Track 0 Grp D, Track 1 EG 2/4, Track 1 Grps 1-5)	8/20/07	7/10/09	No	Yes: provided in the deed.
L6.2 (ESCA Parcel)	6.91	Frog Pond	DACA05-9-07-504	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Site Access Restriction	No: remedy is not yet complete.
L7.1	19.11	School Patton	DACA05-9-94-557	MPUSD Phase I	8/28/94	7/15/95	Yes: Groundwater Restriction	Yes: provided in the deed.
L7.2	12.94	School site - future	DACA05-9-95-575	MPUSD Phase II	4/29/96	2/2/96	Yes: Groundwater Restriction	Yes: provided in the deed.
L7.3	15.11	School Stilwell	DACA05-9-94-558	MPUSD Phase I	8/28/94	7/15/95	No	Yes: provided in the deed.
L7.4	10.67	School Marshall	DACA05-9-94-556	MPUSD Phase I	8/28/94	7/15/95	No	Yes: provided in the deed.
L7.5	40.1	School Fitch Middle	DACA05-9-94-554	MPUSD Phase I	8/28/94	7/15/95	No	Yes: provided in the deed.
L7.6	15.13	School Hayes	DACA05-9-94-555	MPUSD Phase I	8/28/94	7/15/95	No	Yes: provided in the deed.
L7.7	28.96	Officers' Club	DACA05-9-96-620	MPUSD Phase I	4/29/96	2/2/96	No	Yes: provided in the deed.
L7.8	0.32	Building 4550 / Surplus II	DACA05-9-02-599	FOST 6 (Track 0)	5/27/03	12/15/04	No	Yes: provided in the deed.
L7.9	0.32	Building 4560 / Surplus II	DACA05-9-02-599	FOST 6 (Track 0)	5/27/03	12/15/04	No	Yes: provided in the deed.
L9.1.1.1	2.29	Patton Housing	DACA05-9-98-616	Vietnam Veterans	6/12/97	10/19/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.1.1.2	2.24	Patton Housing	DACA05-9-05-570	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/5/07	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.1.2.1	3.47	Patton Housing	DACA05-9-98-616	Vietnam Veterans	6/12/97	10/19/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.1.2.2	2.38	Patton Housing	DACA05-9-05-570	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/5/07	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.2.1	3.61	Martinez Hall	DACA05-9-98-616	Vietnam Veterans	6/12/97	10/19/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.2.2	0.46	ROW / Martinez Hall	DACA05-9-98-616	Vietnam Veterans	6/12/97	10/19/98	Yes: Groundwater Restriction	Yes: provided in the deed.
L9.3	1.05	Warehouse Building 2988 and Building 2990	DACA05-9-98-616	Vietnam Veterans	6/12/97	10/19/98	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.1.1	90.73	Central Campus	DACA05-9-94-602	CSUMB Phase I	7/14/94	8/19/94	No	Yes: provided in the deed.
S1.1.2	126.8	Central Campus	DACA05-9-94-602	CSUMB Phase I	7/14/94	8/19/94	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.1.3	6.52	Central Campus	DACA05-9-94-602	CSUMB Phase I	7/14/94	8/19/94	No	Yes: provided in the deed.
S1.2.1	406.2	Campus Housing / Schoonover	DACA05-9-94-602	CSUMB Phase I	7/14/94	8/19/94	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.2.2	20.28	Fredericks Housing - peanut	DACA05-9-97-578	CSUMB Fredricks & Parcel B	2/7/97	9/15/97	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.3.1	38.18	Maintenance Area 3A	DACA05-9-00-548	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	8/22/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-00-548 (entire parcel).

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S1.3.2 (ESCA Parcel)	332.84	Expansion Area 3B	DACA05-9-07-507	FOSET 5 (ESCA and Non-ESCA OUCTP)	11/15/07	5/8/09	Yes: Excavation Restriction Residential Use Restriction Groundwater Restriction Site Access Restriction	No: remedy is not yet complete.
S1.3.3	9.27	ROW / Intergarrison Road - part	DACA05-9-02-595	FOST 6 (Track 0)	5/27/03	10/16/03	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.4	90.49	South Campus	DACA05-9-00-548	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	8/22/02	No	Yes: in Amendment No. 1 to Deed No. DACA05-9-00-548 (entire parcel).
S1.5.1.1	96.3	Maintenance Area	DACA05-9-00-548	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	8/22/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-00-548 (entire parcel).
S1.5.1.2	11.71	Maintenance Area / Site 17	DACA05-9-02-595	FOST 6 (Track 0)	5/27/03	10/16/03	Yes: Groundwater Restriction	Yes: provided in the deed.
S1.5.2	18.39	Facilities Engineer Area	DACA05-9-00-548	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	8/22/02	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-00-548 (entire parcel).
S1.6	34.39	East of 2nd Avene	DACA05-9-97-578	CSUMB Fredricks & Parcel B	2/7/98	9/15/97	No	Yes: provided in the deed.
S1.7	7.56	Maintenance Buildings	DACA05-9-98-501	CSUMB Parcel 9	10/24/96	2/9/98	Yes: Groundwater Restriction	Yes: provided in the deed.
S2.1.1	34.32	West Parcel	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction	Yes: provided in the deed.
S2.1.1.1	5.26	West Parcel - Habitat Reserve	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction	Yes: provided in the deed.
S2.1.1.2	1.64	West Parcel - Habitat Reserve	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction	Yes: provided in the deed.
S2.1.3	14.48	Site 35	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S2.1.4.1	11.95	Site 34 (35A)	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S2.1.4.2	3.62	Site 35B	DACA05-9-06-535	FOST 6 (Track 0)	5/27/03	3/3/11	Yes: Groundwater Restriction	Yes: provided in the deed.
S2.1.5	343.48	Habitat without contaminant	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.1.5.1	5.06	Development	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.1.6	67.86	Development	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.1.7	1.34	West Parcel	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.2.1	269.73	Development area - northeast area	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.1.1	37.36	Development area - south	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.1.2	11.53	ROW / south development area	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.1.3	0.49	Development area - south	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.1.4	8.78	UCMBEST Nature Reserve	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.

Table 1
Parcels Transferred by Deed as of September 30, 2016
Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty
S2.3.2.1	36.75	Habitat Reserve - south	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.2.2	33.12	ROW / South reserve	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.2.3	3.02	ROW / South reserve	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.3.2.4	90.35	Habitat Reserve - south	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.4	10.98	Habitat Reserve - west	DACA05-9-94-603	UCSC Phase I	6/15/94	8/31/94	Yes: Groundwater Restriction per Monterey County Code Chapter 15.08 - not by deed	Yes: provided in Section 23 of deed.
S2.5.1.1	15.55	Office Park / Transit Center	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S2.5.1.2	2.21	Office Park / Transit Center	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S2.5.2.1	25.4	Office Park	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S2.5.2.2	3.78	Office Park	DACA05-9-97-599	FOSET 2 (Housing Areas and Former Garrison)	12/3/01	6/28/04	Yes: Groundwater Restriction	Yes: in Amendment No. 1 to Deed No. DACA05-9-97-599 (entire parcel).
S3.1.1	476.79	State Park - east side	DACA05-9-05-574	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/29/06	Yes: Groundwater Restriction Residential Use Restriction	Yes: provided in the deed.
S3.1.2	468.19	State Park - west side	DACA05-9-05-574	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/29/06	Yes: Groundwater Restriction Residential Use Restriction	Yes: provided in the deed.
S3.1.3	21.9	Balloon Spur Interior	DACA05-9-05-574	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/29/06	Yes: Residential Use Restriction	Yes: provided in the deed.
S3.1.4	12.59	Development Park area	DACA05-9-05-574	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	9/29/06	Yes: Residential Use Restriction	Yes: provided in the deed.
S3.2.1	11.28	Seaside Drumstick	DACA05-9-08-527	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	8/28/08	No	Yes: provided in the deed.
S3.2.2	0.09	Seaside Drumstick	DACA05-9-08-527	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	8/28/08	No	Yes: provided in the deed.
S4.1.1	72.14	ROW / Hwy 1	DACA05-9-05-572	FOST 9 (Track 0 Plug-in "C" and Track 1 Parcels)	8/15/05	8/8/07	Yes: Groundwater Restriction	Yes: provided in the deed.
S4.1.2.1	148.51	ROW / Hwy 1	DACA05-9-02-600	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
S4.1.2.2	0.15	ROW / Hwy 1	DACA05-9-02-600	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
S4.1.3	0.24	ROW / Hwy 1 Railroad crossing	DACA05-9-02-600	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
S4.1.4	0.41	Railroad Union Pacific / Hwy 1	DACA05-9-02-600	FOST 6 (Track 0)	5/27/03	9/1/04	Yes: Groundwater Restriction	Yes: provided in the deed.
S4.1.5	5.78	ROW / Hwy 1	DACA05-9-02-600	FOST 6 (Track 0)	5/27/03	9/1/04	No	Yes: provided in the deed.
S4.2.1	37.26	ROW / future Hwy 68	DACA05-9-05-528	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
S4.2.2	1.01	ROW / North of Hwy 68	DACA05-9-05-528	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
S4.2.3	14.01	ROW / South of Hwy 68	DACA05-9-05-528	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
S4.2.4	25.73	ROW / South of Hwy 68	DACA05-9-05-528	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.
S4.3	1.34	ROW / Hwy 68 at Corral de Tierra	DACA05-9-05-528	FOST 8 (Track 0 and Track 0 Plug-in "B" Parcels)	6/7/05	3/15/06	No	Yes: provided in the deed.

Footnotes:

Table 1
Parcels Transferred by Deed as of September 30, 2016
Former Fort Ord, California

USACE Parcel Number	Acreage	Parcel Name	USACE Deed Tracking Number	Transfer Document (FOST, FOSET)	Transfer Document Date (FOST, FOSET)	Transfer Date	Deed Restriction[1]	CERCLA Warranty

1- Groundwater Restriction: Denotes properties with deed containing a restriction or notice of presence of contamination grounwater that (a) prohibits access to or use of groundwater or prohibits access to groundwater without first consulting with the BCT and the County of Monterey.

2- USACE Deed Tracking Number refers to a Letter of Transfer, not a deed.

3- per Letter of Transfer, the Army will take actions necessary to protect human health and the environment in accordance with applicable law and the Department of Defense or Army policies.

4 - Parcel E4.4.1 was part of Parcel E4.4, which was transferred on August 8, 2000; an error in the deed's legal description that had excluded Parcel E4.4.1 was revised in a corrective deed issued May 5, 2015.

Notes:

AAFES = Army and Air Force Exchange Service
ASP = Ammunition Supply Point
BOQ = bachelor officers quarters
BLM = Bureau of Land Management
CSUMB = California State University Monterey Bay
DBRAC = Department of Base Realignment and Closure
Dev = Development
distr = district
DoD = Department of Defense
DPW = Department of Public Works
ESCA = Environmental Services Cooperative Agreement
EVOC = Emergency Vehicle Operations Center
FAAF = Fritzsche Army Airfield
FORA = Fort Ord Reuse Authority
FOSET = Finding of Suitability to Early Transfer
FOSL = Finding of Suitability to Lease
FOST = Finding of Suitability to Transfer
Gen. = General
Grp(s) = Group(s)
MOUT = Military Operations in Urban Terrain
MPC = Monterey Peninsula College
MPUSD = Monterey Peninsula Unified School District
N = North
NA = Not applicable
NW = Northwest
OU 1 = Operable Unit 1
OU 2 = Operable Unit 2
OUCTP = Operable Unit Carbon Tetrachloride Plume
ROW = Right of way
UCMBEST = University of California Monterey Bay Education, Science, and Technology
UCSC = University of California, Santa Cruz
USACE = U.S. Army Corps Of Engineers
VOQ = visiting officers quarters

Table 2
HTW Site Summary
Former Fort Ord, California

Site Number	Site Name	Record of Decision (ROD)	Completed in 1st 5-Year Review (2001)	Completed in 2nd 5-Year Review (2007)	Completed in 3rd 5-Year Review (2012)	Completed in 4th 5-Year Review (2017)	Ongoing
1	Ord Village Sewage Treatment Plant	Interim Action Sites ROD		X			
2	Main Garrison Sewage Treatment Plant	Basewide Remedial Investigation Sites ROD					X
3	Beach Trainfire Ranges					X	
4	Beach Stormwater Outfalls	Basewide Remedial Investigation Sites ROD	X				
5	Range 36A (within Site 39)	Basewide Remedial Investigation Sites ROD	X				
6	Range 39, Abandoned Car Dump	Interim Action Site			X		
7	Ranges 40 and 41 (within Site 39)	Basewide Remedial Investigation Sites ROD					X
8	Range 49, Molotov Cocktail Range	Interim Action Sites ROD		X			
9	Range 40A (within Site 39)	Basewide Remedial Investigation Sites ROD					X
10	Burn Pit	Interim Action Sites ROD		X			
11	Army and Air Force Exchange Service Fueling Station	No Action Sites ROD	X				
12	Lower Meadow Disposal Area	Basewide Remedial Investigation Sites ROD					X
13	Railroad Right-	No Action	X				

Table 2
HTW Site Summary
Former Fort Ord, California

Site Number	Site Name	Record of Decision (ROD)	Completed in 1st 5-Year Review (2001)	Completed in 2nd 5-Year Review (2007)	Completed in 3rd 5-Year Review (2012)	Completed in 4th 5-Year Review (2017)	Ongoing
	of-Way	Sites ROD					
14	707th Maintenance Facility	Interim Action Sites ROD	X				
15	Directorate of Engineering and Housing (DEH) Yard	Interim Action Sites ROD	X				
16	DOL Maintenance Yard	Basewide Remedial Investigation Sites ROD	X				
17	Disposal Area, 1400 Block Motor Pool	Basewide Remedial Investigation Sites ROD	X				
18	1600 Block Facility	No Action Sites ROD	X				
19	2200 Block Facility	No Action Sites ROD	X				
20	South Parade Ground and 3800 and 519th Motor Pools	Interim Action Sites ROD	X				
21	4400/4500 Block Motor Pool East	Interim Action Sites ROD		X			
22	4400/4500 Block Motor Pool West	Interim Action Sites ROD	X				
23	3700 Block Motor Pool Complex	No Action Sites ROD	X				
24	Old Directorate of Engineering and Housing (DEH) Yard	Interim Action Sites ROD	X				
25	Former Defense Reutilization Marketing Office	Basewide Remedial Investigation Sites ROD	X				
26	Sewage Pump Stations, Buildings	No Action Sites ROD	X				

Table 2
HTW Site Summary
Former Fort Ord, California

Site Number	Site Name	Record of Decision (ROD)	Completed in 1st 5-Year Review (2001)	Completed in 2nd 5-Year Review (2007)	Completed in 3rd 5-Year Review (2012)	Completed in 4th 5-Year Review (2017)	Ongoing
	5871 and 6143						
27	Army Reserve Motor Pool	No Action Sites ROD	X				
28	Barracks and Main Garrison Area	No Action Sites ROD	X				
29	Defense Reutilization Marketing Office	No Action Sites ROD	X				
30	Driver Training Area	Interim Action Sites ROD		X			
31	Former Dump Site	Basewide Remedial Investigation Sites ROD					X
32	East Garrison Sewage Treatment Plant	Interim Action Sites ROD		X			
33	Golf Course Maintenance Area	Basewide Remedial Investigation Sites ROD					X
34	Fritzsche Army Airfield (FAAF) Fueling Facility	Interim Action Sites ROD		X			
34B	Former Burn Pit	Interim Action Sites ROD			X		
35	FAAF Aircraft Cannibalization Yard	No Action Sites ROD	X				
36	FAAF Sewage Treatment Plant	Interim Action Sites ROD	X				
37	Trailer Park Maintenance Shop	No Action Sites ROD	X				
38	Army and Air Force Exchange Service Dry Cleaners	No Action Sites ROD	X				

Table 2
HTW Site Summary
Former Fort Ord, California

Site Number	Site Name	Record of Decision (ROD)	Completed in 1st 5-Year Review (2001)	Completed in 2nd 5-Year Review (2007)	Completed in 3rd 5-Year Review (2012)	Completed in 4th 5-Year Review (2017)	Ongoing
39	Inland Ranges	Basewide Remedial Investigation Sites ROD					X
39A	East Garrison Ranges	Interim Action Sites ROD		X			
39B	Inter-Garrison Training Area	Interim Action Sites ROD			X		
40	FAAF Helicopter Defueling Area	Interim Action Sites ROD				X	
41	Crescent Bluff Fire Drill Area	Interim Action Sites ROD				X	
OF-15	Outfall 15	Interim Action Sites ROD				X	
OF34/35	Outfalls 34 and 35	Interim Action Sites ROD	X				

Notes:
DEH = Directorate of Engineering and Housing
FAAF = Fritzsche Army Airfield
HTW = Hazardous and Toxic Waste
OF = Outfall
ROD = Record of Decision

Table 3
Groundwater Protection Zone Status and Deed Restrictions by Site
Former Fort Ord, California

Site Number	Site Name	Record of Decision (ROD)	Within Special Groundwater Protection Zone?	Deed Restriction? (See Note 1)
1	Ord Village Sewage Treatment Plant	Interim Action Sites ROD	Yes	No
2	Main Garrison Sewage Treatment Plant	Basewide Remedial Investigation Sites ROD	Yes	Yes
3	Beach Trainfire Ranges	Site 3 ROD/Track 1	Yes	Yes
5	Range 36A (within Site 39)	Basewide Remedial Investigation Sites ROD	No	No
6	Range 39, Abandoned Car Dump	Interim Action Sites ROD	No	No
7	Ranges 40 and 41 (within Site 39)	Basewide Remedial Investigation Sites ROD	No	No
8	Range 49, Molotov Cocktail Range	Interim Action Sites ROD	No	No
9	Range 40A (within Site 39)	Basewide Remedial Investigation Sites ROD	No	No
10	Burn Pit	Interim Action Sites ROD	No	No
12	Lower Meadow Disposal Area	Basewide Remedial Investigation Sites ROD	Yes	Yes
14	707th Maintenance Facility	Interim Action Sites ROD	Yes	No
15	Directorate of Engineering and Housing (DEH) Yard	Interim Action Sites ROD	Yes	No
20	South Parade Ground and 3800 and 519th Motor Pools	Interim Action Sites ROD	Yes	No
21	4400/4500 Block Motor Pool East	Interim Action Sites ROD	Yes	No
22	4400/4500 Block Motor Pool West	Interim Action Sites ROD	Yes	No
24	Old Directorate of Engineering and Housing (DEH) Yard	Interim Action Sites ROD	Yes	No
30	Driver Training Area	Interim Action Sites ROD	Yes	No
31	Former Dump Site	Basewide Remedial Investigation Sites ROD	No	Yes
32	East Garrison Sewage Treatment Plant	Interim Action Sites ROD	Yes	Yes
33	Golf Course Maintenance Area	Basewide Remedial Investigation Sites ROD	No	Yes
34	Fritzsche Army Airfield (FAAF) Fueling Facility	Interim Action Sites ROD	Yes	Yes
34B	Former Burn Pit	Interim Action Sites ROD	Yes	No
36	FAAF Sewage Treatment Plant	Interim Action Sites ROD	Yes	No
39	Inland Ranges	Basewide Remedial Investigation Sites ROD	No	Yes
39A	East Garrison Ranges	Interim Action Sites ROD	Yes	No
39B	Inter-Garrison Training Area	Interim Action Sites ROD	Yes	No
40	FAAF Helicopter Defueling Area	Interim Action Sites ROD	Yes	No
41	Crescent Bluff Fire Drill Area	Interim Action Sites ROD	No	No

Notes:
1. If "Yes" then see Table 1 for details on the deed restrictions.
DEH = Directorate of Engineering and Housing
FAAF = Fritzsche Army Airfield
ROD = Record of Decision

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Table 4
Aquifer Cleanup Levels
Former Fort Ord, California

Chemicals of Concern	Maximum Contaminant Levels (MCLs)		Aquiver Cleanup Levels (ACLs) µg/L	Basis for Selection
	State (EPA) µg/L	Federal (EPA) µg/L		
Operable Unit 1				
Benzene	1.0	5.0	1.0	State MCL
Chloroform	--	100	2.0	Risk-based Calculation
1,1-Dichloroethane (1,1-DCA)	5.0	--	5.0	State MCL
1,2-Dichloroethane (1,2-DCA)	0.5	5.0	0.5	State MCL
1,1-Dichloroethylene (1,1-DCE)	6.0	7.0	6.0	State MCL
Total 1,2-Dichloroethylene	6.0	70	6.0	Lowest MCL for Isomers
Methyl Ethyl Ketone	--	--	1,900	EPA IX. PRG 1995
Tetrachloroethylene (PCE)	5.0	5.0	5.0	State MCL
1,1,1-Trichloroethane (1,1,1-TCA)	200	200	200	State MCL
Trichloroethylene (TCE)	5.0	5.0	5.0	State MCL
Operable Unit 2				
Benzene	1.0	5.0	1.0	State MCL
Carbon Tetrachloride	0.5	5.0	0.5	State MCL
Chloroform	--	100	2.0	Risk-based Calculation
1,1-Dichloroethane (1,1-DCA)	0.5	--	0.5	State MCL
1,2-Dichloroethane (1,2-DCA)	0.5	5.0	0.5	State MCL
Cis-1,2-Dichloroethylene	6.0	70.0	6.0	Lowest MCL for Isomers
Methylene chloride	5.0	5.0	5.0	State MCL
1,2-Dichloropropane	5.0	5.0	1.0	Risk-based Calculation
Tetrachloroethylene (PCE)	5.0	5.0	3.0	Risk-based Calculation
Trichloroethylene (TCE)	5.0	5.0	5.0	State MCL
Vinyl Chloride	0.5	2.0	0.1	Risk-based Calculation
Sites 2 and 12				
Chloroform	--	100	2.0	Risk-based Calculation
1,2-Dichloroethane (1,2-DCA)	0.5	5.0	0.5	State MCL
Cis-1,2-Dichloroethylene	6.0	70.0	6.0	Lowest MCL

Table 4
Aquifer Cleanup Levels
Former Fort Ord, California

Chemicals of Concern	Maximum Contaminant Levels (MCLs)		Aquiver Cleanup Levels (ACLs) µg/L	Basis for Selection
	State (EPA) µg/L	Federal (EPA) µg/L		
				for Isomers
1,1-Dichloroethylene (1,1-DCE)	6.0	7.0	6.0	State MCL
1,3-Dichloropropene (total)	0.5	--	0.5	State MCL
Tetrachloroethylene (PCE)	5.0	5.0	5.0	Risk-based Calculation
Trichloroethylene (TCE)	5.0	5.0	5.0	State MCL
Vinyl Chloride	0.5	2.0	0.1	Risk-based Calculation
Operable Unit Carbon Tetrachloride Plume				
A-Aquifer				
Carbon Tetrachloride	0.5	5.0	0.5	State MCL
Chloroform	--	100	2.0	Risk-based Calculation
Methylene chloride	5.0	5.0	5.0	State MCL
1,1-Dichloroethylene (1,1-DCE)	6.0	7.0	6.0	State MCL
Cis-1,2-Dichloroethylene	6.0	70.0	6.0	Lowest MCL for Isomers
Tetrachloroethylene (PCE)	5.0	5.0	3.0	Risk-based Calculation
Trichloroethylene (TCE)	5.0	5.0	5.0	State MCL
Vinyl Chloride	0.5	2.0	0.1	Risk-based Calculation
Upper 180-Foot Aquifer				
Carbon Tetrachloride	0.5	5.0	0.5	State MCL
Lower 180-Foot Aquifer				
Carbon Tetrachloride	0.5	5.0	0.5	State MCL
1,2-Dichloroethane (1,2-DCA)	0.5	5.0	0.5	State MCL

Notes:
EPA = Environmental Protection Agency
MCL = Maximum Contaminant Level
PRG = Preliminary Remediation Goal
µg/L = micrograms per liter

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2011, Former Fort Ord, California

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
1	20-Jan-11	Tail fin / BLM habitat workers	Unit 14, MRS-BLM, Impact Area, Army property.	1	MD	USACE OE Safety responded. Item determined to be an 81mm mortar high explosive projectile, expended, tail boom. Disposed as MD for recycle.
2	24-Jan-11	Body of illumination device / BLM habitat workers	Unit 14, MRS-BLM, Impact Area, Army property.	1	MD	USACE OE Safety responded. Item determined to be an 81mm projectile, illumination, expended. Disposed as MD for recycle.
3	15-Feb-11	Possible mortar tail fins / BLM habitat workers	Unit 19, MRS-BLM, Impact Area, Army property.	2	MD	USACE OE Safety responded. Item determined to be 2-81mm mortar, projectiles, illumination, expended, tail booms. Disposed as MD for recycle.
4	10-Mar-11	Several mortar fins / BLM habitat workers	Unit 14, MRS-BLM, Impact Area, Army property.	9	MD	USACE OE Safety responded. Items determined to be 9-81mm mortar, high explosive projectiles, expended, tail booms. Disposed as MD for recycle.
5	10-Mar-11	Possible missile / BLM habitat workers	South of Merrill Rd. BLM property.	1	MD	USACE OE Safety responded. Item determined to be, Signal, ground, illumination, launch tube, expended. Disposed as MD for recycle.
6	14-Mar-11	Multiple mortar fins / BLM habitat workers	Unit 14, MRS-BLM, Impact Area, Army property.	4	MD	USACE OE Safety responded. Items determined to be 3-81mm mortar, high explosive projectile, expended, tail booms and 1-81mm mortar, practice, projectile, expended. Disposed as MD for recycle.
7	17-Mar-11	Possible mortar tail fin and other item / BLM habitat workers	Unit 14, MRS-BLM, Impact Area, Army property.	2	MD	USACE OE Safety responded. Items determined to be 81mm mortar, high explosive projectile, expended, tail boom, and 81mm mortar, practice projectile, expended. Disposed as MD for recycle.
8	11-May-11	Possible flare casing / BLM habitat workers	Crescent Bluff Rd. BLM property.	1	MD	USACE OE Safety responded. Item determined to be a Signal, ground, illumination, expended. Item inaccessible due to topography. Left in place.
9	1-Jun-11	Possible illumination round	Jack's Rd. between Pilarcitos and Merrell Rds.	1	MD	USACE Safety responded. Item determined to be a Simulator, projectile, air burst, xpended. Disposed as MD for recycle.
10	13-Sep-11	Possible 60mm practice round / CSUMB Police Dept.	Parking Lot 20 (A Street and 7th Avenue) CSUMB property	1	MD	USACE Safety responded. Item determined to be a 60mm mortar, practice projectile, expended. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2011, Former Fort Ord, California (Continued)

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
11	20-Sep-11	Possible 2-60mm mortar tail sections / BLM habitat workers	Unit 22, MRS-BLM, Impact Area, Army property	1	MD	USACE Safety responded. Items determined to be 2-3.5-inch Rockets, expended. Disposed as MD for recycle.
12	21-Sep-11	Possible 2-60mm tail sections and 2-illumination mortar, expended / BLM habitat workers	Unit 22, MRS-BLM Impact Area, Army property	1	MD	USACE Safety responded. Items determined to be 2-3.5-inch Rockets, expended a flare round, signal, expended, and a 60mm mortar, illumination projectile, expended. Disposed as MD for recycle.
13	26-Sep-11	A silver tube with winged bottom reported by BLM habitat workers	Mima Mounds Meadow, BLM-North, BLM property	1	MD	USACE Safety responded. Item determined to be a Signal, ground, illumination, expended. Disposed as MD for recycle.
14	8-Dec-11	A small shell 2-inch diameter x 5-inch long / BLM habitat workers	MRS-16, Army property	1	MD	USACE Safety responded. Item determined to be Rocket, 2.36-inch, practice, expended. Disposed as MD for recycle.
15	22-Dec-11	Round metallic object sticking above ground / BLM habitat workers	West of Henneken's Ranch Rd. and Trail 56	2	MD	USACE Safety responded. Item determined to be Mine, antitank, practice, inert (additional item located during area investigation). Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2012, Former Fort Ord, California

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
1	11-Jan-12	Tail boom, Cartridge, 81mm Illumination, M301A3 expended / BLM habitat workers	MRS-BLM, Unit 14 (Army restricted)	1	MD	Army MEC safety contractor responded. Item determined to be the tail boom portion of an 81mm M301A3 projectile, expended. Disposed as MD for recycle.
2	8-Feb-12	40mm “live” practice “blue egg” M781 / BLM habitat workers	BLM property East of Jack Rd. North of Merrill Rd. (Army transferred)	1	DMM	Army MEC Safety responded. Item determined to be cartridge, 40mm, practice. Disposed as DMM. Consolidated at storage location. Detonated February 16.
3	21-Mar-12	2-3 primer, striker and striker pin assemblies for grenades / BLM habitat workers	BLM property South of intersection Barloy Canyon and Sand Ridge Roads. (Army transferred)	3	MD	Army MEC Safety responded. Item determined to be 3 Fuze, grenade, hand, practice, M205 series, expended. Disposed as MD for recycle.
4	26-Mar-12	Mortar fins / BLM habitat workers	MRS-BLM, Unit 19 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a Mortar, 60mm, training. Stored for confirmation detonation. Detonation May 31 confirmed MD. Disposed for recycle.
5	17-Apr-12	2 small cylinders / BLM habitat workers	North central Unit 10B. (Army controlled).	2	MD	Army MEC Safety responded. Item determined to be 2 Signal Ground, M127A, expended. Disposed as MD for recycle.
6	18-Apr-12	Metal cylinder / BLM habitat workers	MRS-BLM Unit 21, (Army restricted).	2	MD	Army MEC Safety contractor responded. Item determined to be a Rocket, 3.5-inch, practice, expended. Disposed as MD for recycle.
7	25-Apr-12	Metal cylinder / BLM habitat workers	MRS-BLM Unit 21, (Army restricted).	1	MD	Army MEC Safety contractor responded. Item determined to be a Rocket, 3.5-inch, practice, expended. Disposed as MD for recycle.
8	13-May-12	Hand grenade / Marina Police	Monterey County property, (Army transferred)	1	ISD	Santa Clara County Sheriff’s bomb squad responded. Insufficient data was collected to determine the status of the item. Item destroyed in place.
9	30-May-12	Metal item / BLM habitat workers	MRS-BLM, Unit 19 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a Mortar, 81mm Illumination, M301/A2/1, expended. Disposed as MD for recycle.
10	16-Jul-12	“slap flare” / BLM habitat workers	BLM property (Army transferred)	1	MD	Army MEC Safety responded. Item determined to be a Signal, ground, illumination, M126, expended. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2012, Former Fort Ord, California (Continued)

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
11	17-Jul-12	Hollow sphere with 2 holes / BLM habitat workers	Meadow with Mima mound sign off of trail 56. BLM property (Army transferred).	1	MD	Army MEC Safety responded. Items determined to be Grenade, hand, M69, inert. Disposed as MD for recycle.
12	6-Aug-12	Cartridge Casings / BLM habitat workers	MRS-BLM, Unit 18, impact area (Army restricted)	9	MD	Army MEC Safety responded. Items determined to be casings, 20mm M103, expended. Collected as MD for recycle.
13	15-Aug-12	Possible hand grenade / PG&E workers	Monterey County. Northwest intersection of Reservation and Paniezra Rds. (Army transferred)	1	MD	FORA MEC Safety responded. Item determined to be a grenade, hand, Mk1, practice, inert. Disposed as MD for recycle.
14	17-Sep-12	Rocket body / BLM habitat workers	MRS-BLM, Unit 18, impact area, (Army restricted)	1	MD	Army MEC Safety responded. Item determined to be Rocket, 3.5-inch practice, expended. Disposed as MD for recycle.
15	29-Sep-12	Pineapple shaped item / military housing resident	4212 Malmedy Road, Ord Military Community (Army retained)	1	MD	Army MEC Safety responded. Item determined to be a grenade, hand, M30, practice, inert. Disposed as MD for recycle.
16	10-Oct-12	Mortar / CSUMB police	CSUMB property (Army transferred)	2	MD	Army MEC Safety responded. Items determined to be a mortar, 81mm, practice, inert. Disposed as MD for recycle.
17	10-Oct-12	Multiple round metallic spheres / York School staff	York School parcel, (Army transferred)	1	MD	Army security staff responded. Items determined to be 2 grenades, hand, M30, practice, inert. Disposed as MD for recycle.
18	5-6-Nov-12	Several 81 and 60mm fins and canisters / BLM habitat workers	MRS-BLM, Unit 14, (Army restricted)	4	MD	Army MEC Safety responded. Items determined to be 7 mortar, 81 and 60mm, fins and canisters, expended. Disposed as MD for recycle.
19	13-Nov-12	“Slap flare” / BLM habitat workers	MRS-10-B, (Army controlled)	1	MD	Army MEC Safety responded. Item determined to be Signal, illumination, ground, M125 series, expended. Disposed as MD for recycle.
20	9-Dec-12	Rifle grenade / Army contractor (during erosion control actions)	MRS-BLM, Unit 17, Range 34 (Army restricted)	1	UXO	Army MEC contractor responded. Item determined to be a Grenade, rifle, white phosphorus. Consolidated at storage location. Detonated as MEC December 13.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2013, Former Fort Ord, California

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
1	31-Jan-13	Tail Boom Mortar, 81mm, HE expended / BLM habitat workers	MRS-BLM, Unit 14 (Army restricted) vicinity Broadway and Orion Roads	1	MD	Army MEC safety contractor responded. Item determined to be the tail boom portion of an 81mm projectile, expended. Disposed as MD for recycle.
2	3-Feb-13	Possible “booby trap” firing device attached to a tree / BLM habitat workers	BLM property East of Jack Rd. and Skyline Rd. (transferred)	1	MD	Army MEC Safety responded. Item determined to be an expended Flare, surface, trip, M49. Disposed as MD.
3	10-Mar-13	Light Antitank weapon (LAW) Expended / CSUMB Police Department	CSUMB housing area vicinity Wainwright and Wedemeyer Courts (transferred)	1	MD	Army MEC Safety responded. Item determined to be an expended M74 Light Antitank Rocket launcher (tube). Disposed as MD trash.
4	21-May-13	81mm Mortar fins (expended) Tail Boom / BLM habitat workers	MRS-BLM, Unit 14 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a tail boom assemble to a 81mm mortar Illumination. M301A3. Disposed as MD for recycle.
5	15-Jun-13	Projectile, 40mm, Practice, (model unknown) / BLM habitat workers	Trail 49, 500 feet north of Lookout Ridge Rd. (transferred)	1	MD	Army MEC Safety responded. Item determined to be 40mm grenade, M781, practice, projectile, inert. Disposed as MD for recycle.
6	22-Jun-13	Military CS Grenades/Trip Flares / CSUMB police (by construction contractor)	Bldg. 5271 6th Ave. #46 CSUMB (transferred)	2	DMM	Monterey County Bomb Squad responded to call from CSUMB police. Items determined to be a military CS grenade and trip flares under a former barracks. Items transported from site by responding squad. Interview determined items to be DMM. Disposition unknown.
7	26-Jun-13	40mm projectile, signal, illumination, ground (model unknown) / BLM habitat workers	Trail 56 Hennenkins Ranch Road (transferred)	1	MD	Army MEC Safety responded. Item determined to be signal, Illumination, expended. Item disposed as MD for recycle.
8	31-Jul-13	Rocket motors (2), 2.36-inch, high explosive antitank, M6 / BLM habitat workers	MRS-BLM Unit 21, HA 37 (Army restricted).	2	MD	Army MEC Safety contractor responded. Item determined to be (2) expended Rocket, 2.36-inch antitank, practice. Disposed as MD for recycle.
9	21-Aug-13	81mm Rocket Mortar (2) / BLM work crew	MRS-BLM Unit 14 (Army transferred)	2	MD	Army MEC safety contractor responded. Items determined to be projectile, mortar, 81mm, practice, M43A1, unfuzed. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2013, Former Fort Ord, California (Continued)

Number	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
10	22-Aug-13	Fuze / BLM habitat workers	MRS-BLM, Unit 12 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a fuze, mortar, 81mm, expended. Disposed as MD for recycle.
11	4-Sep-13	Mortar projectiles (2), 81mm Illumination / BLM habitat workers	Unit 14 (Army restricted)	2	MD	Army MEC Safety responded. Item determined to be remnants of expended projectiles, 81mm Illumination. Disposed as MD for recycle.
12	9-Sep-13	Mortar projectile, 81mm Practice / BLM habitat workers	MRS-BLM Unit 14 (Army restricted).	1	MD	Army MEC Safety contractor responded. Items determined to be expended projectile, mortar, 81mm. Disposed as MD for recycle.
13	24-Oct-13	Blue intact Mine, antipersonnel / BLM habitat workers	MRS-10A Trail 91 (Army controlled)	1	DMM	Army MEC Safety responded. Item determined to be DMM mine, antipersonnel, practice, M8 w/intact signal charge. Collected for detonation. Detonated December 3.
14	31-Oct-13	M2 practive mine, inert / BLM habitat workers	Office Pilarcitios Canyon Road (transferred)	1	RRD	Army MEC safety responded. Item determined to be an M2 mine, practice, training aide, inert. Disposed as RRD for recycle.
15	6-Nov-13	Multiple mortar projectiles / BLM habitat workers	MRS-Ranges 43-48, in Range 48 east of Evolution Road, (Army restricted)	6	MD	Army MEC Safety contractor responded. Items identified as 3-60mm mortar, M49 projectiles, expended (MD) and 3-81mm mortar, M43 projectiles (MPPEH). MPPEH items detonated on December 3. All items determined to be MD. Disposed as MD for recycle.
16	13-Nov-13	Fuze, Grenade, Practice, expended / BLM habitat workers	MRS-BLM Unit 34 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a fuze, grenade, hand, practice, expended. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2014, Former Fort Ord, California

ID	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
1	6-Jan-14	Unknown metal debris / Native Plant Society researcher	Hawkeye fuel break road, MRS-BLM (Army restricted)	1	MD	USACE MEC Safety Specialist responded. Item determined to be an unidentifiable metal fragment. Disposed as MD for recycle.
2	6-Jan-14	Mortar projectile / BLM Weed Crew	Unit 14 MRS-BLM (Army restricted)	1	MD	Army MEC safety contractor responded. Item determined to be a fin assembly, 81mm mortar, illumination inert. Disposed as MD for recycle.
3	13-Jan-14	Projectile / Habitat management contractor	BLM lands, Watkins Gate Road and West Machinegun Flats (transferred)	1	MD	Army MEC Safety contractor responded. Item determined to be an expended 75mm Shrapnel projectile (expended). Disposed as MD for recycle.
4	3-Feb-14	Munitions Casing / BLM Ranger	BLM lands, Engineer Road, east of Reservation Road. (transferred)	1	MD	USACE MEC Safety Specialist responded. Item determined to be casing, 40mm grenade, illumination (Expended). Disposed as MD for recycle.
5	20-Feb-14	Signal, illumination, ground / BRAC staff biologist	MRS-BLM, Unit 21, Range 37 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be an M125 Series, Signal Ground Illumination, expended. Disposed as MD for recycle.
6	24-Feb-14	Round casing / BLM weed crew	MRS-BLM, Unit 14, (Army restricted)	1	MD	Army MEC Safety Specialist responded. Item determined to be expended 105mm casing, artillery, (Expended) likely used as Army engineer bench mark. Left in place.
7	24-Feb-14	Munitions casing stamped: 105mm M1414 1971 / BLM Ranger	Engineer Road west of Reservation Rd. (Transferred)	1	MD	Army MEC Safety contractor responded. Item determined to be an Projectile, 81mm, illumination, M301 series (Expended). Disposed as MD for recycle.
8	10-Mar-14	9 40mm aluminum casings (Expended) / ESCA UXO Technicians	Interim range area, Range 45 (Transferred)	9	MD	ESCA UXO contractor determined items to be to be (9) expended 40mm, grenade casing, type unknown. Disposed as MD for recycle.
9	16-Apr-14	Missile body / BLM work crew	MRS-BLM Unit 21 (Army restricted)	1	MD	Army MEC safety contractor responded. Items determined as rocket, 3.5-inch, practice, M29, expended. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2014, Former Fort Ord, California (Continued)

ID	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
10	22-Apr-14	Mortar Projectile / BLM habitat workers	MRS-BLM, Unit 14 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a fuze, mortar, 81mm, practice, M43 series, expended. Retained for demolition. Determined as MD by demolition. Disposed for recycle.
11	29-Apr-14	Grenade, hand, smoke, M18 series / ESCA UXO contractor	East Garrison Habitat Parcel (Transferred)	1	MD	ESCA UXO contractor item determined to be Grenade, smoke, M18 expended. Disposed as MD for recycle.
12	5-May-14	2.36-inch rocket / BLM weed crew	MRS-BLM, Unit 21, HA 37 (Army restricted)	1	MD	Army MEC safety contractor responded. 2.36-inch rocket, M7 practice, expended. Disposed as MD for recycle.
13	28-May-14	2 metal items / BLM weed crew	MRS-BLM, Unit 2, HA 26 (Army restricted)	2	MD	Army MEC safety contractor responded. Items determined to be a signal, illumination, ground, M125 series, expended. Disposed as MD for recycle.
14	10-Jul-14	TEA Rocket motor / Contractor (ESCA) habitat worker	Interim Action Ranges HA 44 (Transferred)	1	MD	USACE MEC safety specialist responded. Item identified as TEA rocket, expended. Disposed as MD for recycle.
15	15-Sep-14	Suspected mortar projectile / BLM weed crew	MRS-BLM Unit 14 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a projectile, 81mm mortar, illumination, M301 series, expended. Disposed as MD for recycle.
16	17-Sep-14	Suspected mortar projectile / BLM weed crew	MRS-BLM Unit 14 (Army restricted)	1	MD	Army MEC Safety contractor responded. Item determined to be a projectile, 81mm mortar, illumination, M301 series, expended. Disposed as MD for recycle.
17	8-Oct-14	Suspected aerial illumination flare / BLM ranger	BLM lands, Henniken's Ranch Road, north of Eucalyptus Road. (transferred)	1	MD	USACE MEC safety specialist responded. Item determined to be a signal, illumination, M125 series, expended. Disposed as MD for recycle.
18	8-Oct-14	Suspected aerial illumination flare / BLM ranger	BLM lands, 20 meters of illegal trail vicinity; Trails 56 and 20 (transferred)	1	MD	USACE MEC safety specialist responded. Item determined to be a signal, illumination, ground, parachute, M19 series, expended. Disposed as MD for recycle.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2014, Former Fort Ord, California (Continued)

ID	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
19	15-Oct-14	Collection of rockets, 35mm, subcaliber, practice, and 60mm mortar projectiles / MEC contractor safety escort	MRS-BLM, Unit 19 Vicinity Chinook and Broadway Roads (Army restricted)	3	UXO	Army MEC safety contractor responded. Items determined to be 3 rocket, subcaliber, practice M73, MEC; 46 rocket, subcaliber M73, expended; 2 projectile, 60mm mortar, practice M50, inert; 2 signal, illumination, ground, M126 series, expended. MEC consolidated in storage pending detonation. Detonation Oct 29 confirmed 3-35mm subcaliber rockets as MEC. MD disposed for recycle.
20	13-Nov-14	Slap flare / BLM weed crew	BLM lands, north of Eucalyptus Road vicinity Barloy Canyon Road. (transferred)	1	MD	USACE MEC safety specialist responded. Item determined to be a signal, illumination, ground, parachute, M19 series, expended. Disposed as MD for recycle.
21	24-Nov-14	Possible missile / BLM weed crew	BLM lands, south of Pilarcitos Canyon in drainage ditch near stock pond. (transferred)	1	MD	USACE MEC safety specialist responded. Item determined to be a 75mm projectile, shrapnel, expended. Disposed as MD for recycle.
22	12-Dec-14	Cartridge case, 40mm (projectile removed/case intact; expended) / ESCA contractor biologist	Interim ranges area. Range 45 (transferred)	25	MD	ESCA MEC contractor determined all items as MD and retained for recycle. **

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Incidental Military Munitions Items Found through December 31, 2015*, Former Fort Ord, California

ID	Date Found	Item(s) found / Reported by	Location	Quantity	Type	Disposition
1	3-Mar-15	Projectile, 40mm, practice, M382 / Army DGM contractor	Army Impact Area Unit 11. (Army restricted)	1	UXO	USACE MEC Safety contractor responded. Item determined to be UXO 40mm grenade, M382 Practice. Item disposed in place by detonation.
2	2-Apr-15	Slap flare / BLM	BLM property north side of Pilarcitos Canyon Rd. (Transferred)	1	MD	Army Ordnance and Explosives Specialist responded. Item determined to be an expended (MD) M125 Series, Signal Ground Illumination. The item was removed, inspected, and stored for recycle.
3	9-Jul-15	Projectile, 40mm grenade / Weston Solutions	Central Coast Veterans Cemetery (Transferred)	1	UXO	Army MEC Safety response CBRNE responded. Item determined to be a UXO 40mm grenade, HE, model unknown. Item was disposed in place by detonation.
4	20-Jul-15	Rocket, 2.36-inch, practice, M7 / Army contractor, MEC safety escort	West Machine Gun Road and Hennekens Ranch Road. Area B (Army controlled)	1	MD	Army MEC Safety contractor responded. Item determined to be expended (MD) Rocket, 2.36-inch M7 practice. The item was removed, inspected and stored for recycle.
5	27-Jul-15	Signal, ground / BLM	Vicinity Trail 20 intersection with Trail 73. (Transferred)	1	MD	Army Ordnance and Explosives Specialist responded and identified the item as an expended (MD) signal, ground, rifle, parachute, M17 series. The item was removed, inspected, and stored for recycle.
6	10-Aug-15	Signal, illumination, ground / BLM	BLM property north side of Pilarcitos Canyon Rd. (Transferred)	1	MD	Army Ordnance and Explosives Specialist responded and identified the item as an expended (MD) signal, ground, model unknown. The item was removed, inspected, and stored for recycle.
7	22-Sep-15	Mine, practice, M2A1 / BLM	BLM property Trail 39, 100 feet east of intersection Trail 38 (Transferred)	1	MD	Army Ordnance and Explosives Specialist responded and identified the item as an inert (MD) Mine M2A1B1, antipersonnel, practice, expended. The item was removed, inspected, and stored for recycle.
8	1-Dec-15	Cartridge Case, Practice, 40mm, M407A and Projectile, 40mm, Model Unknown, Ogive (Expended) / ESCA	FORA property within the restricted Impact Area (Range 45)	11	MD	ESCA RP Team responded and identified the items as described. The items were moved to ESCA RP MD storage.
9	15-Dec-15	1-40mm Cartridge Case, Practice, M407A1 (MD), Expended / ESCA	FORA property within the restricted Impact Area (Range 45)	1	MD	ESCA RP Team responded and dentified the items as described. The items were moved to ESCA RP MD storage.

Notes:
* Munitions reported in this table are based on published Annual Reports submitted by September 30. 2016 (the Five-Year Review cut-off date).
** Refer to Section 14 of the 4th Five-Year Review, the Interim Action Ranges MRA section, where more details are provided regarding the 25 MD items found on December 12, 2014.

Table 5
Incidental Military Munitions Items Found
Former Fort Ord, California

Acronyms:
BLM = Bureau of Land Management
BRAC = Base Realignment and Closure
CBRNE = Chemical, Biological, Radiological, Nuclear, and Explosive
CSUMB = California State University Monterey Bay
DGM = digital geophysical mapping
DMM = Discarded Military Munitions
ESCA = Environmental Services Cooperative Agreement
FORA = Fort Ord Reuse Authority
HA = Historical Area
HE = High Explosive
ISD = Insufficient Data
LAW = Light Antitank weapon
MD = Munitions Debris
MEC = Munitions and Explosives of Concern
mm = millimeter
MPPEH = Material Potentially Presenting An Explosive Hazard
MRS = Munitions Response Site
OE = Ordnance and Explosives
PG&E = Pacific Gas and Electric (Company)
Rd. = Road
RP = Remediation Program
RRD = range-related debris
TEA = Training Effectiveness Analysis
USACE = United States Army Corps of Engineers
UXO = unexploded ordnance

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PLATES

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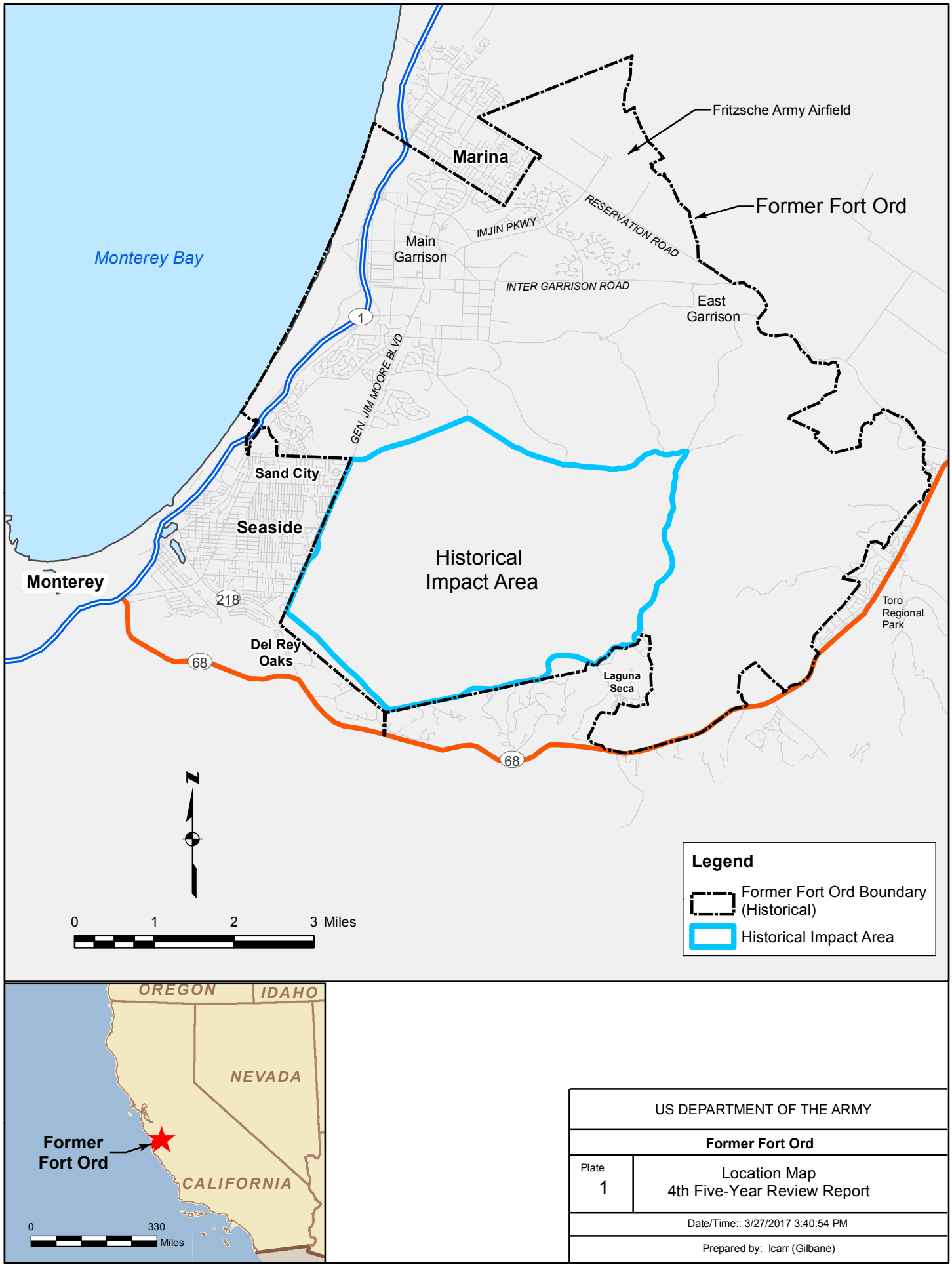

US DEPARTMENT OF THE ARMY	
Former Fort Ord	
Plate 1	Location Map 4th Five-Year Review Report
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Prepared by: lcarr (Gilbane)	

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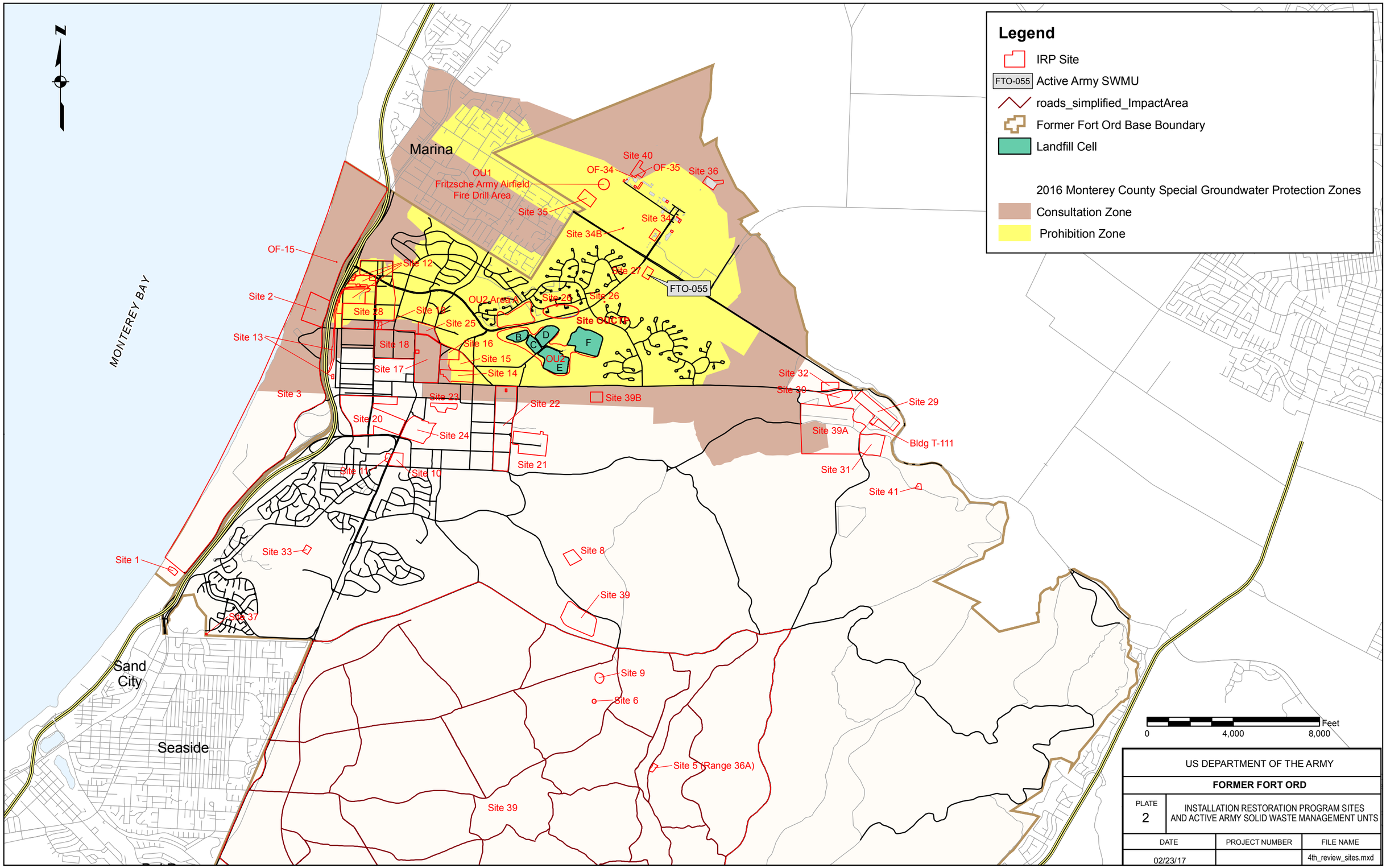
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MONTEREY BAY
Marina
Sand City
Seaside
OU1
Fritzsche Army Airfield
Fire Drill Area
OU2 Area A
Site OU2C
OU2
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Site 34B
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Site 37
Site 38
Site 39
Site 39A
Site 39B
Site 40
Site 41
Site 5 (Range 36A)
Site 6
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OF-34
OF-35
Bldg T-111
A
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F
Legend
IRP Site
FTO-055 Active Army SWMU
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Former Fort Ord Base Boundary
Landfill Cell
2016 Monterey County Special Groundwater Protection Zones
Consultation Zone
Prohibition Zone
0
4,000
8,000
Feet
US DEPARTMENT OF THE ARMY
FORMER FORT ORD
PLATE 2
INSTALLATION RESTORATION PROGRAM SITES AND ACTIVE ARMY SOLID WASTE MANAGEMENT UNTS
DATE
02/23/17
PROJECT NUMBER
FILE NAME
4th_review_sites.mxd

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N

MONTEREY BAY

2013 OU1 TCE A-Aquifer
(5 µg/L)

OUCTP A-Aquifer
(0.5 µg/L)

OUCTP
Lower 180-foot Aquifer
(0.5 µg/L)

2/12 TCE
Upper 180-foot Aquifer
(5 µg/L)

OUCTP
Upper 180-foot Aquifer
(0.5 µg/L)

OU2 TCE A-Aquifer
(5 µg/L)

OU2 TCE
Upper 180-foot Aquifer
(5 µg/L)

Legend

- Groundwater Plume
- 2012 Monterey County Special Groundwater Protection Zone
  - Consultation Zone
  - Prohibition Zone
- Roads
- Former Fort Ord Base Boundary

0 1,500 3,000 Feet

US DEPARTMENT OF THE ARMY

FORMER FORT ORD

PLATE	
3	GROUNDWATER PLUMES MARCH 2012 4th FIVE-YEAR REVIEW

DATE	PROJECT NUMBER	FILE NAME
01/25/17		4TH_plumes12.mxd

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N

MONTEREY BAY

OUCTP A-Aquifer
(0.5 µg/L)

OUCTP
Lower 180-foot Aquifer
(0.5 µg/L)

OUCTP
Upper 180-foot Aquifer
(0.5 µg/L)

2/12 PCE
Upper 180-foot Aquifer
(5 µg/L)

OU2 TCE A-Aquifer
(5 µg/L)

OU2 TCE
Upper 180-foot Aquifer
(5 µg/L)

Legend

- Groundwater Plume
- Roads
- Former Fort Ord Base Boundary

2016 Monterey County Special GroundwaterProtection Zones

- Consultation Zone
- Prohibition Zone

0 1,500 3,000 Feet

US DEPARTMENT OF THE ARMY

FORMER FORT ORD

PLATE	GROUNDWATER PLUMES JUNE 2016 4th FIVE-YEAR REVIEW REPORT		
4			
DATE	PROJECT NUMBER	FILE NAME	
01/25/17		4TH_plumes16.mxd	

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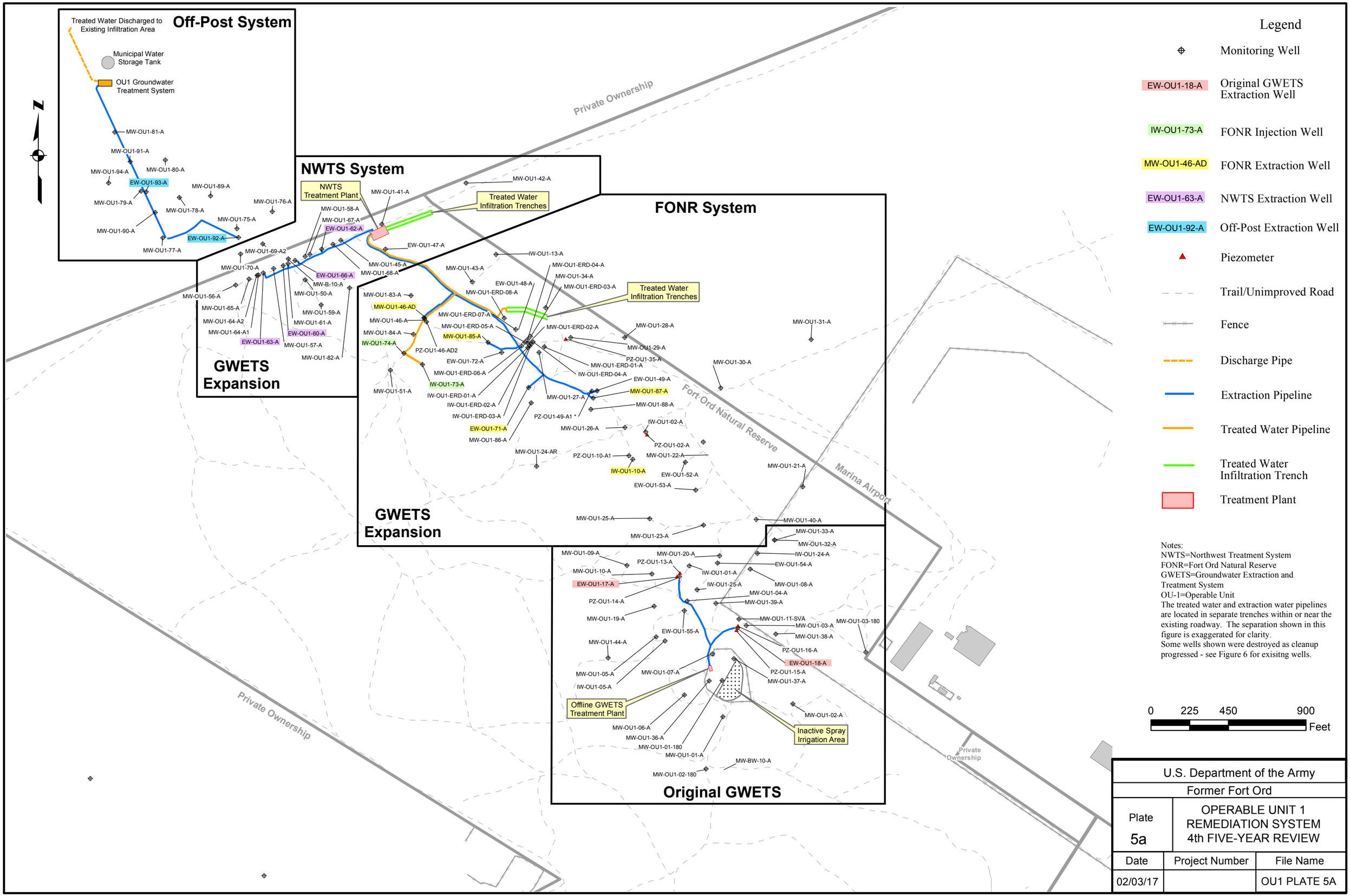
Off-Post System
Treated Water Discharged to Existing Infiltration Area
Municipal Water Storage Tank
OU1 Groundwater Treatment System
MW-OU1-81-A
MW-OU1-91-A
MW-OU1-80-A
MW-OU1-94-A
EW-OU1-93-A
MW-OU1-89-A
MW-OU1-79-A
MW-OU1-78-A
MW-OU1-76-A
MW-OU1-75-A
MW-OU1-90-A
EW-OU1-92-A
MW-OU1-77-A
NWTS System
NWTS Treatment Plant
MW-OU1-41-A
MW-OU1-42-A
Treated Water Infiltration Trenches
MW-OU1-58-A
MW-OU1-67-A
EW-OU1-62-A
EW-OU1-47-A
MW-OU1-69-A2
MW-OU1-70-A
MW-OU1-45-A
MW-OU1-68-A
EW-OU1-66-A
MW-B-10-A
MW-OU1-56-A
MW-OU1-50-A
MW-OU1-65-A
MW-OU1-59-A
MW-OU1-64-A2
MW-OU1-61-A
MW-OU1-64-A1
EW-OU1-60-A
EW-OU1-63-A
MW-OU1-57-A
MW-OU1-82-A
GWETS Expansion
FONR System
MW-OU1-43-A
IW-OU1-13-A
MW-OU1-ERD-04-A
MW-OU1-34-A
EW-OU1-48-A
MW-OU1-ERD-08-A
MW-OU1-ERD-03-A
Treated Water Infiltration Trenches
MW-OU1-83-A
MW-OU1-46-AD
MW-OU1-ERD-07-A
MW-OU1-46-A
MW-OU1-ERD-05-A
MW-OU1-ERD-02-A
MW-OU1-28-A
MW-OU1-84-A
MW-OU1-85-A
MW-OU1-29-A
IW-OU1-74-A
PZ-OU1-46-AD2
PZ-OU1-35-A
EW-OU1-72-A
MW-OU1-ERD-01-A
MW-OU1-ERD-06-A
IW-OU1-ERD-04-A
EW-OU1-49-A
IW-OU1-73-A
MW-OU1-51-A
MW-OU1-87-A
IW-OU1-ERD-01-A
MW-OU1-27-A
MW-OU1-88-A
IW-OU1-ERD-02-A
PZ-OU1-49-A1
IW-OU1-ERD-03-A
IW-OU1-02-A
EW-OU1-71-A
MW-OU1-26-A
MW-OU1-86-A
PZ-OU1-02-A
MW-OU1-24-AR
PZ-OU1-10-A1
MW-OU1-22-A
IW-OU1-10-A
EW-OU1-52-A
EW-OU1-53-A
MW-OU1-25-A
MW-OU1-40-A
MW-OU1-23-A
MW-OU1-33-A
MW-OU1-32-A
MW-OU1-09-A
MW-OU1-20-A
IW-OU1-24-A
PZ-OU1-13-A
EW-OU1-54-A
MW-OU1-10-A
IW-OU1-01-A
EW-OU1-17-A
IW-OU1-25-A
MW-OU1-08-A
MW-OU1-04-A
PZ-OU1-14-A
MW-OU1-39-A
MW-OU1-19-A
MW-OU1-11-SVA
MW-OU1-03-180
MW-OU1-03-A
EW-OU1-55-A
MW-OU1-38-A
MW-OU1-44-A
PZ-OU1-16-A
EW-OU1-18-A
MW-OU1-05-A
MW-OU1-07-A
PZ-OU1-15-A
IW-OU1-05-A
MW-OU1-37-A
Offline GWETS Treatment Plant
MW-OU1-02-A
Inactive Spray Irrigation Area
MW-OU1-06-A
MW-OU1-36-A
MW-OU1-01-180
MW-OU1-01-A
MW-BW-10-A
MW-OU1-02-180
Original GWETS
MW-OU1-31-A
MW-OU1-30-A
MW-OU1-21-A
Private Ownership
Fort Ord Natural Reserve
Marina Airport
Private Ownership
Private Ownership
N
Legend
Monitoring Well
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
Piezometer
Trail/Unimproved Road
Fence
Discharge Pipe
Extraction Pipeline
Treated Water Pipeline
Treated Water Infiltration Trench
Treatment Plant
Notes:
NWTS=Northwest Treatment System
FONR=Fort Ord Natural Reserve
GWETS=Groundwater Extraction and Treatment System
OU-1=Operable Unit
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.
0
225
450
900
Feet
U.S. Department of the Army
Former Fort Ord
Plate
5a
OPERABLE UNIT 1
REMEDIATION SYSTEM
4th FIVE-YEAR REVIEW
Date
02/03/17
Project Number
File Name
OU1 PLATE 5A

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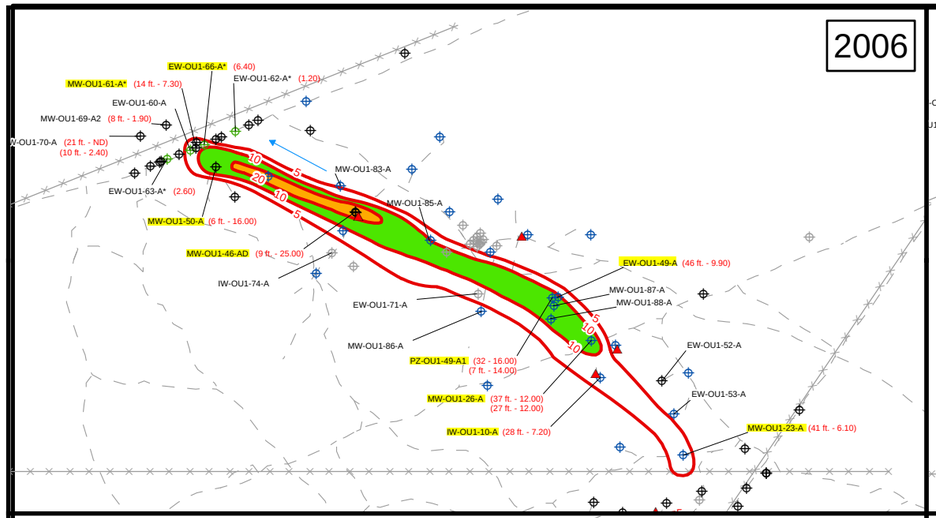

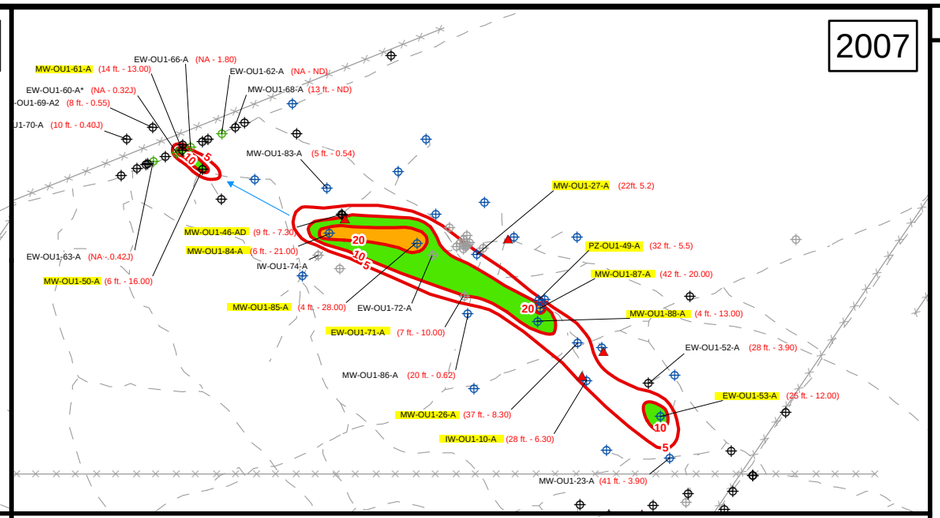

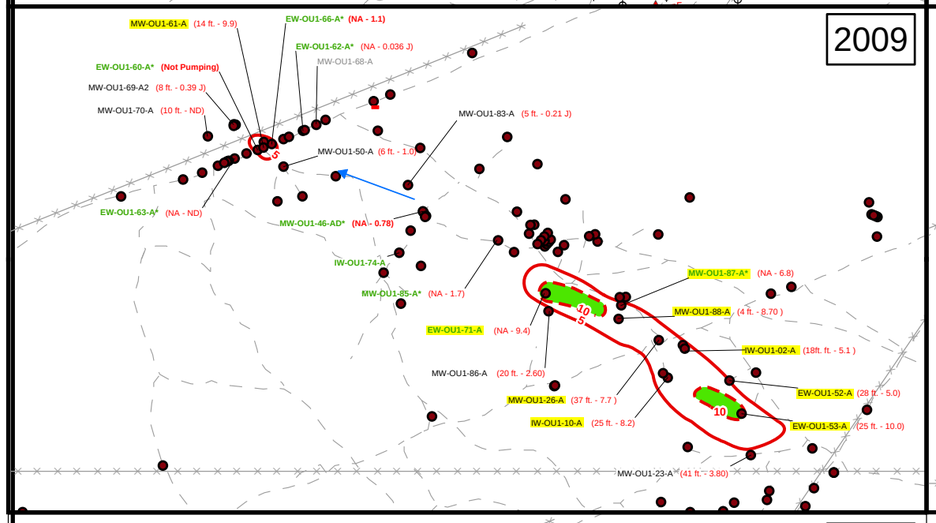

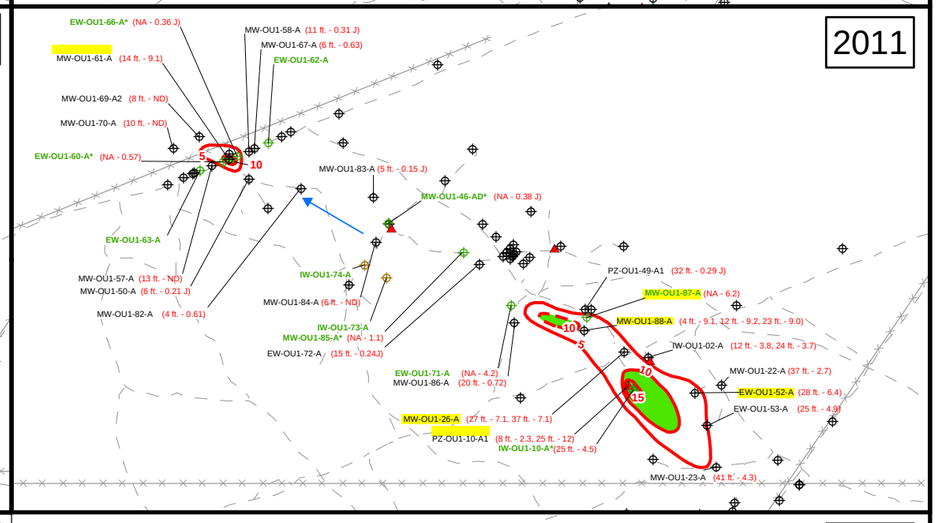

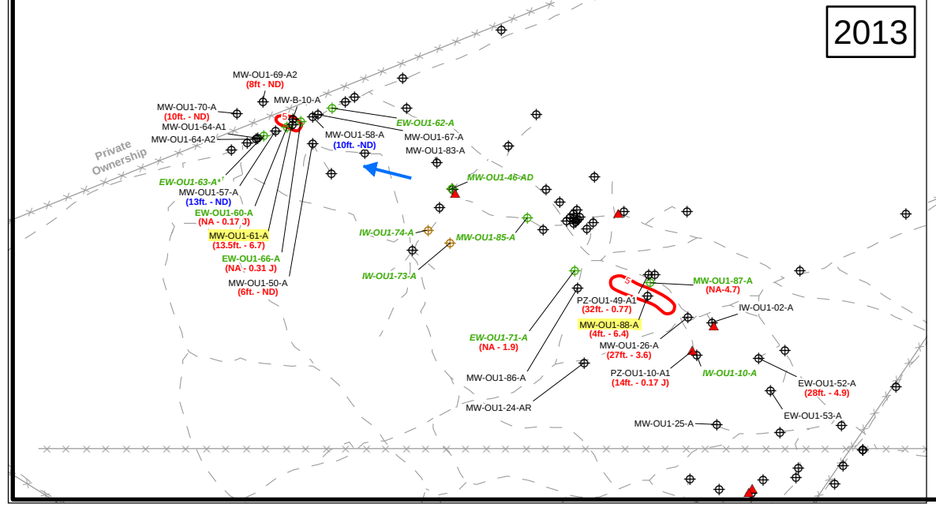

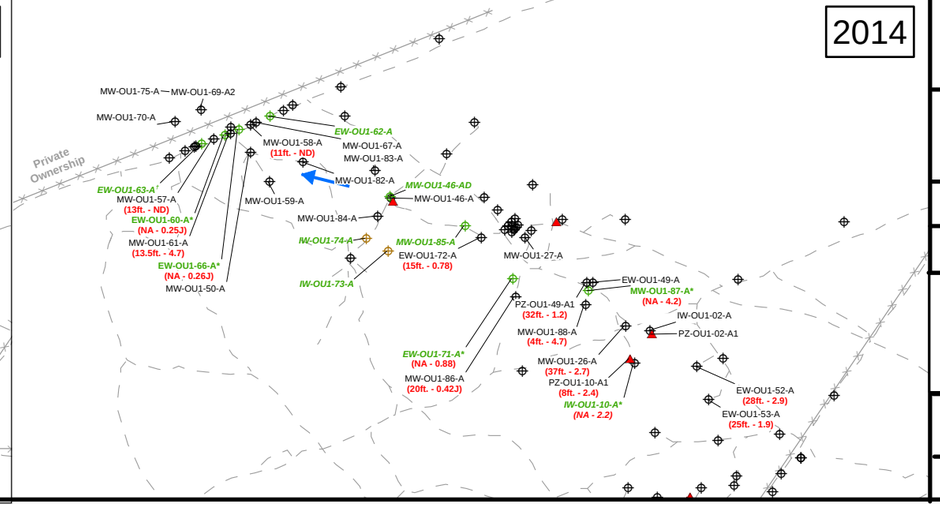

Legend

- Monitoring Well
- Extraction Well
  Bold green font indicates active well
- Injection Well
  Bold green font indicates active 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

Notes:
MCL=Maximum Contaminant Level (specified in OU-1 ROD - 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
Note to scale

N

0 200 400 800 Feet

US DEPARTMENT OF ARMY

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Plate 5b

TCE CONCENTRATION IN SEPTEMBER GROUNDWATER MONITORING 2006-2014 4th FIVE-YEAR REVIEW REPORT

Date	PROJECT NUMBER	File Name
02/03/17		OU1 Plate b

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US DEPARTMENT OF THE ARMY

FORMER FORT ORD

PLATE	
6	OPERABLE UNIT 2 REMEDIATION SYSTEMS AND FORMER LANDFILLS 4th FIVE-YEAR REIVEW REPORT

DATE	PROJECT NUMBER	FILE NAME
10/18/16	141234	4TH_yr_OU2.mxd

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Legend

- SVE Wells
- Injection Well
- Infiltration Well
- Extraction Well
- Groundwater Collection Pipeline
- SVE Pipeline
- Treated Water Injection Pipeline

IMJIN PARKWAY

OU2 GWTP

Soil Vapor Treatment Unit

SITES 2/12 GROUNDWATER TREATMENT PLANT

VE-12-09
VE-12-10
EW-12-08-180U
EW-12-05-180M
VE-12-06
VE-12-07
VE-12-08
EW-12-06-180M
IW-02-01-180
EW-12-07-180M
VE-12-04
EW-12-03-180M
VE-12-05
IW-02-02-180
EW-12-03-180U
INF-02-03-180
EW-12-04-180U
EW-12-04-180M
VE-12-03
VE-12-02
VE-12-01
INF-02-02-180
INF-02-01-180

HIGHWAY 1

2ND AVE

0 300 600 FEET

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, G
User Community

US DEPARTMENT OF THE ARMY

FORMER FORT ORD

PLATE	SITES 2 AND 12 REMEDIATION SYSTEM 4th FIVE-YEAR REIVEW REPORT
7	

DATE	PROJECT NUMBER	FILE NAME
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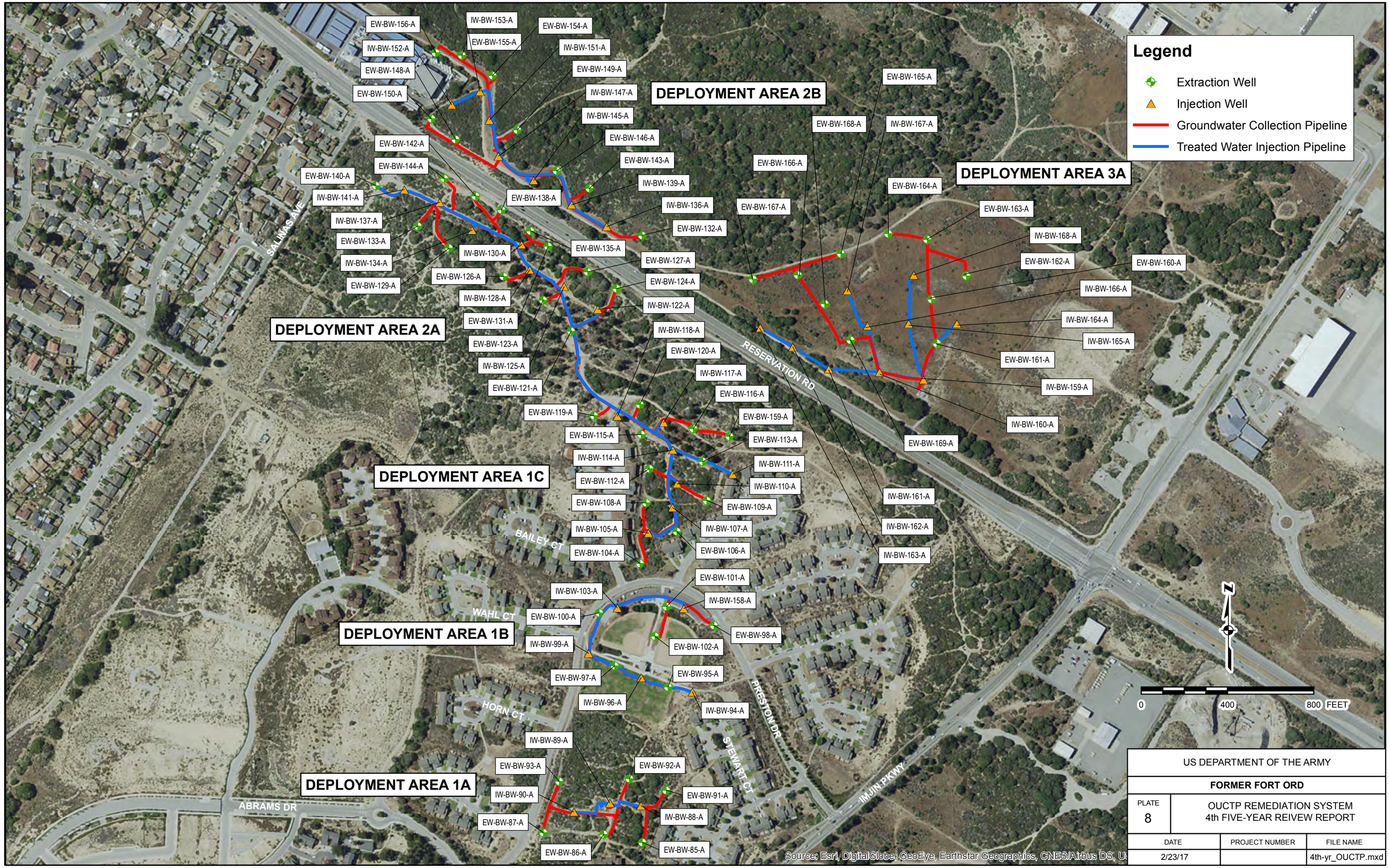

US DEPARTMENT OF THE ARMY

FORMER FORT ORD

PLATE	
8	OUCTP REMEDIATION SYSTEM 4th FIVE-YEAR REIVEW REPORT

DATE	PROJECT NUMBER	FILE NAME
2/23/17		4th-yr_OUCTP.mxd

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0 4,500 9,000 Feet

MONTEREY BAY

Marina

Sand City

Seaside

Del Rey Oaks

Laguna Seca

HWY-1 (S)

IMJIN PKWY

RESERVATION RD

ABRAMS DR

INTER-GARRISON RD

IGHTFIGHTER DR

GEN. JIM MOORE BLVD

GIGLING RD

BROADWAY AVE

EUCALYPTUS RD

BARLOY CANYON RD

KEENENKENS RANCH RD

SOUTH BOUNDARY RD

HWY- 68

CSUMB Off-Campus MRA

County North MRA

Future East Garrison MRA

Parker Flats MRA

Seaside MRA

Interim Action Ranges MRA

Impact Area MRA

Watkins Gate Burn Area (Unit)

Ranges 43-48

Ranges 43-48 (South)

Range 30A

"11-Grid Area"

MRS-16

MOUT Site MRA

Laguna Seca Parking MRA

Del Rey Oaks MRA

DRO/Monterey MRA

15 SEA 01

15 SEA 02

15 SEA 03

15 SEA 04

15 DRO 01

15 DRO 01A

15 DRO 02

15 MOCO 01

15 MOCO 02

06 EXP

50 EXP

53 EXP

44 EDC

54 EDC

44 PBC

53 BLM

MRS-31

MRS-13C

NON-ESCA

Parcel F2.6 (Retained by Army)

MRS-13B

ESCA

Parcel L2.4.1

Parcel L2.3

MRS-45

MRS-04A

MRS-27A

Parcels in MRS-13B Enlargement

Former Fort Ord Base Boundary

Track 3 Impact Area MRA

Munitions Response Site with Site Number (MRS- prefix not shown for clarity)

Unit

Track 1 Site

Interim Action MR Site

Eucalyptus Fire Area (Actual)

Watkins Gate Burn Area (Actual)

Del Rey Oaks MRA

Track 2 Parker Flats MRA

BLM Area A (Track 1)

BLM Area B

BLM Area C

ESCA Group 1

Parker Flats and Seaside MRA

ESCA Group 2

CSUMB Off-Campus MRA

County North MRA (Track 1)

ESCA Group 3

DRO/Monterey, Laguna Seca Parking, and MOUT Site MRAs

Interim Action Ranges MRA

ESCA Group 4

Future East Garrison MRA

CSUMB - California State University Monterey Bay
DRO - Del Rey Oaks
ESCA - Environmental Services Cooperative Agreement
FORA - Fort Ord Reuse Authority
FOST - Finding of Suitability to Transfer
MOUT - Military Operations in Urban Terrain
MRA - Munitions Response Area
MRS - Munitions Response Site

Saturated Area with Fence

MRS-27H

MRS-16

MRS-58

MRS-BLM

MRS-35

Eucalyptus Rd

Parker Flats Rd

MRS-16 Enlargement

US DEPARTMENT OF THE ARMY

Former Fort Ord

Plate 9

Munitions Response Sites
4th Five Year Review Report

Date/Time:: 3/27/2017 3:12:27 PM

Prepared by: Icarr (Gilbane)

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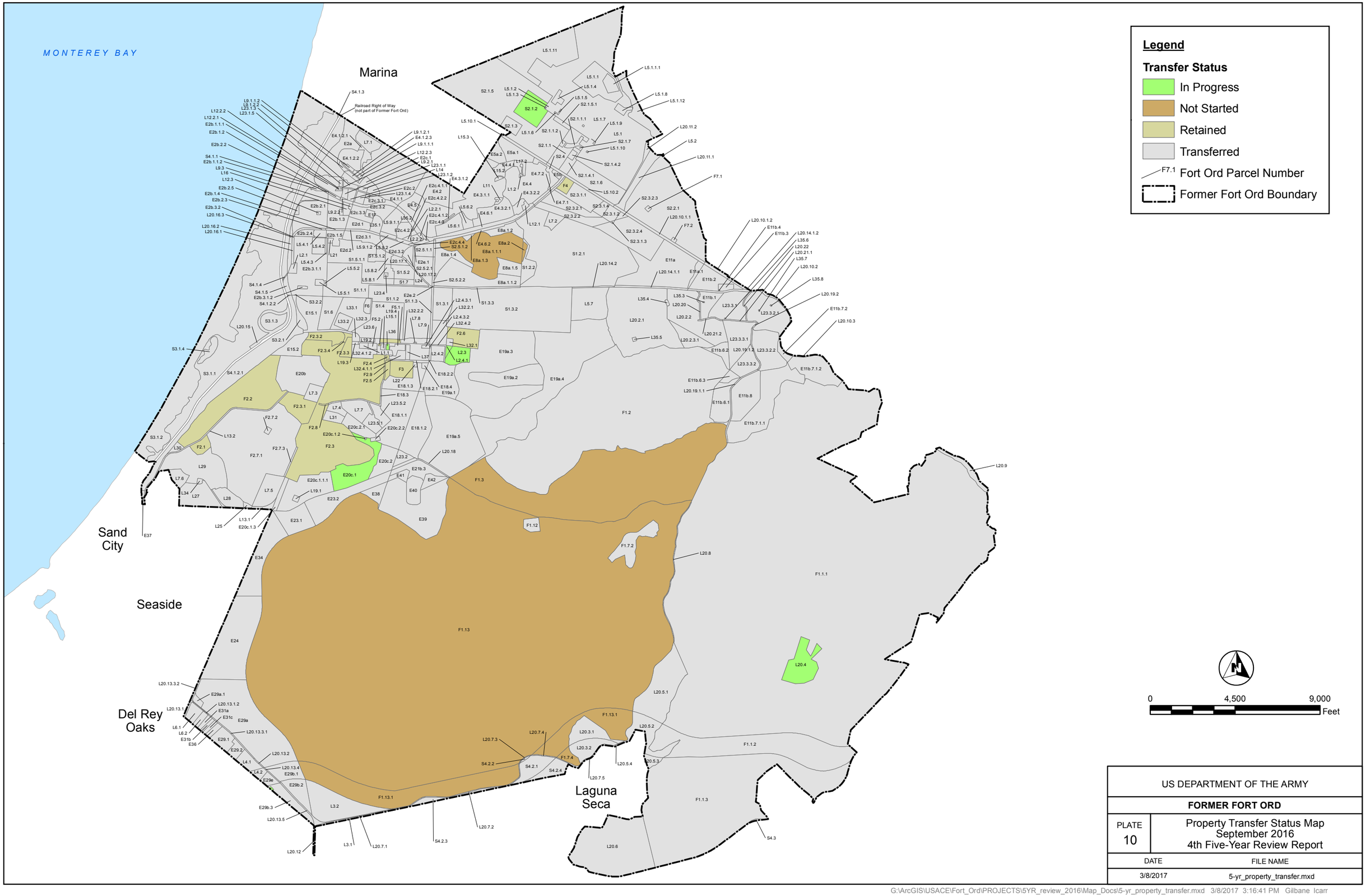

US DEPARTMENT OF THE ARMY

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PLATE	Property Transfer Status Map September 2016 4th Five-Year Review Report
10	

DATE	FILE NAME
3/8/2017	5-yr_property_transfer.mxd

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\5YR_review_2016\Map_Docs\5-yr_property_transfer.mxd 3/8/2017 3:16:41 PM Gilbane Icarr

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APPENDIX A

References

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Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
References listed below were used to prepare this Five Year Review and were the current versions available at the time of the September 30, 2016 review period end date. Therefore, documents provided in this reference list that were not in a final version by September 30, 2016, may be subsequently replaced by a newer version in the Fort Ord Administrative Record.					
Sections 1 through 4					
1 to 4	General	11/19/1990	U.S. Department of the Army (Army), U.S. Environmental Protection Agency (EPA) Region 9, and State of California,	*Federal Facility Agreement under CERCLA Section 120 Administrative Docket Number: 90-14. (Effective November 19, 1990)*	BW-0119
1 to 4	General	6/1/1993	Army, 1993	*Fort Ord Disposal and Reuse Environmental Impact Statement (EIS). Final. Technical Assistance from Jones & Stokes Associates, Inc. (JSA 90-214S). U.S. Army Corp of Engineers. Sacramento District, Sacramento, CA*	BW-1348
1 to 4	General	6/1/2001	EPA, 2001	*U.S. EPA Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P, June 2001*	Not Applicable
1 to 4	General	3/30/2007	Army, 2007a	*Environmental Services Cooperative Agreement (ESCA) under the authority of Title 10 United States Code, Section 2701(d) - Environmental Restoration Program* (10 U.S.C. 2701)	ESCA-0031
1 to 4	General	7/26/2007	Army et al., 2007	*Federal Facility Agreement, CERCLA Section 120, Amendment No. 1 Related to Early Transfer Property Referenced in FOSET 5*	BW-0119B
1 to 4	General	11/15/2007	Army, 2007b	*Finding of Suitability for Early Transfer (FOSET), ESCA Parcels and Non-ESCA Parcels (OUCTP), Former Fort Ord, California (FOSET 5).*	FOSET-004J
1 to 4	General	2/27/2008	California Department of Toxic Substances Control (DTSC), 2008	*Memorandum of Agreement (MOA) Among the Fort Ord Reuse Authority (FORA), Monterey County, and Cities of Seaside, Monterey, Del Rey Oaks and Marina, California State University Montery Bay, University of California Santa Cruz, Monterey Peninsula College, and the Department of Toxic Substances Control (DTSC) Concerning Monitoring and Reporting on Environmental Restrictions on the Former Fort Ord.* (MOA was finalized on February 27, 2008.)	Included in OE-0714A
1 to 4	General	7/25/2008	EPA, 2008	*Letter: Effective Date of Administrative Order on Consent (AOC). For Cleanup Of Portions Of The Former Fort Ord, U.S. EPA Region 9, CERCLA Docket No. R9-2007-03*	ESCA-0098
1 to 4	General (MRS Security Program)	6/1/2012	Fort Ord Base Realignment and Closure (Fort Ord BRAC), 2012	*Fort Ord Munitions Response Site Security Program Annual Report 2011.*	OE-0422K
1 to 4	General	9/17/2012	Army, 2012	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
1 to 4	General (MRS Security Program)	6/13/2013	Fort Ord BRAC, 2013	*Fort Ord Munitions Response Site Security Program Annual Report 2012.*	OE-0422M

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
1 to 4	General (MRS Security Program)	4/29/2014	Fort Ord BRAC, 2014	*Fort Ord Munitions Response Site Security Program Annual Report 2013.*	OE-0422N
1 to 4	General (MRS Security Program)	5/28/2015	Fort Ord BRAC, 2015	*Fort Ord Munitions Response Site Security Program Annual Report 2014*	OE-0422O
1 to 4	General (MRS Security Program)	3/1/2016	Fort Ord BRAC, 2016	*Fort Ord Munitions Response Site Security Program Annual Report 2015*	OE-0422P
Section 5					
5	OU 1	6/5/1987	Harding Lawson Associates (HLA), 1987	*Remedial Investigation/Feasibility Study of Groundwater Contamination Fritzsche Army Airfield Fire Drill Area Fort Ord, California*	OU1-060
5	OU 1	12/1/1989	EPA, 1989	*Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.*	Not Applicable
5	OU 1	1991	EPA, 1991	*Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.*	Not Applicable
5	OU 1	2/16/1995	Army, 1995	*Record of Decision, Operable Unit I, Fritzsche Army Airfield Fire Drill Area. Fort Ord, California*	OU1-308
5	OU 1	4/1/1997	Army, 1997	*Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California*	BW-1787
5	OU 1	6/1/2001	EPA, 2001	*U.S. EPA Comprehensive Five-Year Review Guidance (OSWER Directive 9355.7-03B-P) June 2001*	Not Applicable
5	OU 1	7/1/2004	EPA, 2004	*Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005, July 2004.*	Not Applicable
5	OU 1	3/1/2009	EPA, 2009	*U.S. EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance (EPA 530/R-09-007) March 2009*	Not Applicable
5	OU 1	8/12/2010	Army, 2010	*Explanation of Significant Differences No. 1 Operable Unit I, Fritzsche Army Airfield Fire Drill Area. Fort Ord, California.*	OU1-581
5	OU 1	9/8/2011	EPA, 2011	*EPA Letter to Gail Youngblood, Fort Ord BRAC Environmental Coordinator, Department of the Army, regarding Request for Designation of Operating Properly and Successfully, Operable Unit 1 Trichloroethene Plume, Fort Ord, California*	OU1-590A
5	OU 1	9/15/2011	HydroGeoLogic, Inc. (HGL), 2011	*Final Rebound Evaluation Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California*	OU1-559D
5	OU 1	10/27/2011	Army, 2011	*Army letter to Marina in Motion forwarding the report "Understanding Soil Gas at the Former Fort Ord"*	BW-2588
5	OU 1	11/8/2011	HGL, 2011a	*Final 2010 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California*	OU1-588A

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
5	OU 1	7/25/2012	HGL, 2012	*Final 2011 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area. Former Fort Ord, California*	OU1-595A
5	OU 1	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
5	OU 1	3/30/2013	HGL, 2013	*Final 2012 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area*	OU1-599A
5	OU 1	2014	EPA, 2014	*Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120.*	Not Applicable
5	OU 1	4/4/2014	HGL, 2014	*Final 2013 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area*	OU1-603A
5	OU 1	2/28/2015	HGL, 2015	*Final 2014 Annual and Third Quarter Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area*	OU1-613A
5	OU 1	5/12/2015	HGL, 2015a	*Final Technical Memorandum, Operable Unit 1 Exit Strategy*	OU1-614B
5	OU 1	12/3/2015	HGL, 2015b	*Final 2015 Annual Groundwater Monitoring Report, Operable Unit 1, Fritzsche Army Airfield Fire Drill Area, Former Fort Ord, California*	OU1-618A
5	OU 1	02/09/2016	DTSC, 2016	*Review of Draft Technical Memorandum Operable Unit 1, Attainment Monitoring Evaluation and Summary for EPA Designated Emerging Contaminant, Former Fort Ord, California*	OU1-626.3
5	OU 1	3/16/2016	HGL, 2016	*Final Remedial Action Completion Report/Technical Memorandum, Operable Unit 1 Attainment Monitoring Results, Sampling Events #1 through #4, Former Fort Ord, California*	OU1-623A
5	OU 1	3/17/2016	RWQCB, 2016	*Water Quality Control Plan for the Central Coastal Basin, March 2016 Edition.*	Not Applicable
5	OU 1	5/25/2016	EPA, 2016	*Lifetime Health Advisories and Health Effects Support Documents for Perfluorooctanoic Acid and Perfluorooctane Sulfonate Federal Register / Vol. 81, No. 101 / Wednesday, May 25, 2016 / Notices*	TBD
5	OU 1	08/19/2016	RWQCB, 2016a	*CCRWQCB letter to Mr. William Collins regarding Legal Opinion on New USEPA Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) USEPA Health Advisory For Operable Unit 1 (OU1), Former Fort Ord Superfund Site, Monterey County*	OU-625
5	OU 1	8/25/2016	HGL, 2016a	*Final 2016 Annual Groundwater Monitoring Report, Operable Unit 1 Fritzsche Army Airfield, Fire Drill Area, Former Fort Ord, California*	OU1-624A
5	OU 1	2/21/2017	EPA, 2017	*EPA letter to the Department of Army regarding 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.* (Technical Memorandum Date: 8/25/2016)	OU1-626.4

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
Section 6					
6	OU 2	4/1/1990	HLA, 1990	*Final Fort Ord Landfills: Preliminary Hydrogeologic Investigation, Vol I, Vol II Appendices A-G, Vol III Appendices H-L, April 20, 1990*	OU2-060
6	OU 2	6/8/1993	Dames and Moore, 1993	*Final Remedial Investigation Report, Remedial Investigation/ Feasibility Study Fort Ord Landfills, Fort Ord California, June 8, 1993*	OU2-222
6	OU 2	7/15/1994	Army, 1994	*Final Record of Decision, Operable Unit 2, Fort Ord Landfills, Fort Ord, California*	OU2-480
6	OU 2	8/3/1995	Army, 1995	*Explanation of Significant Differences, Operable Unit 2, Fort Ord Landfills, Fort Ord, California*	OU2-406
6	OU 2	10/1/1995	HLA, 1995	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation Introduction and Basewide Hydrogeologic Characterization*	BW-1283A
6	OU 2	1/4/1996	EPA, 1996	Letter from EPA to Acting Deputy Assistant Secretary of the Army regarding Fort Ord - CERCLA Section 120(h)(3), Transfer of Property, Overlying OU-2 (Landfills) Groundwater Plume.	OU2-495
6	OU 2	8/13/1996	Army, 1996	*Explanation of Significant Differences, Area A, Operable Unit 2 Landfill, Fort Ord, California.*	OU2-458
6	OU 2	1/13/1997	Army, 1997	*Explanation of Significant Differences, Consolidation of Remediation Waste in a Corrective Action Management Unit (CAMU) Operable Unit 2 Landfill, Fort Ord, California*	OU2-523
6	OU 2	1/13/1997	Army, 1997a	*Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California.*	RI-025
6	OU 2	12/1/1997	EA, 1997	*User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion*	Not Applicable
6	OU 2	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable
6	OU 2	9/13/2001	IT Corporation (IT, 2001)	*Construction Completion Report Operable Unit 2 Groundwater Remedy Expansion Revision 0*	OU2-613
6	OU 2	1/31/2005	Shaw, 2005	*Draft Final Remedial Action Construction Completion Report, Operable Unit 2 Landfills, Areas A through F, Former Fort Ord, California, January 2005*	OU2-630B
6	OU 2	10/4/2006	Army, 2006	*Explanation of Significant Differences, No Further Action Related to Munitions and Explosives of Concern, Landfill Gas Control, Reuse of Treated Groundwater, Designation of CAMU Requirements as Applicable or Relevant and Appropriate Requirements (ARARs), Operable Unit 2 Landfills, Former Fort Ord, California*	OU2-656
6	OU 2	2/6/2008	Army, 2008	*Record of Decision, Carbon Tetrachloride Groundwater Contamination Study, Fort Ord, California.*	OUCTP-0021D

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6	OU 2	8/4/2008	Shaw E&I, 2008	*Operation and Maintenance Plan, Operable Unit 2 Landfills, Former Fort Ord, California, Revision 2*	OU2-593F
6	OU 2	8/31/2009	Ahtna, Environmental Inc. (Ahtna), 2009	*Final Operations and Maintenance Manual, Volume I, Operable Unit 2 (OU2) Groundwater Remedy, Former Fort Ord, California*	BW-2479G
6	OU 2	3/25/2010	Harbaugh et al., 2010	*United States Geologic Survey (USGS) MODFLOW-2000 Version 1.19.01 2010/03/25 (https://water.usgs.gov/ogw/modflow/)*	Not Applicable
6	OU 2	6/3/2010	Shaw E&I, 2010	*Annual Report, 2010, Operations and Maintenance, Operable Unit 2 Landfills, Former Fort Ord, California, Revision 0*	OU2-682
6	OU 2	8/26/2011	Ahtna, 2011	*Final Annual Groundwater Treatment Systems, Operation and Data Summary Report, January through December 2010 Operable Unit 2 Groundwater Remedy, Former Fort Ord, California*	BW-2565B
6	OU 2	10/1/2011	DTSC, 2011	*Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance), Dept. of Toxic Substance Control, California Environmental Protection Agency, October 2011*	Not Applicable
6	OU 2	10/27/2011	Army, 2011	*Army letter to Marina in Motion forwarding the report "Understanding Soil Gas at the Former Fort Ord"*	BW-2588
6	OU 2	6/1/2012	Ahtna, 2012	*Report of Quarterly Monitoring, October through December 2011, Groundwater Monitoring Program Sites 2 and 12, OU2, OUCPT and OU1 off-site Former Fort Ord, California*	BW-2629
6	OU 2	6/8/2012	Ahtna, 2012a	*Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2011, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California*	BW-2604A
6	OU 2	8/1/2012	ITSI Gilbane, 2012	*Final Design Report, Revised OU2 Landfill Area E Expansion Construction, Former Fort Ord, California*	OU2-683B
6	OU 2	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
6	OU 2	7/1/2013	Ahtna, 2013	*Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2012, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California*	BW-2663
6	OU 2	5/29/2014	Ahtna, 2014	*Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2013, Operable Unit 2 and Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Groundwater Remedies, Former Fort Ord, California*	BW-2687A
6	OU 2	10/8/2014	Gilbane, 2014	*Final Construction Quality Control and Quality Assurance Report, Area E Phase 1, Operable Unit 2 Landfills, Former Fort Ord, California*	OU2-687B
6	OU 2	5/1/2015	Ahtna, 2015	*Operable Unit 2, First Quarter 2015, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*	OU2-693

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6	OU 2	7/20/2015	Gilbane, 2015	*Final Annual Report 2014, Operations and Maintenance, Operable Unit 2 Landfills, Former Fort Ord, California*	OU2-696
6	OU 2	11/20/2015	RORE Innovative Solutions Joint Venture (RORE/ITSI), 2015	*Design Analysis Report, Design-Build Groundwater Treatment Plant Relocation and System Improvements, Former Fort Ord, Seaside, California, November 2015*	OU2-697
6	OU 2	2/1/2016	Ahtna, 2016c	*Operable Unit 2 Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*	OU2-700
6	OU 2	3/14/2016	Ahtna, 2016e	*Final Operable Unit 2, Fourth Quarter 2014 through Third Quarter 2015, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*	OU2-699A
6	OU 2	4/29/2016	Ahtna, 2016d	*Final Annual Report, 2015, Operations and Maintenance, Operable Unit 2 Landfills, Former Fort Ord, California*	OU2-703
6	OU-2	6/1/2016	Ahtna, 2016a	*Quality Assurance Project Plan, Former Fort Ord, California, Volume 1, Appendix D, Draft Final Revision 1, Operable Unit 2 Landfills*	OU2-702B
6	OU 2	8/1/2016	Ahtna, 2016b	*Operable Unit 2, First Quarter 2016, Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*	OU2-704
6	OU 2	2/3/2017	Ahtna, 2017	*Draft Operable Unit 2 Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*	OU2-705
Section 7					
7.1	Site 2 and 12	10/1/1995	HLA, 1995a	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation Introduction and Basewide Hydrogeologic Characterization*	BW-1283A
7.1	Site 2 and 12	10/1/1995	HLA, 1995b	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume V - Feasibility Study Sites 2 and 12, Sites 16 and 17, Site 3*	BW-1283Q
7.1	Site 2 and 12	1/13/1997	Army, 1997	*Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California.*	RI-025
7.1	Site 2 and 12	6/1/1999	IT, 1999	*Draft Final Remedial Action Confirmation Report and Post-Remediation Health Risk Assessment Site 12 Remedial Action, Basewide Remediation Sites, Fort Ord, California, Revision 0*	BW-2031D
7.1	Site 2 and 12	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable
7.1	Site 2 and 12	7/3/2002	EPA, 2002	*Concurrence letter from EPA to the Army Regarding the Sites 2/12 Groundwater Remedy, Operating Properly and Successfully Evaluation report, Former Fort Ord, California*	BW-2134C
7.1	Site 2 and 12	6/3/2003	Ahtna, 2003	*Draft Final Sites 2 and 12 In-Situ Chemical Oxidation Pilot Study Report, Former Fort Ord, California*	BW-2209G

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
7.1	Site 2 and 12	2/6/2006	Shaw, 2006	*Treatment Augmentation Work Plan, Sites 2 and 12 Groundwater Remedy Expansion, Former Fort Ord, California, February 2006, Revision 0*	BW-2375
7.1	Site 2 and 12	2/6/2008	Army, 2008	*Record of Decision, Carbon Tetrachloride Groundwater Contamination Study, Fort Ord, California*	OUCTP-0021D
7.1	Site 2 and 12	8/31/2009	Ahtna, 2009	*Final Operations and Maintenance Manual, Volume II Sites 2 and 12 (Sites 2/12) Groundwater Remedy, Former Fort Ord, California*	BW-2479G
7.1	Site 2 and 12	10/1/2011	DTSC, 2011	*Final Guidance For The Evaluation And Mitigation, Of Subsurface Vapor Intrusion To Indoor Air (Vapor Intrusion Guidance)*	Not Applicable
7.1	Site 2 and 12	6/1/2012	AMEC/Ahtna, 2012	*Report of Quarterly Monitoring October through December 2011 Groundwater Monitoring Program, Sites 2 and 12, OU2, OUCTP, and OU1 Off – Site, Former Fort Ord, California*	BW-2629
7.1	Site 2 and 12	6/31/2012	Ahtna, 2012	*Final Annual Groundwater Treatment Systems Operation Data Summary Report January through December 2011 Sites 2 and 12 Groundwater Remedy, Former Fort Ord, California, June 2012. Vol II*	BW-2604A
7.1	Site 2 and 12	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
7.1	Site 2 and 12	2/27/2013	U.S. Army Corps of Engineers (USACE), 2013	*Final Soil Gas Investigation Work Plan Addendum, Sites 2 and 12, Former Fort Ord, California*	BW-2643A
7.1	Site 2 and 12	6/25/2013	Ahtna, 2013	*Final Annual Groundwater Treatment Systems Operation Data Summary Report January through December 2012 Sites 2 and 12 Groundwater Remedy, Former Fort Ord, California, June 2013*	BW-2663
7.1	Site 2 and 12	7/1/2013	Ahtna, 2012a	*Final Annual Groundwater Treatment Systems, Operation Data Summary Report, January through December 2012, Sites 2 and 12 Groundwater Remedy, Former Ft. Ord, California (Vol II)*	BW-2652A
7.1	Site 2 and 12	5/25/2014	Ahtna, 2014	*Final Annual Groundwater Treatment Systems Operation Data Summary Report, January through December 2013, Operable Unit 2 and Sites 2 and 12 Groundwater Remedy, Former Fort Ord, California, Volume I and II*	BW-2687A
7.1	Site 2 and 12	10/25/2014	Ahtna, 2014a	*Sites 2 and 12 Second Quarter 2014 Groundwater and Soil Vapor Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2726
7.1	Site 2 and 12	2/27/2015	Ahtna, 2015	*Final Remedial Investigation/Feasibility Study Addendum at Sites 2 and 12, Former Fort Ord, California*	BW-2721B
7.1	Site 2 and 12	3/20/2015	Ahtna, 2015e	*Sites 2 and 12 Fourth 2013 through Third Quarter 2014 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	RI-050A
7.1	Site 2 and 12	6/23/2015	Ahtna, 2015a	*Sites 2 and 12 First Quarter 2015 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2748
7.1	Site 2 and 12	7/10/2015	Ahtna, 2015b	*Final Remedial Action Work Plan Addendum Sites 2 and 12 Groundwater Remediation, Former Fort Ord, California, July 2015*	BW-2738B

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7.1	Site 2 and 12	8/28/2015	Ahtna, 2015c	*Sites 2 and 12 Second Quarter 2015 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2759
7.1	Site 2 and 12	10/1/2015	Ahtna, 2015d	*Final Operations and Maintenance Manual Volume III, Sites 2 and 12 Soil Vapor Extraction and Treatment System, Former Fort Ord, California*	BW-2763A
7.1	Site 2 and 12	2/1/2016	Army, 2016	*Explanation of Significant Differences No. 1, Basewide Remedial Investigation Sites 2 and 12, Former Fort Ord, California*	BW-2794
7.1	Site 2 and 12	2/19/2016	Ahtna, 2016	*Sites 2 and 12 Fourth Quarter 2015 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2796
7.1	Site 2 and 12	3/14/2016	Ahtna, 2016c	*Sites 2 and 12 Fourth Quarter 2014 through Third Quarter 2015 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	RI-051A
7.1	Site 2 and 12	3/31/2016	Ahtna, 2016a	*Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix A, Final Revision 4, Groundwater Remedies and Monitoring at Operable Unit 2, Sites 2 and 12, and Operable Unit Carbon Tetrachloride Plume*	BW-2785A
7.1	Site 2 and 12	3/31/2016	Ahtna, 2016b	*Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix C, Final Revision 1, Soil Gas Monitoring at Sites 2 and 12*	BW-2792A
7.1	Site 2 and 12	5/17/2016	Ahtna, 2016d	*Sites 2 and 12 First Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2803
7.1	Site 2 and 12	8/29/2016	Ahtna, 2016e	*Sites 2 and 12 Second Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	BW-2803A
7.1	Site 2 and 12	2/15/2017	Ahtna, 2017	*Draft Sites 2 and 12 Fourth Quarter 2015 through Third Quarter 2016 Groundwater and Soil Gas Monitoring and Treatment System Report, Former Fort Ord, California*	TBD
7.2	Site 31	10/1/1995	HLA, 1995	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume I-VI - Site 31*	BW-1283A
7.2	Site 31	1/13/1997	Army, 1997	*Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California*	RI-025
7.2	Site 31	4/29/1999	IT/HLA, 1999	*Remedial Action Confirmation Report, Site 31 Remedial Action, Basewide Remediation Sites, Former Fort Ord, California*	BW-2035
7.2	Site 31	9/20/1999	EPA, 1999	*Letter from the EPA dated September 20, 1999 to the Department of the Army regarding the Draft Final Remedial Action Confirmation Report, Site 31 Remedial Action, Basewide Remediation Sites, Former Fort Ord, California*	BW-2035B
7.2	Site 31	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
7.2	Site 31	6/1/2006	DTSC, 2006	*Letter from the California Department of Toxic Substances Control dated June 1, 2006 to the Department of Army regarding the Conditional No Further Action, Draft Final Site 31 Remedial Action Confirmation Report, Basewide Remedial Sites, Former Fort Ord, California*	BW-2035A.1
7.2	Site 31	9/1/2009	Cal/EPA, 2009	*Revised California Human Health Screening Levels for Lead, Integrated Risk Assessment Branch, OEHHA, Cal EPA*	Not Applicable
7.2	Site 31	7/10/2009	United States of America and Fort Ord Reuse Authoring (FORA), 2009	*Exhibit B of Quitclaim Deed (No. DACA05-9-06-549)*	Not Applicable
7.2	Site 31	9/1/2011	DTSC, 2011	*User's Guide To Leadspread 8 and Recommendations For Evaluation Of Lead Exposures In Adults, California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Office (HERO). Model is available at: http://www.dtsc.ca.gov/AssessingRisk/leadspread8.cfm*	Not Applicable
7.2	Site 31	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012.*	BW-2632
7.2	Site 31	11/11/2013	ITSI Gilbane, 2013	*Draft Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674
7.2	Site 31	8/31/2016	KEMRON, 2016	*Draft Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674A
7.2	Site 31	2/28/2017	KEMRON, 2017	*Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674B
7.3	Site 39	12/1/1994	HLA, 1994	*Draft Final Basewide Remedial Investigation Report, Remedial Investigation/Feasibility Study, Fort Ord, California. Prepared for USACE*	BW-1568
7.3	Site 39	1/1/1997	Army, 1997	*Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California*	RI-025
7.3	Site 39	1/13/1997	Army, 1997a	*Interim Record of Decision Site 3 Beach Train fire Ranges Fort Ord, California*	BW-0070
7.3	Site 39	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable
7.3	Site 39	8/1/2002	IT, 2002	*Draft Final Sampling and Analysis Plan, Characterization and Remediation Confirmation, Site 39, Ranges 18 and 19, Former Fort Ord, California*	RI-035A
7.3	Site 39	2/25/2005	Shaw, 2005	*Draft Final Remedial Action Confirmation Report, Site 39, Ranges 18 and 19, Basewide Remediation Sites, Former Fort Ord, California*	BW-2222F
7.3	Site 39	9/27/2006	Burleson Consulting, Inc. (Burleson), 2006	*Draft Wetland Monitoring and Restoration Plan, Former Fort Ord, California*	BW-2453

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
7.3	Site 39	4/1/2007	California Environmental Protection Agency (Cal/EPA), 2007	*Development of Health Criteria for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(G): Child-Specific Benchmark Change in Blood Lead Concentration for School Site Risk Assessment, Final Report, Integrated Risk Assessment Branch, Office of Environmental Health Hazard Assessment (OEHHA), California Environmental Protection Agency (Cal EPA)*	Not Applicable
7.3	Site 39	10/31/2007	MACTEC Engineering and Consulting (MACTEC), 2007	*Final Report, Ecological Risk Assessment for Small Arms Ranges, Habitat Areas, Impact Area, Former Fort Ord, California. Revision 0*	BW-2226U
7.3	Site 39	10/31/2007	MACTEC and Arcadis, Blasland, Bouck, and Lee, Inc. (MACTEC/ABBL), 2007	*Revision 1, Ecological Risk Assessment for Site 39 Ranges, Habitat Areas, Impact Area, Former Fort Ord, California.*	BW-2226U
7.3	Site 39	3/1/2008	MACTEC, 2008	*Final Feasibility Study Addendum Site 39 Ranges Former Fort Ord, California Revision 0. Prepared for Shaw on behalf of USACE.*	BW-2423F
7.3	Site 39	6/27/2008	Shaw/MACTEC, 2008	*Draft Final Post Remedial Risk Assessment Seasides Parcels 1 through 4, Former Fort Ord, California*	NBW-2447E
7.3	Site 39	3/1/2009	Burleson, 2009	*Protocol for Conducting Vegetation Monitoring in Compliance with the Installation-Wide Multispecies Habitat Management Plan at Former Fort Ord*	BW-2454A
7.3	Site 39	8/25/2009	Army, 2009	*Final Record of Decision Amendment Site 39 Inland Ranges, Former Fort Ord, California. United States Department of the Army Base Realignment and Closure (BRAC).*	RI-041E
7.3	Site 39	9/30/2009	Denise Duffy and Associates & Shaw E&I, Inc.(Duffy/Shaw), 2009	*Final Habitat Restoration Plan, Site 39 Inland Ranges, Former Fort Ord, California.*	BW-2450G
7.3	Site 39	11/24/2009	MACTEC/Shaw, 2009	*Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1*	BW-2300J
7.3	Site 39	12/1/2009	Shaw, 2009	*Final Remedial Design/Remedial Action Work Plan Site 39 Inland Ranges Remediation and OU 2 Landfills, Area E Construction Former Fort Ord, California*	RI-044D
7.3	Site 39	9/1/2011	DTSC, 2011	*User's Guide To Leadspread 8 and Recommendations For Evaluation Of Lead Exposures In Adults, California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Office (HERO). Model is available at: http://www.dtsc.ca.gov/AssessingRisk/leadspread8.cfm*	Not Applicable
7.3	Site 39	1/4/2012	ITSI Gilbane, 2012	*Field Work Variance No. 08-005, modifies Appendix O of the Final Remedial Design/Remedial Action Work Plan for HA-38, Site 39 Inland Ranges Remediation and OU2 Landfills, Area E Construction, Former Fort Ord, California*	RI-044D.18

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7.1	Site 39	1/17/2012	Shaw, 2012	*Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2*	BW-2300L
7.3	Site 39	5/16/2012	ITSI Gilbane, 2012a	*Field Work Variance No. 08-004 modifies the Final Remedial Design/Remedial Action Work Plan, Site 39 Inland Ranges Remediation and OU2 Landfills, Area E Construction, Former Fort Ord, California*	RI-044D.19
7.3	Site 39	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
7.3	Site 39	2/20/2013	ITSI Gilbane, 2013	*Work Variance No. 08-006 amends the Addendum to the Site Specific Work Plan Historical Area 37 Remedial Action, Site 39 Inland Ranges (HA37 SSWP Addendum) - See Other Field Work Variances under Final Remedial Design/Remedial Action Work Plan, Site 39 Inland Ranges Remediation and OU2 Landfills, Area E Construction, Former Fort Ord, California*	RI-044D.20
7.3	Site 39	5/14/2014	ITSI Gilbane, 2014	*Final Technical Memorandum, Basewide Range Assessment, Units 4, 11, and 12, Former Fort Ord, California*	RI-048A
7.3	Site 39	12/11/2014	ITSI Gilbane/CB&I Federal Services LLC (CB&I), 2014	*Final (revised) Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California*	RI-047C
7.3	Site 39	1/30/2015	Gilbane, 2015	*Final Technical Memorandum, Basewide Range Assessment Investigation, Unit 6, Former Fort Ord, California*	BW-2719B
7.3	Site 39	4/30/2015	Tetra Tech 2015	*Revisions of Protocol for Conducting Vegetation Monitoring for Compliance with the Installation-Wide Multispecies Habitat Management Plan, Former Fort Ord*	BW-2745
7.3	Site 39	11/15/2015	ITSI Gilbane, 2015	*Final Historical Area (HA) 23D Sampling Work Plan, Former Fort Ord, California*	BW-2760A
7.3	Site 39	2/8/2016	Gilbane, 2015a	*Final Units 1, 2, 3, 7, 33, and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan, Fort Ord, California*	BW-2751B
7.3	Site 39	6/21/2016	KEMRON, 2016	*Final Quality Assurance Project Plan Former Fort Ord, California Volume I, Appendix B, Soil Sampling, Basewide Range Assessment*	BW-2767B
7.3	Site 39	7/28/2016	KEMRON, 2016a	*Addendum to the Final Units 1, 2, 3, 7, 10, and 33 and Watkins Gate Burn Area North and South (WGBA) Sampling Work Plan, Fort Ord, California*	BW-2751B.2
7.3	Site 39	2/28/2017	KEMRON, 2017	*Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674B
7.4	Site 33	9/30/1995	HLA, 1995	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume I-VI - Site 33*	BW-1283A
7.4	Site 33	9/1/1996	HLA, 1996	*Draft Final Site Characterization, Site 33 - Golf Course, Fort Ord, California*	BW-1363
7.4	Site 33	1/13/1997	Army, 1997	*Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California*	RI-025

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7.4	Site 33	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable
7.4	Site 33	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
7.4	Site 33	2/28/2017	KEMRON, 2017	*Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674B
Section 8					
8	Site 3	10/19/1995	HLA, 1995	*Basewide Remedial Investigation/Feasibility Study, Former Fort Ord, California, Volume II - Remedial Investigation, Site 3*	BW-1283I
8	Site 3	1/13/1997	Army, 1997	*Interim Record of Decision Site 3 Beach Trainfire Ranges Fort Ord, California.*	SITE3-070
8	Site 3	9/30/1998	HLA, 1998	*Draft Final Additional Ecological Risk Evaluations, Site 3 - Beach Trainfire Ranges, Former Fort Ord, California. Prepared for USACE.*	SITE3-093
8	Site 3	5/16/2000	California Department of Parks and Recreation (DPR), 2000	*Habitat Restoration and Monitoring Plan for Lead Remediation Areas on the Future Fort Ord Dunes State Park. Prepared by California State Parks for Presidio of Monterey Annex, Monterey, California.*	BW-2279A
8	Site 3	8/7/2000	IT Corporartion (IT), 2000	*Final Remedial Action Confirmation Report and Post-Remediation Risk Assessment, Site 3 Remedial Action, Basewide Remedial Action Investigation Sites Fort Ord, California*	SITE3-105A
8	Site 3	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable
8	Site 3	3/25/2005	Army 2005	*Record of Decision, No Further Action Related to Munitions and Explosives of Concern - Track 1 Sites; No Further Remedial Action with Monitoring for Ecological Risks from Chemical Contamination at Site 3 (MRS-22), Former Fort Ord, California. (signed by USEPA April 26, 2005)*	OE-0526
8	Site 3	11/30/2006	Shaw/MACTEC, 2006	*Draft Final Post-Remediation Ecological Habitat Sampling and Analysis Plan Site 3, Beach Trainfire Ranges Former Fort Ord, California, Revision 0.*	SITE3-113C
8	Site 3	04/2007	Cal/EPA, 2007	*Development of Health Criteria for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(G): Child-Specific Benchmark Change in Blood Lead Concentration for School Site Risk Assessment, Final Report, Integrated Risk Assessment Branch, OEHHA, Cal EPA*	Not Applicable
8	Site 3	8/30/2007	Arcadis U.S., Inc. (Arcadis), 2007	*Results of January 2007 Post-Remediation Sampling at Site 3 Beach Trainfire Ranges*	SITE3-114C
8	Site 3	11/9/2007	DTSC, 2007	*Fort Ord Dunes State Park Memorandum of Understanding and Land Use Covenant between DTSC and Department of Parks and Recreation.*	OTH-223G.2

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
8	Site 3	6/25/2008	Shaw, 2008	*Final Habitat Restoration And Monitoring Plan Non-Remediated Areas Fort Ord Dunes State Park (Formerly Site 3) Former Fort Ord, California*	BW-2279J
8	Site 3	09/2009	Cal/EPA, 2009	*Revised California Human Health Screening Levels for Lead, Integrated Risk Assessment Branch, OEHHA, Cal EPA.*	Not Applicable
8	Site 3	1/24/2011	California State Parks (CSP, 2011)	*Draft Final 2010 Habitat Restoration and Monitoring Report Non-Remediated Areas, Fort Ord Dunes State Park.*	BW-2549A
8	Site 3	09/2011	DTSC, 2011	*User's Guide To Leadspread 8 and Recommendations For Evaluation Of Lead Exposures In Adults, California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Office (HERO). Model is available at: http://www.dtsc.ca.gov/AssessingRisk/leadspread8.cfm*	Not Applicable
8	Site 3	4/30/2012	CSP, 2012	*2011 Final Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park*	BW-2595A
8	Site 3	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012.*	BW-2632
8	Site 3	11/30/2012	CSP, 2012a	*2012 Draft Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park*	BW-2638
8	Site 3	11/11/2013	ITSI Gilbane, 2013	*Draft Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674
8	Site 3	6/18/2014	CSP, 2014	*2013 Final Habitat Restoration and Monitoring Report, non-Remediated Areas, Fort Ord Dunes State Park*	BW-2677B
8	Site 3	4/27/2016	Chenega Support Services (Chenega) 2016a	*2015 Annual Biological Monitoring Report, Fort Ord Dune State Park, Former Fort Ord, California*	BW-2799
8	Site 3	8/31/2016	KEMRON, 2016	*Draft Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674A
8	Site 3	9/23/2016	Chenega, 2016b	*Final 2016 Annual Biological Monitoring Report, Fort Ord Dune State Park, Former Fort Ord, California*	BW-2812
8	Site 3	2/28/2017	KEMRON, 2017	*Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674B
Section 9					
9	IA Sites	11/4/1993	Army, 1993	*Superfund Proposed Plan - Interim Action Remedial Excavations Are Proposed for Cleanup of Selected Areas*	IAFS-051
9	IA Sites	11/4/1993	HLA, 1993	*Final Interim Action Feasibility Study, Impacted Surface Soil Remediation.*	IAFS-050
9	IA Sites	2/23/1994	Army, 1994	*Interim Action Record of Decision, Contaminated Surface Soil Remediation, Fort Ord, California. Signed February 23, 1994*	IAFS-089
9	IA Sites	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P*	Not Applicable

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9	IA Sites	9/17/2012	Army, 2012	*Final Third Five-Year Review Report for Fort Ord Superfund Site, Monterey, California. September 2012*	BW-2632
9	IA Sites	2/28/2017	KEMRON, 2017	*Final Technical Memorandum, Evaluation of Lead Concentrations at Selected Sites, Former Fort Ord, Monterey, California*	BW-2674B
9	IA Site 1	12/10/1997	HLA, 1997g	*Interim Action Confirmation Report Site 1 Ord Village Sewage Treatment Plant.*	IAFS-199
9	IA Site 1	4/6/1998	EPA, 1998a	*USEPA Approves Interim Action Confirmation Report for Site 1. Subject: Remedial Action Completion, Operable Unit #4, Site 1 Ord Village, Fort Ord, California.*	BW-1972
9	IA Site 1	4/11/2005	DTSC, 2005a	*Letter: Completion of Interim Action Confirmation Report Site 1 Ord Village Sewage Treatment Plant, Former Fort Ord, California.*	IAFS-199F
9	IA Site 6	1/10/1997	HLA, 1997b	*Interim Action Confirmation Report, Site 6 – Range 39 (Abandoned Car Dump), Fort Ord, California.*	IAFS-133
9	IA Site 6	1/31/1997	EPA, 1997a	*Letter: Remedial Action Completion, Operable Unit 3, Site 6-Range 39 (Abandoned Car Dump), Fort Ord, California.*	BW-1645
9	IA Site 6	6/27/2007	DTSC, 2007a	*Letter: No Further Action (NFA), Interim Action (IA) Confirmation Report, Interim Action Site 6, Range 39 (Abandoned Car Dump).*	IAFS-133B
9	IA Site 8	8/26/1996	HLA, 1996g	*Interim Action Confirmation Report, Site 8 – Range 49 (Molotov Cocktail Range), Fort Ord, California.*	BW-1501
9	IA Site 8	10/3/1996	RWQCB, 1996b	*Memorandum: Interim Action Confirmation Report, Site 8-Range 49 (Molotov Cocktail Range), Fort Ord, California.*	BW-1528
9	IA Site 8	4/14/1997	EPA, 1997d	*Letter: Remedial Action Completion, Operable Unit #4, Site 8-Range 49, Former Fort Ord, California.*	IAFS-162
9	IA Site 8	10/20/2006	DTSC, 2006c	*Letter: Interim Action Confirmation Report, Site 8-Range 49, Former Fort Ord, California.*	BW-1502A
9	IA Site 10	5/4/1995	EPA, 1995	*Letter: Remedial Action Completion, Operable Unit #3, Site 10-Burn Pit, Fort Ord, California.*	BW-1384
9	IA Site 10	8/30/1996	HLA, 1996h	*Interim Action Confirmation Report, SITE 10 - Burn Pit, Fort Ord, California.*	BW-1382
9	IA Site 10	10/3/1996	RWQCB, 1996c	*Memorandum: Interim Action Report, Site 10 - Burn Pit, Former Fort Ord, California.*	BW-1531
9	IA Site 10	6/27/2007	DTSC, 2007b	*Letter: No Further Action, Interim Action Confirmation Report, Interim Action Site 10, Burn Pit, Former Fort Ord, California.*	BW-1382A
9	IA Site 14	2/12/1996	HLA, 1996a	*Confirmation Report, Site 14 - 707th Maintenance Facility, Fort Ord, California.*	BW-1517

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9	IA Site 14	3/7/1996	EPA, 1996a	*USEPA Comments and Concurrence Letter on Confirmation Report, Site 14 - 707th Maintenance Facility, Fort Ord, California.*	BW-1615
9	IA Site 14	2/11/1998	DTSC, 1998a	*Completion of Interim Actions for Installation Restoration Sites 14 and 15, Building 4885 Disposal Parcel and Building 2881/2901 Disposal Parcel.*	IAFS-202
9	IA Site 14	7/17/2003	DTSC, 2003	*DTSC Review of the Draft Final Field Investigation and Data Review, Solid Waste Management Units, Fort Ord California, dated July 30, 2002. Solid Waste Management Units FTO-004 and FTO-061- 707th Maintenance Battalion A, B and C Motor Pools. (NFA Concurrence on SWMUs Within Site 14)*	BW-1946D
9	IA Site 15	8/13/1996	HLA, 1996f	*Remedial Action Completion, Operable Unit #4, Site 15-Directorate of Engineering and Housing Yard, Former Fort Ord, California.*	BW-1515
9	IA Site 15	9/25/1996	RWQCB, 1996a	*Memorandum Subject: Confirmation Report, Site 15-Directorate of Engineering and Housing Yard, Fort Ord, California.*	BW-1551
9	IA Site 15	4/7/1997	EPA, 1997c	*Letter: Remedial Action Completion, Operable Unit #4, Site 15-Directorate of Engineering and Housing Yard, Former Fort Ord, California.*	BW-1688
9	IA Site 20	7/1/1996	HLA, 1996d	*Interim Action Confirmation Report, Site 20 - South Parade Ground 3800 and 519th Motor Pools, Fort Ord, California.*	BW-1351
9	IA Site 20	7/28/1997	EPA, 1997k	*Letter: Remedial Action Completion, Operable Unit #4, Site 20- South Parade Ground, 3800 and 519th Motor Pool. Former Fort Ord, California.*	BW-1351B
9	IA Site 20	3/12/1998	DTSC, 1998c	*Letter: Completion of Interim Actions for Installation Restoration Sites 20 and 24. (Main Garrison Parcel numbers E15.1, S.14 and CSUMB Phase II Parcel S1.6)*	IAFS-204
9	IA Site 21	7/10/1996	HLA, 1996e	*Interim Action Confirmation Report, SITE 21 - 4400/4500 Motor Pool, East Block, Fort Ord, California.*	BW-1499
9	IA Site 21	4/14/1997	EPA, 1997e	*Letter: Remedial Action Completion, Operable Unit #4, Site 21-440/45//Motor Pool, East Block, Former Fort Ord, California.*	IAFS-161
9	IA Site 21	10/20/2006	DTSC, 2006d	*Letter: Interim Action Confirmation Report, Site 21-440/4500 Motor Pool, East Block, Former Fort Ord, California.*	BW-1500A
9	IA Site 22	5/22/1996	HLA, 1996c	*Interim Action Confirmation Report, Site 22 - 4400/4500 Motor Pool, West Block, Fort Ord, California.*	IAFS-131
9	IA Site 22	9/19/1996	EPA, 1996b	*Letter: Remedial Action Completion Operable Unit #3, Site 22 - 4400/4500 Motor Pool, West Block, Fort Ord, California.*	IAFS-217

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9	IA Site 22	6/8/1998	DTSC, 1998d	*Letter: Completion of Interim Actions for Installation Restoration Site 22, Former Fort Ord, California. (Army Parcel Number S.1.3.1, California State University Parcel Number 3A)*	IAFS-131E
9	IA Site 22	1/13/1999	HLA, 1999	*Site Investigation Former Building 4493 (Site 22), Former Fort Ord, California.*	BW-2033
9	IA Site 24	1/23/1997	HLA, 1997c	*Interim Action Confirmation Report, Site 24 - Old DEH Yard, Fort Ord, California.*	IAFS-135
9	IA Site 24	4/14/1997	EPA, 1997f	*Letter: Remedial Action Completion Operable Unit #4, Site 24 – Old DEH Yard, Former Fort Ord, California.*	IAFS-160
9	IA Site 24	3/12/1998	DTSC, 1998b	*Letter: Confirmation Reports for Site 20 and Site 24. Completion of Interim Actions for Installation Restoration Sites 20 and 24. (Main Garrison Parcel numbers E15.1, S.14 and CSUMB Phase II Parcel S1.6)*	IAFS-204
9	IA Site 30	2/20/1996	HLA, 1996b	*Confirmation Report, Site 30 - Driver Training Area, Fort Ord, California.*	BW-1514
9	IA Site 30	4/14/1997	EPA, 1997g	*Letter: Remedial Action Completion, Operable Unit #4, Site 30 – Driver Training Area, Former Fort Ord, California.*	IAFS-164
9	IA Site 30	10/23/2002	DTSC, 2002a	*Letter: Confirmation Report, Site 30 - Driver Training Area, Fort Ord, California.*	BW-1514A
9	IA Site 32	3/5/1998	HLA, 1998a	*Interim Action Confirmation Report Site 32 East Garrison Sewage Treatment Plant.*	IAFS-203
9	IA Site 32	3/19/1998	EPA, 1998b	*Letter: Remedial Action Completion, Operable Unit #4, Site 32- East Garrison Sewage Treatment Plant, Former Fort Ord, California.*	IAFS-208
9	IA Site 32	10/23/2002	DTSC, 2002b	*Letter: Interim Action Confirmation Report – Site 32, East Garrison Sewage Treatment Plant, Former Fort Ord, California.*	IAFS-203C
9	IA Site 34	9/8/1998	Uribe & Associates, 1998	*Final Interim Action Confirmation Report, Site 34, Fritzsche Army Airfield Fueling Facility, Fort Ord, California.*	IAFS-215
9	IA Site 34	2/5/2002	EPA, 2002	*Letter: Remedial Action Completion, Operable Unit #4, Site 34, Fritzsche Army Airfield Fueling Facility, Fort Ord, California.*	IAFS-215C
9	IA Site 34	10/23/2002	DTSC, 2002c	*Letter: Interim Action Confirmation Report, Site 34, Fritzsche Army Airfield Fueling Facility, Fort Ord, California.*	IAFS-221A
9	IA Site 34B	9/22/2003	MACTEC/Shaw, 2003	*Interim Action Confirmation Report, Interim Action Area 34B, Former Burn Pit, Site 34 - Fritzsche Army Airfield Defueling Area, Former Fort Ord, California.*	IAFS-224

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9	IA Site 34B	6/27/2007	DTSC, 2007c	*Letter: No Further Action, Interim Action Area 34B, Former Burn Pit, Site 34 - Fritzsche Army Airfield Defueling Area, Former Fort Ord, California.*	IAFS-224E
9	IA Site 34B	1/10/2012	EPA, 2012	*No Comments Letter: Interim Action Confirmation Report, Interim Action Area 34B, Former Burn Pit, Site 34 - Fritzsche Army Airfield Defueling Area, Former Fort Ord, California.*	IAFS-224F
9	IA Site 36	6/20/1997	HLA, 1997e	*Interim Action Confirmation Report, Site 36 - Fritzsche Army Airfield Sewage Treatment Plant, Fort Ord, California.*	IAFS-177
9	IA Site 36	7/22/1997	EPA, 1997i	*Letter: Remedial Action Completion Operable Unit #4, Site 36, Fritzsche Army Airfield, Former Fort Ord, California.*	BW-1805
9	IA Site 36	7/23/1998	DTSC, 1998e	*Letter: Completion of Interim Actions for Installation Restoration Sites 36, 40 and Outfalls 34 and 35. Parcels L5.1.1, L5.1.8, L5.2, L5.3.*	IAFS-209
9	IA Site 39A	3/9/2006	Mactec, 2006	*Interim Action Confirmation Report IA Areas 39A HA-80 and 39A HA-85, Site 39A, East Garrison Ranges, Former Fort Ord, California.*	IAFS-232B
9	IA Site 39A	4/17/2006	DTSC, 2006b	*Letter: Draft Interim Action Confirmation Report, Site 39A HA-80, and HA-85, East Garrison Ranges, Former Fort Ord, California.*	IAFS-232C
9	IA Site 39A	5/25/2006	EPA, 2006	*No Comments Letter: Interim Action Confirmation Report IA Areas 39A HA-80 and 39A HA-85, Site 39A, East Garrison Ranges, Former Fort Ord, California.*	IAFS-232D
9	IA Site 39B	12/31/2010	DTSC, 2010	*No Comments Letter: Draft Interim Action Confirmation Report Area 39B, Historical Area 161 Excavation, Inter Garrison Training Area, Former Fort Ord, California.*	IAFS-236.2
9	IA Site 39B	1/6/2011	EPA, 2011	*No Comments Letter: Draft Interim Action Confirmation Report Area 39B, Historical Area 161 Excavation, Inter Garrison Training Area, Former Fort Ord, California.*	IAFS-236.3
9	IA Site 39B	3/24/2011	Shaw, 2011	*Draft Final Interim Action Confirmation Report Area 39B, Historical Area 161 Excavation, Inter Garrison Training Area, Former Fort Ord, California.*	IAFS-236A
9	IA Site 40	1/2/1997	HLA, 1997a	*Interim Action Confirmation Report, Site 40 - Fritzsche Army Airfield Defueling Area, Fort Ord, California.*	IAFS-132
9	IA Site 40	1/31/1997	EPA, 1997b	*Letter: Remedial Action Completion, Operable Unit #3, Site 40, Fritzsche Army Airfield, Fort Ord, California.*	BW-1646
9	IA Site 40	7/23/1998	DTSC, 1998f	*Letter: Completion of Interim Actions for Installation Restoration Sites 36, 40 and Outfalls 34 and 35. Parcels L5.1.1, L5.1.8, L5.2, L5.3.*	IAFS-209

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9	IA Site 41	2/4/1997	HLA, 1997d	*Interim Action Confirmation Report, Site 41 - Crescent Bluff Fire Drill Area, Fort Ord, California.*	IAFS-149
9	IA Site 41	4/14/1997	EPA, 1997h	*Letter: Remedial Action Completion Operable Unit #4 Site 41 - Crescent Bluff Fire Drill Area, Former Fort Ord, California.*	IAFS-163
9	IA Site 41	3/10/2006	DTSC, 2006a	*Letter: Interim Action Confirmation Report, Site 41 - Crescent Bluff Fire Drill Area, Fort Ord, California.*	IAFS-149B
9	OF-15	9/3/1998	HLA, 1998b	*Interim Action Confirmation Report, Outfall 15, Former Fort Ord, California.*	IAFS-213
9	OF-15	3/16/2005	EPA, 2005	*Letter: Completion of Interim Action Confirmation Report, Outfall 15, Former Fort Ord, California.*	IAFS-213E.1
9	OF-15	4/11/2005	DTSC, 2005b	*Letter: Interim Action Confirmation Report, Outfall 15, Former Fort Ord, California.*	IAFS-213G
9	OF-34 and OF-35	6/20/1997	HLA, 1997f	*Interim Action Confirmation Report, Outfalls 34 and 35 - Fritzsche Army Airfield, Fort Ord, California.*	IAFS-176
9	OF-34 and OF-35	7/23/1997	EPA, 1997j	*Letter: Remedial Action Completion, Operable Unit #3, Outfalls 34 and 35 - Fritzsche Army Airfield, Fort Ord, California.*	BW-1804
9	OF-34 and OF-35	7/23/1998	DTSC, 1998g	*Letter: Completion of Interim Actions for Installation Restoration Sites 36, 40 and Outfalls 34 and 35. Parcels L5.1.1, L5.1.8, L5.2, L5.3.*	IAFS-209
Section 10					
10	OUCTP	10/1/1995	HLA, 1995	*Final Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation Introduction and Basewide Hydrogeologic Characterization.*	BW-1283B
10	OUCTP	11/10/1999	HLA, 1999	*Draft Final Carbon Tetrachloride Investigation Report, Fort Ord, California.*	BW-1997U
10	OUCTP	6/1/2001	EPA, 2001	*Comprehensive Five-Year Review Guidance* , OSWER Directive 9355.7-03B-P	Not Applicable
10	OUCTP	4/19/2006	MACTEC, 2006	*Final Operable Unit Carbon Tetrachloride Plume Groundwater Remedial Investigation/Feasibility Study, Former Fort Ord, California, Volumes I through V.*	OUCTP-0011P
10	OUCTP	5/9/2006	Shaw, 2006	*Draft Final Evaluation Report, Pilot Soil Vapor Extraction and Treatment, Operable Unit Carbon Tetrachloride Plume, Former Fort Ord, California*	OUCTP-0013C
10	OUCTP	2/6/2008	Army, 2008	*Record of Decision, Carbon Tetrachloride Groundwater Contamination Study, Former Fort Ord, California.*	OUCTP-0021D

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10	OUCTP	8/12/2009	Shaw, 2009	*Final Operable Unit Carbon Tetrachloride Plume Enhanced In Situ Bioremediation Pilot Study Completion Report, Former Fort Ord, California, Revision 0.*	OUCTP-0041G
10	OUCTP	8/31/2009	Ahtna, 2009	*Final Operations and Maintenance Manual, Volume I, Operable Unit 2 (OU2) Groundwater Remedy, Former Fort Ord, California.*	BW-2479G
10	OUCTP	7/9/2010	Shaw, 2010	*Final Operable Unit Carbon Tetrachloride Plume, Upper 180-Foot Aquifer Remedial Design, Former Fort Ord, California*	OUCTP-0036P
10	OUCTP	3/22/2012	Ahtna, 2012	*Report of Quarterly Monitoring, April through June 2011, Groundwater Monitoring Program, Sites 2 and 12, OU2 and OUCTP, Former Fort Ord, California*	BW-2607
10	OUCTP	9/5/2012	Shaw, 2012	*Technical Memorandum, Deployment Area 2B Post-Treatment and Long-Term Monitoring, Operable Unit Carbon Tetrachloride Plume, A-Aquifer Remedial Action, Former Fort Ord, California*	OUCTP-0057
10	OUCTP	9/19/2012	Shaw, 2012a	*Final Operable Unit Carbon Tetrachloride Plume Upper 180-Foot Aquifer Remedial Action Construction Completion Report*	OUCTP-0054B
10	OUCTP	9/20/2012	ITSI Gilbane, 2012	*Final Operable Unit Carbon Tetrachloride Plume Deployment Area 2A Data Summary Report, Enhanced in situ Bioremediation Remedial Action, Former Fort Ord, California, Revision 0*	OUCTP-0059
10	OUCTP	4/25/2013	Ahtna, 2013	*Report of Quarterly Monitoring, October through December 2012, Groundwater Monitoring Program, Sites 2 and 12, OU2, OUCTP and OU1 Off-Site, Former Fort Ord, California*	BW-2654
10	OUCTP	6/13/2014	Ahtna, 2014	*Final Annual Report of Quarterly Monitoring, October 2012 through September 2013, Groundwater Monitoring Program, Sites 2 and 12, OU2, OUCTP, and OU1 Off-Site*	BW-2693A
10	OUCTP	1/27/2015	Ahtna, 2015	*Draft Quality Assurance Project Plan Appendix A, Revision 3, Groundwater Remedies and Monitoring at OU2, Sites 2/12 and OUCTP*	BW-2735
10	OUCTP	2/20/2015	Ahtna, 2015a	*Operable Unit Carbon Tetrachloride Plume Groundwater Monitoring Quarterly Report, Fourth Quarter 2014*	OUCTP-0066
10	OUCTP	3/20/2015	Ahtna, 2015b	*Final, Fourth Quarter 2013 through Third Quarter 2014, Operable Unit Carbon Tetrachloride Plume, Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0065A
10	OUCTP	1/29/2016	Ahtna, 2016	*Final Operable Unit Carbon Tetrachloride Plume Evaluation Technical Memorandum, A-Aquifer, Former Fort Ord, California*	OUCTP-0070
10	OUCTP	2/5/2016	Ahtna, 2016a	*Draft Operable Unit Carbon Tetrachloride Plume, Fourth Quarter 2014 through Third Quarter 2015, Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0071
10	OUCTP	3/11/2016	Ahtna, 2016b	*Final Quality Assurance Project Plan, Volume I Appendix A, Revision 4, Groundwater Remedies and Monitoring at OU2, Sites 2/12 and OUCTP*	BW-2785A

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10	OUCTP	3/14/2016	Ahtna, 2016c	*Final Operable Unit Carbon Tetrachloride Plume, Fourth Quarter 2014 through Third Quarter 2015, Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0071A
10	OUCTP	5/17/2016	Ahtna, 2016d	*Operable Unit Carbon Tetrachloride Plume, 2016 First Quarter, Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0074
10	OUCTP	7/26/2016	Ahtna, 2016e	*Final Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan Addendum, Former Fort Ord, California*	OUCTP-0036K.3
10	OUCTP	8/29/2016	Ahtna, 2016f	*Final Operable Unit Carbon Tetrachloride Plume Second Quarter 2016 Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0073B
10	OUCTP	2/3/2017	Ahtna, 2017	*Draft Operable Unit Carbon Tetrachloride Plume, Fourth Quarter 2015 through Third Quarter 2016 Groundwater Monitoring Report, Former Fort Ord, California*	OUCTP-0075
Section 11					
11	Track 0	6/19/2002	Army, 2002	*Final Record of Decision No Action Regarding Ordnance-Related Investigation, Former Fort Ord, California (Track 0).*	OE-0406
11	Track 0	9/17/2012	Army, 2012	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
Section 12					
12	Track 1	1/13/1997	Army, 1997	*Interim Record of Decision, Site 3 Beach Trainfire Ranges, Fort Ord, California.*	BW-0070
12	Track 1	6/21/2004	MACTEC, 2004	*Final Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California.*	OE-0421M
12	Track 1	3/10/2005	Army, 2005a	*Record of Decision: No further Action Related to Munitions and Explosives of Concern - Track 1 Sites/ No Remedial Action with Monitoring for Ecological Risks from Chemical Contamination at Site 3 (MRS-22), Former Fort Ord, California.*	OE-0526
12	Track 1	5/6/2005	Army, 2005b	*Track 1 Plug-in Approval Memorandum MRS-6 Expansion Area, Former Fort Ord, Monterey, California.*	OE-0529
12	Track 1	3/23/2006	Army, 2006a	*Track 1 Plug-in Approval Memorandum East Garrison Areas 2 and 4 NE, Former Fort Ord, Monterey, California.*	OE-0559A
12	Track 1	5/31/2006	Army, 2006b	*Track 1 Plug-in Approval Memorandum Multiple Sites, Groups 1 - 5, Former Fort Ord, California.*	OE-0591
12	Track 1	2/16/2010	Army, 2010	*Final Track 1 Plug-in Approval Memorandum, County North Munitions Response Area, Former Fort Ord, California.*	ESCA-0169A
12	Track 1	3/24/2011	Army, 2011a	*Track 1 Plug-in Approval Memorandum BLM-Headquarters and MRS-35, Former Fort Ord, California.*	OE-0740

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12	Track 1	9/30/2011	Army, 2011b	*Track 1 Plug-in Approval Memorandum MRS-24A, MRS-24C, and Parcel E20c.1, Former Fort Ord, California.*	OE-0741A
12	Track 1	6/1/2012	Fort Ord BRAC, 2012	*Fort Ord Munitions Response Site Security Program Annual Report 2011.*	OE-0422L
12	Track 1	8/21/2012	Army, 2012a	*Track 1 Plug-In Approval Memorandum BLM Area A, Former Fort Ord, California.*	OE-0780
12	Track 1	9/17/2012	Army, 2012b	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
12	Track 1	6/13/2013	Fort Ord BRAC, 2013	*Fort Ord Munitions Response Site Security Program Annual Report 2012.*	OE-0422M
12	Track 1	4/29/2014	Fort Ord BRAC, 2014	*Fort Ord Munitions Response Site Security Program Annual Report 2013.*	OE-0422N
12	Track 1	5/28/2015	Fort Ord BRAC, 2015	*Fort Ord Munitions Response Site Security Program Annual Report 2014.*	OE-0422O
12	Track 1	3/1/2016	Fort Ord BRAC, 2016	*Fort Ord Munitions Response Site Security Program Annual Report 2015.*	OE-0422P
Section 13					
13	Track 2, Parker Flats	10/1988	EPA, 1988	*US EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, EPA/540/G-89/004 OWSER Directive 9355.3-01 October 1988*	Not Applicable
13	Track 2, Parker Flats	6/13/1997	FORA, 1997	*Fort Ord Base Reuse Plan.*	Not Applicable
13	Track 2, Parker Flats	8/31/2006	MACTEC, 2006	*Final Track 2 Munitions Response Remedial Investigation/ Feasibility Study, Parker Flats Munitions Response Area, Former Fort Ord, California, Volume 1 Remedial Investigation, Volume III Feasibility Study.*	OE-0523N
13	Track 2, Parker Flats	8/26/2008	Army, 2008	*Record of Decision Parker Flats Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California. Dated June 24, 2008. USEPA signature date is August 26, 2008.*	OE-0661
13	Track 2, Parker Flats	6/30/2009	MACTEC/Shaw, 2009	*Final Remedial Design/Remedial Action Work Plan, Parker Flats Munitions Response Area, Former Fort Ord, California, Revision 1.*	OE-0667J
13	Track 2, Parker Flats	7/27/2009	EPA, 2009	EPA Letter: *Remedial Action Completion at the Parker Flats Munitions Response Area*	OE-0667L
13	Track 2, Parker Flats	8/4/2009	ESCA RP Team, 2009	*Final Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, Parker Flats Munitions Response Area Phase I, Former Fort Ord, Monterey County, California.*	ESCA-0166

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13	Track 2, Parker Flats	3/4/2010	Army, 2010	Memorandum to Presidio of Monterey from Army (Fort Ord BRAC): *Selected Munitions Response Remedy for the Joe Lloyd Way Industrial Area (Parcel F2.6) within Ord Military Community.*	OE-0710
13	Track 2, Parker Flats	1/19/2012	Army, 2012a	*Report of Annual Monitoring of Land Use Controls(Parker Flats Parcels F2.6, L2.4.1 and L2.3) within the Parker Flats Munitions Response Area (MRA) at the former Fort Ord, covering the 2011 reporting period.*	OE-0667M
13	Track 2, Parker Flats	9/17/2012	Army, 2012b	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
13	Track 2, Parker Flats	6/1/2012	Fort Ord BRAC, 2012	*Fort Ord Munitions Response Site Security Program Annual Report 2011*	OE-0422L
13	Track 2, Parker Flats	1/22/2013	Army, 2013	*Report of Annual Monitoring of Land Use Controls (Parker Flats Parcels F2.6, L2.4.1 and L2.3) within the Parker Flats Munitions Response Area (MRA) at the former Fort Ord, covering the 2012 reporting period.*	BW-2642
13	Track 2, Parker Flats	6/13/2013	Fort Ord BRAC, 2013	*Fort Ord Munitions Response Site Security Program Annual Report 2012.*	OE-0422M
13	Track 2, Parker Flats	2/12/2014	Army, 2014	*Report of Annual Monitoring of Land Use Controls (Parker Flats Parcels F2.6, L2.4.1 and L2.3) within the Parker Flats Munitions Response Area (MRA) at the former Fort Ord, covering the 2013 reporting period.*	OE-0667N
13	Track 2, Parker Flats	4/29/2014	Fort Ord BRAC, 2014	*Fort Ord Munitions Response Site Security Program Annual Report 2013.*	OE-0422N
13	Track 2, Parker Flats	1/16/2015	FORA, 2015a	*Land Use Covenant Annual Reports July 1, 2011 through June 30, 2012.*	ESCA-0312
13	Track 2, Parker Flats	1/16/2015	FORA, 2015b	*Land Use Covenant Annual Reports July 1, 2012 through June 30, 2014.*	ESCA-0313
13	Track 2, Parker Flats	1/20/2015	Army, 2015	*Report of Annual Monitoring of Land Use Controls (Parker Flats Parcels F2.6, L2.4.1 and L2.3) within the Parker Flats Munitions Response Area (MRA) at the former Fort Ord, covering the 2014 reporting period.*	OE-0836
13	Track 2, Parker Flats	5/28/2015	Fort Ord BRAC, 2015	*Fort Ord Munitions Response Site Security Program Annual Report 2014.*	OE-0422O
13	Track 2, Parker Flats	12/18/2015	FORA, 2015c	*Land Use Covenant Annual Reports July 1, 2014 through June 30, 2015.*	ESCA-0319
13	Track 2, Parker Flats	1/5/2016	ESCA RP Team, 2016	*Revised Draft Residential Protocol Implementation Technical Report, Parker Flats Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0311A
13	Track 2, Parker Flats	1/19/2016	Army, 2016	*Report of Annual Monitoring of Land Use Controls (Parker Flats Parcels F2.6, L2.4.1 and L2.3) within the Parker Flats Munitions Response Area (MRA) at the former Fort Ord, covering the 2015 reporting period.*	OE-0873
13	Track 2, Parker Flats	3/1/2016	Fort Ord BRAC, 2016	*Fort Ord Munitions Response Site Security Program Annual Report 2015.*	OE-0422P

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Section 14					
14	Interim Action Sites	4/1/1997	USACE, 1997	*Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP). With technical assistance from Jones and Stokes Associates, Sacramento, California.*	BW-1787
14	Interim Action Sites	3/30/1999	U.S. Fish and Wildlife Service (USFWS), 1999	*Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California (1-8-99-F/C-39R).*	BW-2232A
14	Interim Action Sites	3/7/2002	Harding ESE, 2002	*Final Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study For Ranges 43-48, Range 30A, Site OE-16, Former Fort Ord, California.*	OE-0332JJ
14	Interim Action Sites	9/20/2002	Army, 2002	*Record of Decision, Interim Action for Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California.*	OE-0414
14	Interim Action Sites	10/22/2002	USFWS, 2002	*Biological Opinion on the Closure and Reuse of Fort Ord, Monterey County, California, as it affects Monterey Spineflower Critical Habitat (1-8-01-F-70R).*	BW-2233
14	Interim Action Sites	3/14/2005	USFWS, 2005	*Cleanup and Reuse of Former Fort Ord, Monterey County, California as it affects California Tiger Salamander and Critical Habitat for Costa Contra Goldfields (1-8-04-F-25R).*	BW-2334
14	Interim Action Sites	8/9/2006	Shaw, 2006	*Final Work Plan, MRS-16 Munitions and Explosives of Concern Removal, Former Fort Ord, California.*	OE-0583L
14	Interim Action Sites	1/26/2007	Parsons Environmental, Inc. (Parsons), 2007	*Final MRS-Ranges 43-48 Interim Action Technical Information Paper, Former Fort Ord, Monterey, California, Military Munitions Response Program.*	OE-0590L
14	Interim Action Sites	4/30/2007	Presidio of Monterey (POM) Fire Department, 2007	*Draft Final Prescribed Burn 2006, MRS-16 After Action Report, Former Fort Ord, Monterey County, California.*	OE-0613E
14	Interim Action Sites	6/1/2007	USFWS, 2007	*Amendment to Biological Opinion 1-8-04-F-25R, for the Cleanup and Reuse of Former Fort Ord, Monterey County, California as it affects California Tiger Salamander and Critical Habitat for Costa Contra Goldfields.*	BW-2334C
14	Interim Action Sites	5/15/2008	Army, 2008	*Record of Decision, Impact Area Munitions Response Area Track 3 Munitions Response Site, Former Fort Ord, California, Dated April 18, 2008 (signed by USEPA on May 15, 2008).*	OE-0647
14	Interim Action Sites	7/14/2009	Shaw, 2009	*Final MRS-16 Munitions and Explosives of Concern Remedial Action Report, Former Fort Ord, California.*	OE-0682F
14	Interim Action Sites	5/24/2011	ESCA RP Team, 2011	*Final Phase II Interim Action Work Plan, Interim Action Ranges Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0252B
14	Interim Action Sites	9/17/2012	Army, 2012	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632

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14	Interim Action Sites	1/28/2015	ESCA RP Team, 2015a	*Final Interim Remedial Action Completion Report, Interim Action Ranges Munitions Response Area, Phase II, Former Fort Ord, Monterey County, California.*	ESCA-0285B
14	Interim Action Sites	5/28/2015	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).*	BW-2747
14	Interim Action Sites	10/23/2015	ESCA RP Team, 2015b	*Final Focused Feasibility Study, Interim Action Ranges Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0310A
14	Interim Action Sites	5/6/2015	Gilbane, 2015	*Final, Revision 2, Track 2 Munitions Response Remedial Investigation/ Feasibility Study, BLM Area B and MRS-16, Former Fort Ord, California*	OE-0802D
14	Interim Action Sites	3/14/2016	Army, 2016	*Superfund Proposed Plan, Final Remedial Action is Proposed for Interim Action Ranges Munitions Response Area, Focused Feasibility Study, Former Fort Ord, Monterey County, California*	ESCA-0323
14	Interim Action Sites	3/18/2016	ESCA RP Team, 2016	*2015 Annual Natural Resource Monitoring, Mitigation and Management Report, Covering Activities Conducted from January 1, 2014 through December 31, 2014.*	ESCA-0325
14	Interim Action Sites	1/18/2017	Army, 2017a	*Record of Decision, Interim Action Ranges Munitions Response Area, Former Fort Ord, California*	ESCA-0331
14	Interim Action Sites (MRS-16)	3/9/2017	Army, 2017b	*Final Record of Decision, Track 2, Bureau of Land Management Area B and Munitions Response Site 16, Former Fort Ord, California*	OE-0897
Section 15					
15	Track 3	10/1988	EPA, 1988	*US EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, EPA/540/G-89/004 OWSER Directive 9355.3-01 October 1988*	Not Applicable
15	Track 3	4/1/1997	USACE, 1997	*Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California.*	BW-1787
15	Track 3	6/13/1997	FORA, 1997	*Fort Ord Base Reuse Plan.*	Not Applicable
15	Track 3	5/4/2004	Parsons, 2004	*Final Technical Information Paper, Time-Critical Removal Action (Surface Removal of MEC), Watkins Gate Burn Area, Former Fort Ord, California, Military Munitions Response Program.*	OE-0487
15	Track 3	11/1/2006	Parsons, 2006	*Replacement Pages for Final Technical Information Paper, Time-Critical Removal Action (Surface Removal of MEC), Watkins Gate Burn Area, Former Fort Ord, California.*	OE-0487J
15	Track 3	6/25/2007	MACTEC, 2007	*Final Track 3 Impact Area Munitions Response Area, Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California, Volumes 1 and 2.*	OE-0596R

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15	Track 3	4/18/2008	Army, 2008	*Record of Decision Impact Area Munitions Response Area Track 3 Munitions Response Site, Former Fort Ord, California.*	OE-0647
15	Track 3	8/4/2009	USACE, 2009	*Final Work Plan Remedial Design (RD)/Remedial Action (RA) Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California.*	OE-0660K
15	Track 3	2/11/2010	Shaw E&I, 2010	*Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord, California.*	OE-0685D
15	Track 3	3/29/2011	Shaw, 2011a	*Final MRS-BLM Units 18 and 22, Munitions and Explosives of Concern, Remedial Action Report, (Track 3) Former Fort Ord California.*	OE-0721B
15	Track 3	7/13/2011	Fort Ord BRAC, 2011a	*Track 3 Surface Removal Area Munitions and Explosives of Concern Monitoring Reports, Former Fort Ord, California 2011.*	OE-0847B
15	Track 3	11/7/2011	Army, 2011	*Army Memorandum for Record - Minor Change to the Selected Remedy, Fort Ord Track 3 Impact Area Munitions Response Area (MRA).*	OE-0757
15	Track 3	12/30/2011	Shaw, 2011b	*Final MRS-BLM Units 14 and 19, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California.*	OE-0753B
15	Track 3	1/17/2012	Shaw, 2012	*Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2 (Volume 1-3)*	BW-2300L
15	Track 3	6/1/2012	Fort Ord BRAC, 2012a	*Fort Ord Munitions Response Site Security Program Annual Report 2011.*	OE-0422L
15	Track 3	9/13/2012	Fort Ord BRAC, 2012b	*Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2012 .*	OE-0847C
15	Track 3	9/17/2012	Army, 2012	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
15	Track 3	6/6/2013	ITSI Gilbane, 2013a	*Final MRS-BLM Units 15, 21, 32, and 34, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California.*	OE-0783B
15	Track 3	6/13/2013	Fort Ord BRAC, 2013a	*Fort Ord Munitions Response Site Security Program Annual Report 2012.*	OE-0422M
15	Track 3	9/10/2013	ITSI Gilbane, 2013b	*Technical Memorandum, Removal of Radium Dials from Impact Area Target Vehicle, Former Fort Ord, California.*	Not Applicable
15	Track 3	9/30/2013	Fort Ord BRAC, 2013b	*Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord California, 2013.*	OE-0847D
15	Track 3	4/29/2014	Fort Ord BRAC, 2014a	*Fort Ord Munitions Response Site Security Program Annual Report 2013.*	OE-0422N
15	Track 3	8/1/2014	ITSI Gilbane, 2014	*Final MRS-BLM Units 4, 11 and 12, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California.*	OE-0799B
15	Track 3	9/30/2014	Fort Ord BRAC, 2014b	*Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord California, 2014 .*	OE-0847E
15	Track 3	5/28/2015	Fort Ord BRAC, 2015	*Fort Ord Munitions Response Site Security Program Annual Report 2014.*	OE-0422O

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15	Track 3	5/28/2015	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).*	BW-2747
15	Track 3	10/30/2015	KEMRON, 2015a	*Final MRS-BLM Watkins Gate Burn Area MEC Remedial Action, Technical Memorandum, Former Fort Ord, California.*	OE-0832A
15	Track 3	10/30/2015	KEMRON, 2015b	*Draft Final of MRS-BLM Units 6, 7, 10, and 33, MEC Remedial Action Report, Former Fort Ord, California.*	OE-0867
15	Track 3	12/15/2015	KEMRON, 2015c	*Final Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (Includes Portions of 5A, 9, 25, 28 and 31) Former Fort Ord, California.*	OE-0862B
15	Track 3	12/17/2015	Army, 2015	*Letter from the Army to EPA documenting that 100-foot buffer is complete.*	OE-0854A.3
15	Track 3	1/27/2016	Fort Ord BRAC, 2016a	*Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord California, 2015.*	OE-0847F
15	Track 3	2/12/2016	KEMRON, 2016a	*MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California.*	OE-0875
15	Track 3	2/29/2016	KEMRON, 2016b	*Final Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action MRS-BLM Unit 28 Former Fort Ord, California.*	OE-0859B
15	Track 3	3/1/2016	Fort Ord BRAC, 2016b	*Fort Ord Munitions Response Site Security Program Annual Report 2015.*	OE-0422P
15	Track 3	4/15/2016	KEMRON, 2016c	*Draft Units 11 and 12 MEC Risk Reduction Technical Memorandum, Former Fort Ord, California.*	OE-0877
15	Track 3	7/27/2016	POM Fire Department, 2016	*Draft Final MRS-BLM Units 25 and 31 Prescribed Burn Plan.*	OE-0881A
15	Track 3	7/29/2016	KEMRON, 2016d	*Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California .*	OE-0880A
15	Track 3	8/8/2016	KEMRON, 2016e	*Field Work Variance No. 006 for Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action, Units 25 and 31, Former Fort Ord, California .*	OE-0880A.2
15	Track 3	8/11/2016	KEMRON, 2016f	*MRS-BLM Units 5A and 9, MEC Remedial Action Technical Memorandum, Former Fort Ord, California.*	OE-0878A
15	Track 3	2/14/2017	KEMRON, 2017	*MRS-BLM Unit 23, MEC Remedial Action Technical Memorandum, Former Fort Ord, California.*	OE-0893A
Section 16					
16	Track 2, Del Rey Oaks	10/1988	EPA, 1988	*US EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, EPA/540/G-89/004 OWSER Directive 9355.3-01 October 1988*	Not Applicable

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16	Track 2, Del Rey Oaks	12/28/2000	USA Environmental, Inc., (USA), 2000	*Final After Action Report, 100% Grid Sampling, Inland Range Contract, Former Fort Ord, California, Site OE-15B .*	OE-0287A
16	Track 2, Del Rey Oaks	4/24/2001	USA, 2001a	*Final After Action Report, Geophysical Sampling, Investigation & Removal, Inland Range Contract, Former Fort Ord, California, Site Del Rey Oaks Group .*	OE-0293A
16	Track 2, Del Rey Oaks	9/23/2001	USA, 2001b	*Final 4' OE Removal After Action Report, Inland Range Contract, Former Fort Ord, OE-15 (Roads and Trails).*	OE-0316
16	Track 2, Del Rey Oaks	9/30/2001	USA, 2001c	*Gridstats/Sitestats Sampling After Action Report, Inland Range Contract, Former Fort Ord, California, Site MRS-43 and OE-15 DRO.1.*	OE-0336
16	Track 2, Del Rey Oaks	9/30/2001	USA, 2001d	*Final 4-Foot OE Removal & Investigation After Action Report, Inland Range Contract, Former Fort Ord, California, IT Corporation Support (HTW) .*	OE-0340
16	Track 2, Del Rey Oaks	10/13/2001	USA, 2001e	*Final 100% Grid Sampling 4' OE Removal Former Fort Ord, California. Site OE-15 Seaside 1-4, DRO.02, and MoCo 1 & 2 , After Action Report.*	OE-0338
16	Track 2, Del Rey Oaks	11/15/2001	USA, 2001f	*Final 4' OE Removal After Action Report, Inland Range Contract, Former Fort Ord, California, Former Fort Ord Fuel Breaks.*	OE-0362
16	Track 2, Del Rey Oaks	8/11/2003	Parsons, 2003	*Final OE-15 DRO 01-2 After-Action Report Geophysical Investigation of Eastern Boundary, Excavation of Range 26 Berm, and Clearance of Machine Gun Links from 12-Grid Area.*	OE-0293J
16	Track 2, Del Rey Oaks	7/28/2004	Army, 2004	*Finding of Suitability for Early Transfer (FOSET) with CERCLA 120(h)(3) Covenant Deferral, Del Rey Oaks Parcels. (Signed Version).*	FOSET-003K
16	Track 2, Del Rey Oaks	8/22/2007	MACTEC, 2007	*Final Track 2 Munitions Response Remedial Investigation/ Feasibility Study, Del Rey Oaks Munitions Response Area, Former Fort Ord, California, Revision 1.*	OE-0615Q
16	Track 2, Del Rey Oaks	2/27/2008	DTSC, 2008a	*Memorandum of Agreement (MOA) Among the Fort Ord Reuse Authority (FORA), Monterey County, and Cities of Seaside, Monterey, Del Rey Oaks and Marina, California State University Montery Bay, University of California Santa Cruz, Monterey Peninsula College, and the Department of Toxic Substances Control (DTSC) Concerning Monitoring and Reporting on Environmental Restrictions on the Former Fort Ord.* (MOA was finalized on February 27, 2008.)	Included in OE-0714A
16	Track 2, Del Rey Oaks	3/18/2008	DTSC, 2008b	DTSC Letter: *Residential Protocol, March 2008.*	OE-0637A
16	Track 2, Del Rey Oaks	11/21/2008	Army, 2008	*Final Record of Decision, Del Rey Oaks Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California, Dated October 6, 2008. Signed by USEPA November 21, 2008.*	OE-0670
16	Track 2, Del Rey Oaks	7/30/2010	ARCADIS, 2010	*Draft Final Remedial Design/Remedial Action Work Plan, Del Rey Oaks Munitions Response Area, Former Fort Ord, Del Rey Oaks, California. (Includes MOA with FORA, et al. and DTSC Concerning Monitoring and Reporting on Environmental Restrictions.)*	OE-0714A

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16	Track 2, Del Rey Oaks	8/20/2010	EPA, 2010	*Remedial Action Completion at the Del Rey Oaks Munitions Response Area.*	OE-0714A.2
16	Track 2, Del Rey Oaks	1/17/2012	Shaw, 2012	*Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2 (Volume 1-3)*	BW-2300L
16	Track 2, Del Rey Oaks	6/1/2012	Fort Ord BRAC, 2012	*Fort Ord Munitions Response Site Security Program Annual Report 2011*	OE-0422L
16	Track 2, Del Rey Oaks	9/17/2012	City of Del Rey Oaks, 2012	*Amendment No. 1 and Partial Termination of Covenant to Restrict Use of Property Environmental Restriction.*	N/A
16	Track 2, Del Rey Oaks	9/17/2012	Army, 2012	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
16	Track 2, Del Rey Oaks	6/13/2013	Fort Ord BRAC, 2013	*Fort Ord Munitions Response Site Security Program Annual Report 2012.*	OE-0422M
16	Track 2, Del Rey Oaks	4/29/2014	Fort Ord BRAC, 2014	*Fort Ord Munitions Response Site Security Program Annual Report 2013.*	OE-0422N
16	Track 2, Del Rey Oaks	11/14/2014	FORA, 2014	*Land Use Covenant Annual Reports, July 1, 2012 -June 30, 2014.*	ESCA-0313
16	Track 2, Del Rey Oaks	5/28/2015	Fort Ord BRAC, 2015	*Fort Ord Munitions Response Site Security Program Annual Report 2014.*	OE-0422O
16	Track 2, Del Rey Oaks	12/18/2015	FORA, 2015	*Land Use Covenant Annual Reports - Submittal for FY14 - 15.*	ESCA-0319
16	Track 2, Del Rey Oaks	3/1/2016	Fort Ord BRAC, 2016	*Fort Ord Munitions Response Site Security Program Annual Report 2015.*	OE-0422P
Section 17					
17	Track 2, MRS-34	12/1/1993	USACE, Huntsville Division (USACE HD), 1993	*Archives Search Report. Fort Ord, California, Monterey County, California. Prepared by U.S. Army Corps of Engineers, St. Louis District.*	OE-0005
17	Track 2, MRS-34	11/1/1994	USACE HD, 1994	*Archives Search Report (Supplement No. 1). Fort Ord, California, Monterey California. Prepared by U.S. Army Corps of Engineers, St. Louis District.*	OE-0010
17	Track 2, MRS-34	1/2/1997	USACE HD, 1997	*Draft Revised Archives Search Report, Former Fort Ord, California. Monterey County, California. Prepared by U.S. Army Corps of Engineers, St. Louis District.*	OE-0022
17	Track 2, MRS-34	4/1/1997	USACE, 1997	*Installation-wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP) . April. With technical assistance from Jones and Stokes, Sacramento, California.*	BW-1787
17	Track 2, MRS-34	6/13/1997	FORA, 1997	*Fort Ord Reuse Plan*	Not Applicable

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17	Track 2, MRS-34	8/1/2000	Army, 2000	*Finding of Suitability for Early Transfer (FOSET) with a CERCLA 120(h)(3) Covenant Deferral, Fritzsche Army Airfield Phase II Parcels and Restriction and Covenant to Restrict Use of Property, Environmental Restriction re: Fritzsche Army Airfield .*	FOSET-001J
17	Track 2, MRS-34	9/17/2012	Army, 2012	*Final 3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California*	BW-2632
17	Track 2, MRS-34	9/28/2012	ITSI, 2012	*Final Track 2 Munitions Response, Remedial Investigation, Munitions Response Site 34, Fritzsche Army Airfield Area, Former Fort Ord, California .*	OE-0768B
17	Track 2, MRS-34	7/29/2015	Army, 2015	*Final Record of Decision, Track 2 Munitions Response Site 34, Former Fritzsche Army Airfield, Former Fort Ord, California .*	OE-0866
Section 18					
18	BLM Area B and MRS-16	4/19/1995	Army, 1995	*Memorandum of Understanding Between the U.S. Army and U.S. Department of the Interior, Bureau of Land Management*	OE-0006A
18	BLM Area B and MRS-16	10/18/1996	Army, 1996	*Letter of Transfer, Portion of Former Fort Ord from the Department of the Army to the Department of the Interior, Bureau of Land Management Parcel A, Parcel B and Range Control Compound*	OE-0152
18	BLM Area B and MRS-16	9/20/2002	Army, 2002	*Record of Decision, Interim Action for Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California.*	OE-0414
18	BLM Area B and MRS-16	4/8/2015	Army, 2015	*Superfund Proposed Plan, Remedial Action is Proposed for BLM Area B and Muitions Response Site 16, Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California*	OE-0846
18	BLM Area B and MRS-16	5/6/2015	Gilbane, 2015	*Final, Revision 2, Track 2 Munitions Response Remedial Investigation/Feasibility Study, BLM Area B and MRS-16, Former Fort Ord, California*	OE-0802D
18	BLM Area B and MRS-16	3/9/2017	Army, 2017	*Final Record of Decision Track 2 Bureau of Land Management Area B and Munitions Response Site 16, Former Fort Ord, California*	OE-0897
Sections 19 through 22					
19	ESCA Group 1	6/13/1997	FORA, 1997	*Fort Ord Base Reuse Plan.*	Not Applicable
19	ESCA Group 1	3/18/2008	DTSC, 2008	*Letter from DTSC to Army conveying March 2008 Residential Protocol.*	OE-0637A
19	ESCA Group 1	8/6/2008	Army, 2008	*Record of Decision Parker Flats Munitions Response Area Track 2 Munitions Response Site, Former Fort Ord, California.*	OE-0661
19	ESCA Group 1	9/26/2008	ESCA RP Team, 2008a	*Final Technical Information Paper Phase II Seaside Munitions Response Area Roadway Alignment and Utility Corridor, Former Fort Ord, California.*	ESCA-0117

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19	ESCA Group 1	12/17/2008	ESCA RP Team, 2008b	*Final Group 1 Remedial Investigation/Feasibility Study Work Plan, Seaside Munitions Response Area and Parker Flats Munitions Response Area Phase II, Former Fort Ord, Monterey County, California.*	ESCA-0124
19	ESCA Group 1	3/25/2011	ESCA RP Team, 2011	*Final Technical Information Paper, Phase II Seaside Munitions Response Area Outside Roadway Alignment and Utility Corridor (Pollution Report and Removal Action Activity Report), Former Fort Ord, Monterey, California.*	ESCA- 0251B
19	ESCA Group 1	9/21/2013	ESCA RP Team, 2013	*Final Technical Information Paper, Parker Flats Munitions Response Area Phase II, Former Fort Ord, Monterey County, California.*	ESCA-0270A
19	ESCA Group 1	12/18/2015	ESCA RP Team, 2015a	*Draft Group 1 Remedial Investigation/Feasibility Study, Seaside and Parker Flats (Phase II) Munitions Response Areas, Former Fort Ord, Monterey County, California.*	ESCA-0318
19	ESCA Group 1	12/22/2015	ESCA RP Team, 2015b	*Revised Draft Residential Protocol Implementation Technical Report, Seaside Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0306A
19	ESCA Group 1	1/5/2016	ESCA RP Team, 2016	*Revised Draft Residential Protocol Implementation Technical Report, Parker Flats Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0311A
19	ESCA Group 1	2/20/2017	ESCA RP Team, 2017a	*Field Variance Form No. G1WP-012, Expansion of Level 2 Baseline DGM Survey in Seaside MRA as required by DTSC letter dated 1/9/17*	ESCA-0133L
19	ESCA Group 1	1/18/2017	ESCA RP Team, 2017b	*Residential Protocol Implementation Technical Report, Seaside Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0306B
19	ESCA Group 1	5/4/2017	ESCA RP Team, 2017c	*Final Group 1 Remedial Investigation/Feasibility Study*	ESCA-0318B
20	ESCA Group 2	6/13/1997	FORA, 1997	*Fort Ord Base Reuse Plan.*	Not Applicable
20	ESCA Group 2	11/15/2007	Army, 2007	*Final Finding of Suitability for Early Transfer (FOSET), Former Fort Ord, California, Environmental Services Cooperative Agreement (ESCA) Parcels and Non-ESCA Parcels (Operable Unit Carbon Tetrachloride Plume) (FOSET 5).*	FOSET-004J
20	ESCA Group 2	3/18/2008	DTSC, 2008	*Letter from DTSC to Army conveying March 2008 Residential Protocol.*	OE-0637A
20	ESCA Group 2	2/16/2010	Army, 2010	*Final Track 1 Plug-In Approval Memorandum, County North Munitions Response Area, Former Fort Ord, California.*	ESCA-0169A
20	ESCA Group 2	10/8/2012	ESCA RP Team, 2012	*Final Residential Quality Assurance Process Pilot Study Technical Information Paper CSUMB Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0257B
20	ESCA Group 2	2/18/2013	ESCA RP Team, 2013	*Final Group 2 Remedial Investigation/Feasibility Study, California State University Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0177E

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
20	ESCA Group 2	2/28/2014	DTSC, 2014	*Letter from DTSC to FORA regarding FORA email dated January 22, 2014, for evaluation (contrast and comparison) of Fort Ord ESCA RQA Process and the DTSC Statewide Residential Protocol.*	Not Applicable
20	ESCA Group 2	10/21/2014	ESCA RP Team, 2014	*Final Residential Protocol Implementation Report, California State University Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California. October 21.*	ESCA-0284B
20	ESCA Group 2	1/16/2015	FORA, 2015a	*Land Use Covenant Annual Reports July 1, 2011 through June 30, 2012.*	ESCA-0312
20	ESCA Group 2	1/16/2015	FORA, 2015b	*Land Use Covenant Annual Reports July 1, 2012 through June 30, 2014.*	ESCA-0313
20	ESCA Group 2	2/26/2015	Army, 2015	*Record of Decision Group 2 California State University Monterey Bay Off-Campus Munitions Response Area, Former Fort Ord, California.*	ESCA-0298
20	ESCA Group 2	5/26/2015	ESCA RP Team, 2015	*Draft Group 2 Land Use Controls Implementation Plan/ Operation and Maintenance Plan, California State University Off-Campus Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0305
20	ESCA Group 2	12/18/2015	FORA, 2015c	*Land Use Covenant Annual Reports July 1, 2014 through June 30, 2015.*	ESCA-0319
21	ESCA Group 3	4/1/1997	USACE, 1997	*Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP). With technical assistance from Jones and Stokes Associates, Sacramento, California.*	BW-1787
21	ESCA Group 3	6/13/1997	FORA, 1997	*Fort Ord Base Reuse Plan.*	Not Applicable
21	ESCA Group 3	4/19/2001	USA, 2001	*Final After Action Report, Site OE-14D (14 West), Former Fort Ord, California.*	OE-0301A
21	ESCA Group 3	11/15/2007	Army, 2007	*Final Finding of Suitability for Early Transfer (FOSET), Former Fort Ord, California, Environmental Services Cooperative Agreement (ESCA) Parcels and Non-ESCA Parcels (Operable Unit Carbon Tetrachloride Plume) (FOSET 5).*	FOSET-004J
21	ESCA Group 3	7/31/2012	ESCA RP Team, 2012	*Final Group 3 Remedial Investigation/Feasibility Study, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California.*	ESCA-0249B
21	ESCA Group 3	11/25/2014	Army, 2014	*Record of Decision, Group 3 Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, California.*	ESCA-0293
21	ESCA Group 3	1/16/2015	FORA, 2015a	*Land Use Covenant Annual Reports July 1, 2011 through June 30, 2012.*	ESCA-0312
21	ESCA Group 3	1/16/2015	FORA, 2015b	*Land Use Covenant Annual Reports July 1, 2012 through June 30, 2014.*	ESCA-0313
21	ESCA Group 3	4/24/2015	ESCA RP Team, 2015	*Draft Group 3 Land Use Controls Implementation Plan/Operation and Maintenance Plan, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California.*	ESCA-0301
21	ESCA Group 3	12/18/2015	FORA, 2015c	*Land Use Covenant Annual Reports July 1, 2014 through June 30, 2015.*	ESCA-0319

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
22	ESCA Group 4	3/18/2008	DTSC, 2008	*Letter from DTSC to Army conveying March 2008 Residential Protocol.*	OE-0637A
22	ESCA Group 4	10/8/2010	ESCA RP Team, 2010	*Final Group 4 Remedial Investigation/Feasibility Study Work Plan, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0233C
22	ESCA Group 4	2/28/2014	DTSC, 2014	*Letter from DTSC to FORA regarding FORA email dated January 22, 2014, for evaluation (contrast and comparison) of Fort Ord ESCA RQA Process and the DTSC Statewide Residential Protocol.*	Not Applicable
22	ESCA Group 4	2/26/2016	ESCA RP Team, 2016a	*Draft Group 4 Remedial Investigation/Feasibility Study, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0322
22	ESCA Group 4	4/15/2016	ESCA RP Team, 2016b	*Final Group 4 Remedial Investigation Technical Information Paper, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0320A
22	ESCA Group 4	5/26/2016	ESCA RP Team, 2016c	*Draft Residential Protocol Implementation Technical Report, Future East Garrison Munitions Response Area, Former Fort Ord, Monterey County, California.*	ESCA-0326
22	ESCA Group 4	6/21/2017	ESCA RP Team, 2017	*Final Group 4 Remedial Investigation/Feasibility Study*	ESCA-0322B
Section 23					
23	Other Investigations	6/1/1995	HLA, 1995	*Final Basewide RI/FS, Fort Ord, California.*	BW-1263
23	Other Investigations	8/8/1996	HLA, 1996	*Draft Field Investigation and Data Review, Solid Waste Management Units, Fort Ord, California.*	BW-1497A
23	Other Investigations	7/26/2001	Harding ESE/IT, 2001	*Basewide Range Assessment Work Plan.*	BW-2085A
23	Other Investigations	7/30/2002	Harding ESE, 2002	*Draft Final Field Investigation and Data Review, Solid Waste Management Units, Fort Ord, California.*	BW-1496A
23	Other Investigations	6/3/2009	MACTEC/Shaw, 2009	*Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1.*	BW-2300J
23	Other Investigations	2/5/2010	MACTEC/Shaw, 2010a	*Final Remaining Remedial Investigation/Feasibility Study Areas Management Plan, Former Fort Ord, California. Revision 0.*	OE-0687E
23	Other Investigations	6/10/2010	MACTEC/Shaw, 2010b	*Final Technical Memorandum, Site Assessment Approach, BLM East/Post-1940 (Southern Portion), Remaining RI/FS Areas, Former Fort Ord, California, Revision 0.*	OE-0709A
23	Other Investigations	8/25/2010	MACTEC/Shaw, 2010c	*Final Technical Memorandum, Site Assessment Approach, BLM East/Post-1940 (Northern Portion), Remaining RI/FS Areas, Former Fort Ord, California.*	OE-0717A
23	Other Investigations	3/24/2011	Army, 2011a	*Track 1 Plug-In Approval Memorandum, BLM-Headquarters and MRS-35, Former Fort Ord, California.*	OE-0740

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
23	Other Investigations	5/4/2011	MACTEC/Shaw, 2011a	*Final Technical Memorandum, Site Assessment Approach, BLM East/Pre-1940 (Northern and Southern Portions), Remaining RI/FS Areas, Former Fort Ord, California.*	OE-0725A
23	Other Investigations	6/20/2011	MACTEC/Shaw, 2011b	*Final Technical Memorandum, Site Assessment Approach, BLM North, Northern and Southern Portions, Remaining RI/FS Areas, Former Fort Ord, California, Revision 0.*	OE-0733A
23	Other Investigations	7/28/2011	Shaw, 2011	*Final Technical Memorandum, Summary of Remedial Action Completion at Historical Areas 18, 19, 22, 23, 26, 27, 27a, 28, 29, 33, 36, 39/40/40A, 43, 44, and 48 (MRS/BLM), Former Fort Ord, California.*	RI-045A
23	Other Investigations	9/30/2011	Army, 2011b	*Final Track 1 Plug-In Approval Memorandum, MRS-24A, MRS-24C, and Parcel E20c.1, Former Fort Ord, California.*	OE-0741A
23	Other Investigations	1/17/2012	Shaw, 2012a	*Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 2 (Volume 1-3)*	BW-2300L
23	Other Investigations	1/26/2012	Shaw, 2012b	*Final Site Assessment Data Report, BLM East/Post-1940 (Southern Portion), Former Fort Ord, California.*	OE-0748B
23	Other Investigations	2/24/2012	Shaw, 2012c	*Final Site Assessment Data Report, BLM East/Post-1940 (Northern Portion), Former Fort Ord, California. (Draft Final issued 12/19/2011; document considered Final as of February MR BCT meeting held on 2/24/2012).*	OE-0754A
23	Other Investigations	4/16/2012	Shaw, 2012d	*Final Site Assessment Data Report, BLM East/Pre-1940 (Northern and Southern Portions), Former Fort Ord, California.*	OE-0755B
23	Other Investigations	7/17/2012	Shaw, 2012e	*Final Site Assessment Data Report, BLM North (Northern and Southern Portions), Former Fort Ord, California. Revision 0.* (Draft Final version issued 5/23/2012; document considered Final as of MR BCT meeting held on 7/17/2012).	OE-0766A
23	Other Investigations	8/21/2012	Army, 2012a	*Track 1 Plug-in Approval Memorandum Multiple Sites, BLM Area A, Former Fort Ord, California.*	OE-0780
23	Other Investigations	9/17/2012	Army, 2012b	*3rd Five-Year Review Report for Fort Ord Superfund Site, Monterey County, California.*	BW-2632
23	Other Investigations	5/14/2014	ITSI Gilbane, 2014	*Final Technical Memorandum, Basewide Range Assessment Investigation, Units 4, 11, and 12, Former Fort Ord, California*	RI-048A
23	Other Investigations	12/14/2014	ITSI Gilbane/CB&I, 2014	*Final (revised) Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California*	RI-047C
23	Other Investigations	1/30/2015	Gilbane, 2015	*Final Technical Memorandum, Basewide Range Assessment Investigation, Unit 6, Former Fort Ord, California*	BW-2719B
23	Other Investigations	7/29/2015	Army, 2015	*Final Record of Decision, Track 2 Munitions Response Site 34, Former Fritzsche Army Airfield, Former Fort Ord, California .*	OE-0866
23	Other Investigations	3/14/2016	Army, 2016	*Superfund Proposed Plan, Final Remedial Action is Proposed for Interim Action Ranges Munitions Response Area, Focused Feasibility Study, Former Fort Ord, Monterey County, California.*	ESCA-0323

Report Section	Site Identification	Date of Document	Document Author, Year (In text Reference)	Document Title	Admin Record Number
23	Other Investigations	6/21/2016	KEMRON, 2016	*Final QAPP Former Fort Ord, California Volume I, Appendix B, Soil Sampling, Basewide Range Assessment*	BW-2767B

APPENDIX B

Field Documentation of Site Inspections and Interviews

List of Sites Inspected and Included in Appendix B:

Operable Unit 1 Groundwater Remedy

Operable Unit 2

Sites 2 & 12 Groundwater Remedy

Site 31

Site 39

Site 33

Site 3

Operable Unit Carbon Tetrachloride Plume

Interim Action Munitions Response Sites

Track 3 Impact Area MRA

CSUMB Off-Campus MRA (ESCA Group 2)

Del Rey Oaks/Monterey MRA (ESCA Group 3)

Laguna Seca Parking MRA (ESCA Group 3)

MOUT Site MRA (ESCA Group 3)

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APPENDIX B

Operable Unit 1 Groundwater Remedy

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Five-Year Review Site Inspection Checklist
Fort Ord: Site – Operable Unit 1

I. SITE INFORMATION	
Site name: Former Fort Ord OU-1	**Date of inspection:** July 13, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
x Access controls
x Institutional controls
x Groundwater pump and treatment
☐ Surface water collection and treatment
☐ Other_____

☐ Monitored natural attenuation
x Groundwater containment
☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **Peter Arroyo** (Name) **HGL OU-1 Site Supervisor** (Title) **July 13, 2016** (Date)
   Interviewed **x at site** ☐ at office ☐ by phone Phone no. **209.321.6255**
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS (Check all that apply)

1. **O&M Documents**

X O&M manual	**X Readily available**	**X Up to date**	☐ N/A
X As-built drawings	**X Readily available**	**X Up to date**	☐ N/A
X Maintenance logs	**X Readily available**	**X Up to date**	☐ N/A

Remarks: **Documents maintained in the US Department of Army contractor's office.**

2.

Site-Specific Health and Safety Plan	**x Readily available**	**x Up to date**	☐ N/A
x Contingency plan/emergency response plan	**x Readily available**	**x Up to date**	☐ N/A

Remarks: **Documents maintained in the US Department of Army and contractor's office.**

3.	**O&M and OSHA Training Records** Remarks: **Maintained in office**	**x Readily available**	**x Up to date**	☐ N/A
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: **System on stand-by mode**			
5.	**Gas Generation Records** Remarks_____	☐ Readily available	☐ Up to date	**x N/A**
6.	**Settlement Monument Records** Remarks_____	☐ Readily available	☐ Up to date	**x N/A**
7.	**Groundwater Monitoring Records** Remarks_____	**x Readily available**	**x Up to date**	☐ N/A
8.	**Leachate Extraction Records** Remarks_____	☐ Readily available	☐ Up to date	**x N/A**
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	X N/A
	X Water (effluent)	**X Readily available**	**X Up to date**	**□ N/A**
	Remarks: **Current up to the time the system was put on stand-by mode.**			
10.	**Daily Access/Security Logs** Remarks: **Current up to the time the system was put on stand-by mode**	**x Readily available**	**x Up to date**	☐ N/A

IV. O&M COSTS

1. **O&M Organization**
   ☐ State in-house ☐ Contractor for State
   ☐ PRP in-house ☐ Contractor for PRP
   ☐ Federal Facility in-house **x Contractor for Federal Facility**
   ☐ Other_____

2. **O&M Cost Records**
   ☐ Readily available ☐ Up to date
   ☐ Funding mechanism/agreement in place
   Original O&M cost estimate_____ ☐ Breakdown attached

   Total annual cost by year for review period if available

	Date		Date	Total cost	
From	2012	To	2013	$250,000	☐ Breakdown attached

   Reliable O&M costs for this reporting period are not reflective of the overall system performance as components of the system were shut down incrementally as different components (extraction/monitoring wells) met their compliance requirements. In 2014, the last remaining components of the system were mothballed and no O&M funds were provided expressly for that purpose.

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: **Two unexpected events resulted in increased costs. First, the Pacific gas and Electric Company (PG&E) meter short-circuited on 15 September 2014 and caused damage to the treatment plant controls and some extraction well variable frequency drives. Second, a lightning strike on 04 August 2015 hit the PG&E transformer and caused damage to the treatment plant controls and some extraction well variable frequency drives.**

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map **X Gates secured** ☐ N/A
   Remarks**: Perimeter fenced; fencing damaged, but functional. Keys to gate locks are properly controlled and assigned to appropriate personnel.**

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks: **Informational signs present.**

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **Site inspections, self-reporting**
Frequency **Annual**
Responsible party/agency **U.S. Department of the Army**
Contact: _____ _____ _____
Name Title Phone no.

Reporting is up-to-date ☐ Yes ☐ No **x N/A**
Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A
Violations have been reported ☐ Yes **x No** ☐ N/A
Other problems or suggestions: ☐ Report attached

_____

2. **Adequacy** **X ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident
Remarks: **One vandalism incident occurred sometime between 27 March 2012 and 03 April 2012 in which injection well IW-OU1-74-A was damaged and some aerosol lubricant entered the well through the drop portal used to measure water levels. Full details of the incident and the response are presented in the Memorandum to File dated 7/11/2012 "Vandalism at Well IW-OU1-74-A Between 27 March and 03 April 2012 Operable Unit 1 Former Fort Ord, California.**

2. **Land use changes on site** ☐ N/A
Remarks: **No changes.**

3. **Land use changes off site** ☐ N/A
Remarks: **No changes.**

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map **X Roads adequate** ☐ N/A
Remarks_____

B. Other Site Conditions

Remarks **The site is located in an access-controlled natural reserve.**

VII. LANDFILL COVERS ☐ Applicable **X N/A**	
VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**	
IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x N/A**	
A. Groundwater Extraction Wells, Pumps, and Pipelines **x Applicable** ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks: **System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.**
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks: **See above.**
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks: **See above.**
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable **x N/A**	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks: **See above.**
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks: **See above.**
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition☐ Requires upgrade ☐ Needs to be provided Remarks: **See above.**

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping **x Carbon adsorbers**
x Filters; 4, 2,000lbs
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually**: ~ 47,000,000 gallons from September 2011 through September 2014. System has been offline except for very brief periods to test since then. Total pumped since inception in July 2006 is ~ 212,000,000 gallons**.
x Quantity of surface water treated annually: **0**
Remarks: **System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.**

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks: **Operational**

3. **Tanks, Vaults, Storage Vessels**
☐ N/A **X Good condition** **X Proper secondary containment** ☐ Needs Maintenance
Remarks_____

4. **Discharge Structure and Appurtenances**
X N/A ☐ Good condition ☐ Needs Maintenance

5. **Treatment Building(s)**
X N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored

6. **Monitoring Wells** (pump and treatment remedy)
X Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____

D. Monitoring Data - System is offline pending site closure. All cleanup targets specified in Record of Decision have been met. Data not collected at the time of the site inspection.

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation - System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance **X N/A**
Remarks_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

All cleanup targets were attained in September 2014 and attainment monitoring completed in December 2015. Site is currently in closeout process.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.
System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
System is offline pending site closure. All cleanup targets specified in Record of Decision have been met.

E. Additional Questions/Comments

1. What is your current role as it relates to the site? **NA**

2-A. Explain the purpose of the system and list what contaminants it is treating for?

1) **Extract and treat groundwater for TCE. There are 10 VOC contaminants listed in the ROD but TCE has been the only one above the cleanup targets since 2008.**
2) **Maintain pumping at the NW boundary road to prevent off-Post migration of TCE above 5 micrograms per liter concentration.**

2-B. What is your overall impression of the system with regards to safety, efficiency and effectiveness? **NA**

2-C. Have any system enhancements been made since the 2012 five year review? If so, explain.

None made since 2010.

2-C. Are there any improvements you recommend to system operation to improve these areas?

No. Cleanup is complete.

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)?

System is monitored remotely 24/7 with telephone alarms to Site Supervisor and Project Manager if unusual conditions or automated shutdown are detected.

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?

As total system pumping has decreased / moved to standby status in response to cleanup progress, on-site inspections have decreased from weekly to monthly. On-site visits in response to alarm notifications are undertaken as soon as possible, typically in less than 24 hours.

3-C. Describe routine O&M activities. **NA**

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five year review (September 2012)? If so please explain changes and reasons for change.

Sampling frequency has varied and well network adjusted in response to cleanup progress to optimize efficiency. Attainment monitoring sampling was performed from May 2015 to December 2015 (approximately 60 day intervals) to confirm cleanup goals were met. Emerging contaminants PFOA and PFOS, although not included in ROD, were added to attainment monitoring analytical schedule as directed by the regulatory agencies to support closure evaluation.

Inspection activities decreased from weekly to monthly as total pumping decreased and system was moved to standby status.

E. Additional Questions/Comments - continued

3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five-year review?

No O&M difficulties or cost changes other than unexpected repairs because of PG&E meter short circuit and lightning strike.

4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset.

The treatment facilities are placed within a secondary containment structure of sufficient size to hold release of tank contents. There are automated shutdown controls to stop operation if leak is detected, water levels in influent tank reach a prescribed level, or pressure in system reaches a prescribed level.

4-B. When was the last time these controls were inspected/tested and documented?

Secondary containment system is examined during the routine inspections. System controls were last inspected / tested after the lightning strike on 04 August 2015.

4-C. Has there been any unintended release of untreated water since the last five- year review? If so, describe nature of release, lessons learned and changes to system and/or SOPs as a result. **None.**

5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?

None have been voiced at annual Community Involvement Workshops or through other channels to our knowledge.

F. System Condition

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, What is the well maintenance protocol:

No. Wells are inspected at least monthly for exterior evidence of wear and tear. Pumping rates are recorded at that time and evaluated along with groundwater elevations for evidence of performance issues.

b) Can the prescribed well maintenance be carried out given the layout of the well and the available Personnel and equipment? **Yes.**

c) When were the well(s) last developed and when will it (they) be redeveloped?

Well EW-OU1-60-A was redeveloped in December 2012 in conjunction with pump replacement. All others have not been redeveloped after startup. No plans to redevelop because cleanup goals have been attained and site is proceeding to closeout.

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?

See item a, above. No evidence of excessive pump wear based on overall performance.

e) Are all of the flow meters/totalizers in good working order?

No. Some flow meters or totalizers at the individual wells are not functioning.

f) Is there an inventory of appropriate spare parts for the pumps and related equipment?

No. Replacement parts are ordered as needed.

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?

Pumping rate at each well is recorded on inspection forms. Major maintenance activities are described in annual groundwater monitoring reports.

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime).

System was designed to treat maximum 200 gpm as described in Final 100% Engineering Design Report Volumes 1-3 (AR numbers OU1-538C, OU1-535J, and OU1-537K).

b) What is the average total of treated water annually?

Pumped approximately 47,000,000 gallons total from September 2011 through October 2014. System has been on standby since then.

c) What are the average total hours of down time annually?

System has been operating ~ 97% of the time prior to lightning strike and subsequent standby status after repairs.

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).

Total of 8,000 pounds of activated carbon currently on-site and to be removed. Last carbon change of 4,000 pounds occurred in January 2012.

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).

8,000 pounds of spent activated carbon to be recycled.

f) Are all ancillary equipment (pumps, blowers, valves, etc.) maintained per manufacturers recommendations? **NA**

h) Do any pumps, blowers or ancillary equipment produce excessive noise? **No.**

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)? **Yes, minor signs of corrosion.**

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 1
Photograph Date: July 13, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 13, 2016

Site: OU 1

Description:
OU 1 N GWTS gated entrance, includes sign and phone number.

Photograph No. 2

Date: July 13, 2016

Site: OU 1

Description:
OU 1 N GWTS control panel looking southwest.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 1
Photograph Date: July 13, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 13, 2016

Site: OU 1

Description:
Looking west at OU 1 N GWTS.

Photograph No. 4

Date: July 13, 2016

Site: OU 1

Description:
OU 1 N GWTS manifold.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 1
Photograph Date: July 13, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 5

Date: July 13, 2016

Site: OU 1

Description:
OU 1 N GWTS showing containment wall on the lower right-hand side of photograph.

Photograph No. 6

Date: July 13, 2016

Site: OU 1

Description:
OU 1 N GWTS access road looking south.

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APPENDIX B

Operable Unit 2

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Five-Year Review Site Inspection Checklist
Fort Ord: Site – Operable Unit 2

I. SITE INFORMATION	
Site name: Operable Unit 2	**Date of inspection:** July 12, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

- **x Landfill cover/containment**
- **x Access controls**
- **x Institutional controls**
- **x Groundwater pump and treatment**
- ☐ Surface water collection and treatment
- **x Other Video monitoring with telematics installed (enhancement to the institutional control)**
- ☐ **Monitored natural attenuation**
- **x Groundwater containment**
- ☐ **Vertical barrier walls**

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **Derek Lieberman** (Name) **Ahtna Project Manager** (Title) **07/12/2016** (Date)
   Interviewed ☐ at site **x at office** ☐ by phone Phone no. **831-384-3735**
   Problems, suggestions; ☐ Report attached _____

2a. **O&M staff** **Mark Fisler** (Name) **Ahtna Senior Treatment System Operator** (Title) **07/12/2016** (Date)
   Interviewed **x at site** ☐ at office ☐ by phone Phone no. **831.384.3735**
   Problems, suggestions; ☐ Report attached _____

2b. **O&M staff** **Eric Schmidt** (Name) **Ahtna Landfills Task Manager** (Title) **07/12/2016** (Date)
   Interviewed **x at site x at office** ☐ by phone Phone no. **831.384.3735**
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - **x O&M manual** — **x Readily available** — **x Up to date** — ☐ N/A
   - **x As-built drawings** — **x Readily available** — **x Up to date** — ☐ N/A
   - **x Maintenance logs** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

2. **Site-Specific Health and Safety Plan** — **x Readily available** — **x Up to date** — ☐ N/A
   Contingency plan/emergency response plan — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Accident Prevention Plan in accordance with EM 385-1-1 Safety and Health Requirements Manual maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

3. **O&M and OSHA Training Records** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — x N/A
   - **x Other permits: Landfill** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Permit maintained in the U.S. Department of the Army contractor's OU2 GWTP office and at Landfill gate.**

5. **Gas Generation Records** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Records maintained for associated landfill in the U.S. Department of the Army contractor's OU2 GWTP office.**

6. **Settlement Monument Records** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Records maintained for associated landfill in the U.S. Department of the Army contractor's OU2 GWTP office.**

7. **Groundwater Monitoring Records** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office and in the Fort Ord Data Integration System.**

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — **x N/A**

   Remarks_____

9. **Discharge Compliance Records**
   - **x Air** — **x Readily available** — **x Up to date** — ☐ N/A
   - **x Water (effluent)** — **x Readily available** — **x Up to date** — ☐ N/A

   Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — ☐ N/A

    Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☐ Contractor for PRP
   - ☐ Federal Facility in-house
   - **x Contractor for Federal Facility**
   - ☐ Other_____

2. **O&M Cost Records**
   - ☐ Readily available
   - **X Up to date**
   - **X Funding mechanism/agreement in place**

   Original O&M cost estimate **$485,000/yr per OU2 ROD** ☐ Breakdown attached

   Total annual cost by year for review period if available

From	**1/1/12** Date	**To** **12/31/12** Date	**$1,393,000** Total cost	☐ Breakdown attached
From	**1/1/13** Date	**To** **12/31/13** Date	**$1,416,000** Total cost	☐ Breakdown attached
From	**1/1/14** Date	**To** **12/31/14** Date	**$1,688,000** Total cost	☐ Breakdown attached
From	**1/1/15** Date	**To** **12/31/15** Date	**$2,909,000** Total cost	☐ Breakdown attached
From	**1/1/16** Date	**To** **12/31/16** Date	**$1,887,000** Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: **Costs are higher than original estimates due to significant expansion of groundwater extraction and treatment operations and inclusion of thermal treatment unit (TTU) for landfill gas that were not in the original ROD estimates.**

V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A
   Remarks: **GWTP compound and Landfill perimeter fenced; fencing in good condition. Keys to gate locks are properly controlled and assigned to appropriate personnel.**

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks: **Posted signs indicate U.S. Government property, security cameras.**

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **Site inspections, self-reporting**
Frequency: **Annually**
Responsible party/agency: **U.S. Department of the Army**
Contact: _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date **x Yes** ☐ No ☐ N/A
Reports are verified by the lead agency **x Yes** ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A
Violations have been reported ☐ Yes **x No** ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**
Remarks_____

2. **Land use changes on site** **x N/A**
Remarks_____

3. **Land use changes off site** **x N/A**
Remarks_____

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks: **Roads are generally in good condition, some erosion repair in progress on landfill perimeter.**

B. Other Site Conditions

Remarks: **The site is clean and well maintained.**

VII. LANDFILL COVERS **x Applicable** ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks: **Moderate settlement evident in Landfills Area F due to trench and fill disposal method.**

2. **Cracks** ☐ Location shown on site map **x Cracking not evident**
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks: **Minor erosion evident in Landfills Area E due to El Niño event in winter of 2015/2016; repairs are in progress.**

4. **Holes** ☐ Location shown on site map **x Holes not evident**
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☐ Grass **x Cover properly established** ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks**: Some stress to vegetative cover due to long term drought conditions over last several years; however, precipitation due to El Niño event in winter 2015/2016 promoted some recovery.**

6. **Alternative Cover (armored rock, concrete, etc.)** **x N/A**
Remarks_____

7. **Bulges** ☐ Location shown on site map **x Bulges not evident**
Areal extent_____ Height_____
Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
x Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks: **During precipitation events ponding on western portion of Area E in a tie-in trench left in place by the previous O&M contractor.**

9. **Slope Instability** **x Slides** ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks: **Some minor instability observed on west side of Area E, possibly due to ponding noted above.**

B. Benches ☐ Applicable **x N/A**

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map **x N/A** or okay
   Remarks_____

2. **Bench Breached** ☐ Location shown on site map **x N/A** or okay
   Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map **x N/A** or okay
   Remarks_____

C. Letdown Channels ☐ Applicable **x N/A**

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map **x No evidence of settlement**
   Areal extent_____ Depth_____
   Remarks_____

2. **Material Degradation** ☐ Location shown on site map **x No evidence of degradation**
   Material type_____ Areal extent_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map **x No evidence of erosion**
   Areal extent_____ Depth_____
   Remarks_____

4. **Undercutting** ☐ Location shown on site map **x No evidence of undercutting**
   Areal extent_____ Depth_____
   Remarks_____

5. **Obstructions** Type_____ **x No obstructions**
   ☐ Location shown on site map Areal extent_____
   Size_____
   Remarks_____

6. **Excessive Vegetative Growth** Type_____
   x No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Areal extent_____
   Remarks_____

D. Cover Penetrations **x Applicable** ☐ N/A

1. **Gas Vents** ☐ Active **x Passive**
   x Properly secured/locked **x Functioning** **x Routinely sampled** **x Good condition**
   ☐ Evidence of leakage at penetration ☐ Needs Maintenance
   ☐ N/A
   Remarks_____

2.	**Gas Monitoring Probes** **x Properly secured/locked** **x Functioning** **x Routinely sampled** **x Good condition** ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks_____
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance **x N/A** Remarks
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance **x N/A** Remarks
5.	**Settlement Monuments** **x Located** ☐ Routinely surveyed ☐ N/A Remarks:
E. Gas Collection and Treatment	**x Applicable** ☐ N/A
1.	**Gas Treatment Facilities** **x Flaring** **x Thermal destruction** ☐ Collection for reuse **x Good condition** ☐ Needs Maintenance Remarks_____
2.	**Gas Collection Wells, Manifolds and Piping** **x Good condition** ☐ Needs Maintenance Remarks_____
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance **x N/A** Remarks_____
F. Cover Drainage Layer	**x Applicable** ☐ N/A
1.	**Outlet Pipes Inspected** **x Functioning** ☐ N/A Remarks_____
2.	**Outlet Rock Inspected** **x Functioning** ☐ N/A Remarks_____
G. Detention/Sedimentation Ponds	**x Applicable** ☐ N/A
1.	**Siltation** Areal extent_____ Depth_____ ☐ N/A **x Siltation not evident** Remarks_____
2.	**Erosion** Areal extent_____ Depth_____ **x Erosion not evident** Remarks_____
3.	**Outlet Works** ☐ Functioning **x N/A** Remarks_____
4.	**Dam** ☐ Functioning **x N/A** Remarks_____

H. Retaining Walls ☐ Applicable **x N/A**	
I. Perimeter Ditches/Off-Site Discharge **x Applicable** ☐ N/A	
1. **Siltation** ☐ Location shown on site map **x Siltation not evident** Areal extent_____ Depth_____ Remarks_____	
2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A **x Vegetation does not impede flow** Areal extent_____ Type_____ Remarks_____	
3. **Erosion** ☐ Location shown on site map **x Erosion not evident** Areal extent_____ Depth_____ Remarks_____	
4. **Discharge Structure** **x Functioning** ☐ N/A Remarks_____	
VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**	
IX. GROUNDWATER/SURFACE WATER REMEDIES **x Applicable** ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines **x Applicable** ☐ N/A	
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating **x Needs Maintenance** ☐ N/A Remarks: **Five extraction wells require redevelopment to increase operating capacity; two extraction wells must be replaced due to damages well screen or casing. Additional information is provided in the August 29, 2016 *Operable Unit 2 Second Quarter 2016 Groundwater Monitoring and Treatment System Report, Former Fort Ord, California*, AR# OU2-704A.**	
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** **x Good condition** ☐ Needs Maintenance Remarks_____	
3. **Spare Parts and Equipment** **x Readily available** ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks_____	
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable **x N/A**	

C. Treatment System **x Applicable** ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping **x Carbon adsorbers**
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   x Good condition ☐ Needs Maintenance
   x Sampling ports properly marked and functional
   x Sampling/maintenance log displayed and up to date
   x Equipment properly identified
   x Quantity of groundwater treated annually: 266 million gallons
   ☐ Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A **x Good condition** ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A **x Good condition** **x Proper secondary containment** ☐ Needs Maintenance
   Remarks

4. **Discharge Structure and Appurtenances**
   ☐ N/A **x Good condition** ☐ Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   ☐ N/A **x Good condition (esp. roof and doorways)** ☐ Needs repair
   x Chemicals and equipment properly stored
   Remarks: **Building to be decommissioned in 2017 after construction of new groundwater treatment facility.**

6. **Monitoring Wells** (pump and treatment remedy)
   x Properly secured/locked **x Functioning** **x Routinely sampled** **x Good condition**
   x All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   x Is routinely submitted on time **x Is of acceptable quality**

2. Monitoring data suggests:
   x Groundwater plume is effectively contained **x Contaminant concentrations are declining**

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ All required wells located ☐ Needs Maintenance **x N/A**
   Remarks_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The OU2 groundwater treatment system is generally functioning in accordance with system design and modification criteria. Based on monitoring and evaluation reports the system is capturing and reducing groundwater contamination at OU2; however, several extraction wells require redevelopment or replacement to increase effectiveness (see Item A1 for more information). The OU2 Landfills cover system is generally functioning in accordance with design criteria, though additional erosion control measures are being implemented due to an El Niño event in the winter of 2015/2016. Landfill gas emissions are being effectively controlled by the landfill gas extraction and treatment system.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
Current O&M procedures are consistent with approved O&M plans and are effective in maintaining long-term operations.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.
None identified; however, the existing GWTP will be replaced with a new facility and several new extraction wells will be added to the system in 2017.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
The existing GWTP will be replaced with a new facility and several new extraction wells will be added to the system in 2017 to optimize plume capture and contaminant mass removal. For the existing system:

- **Operational efficiency of EW-OU2-09-A may be improved by installation of a variable frequency drive.**
- **The screen intervals for EW-OU2-05-180 and EW-OU2-06-180 may be modified to optimize plume local plume capture and mass removal.**
- **EW-OU2-10-A, -12-A, -13-A and -16-A should be redeveloped and the pumps lowered in the screen intervals to optimize plume capture and mass removal, and account for regionally declining groundwater elevations.**

Additional erosion control measures will be implemented at the Landfills to mitigate future erosion issues. Specifically, additional drainage systems and best management practices for control of stormwater runoff will be installed.

E. Additional Questions/Comments

1. What is your current role as it relates to the site?
Derek Lieberman – Project Manager

2-A. Explain the purpose of the system and list what contaminants it is treating for?
GWTS: protect human health and comply with federal and state law by returning groundwater to a condition that will allow beneficial uses to occur, including potential future use as a drinking water source. Specifically, the remedial action objective is to remediate chemicals of concern (COCs) in the A-Aquifer and Upper 180-Foot Aquifer to federal or State drinking water Maximum Contaminant Levels or lower for some COCs. These goals are accomplished through hydraulic control and containment of contaminated groundwater, and through extraction and treatment of groundwater exceeding ACLs. The OU2 groundwater plume is characterized by the presence of eleven COCs in groundwater in the A-Aquifer and Upper 180-Foot Aquifer at concentrations above their respective ACLs: benzene, carbon tetrachloride, chloroform, 1,1-DCA, 1,2-DCA, cis-1,2-DCE, 1,2-DCP, methylene chloride, PCE, TCE, and vinyl chloride.
Landfills engineered cover system: prevent rainwater percolation through waste buried in the landfills and prevent exposure of sanitary waste in the landfills materials to the surrounding environment.
Landfill gas extraction and treatment system: provide for the protection of public health and safety and the environment in accordance with Title 27 of California Code of Regulations, which requires that methane concentrations do not exceed 5 percent by volume (%v) in air at the landfill property boundary. Also, control trace gases to prevent adverse acute and chronic exposure to toxic and/or carcinogenic compounds.

2-B. What is your overall impression of the system with regards to safety, efficiency and effectiveness?
The systems are safely, efficiently and effectively operated and maintained, though improvements are expected with construction of a new groundwater treatment facility and installation of additional groundwater extraction wells, and implementation of additional erosion control measures at the Landfills.

2-C. Have any system enhancements been made since the 2012 five year review? If so, explain. **None.**

2-D. Are there any improvements you recommend to system operation to improve these areas?
See "Opportunities for Optimization" above.

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)?
There is not a continuous on-site O&M presence; however, the GWTS and TTU are monitored remotely through the supervisory control and data acquisition (SCADA) system during non-business hours. Additionally, the operators receive alarms via SCADA in the event of a system shutdown or other critical issue.

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?
Monday through Friday 0700 to 1730.

3-C. Describe routine O&M activities.
Routine O&M activities are described in the *Final Operations and Maintenance Manual, Volume I, Operable Unit 2 (OU2) Groundwater Remedy, Former Fort Ord, California* (Administrative Record Number BW-2479C) and the *Operations and Maintenance Plan, Operable Unit 2 Landfills, Former Fort Ord, California* (Administrative Record Number OU2-593F).

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five year review (September 2012)? If so, please explain changes and reasons for change. **None.**

E. Additional Questions/Comments - continued

3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review?
None.

4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset.
Secondary containment of GWTP equipment and conveyance piping, leak detection systems, and automatic shutdown via SCADA protocols.

4-B. When was the last time these controls were inspected/tested and documented?
In accordance with the O&M Manual, secondary containment and other mechanical systems are inspected and documented at least semi-annually, and an integrity check of the leak detection systems, including SCADA protocols, is performed at least annually.

4-C. Has there been any unintended release of untreated water since the last 5 year review? If so, describe nature of release, lessons learned and changes to system and/or SOPs as a result.
No.

5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?
No.

F. System Condition

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, what is the well maintenance protocol:
Yes. The maintenance program consists of preventive maintenance and rehabilitation as described in Section 12.0 of the O&M Manual.

b) Can the prescribed well maintenance be carried out given the layout of the well and the available personnel and equipment? **Yes.**

c) When were the well(s) last developed and when will it (they) be redeveloped?
Last developed upon installation. Extraction wells EW-OU2-09-A, -10-A, -12-A, -13-A, and -16-A are scheduled for redevelopment in conjunction with construction of new GWTP. There are no current plans for redevelopment of other wells.

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?
Yes. The maintenance program is described in Section 12.0 of the O&M Manual and is documented in the operator's logbook and daily progress reports. Excessive pump wear due to sediments has not been observed except in EW-OU2-02-180, where a breach in the well casing resulted in sediment buildup in the well.

e) Are all of the flow meters/totalizers in good working order? **Yes.**

f) Is there an inventory of appropriate spare parts for the pumps and related equipment? **Yes.**

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?**Yes.**

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime).
Minimum influent flow = 300 gpm; maximum influent flow = 1240 gpm; average influent concentration over last five years is 8.4 micrograms/liter; operates 24 hours/day; expected downtime is less than 438 hours per year (i.e., 95% operability).

b) What is the average total of treated water annually? **332 million gallons since startup in 1995.**

c) What are the average total hours of down time annually? **72 hours since 2007.**

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).
Approximately 80,000 pounds of activated carbon annually.

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).
Approximately 80,000 pounds of spent activated carbon annually.

f) Are all ancillary equipment (pumps, blowers, valves, etc.) are maintained per manufacturers recommendations? **Yes.**

h) Do any pumps, blowers or ancillary equipment produce excessive noise? **No.**

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase GAC vessel, pipes and/or ductwork)?
Minor surficial rust on some exterior metal components.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 12, 2016

Site: OU 2

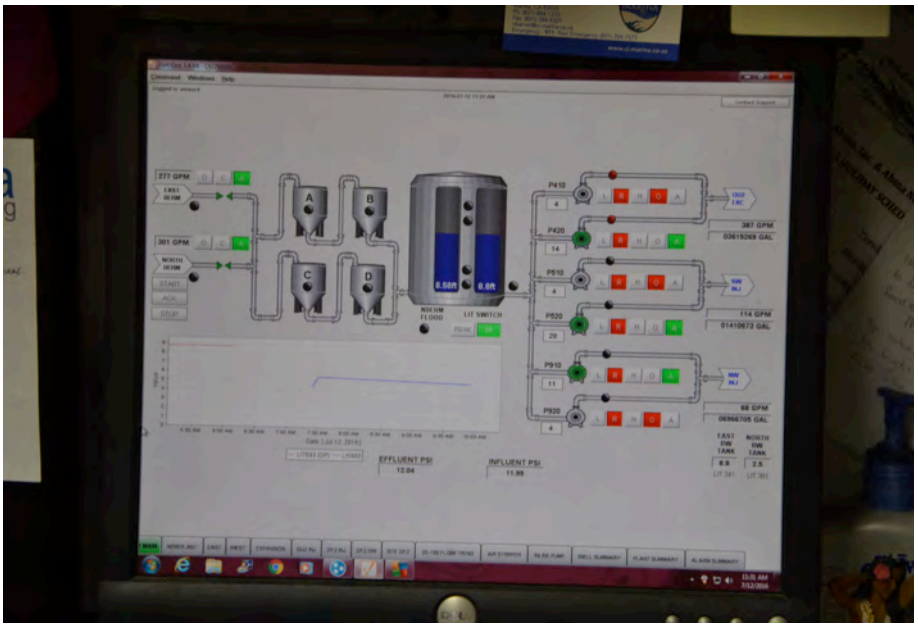
Description:
OU 2 GWTP looking east showing site fence and secondary containment.

Photograph No. 2

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP process display panel.



Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP motor control center (MCC).

Photograph No. 4

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP backwash tank in foreground and effluent tank in background. Tanks located on east side of the system; view looking south.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 5

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP GAC vessel.

Photograph No. 6

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP piping manifold on northeast exterior of the system.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 7

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP flow distribution piping manifold looking south and GAC vessel A on right.

Photograph No. 8

Date: July 12, 2016

Site: OU 2

Description:
OU 2 GWTP flow distribution piping manifold looking west and GAC vessel B on left.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 9

Date: July 12, 2016

Site: OU 2

Description:
General view of the landfill gas extraction and treatment system TTU in operation, looking north from Landfills Area E.

Photograph No. 10

Date: July 12, 2016

Site: OU 2

Description:
Landfill gas extraction and treatment system TTU, looking north from inside the TTU compound.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 11

Date: July 12, 2016

Site: OU 2

Description:
Landfill gas extraction and treatment system TTU control panel.

Photograph No. 12

Date: July 12, 2016

Site: OU 2

Description:
Landfill gas extraction and treatment system TTU control panel.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 13

Date: July 12, 2016

Site: OU 2

Description:
Landfill gas extraction and treatment system TTU influent manifold valves.

Photograph No. 14

Date: July 12, 2016

Site: OU 2

Description:
Landfill gas extraction and treatment system TTU influent piping.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 2
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 15

Date: July 12, 2016

Site: OU 2

Description:
Landfills surface drainage feature, access road, perimeter fence and landfill cell vegetative cover on right-hand side of photograph (all typical).

Photograph No. 16

Date: July 12, 2016

Site: OU 2

Description:
Landfills surface drainage feature and landfill cell vegetative cover (typical).

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APPENDIX B

Sites 2 & 12 Groundwater Remedy

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Five-Year Review Site Inspection Checklist
Fort Ord: Sites 2 & 12 Groundwater Remedy

I. SITE INFORMATION	
Site name: Sites 2 & 12	**Date of inspection:** July 12, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
x Access controls
x Institutional controls
x Groundwater pump and treatment
☐ Surface water collection and treatment
☐ Other_____
☐ Monitored natural attenuation
x Groundwater containment
☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **Derek Lieberman** (Name) **Ahtna Program Manager** (Title) **07/12/2016** (Date)
Interviewed ☐ at site **x at office** ☐ by phone Phone no**. 831-384-3735**
Problems, suggestions; ☐ Report attached _____

2a. **O&M staff** **Mark Fisler** (Name) **Ahtna Senior Treatment System Operator** (Title) **07/12/2016** (Date)
Interviewed **x at site** ☐ at office \ ☐ by phone Phone no. **831.384.3735**
Problems, suggestions; ☐ Report attached _____

2b. **O&M staff**
Name Title Date
Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
Problems, suggestions; ☐ Report attached _____

3.	**Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply. Agency _____ Contact _____ _____ _____ _____ Name Title Date Phone no. Problems; suggestions; ☐ Report attached _____
4.	**Other interviews** (optional) ☐ Report attached.
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)
1.	**O&M Documents** **x O&M manual** **x Readily available** **x Up to date** ☐ N/A **x As-built drawings** **x Readily available** **x Up to date** ☐ N/A **x Maintenance logs** **x Readily available** **x Up to date** ☐ N/A Remarks: **Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**
2.	**Site-Specific Health and Safety Plan** **x Readily available** **x Up to date** ☐ N/A Contingency plan/emergency response plan **x Readily available** **x Up to date** ☐ N/A Remarks: **Accident Prevention Plan in accordance with EM 385-1-1 Safety and Health Requirements Manual maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**
3.	**O&M and OSHA Training Records** **x Readily available** **x Up to date** ☐ N/A Remarks: **Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**
4.	**Permits and Service Agreements** ☐ Air discharge permit ☐ Readily available ☐ Up to date **x N/A** ☐ Effluent discharge ☐ Readily available ☐ Up to date **x N/A** ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date **x N/A** **x Other permits: Hazmat storage** **x Readily available** **x Up to date** ☐ N/A Remarks: **For storage of compressed helium and sulfuric acid. Permit maintained in the U.S. Department of the Army contractor's OU2 GWTP office and at Sites 2&12 GWTP.**
5.	**Gas Generation Records** ☐ Readily available ☐ Up to date **x N/A** Remarks:
6.	**Settlement Monument Records** ☐ Readily available ☐ Up to date **x N/A** Remarks:
7.	**Groundwater Monitoring Records** **x Readily available** **x Up to date** ☐ N/A Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office and in the Fort Ord Data Integration System.**
8.	**Leachate Extraction Records** ☐ Readily available ☐ Up to date **x N/A** Remarks _____

9. **Discharge Compliance Records**
x Air **x Readily available** **x Up to date** ☐ N/A
x Water (effluent) **x Readily available** **x Up to date** ☐ N/A
Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

10. **Daily Access/Security Logs** **x Readily available** **x Up to date** ☐ N/A
Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house **x Contractor for Federal Facility**
☐ Other_____

2. **O&M Cost Records**
☐ Readily available **x Up to date**
☐ Funding mechanism/agreement in place
Original O&M cost estimate **$495,000/yr per RI Sites ROD** ☐ Breakdown attached

Total annual cost by year for review period if available

From	**1/1/12** Date	**To** **12/31/12** Date	$349,000 Total cost	☐ Breakdown attached
From	**1/1/13** Date	**To** **12/31/13** Date	$369,000 Total cost	☐ Breakdown attached
From	**1/1/14** Date	**To** **12/31/14** Date	$589,000 Total cost	☐ Breakdown attached
From	**1/1/15** Date	**To** **12/31/15** Date	$694,000 Total cost	☐ Breakdown attached
From	**1/1/16** Date	**To** **12/31/16** Date	$672,000 Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: **Costs higher (2014-2016) than original estimate due to inclusion of a soil vapor extraction and treatment system in 2015 that were not in the original ROD estimate.**

V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A
Remarks: **GWTP compound fenced; fencing in good condition. Keys to gate locks are properly controlled and assigned to appropriate personnel.**

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: **Posted signs indicate U.S. Government property, helium storage and sulfuric acid storage; security cameras mounted on GWTP facility.**

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	**x No**	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	**x No**	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **site inspections, self-reporting**
Frequency: **Annually**
Responsible party/agency: **U.S. Department of the Army**
Contact: _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date	**x Yes**	☐ No	☐ N/A
Reports are verified by the lead agency	**x Yes**	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	**x Yes**	☐ No	☐ N/A
Violations have been reported	☐ Yes	**x No**	☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident
Remarks: **In June 2016, graffiti observed on south side of GWTP facility. Incident was reported to the City of Marina police department.**

2. **Land use changes on site** ☐ N/A
Remarks: **Cinemark movie theater constructed on site; Veterans Administration/Department of Defense medical clinic under construction on site.**

3. **Land use changes off site** ☐ N/A
Remarks: **Residential and hotel under construction adjacent to the site.**

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks: **Roads are in good condition.**

B. Other Site Conditions

Remarks: **The site is clean and well maintained.**

VII. LANDFILL COVERS ☐ Applicable **x N/A**

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES **x Applicable** ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines **x Applicable** ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
x Good condition **x All required wells properly operating** ☐ Needs Maintenance
☐ N/A
Remarks_____
_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
x Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
x Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable **x N/A**

C. Treatment System **x Applicable** ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
x Air stripping **x Carbon adsorbers**
☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
x Good condition ☐ Needs Maintenance
x Sampling ports properly marked and functional
x Sampling/maintenance log displayed and up to date
x Equipment properly identified
x Quantity of groundwater treated annually: 81 million gallons
☐ Quantity of surface water treated annually_____
Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A **x Good condition** ☐ Needs Maintenance
Remarks_____

3. **Tanks, Vaults, Storage Vessels**
☐ N/A **x Good condition** **x Proper secondary containment** ☐ Needs Maintenance
Remarks_____

4.	**Discharge Structure and Appurtenances** ☐ N/A **x Good condition** ☐ Needs Maintenance Remarks_____
5.	**Treatment Building(s)** ☐ N/A **x Good condition** (esp. roof and doorways) ☐ Needs repair **x Chemicals and equipment properly stored** Remarks_____
6.	**Monitoring Wells** (pump and treatment remedy) **x Properly secured/locked** **x Functioning** **x Routinely sampled** **x Good condition** **x All required wells located** ☐ Needs Maintenance ☐ N/A Remarks_____
D. Monitoring Data	
1.	Monitoring Data **x Is routinely submitted on time** **x Is of acceptable quality**
2.	Monitoring data suggests: **x Groundwater plume is effectively contained** **x Contaminant concentrations are declining**
E. Monitored Natural Attenuation	
1.	**Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance **x N/A** Remarks_____
X. OTHER REMEDIES	
	If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.
A. Soil Vapor Extraction Wells and Pipelines	**x Applicable** ☐ N/A
1.	**Pumps, Wellhead Plumbing, and Electrical** **x Good condition** **x All required wells properly operating** ☐ Needs Maintenance ☐ N/A Remarks_____
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** **x Good condition** ☐ Needs Maintenance Remarks_____
3.	**Spare Parts and Equipment** **x Readily available** ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks_____

B. Treatment System	**x Applicable** ☐ N/A
1.	**Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping **x Carbon adsorbers** ☐ Filters_____ ☐ Additive (*e.g.*, chelation agent, flocculent)_____ ☐ Others_____ **x Good condition** ☐ Needs Maintenance **x Sampling ports properly marked and functional** **x Sampling/maintenance log displayed and up to date** **x Equipment properly identified** **x Quantity of soil vapor treated annually: ~ 475 million standard cubic feet** Remarks_____
2.	**Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A **x Good condition** ☐ Needs Maintenance Remarks_____
3.	**Tanks, Vaults, Storage Vessels** ☐ N/A **x Good condition** ☐ Needs Maintenance Remarks_____
4.	**Discharge Structure and Appurtenances** ☐ N/A **x Good condition** ☐ Needs Maintenance Remarks_____
5.	**Treatment Building(s)** **x N/A** ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks_____
C. Monitoring Data	
1	Monitoring Data **x Is routinely submitted on time** **x Is of acceptable quality**
2	Monitoring data suggests: **x Soil gas plume is effectively contained** **x Contaminant concentrations are declining**

XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **The Sites 2&12 groundwater treatment system is generally functioning in accordance with system design and modification criteria. Based on monitoring and evaluation reports the groundwater treatment system is capturing and reducing groundwater contamination at Sites 2&12 and OU 2. The Sites 2&12 soil vapor extraction and treatment system is also generally functioning in accordance with system design and modification criteria. Based on monitoring and evaluation reports the soil vapor extraction and treatment system is capturing and reducing soil gas contamination at Sites 2&12.**
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. **Current O&M procedures are consistent with approved O&M plans and are effective in maintaining long-term operations.**
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. **None identified.**
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. **The remedy was modified in 2015 to add an additional groundwater extraction well and ten soil vapor extraction wells. Monitoring and operations are evaluated for optimization opportunities on a quarterly basis per decision criteria presented in the quality assurance project plans for groundwater and soil gas monitoring.**
E.	**Additional Questions/Comments**
	1. What is your current role as it relates to the site? **Derek Lieberman – Project Manager** 2-A. Explain the purpose of the system and list what contaminants it is treating for? **GWTS: protect human health and comply with federal and state law by returning groundwater to a condition that will allow beneficial uses to occur, including potential future use as a drinking water source. Specifically, the remedial action objective is to remediate chemicals of concern (COCs) in the Upper 180-Foot Aquifer to federal or State drinking water Maximum Contaminant Levels or lower for some COCs. These goals are accomplished through hydraulic control and containment of contaminated groundwater, and through extraction and treatment of groundwater exceeding ACLs. The Sites 2 & 12 groundwater plume is characterized by the presence of eight COCs in groundwater in the Upper 180-Foot Aquifer at concentrations above their respective ACLs: chloroform, 1,1-DCE, 1,2-DCA, cis-1,2-DCE, 1,3-DCP, PCE, TCE, and vinyl chloride.** **SVETS: reduce COC concentrations in soil gas to levels that will not result in concentrations of COCs in groundwater that continue to exceed ACLs.**

2-B. What is your overall impression of the system with regards to safety, efficiency and effectiveness?
The systems are safely, efficiently and effectively operated and maintained.

2-C. Have any system enhancements been made since the 2012 five year review? If so, explain.
The remedy was modified in 2015 to add an additional groundwater extraction well, ten soil vapor extraction wells, and a soil vapor treatment unit.

2-D. Are there any improvements you recommend to system operation to improve these areas?
No additional improvements are recommended at this time.

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)?
There is not a continuous on-site O&M presence; however, the GWTS and SVETS are monitored remotely through the supervisory control and data acquisition (SCADA) system during non-business hours. Additionally, the operators receive alarms via SCADA in the event of a system shutdown or other critical issue.

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?
Monday through Friday 0700 to 1730.

3-C. Describe routine O&M activities.
Routine O&M activities are described in the *Final Operations and Maintenance Manual, Volume II, Sites 2 and 12 (Sites 2/12) Groundwater Remedy, Former Fort Ord, California* (Administrative Record Number BW-2479C) and the *Final Operations and Maintenance Manual Volume III, Sites 2 and 12 Soil Vapor Extraction and Treatment System, Former Fort Ord, California* (Administrative Record Number BW-2763A).

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five year review (September 2012)? If so please explain changes and reasons for change.
None.

E. Additional Questions/Comments - continued

3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review?
None.

4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset.
Secondary containment of GWTP equipment and conveyance piping, leak detection systems, and automatic shutdown via SCADA protocols.

4-B. When was the last time these controls were inspected/tested and documented?
In accordance with the O&M Manual, secondary containment and other mechanical systems are inspected and documented at least semi-annually, and an integrity check of the leak detection systems, including SCADA protocols, is performed at least annually.

4-C. Has there been any unintended release of untreated water since the last 5 year review? If so, describe nature of release, lessons learned and changes to system and/or SOPs as a result. **No.**

5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site? **No.**

F. System Condition

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, what is the well maintenance protocol:
Yes. The maintenance program consists of maintenance activities as described in Section 12.0 of the Groundwater Remedy O&M Manual and Section 4.0 of the SVETS O&M Manual.

b) Can the prescribed well maintenance be carried out given the layout of the well and the available personnel and equipment? **Yes.**

c) When were the well(s) last developed and when will it (they) be redeveloped?
Last developed upon installation. There are no current plans for redevelopment.

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?
Yes. The maintenance program is described in Section 12.0 of the O&M Manual and is documented in the operator's logbook and daily progress reports. Excessive pump wear due to sediments has not been observed.

e) Are all of the flow meters/totalizers in good working order? **Yes.**

f) Is there an inventory of appropriate spare parts for the pumps and related equipment? **Yes.**

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?
Yes.

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime).
Minimum influent flow = 100 gpm; maximum influent flow = 225 gpm; average influent concentration over last five years is 9.6 micrograms/liter; operates 24 hours/day; expected downtime is less than 438 hours per year (i.e., 95% operability).

b) What is the average total of treated water annually? **102 million gallons since 2005.**

c) What are the average total hours of down time annually? **209 hours since 2007.**

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).
Approximately 20,000 pounds of activated carbon every 18 months.

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).
Approximately 20,000 pounds of spent activated carbon every 18 months.

f) Are all ancillary equipment (pumps, blowers, valves, etc.) are maintained per manufacturers recommendations? **Yes.**

h) Do any pumps, blowers or ancillary equipment produce excessive noise? **No.**

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase GAC vessels, pipes and/or ductwork)?
Minor rust on some exterior metal components.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 entrance with sign containing contact and basic design information.

Photograph No. 2

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 inside containment building showing backwash pump, piping, and tank (foreground, left side), GAC vessel (gray tank on right side) for groundwater treatment, potassium permanganate vessels (white tanks on left side) for vapor treatment, and air stripper (background with yellow railing).

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 sulfuric acid holding tank (for pH adjustment) and associated secondary containment (right-hand side of photograph).

Photograph No. 4

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 GWTP GAC vessel piping manifold.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 5

Date: July 12, 2016

Site: Sites 2 & 12
12

Description:
Sites 2&12 GAC vessel.

Photograph No. 6

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 air stripper.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 7

Date: July 12, 2016

Site: Sites 2 & 12

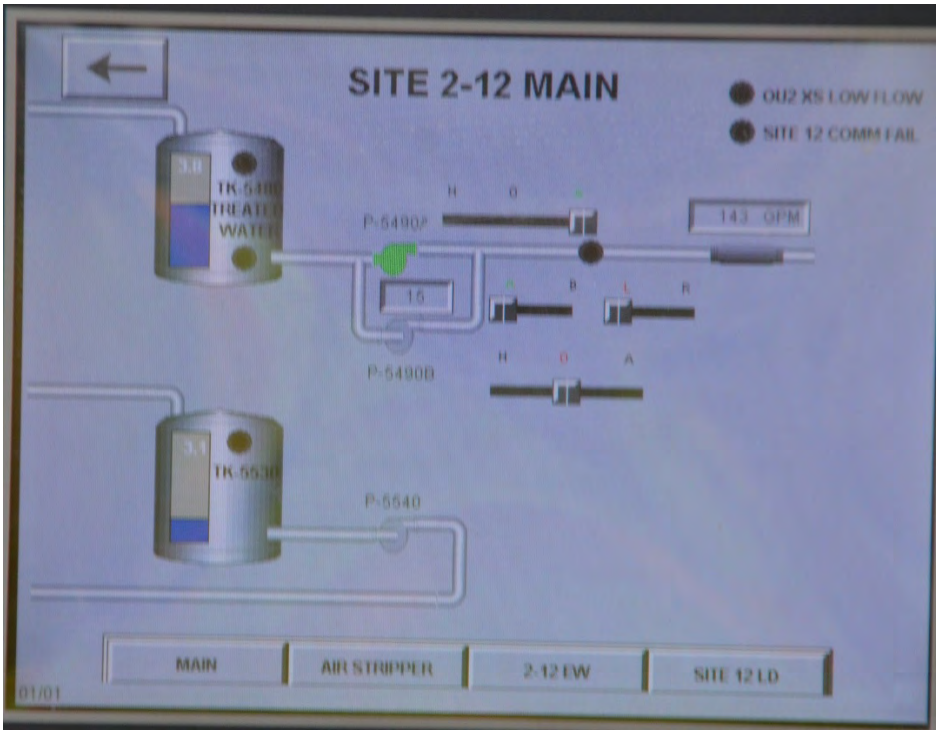
Description:
Sites 2&12 process control and monitoring panel.

Photograph No. 8

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12, close-up of human-machine interface (HMI) touch screen on the process control and monitoring panel.



Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 9

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 electrical equipment (foreground) and SVE system (background) all behind bollards, facing east.

Photograph No. 10

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12, west face of GWTP exterior and loading pad, facing southeast.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 11

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 SVE system behind locked gated fence with warning and informational signs, looking south.

Photograph No. 12

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 SVE system close-up; blower to the right and GAC vessels on the left-hand side of the photograph, respectively (looking east).

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Sites 2 & 12
Photograph Date: 2016

Prepared by: CESAM
Photographer: AHTNA (Photo 13)
Brad Jackson (Photo 14)

Photograph No. 13

Date: September 14, 2016

Site: Sites 2 & 12

Description:
Sites 2&12 SVE well head (typical).

Photograph No. 14

Date: July 12, 2016

Site: Sites 2 & 12

Description:
Sites 2&12, building showing recent graffiti from the June 2016 time-frame (looking northeast). The graffiti has been subsequently removed.

APPENDIX B

Site 31

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Five-Year Review Site Inspection Checklist
Fort Ord Site – Site 31

I. SITE INFORMATION

Site name: Site 31	**Date of inspection:** July 14, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- **x Institutional controls**
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other:
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **X Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **David Eisen** (Name) **USACE MMR Program Manager** (Title) **July 14, 2016** (Date)
   Interviewed ☐ at site **x at office** ☐ by phone Phone no. **831.393.9692**
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	**x N/A**
☐ As-built drawings	☐ Readily available	☐ Up to date	**x N/A**
☐ Maintenance logs	☐ Readily available	☐ Up to date	**x N/A**

Remarks_____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date **x N/A**
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date **x N/A**
   Remarks_____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date **x N/A**
   Remarks_____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x N/A**
	☐ Water (effluent)	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			

IV. O&M COSTS ☐ Applicable **x N/A**

V. ACCESS AND INSTITUTIONAL CONTROLS **x Applicable** (ICs) ☐ N/A

A. Fencing

1.	**Fencing**	☐ Location shown on site map	☐ Gates secured	**x** N/A
	Remarks:			

B. Other Access Restrictions

1.	**Signs and other security measures**	☐ Location shown on site map	**x** N/A
	Remarks:		

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No **x N/A**
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No **x N/A**

Type of monitoring (*e.g.*, self-reporting, drive by) **NA**
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No **x N/A**
Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No
Violations have been reported ☐ Yes ☐ No **x N/A**
Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks: **The site is vacant and there is no evidence of soil disturbance or a change in site or surrounding land use.**

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**
Remarks_____

2. **Land use changes on site** ☐ N/A
Remarks **See C2**
_

3. **Land use changes off site** ☐ N/A
Remarks **See C2**

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads damaged** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks: **The access road is beginning to be overgrown with vegetation.**

B. Other Site Conditions

Remarks: **The site has been restored to a condition consistent with the surrounding landscape.**

VII. LANDFILL COVERS □ Applicable **x N/A**			
IX. GROUNDWATER/SURFACE WATER REMEDIES □ Applicable **x N/A**			
X. OTHER REMEDIES			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
XI. OVERALL OBSERVATIONS			
A.	**Implementation of the Remedy**		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **The remedy (ICs) appears to be functioning as intended. The site is vacant and there is no evidence of soil disturbance, erosion, or residential use.**			
B.	**Adequacy of O&M:**	□ Applicable	**X N/A**
C.	**Early Indicators of Potential Remedy Problems:**	□ Applicable	**X N/A**
D.	**Opportunities for Optimization:**	□ Applicable	**X N/A**
E.	**Additional Questions/Comments**:	□ Applicable	**X N/A**
F.	**System Condition**:	□ Applicable	**X N/A**
G.	**General Treatment System Inspection**:	□ Applicable	**X N/A**

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 31
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 14, 2016

Site: Site 31

Description:
Site 31, footpath heading southeast to the site.

Photograph No. 2

Date: July 14, 2016

Site: Site 31

Description:
Site 31 slope shows moderate level of vegetative growth, no bare soil visible. At escarpment looking southwest.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OU 1
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 14, 2016

Site: Site 31

Description:
Site 31, looking northwest from escarpment. No apparent signs of erosion. Note drainage pipe; center top of photograph.

Photograph No. 4

Date: July 14, 2016

Site: Site 31

Description:
Site 31 slope (typical),

APPENDIX B

Site 39

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Five-Year Review Site Inspection Checklist
Fort Ord: Site – Site 39

I. SITE INFORMATION	
Site name: Site 39	**Date of inspection:** July 13, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

□ Landfill cover/containment
□ Access controls
X Institutional controls
□ Groundwater pump and treatment
□ Surface water collection and treatment
□ Monitored natural attenuation
□ Groundwater containment
□ Vertical barrier walls
x Other: **Excavate soil with unacceptable levels of COCs (e.g., lead, TNT, HMX, and RDX) and restore the site in accordance with habitat restoration requirements.**

Attachments: □ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager:** **Larry Friend** (Name) **Gilbane Basewide Range Assessment Manager** (Title) **July 13, 2016** (Date)
Interviewed □ at site **x at office** □ by phone Phone no. **916.705.1851**
Problems, suggestions; □ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

□ O&M manual	□ Readily available	□ Up to date	**X N/A**
□ As-built drawings	□ Readily available	□ Up to date	**X N/A**
□ Maintenance logs	□ Readily available	□ Up to date	**X N/A**

Remarks_____

2. **Site-Specific Health and Safety Plan** **x Readily available** **x Up to date** □ N/A
□ Contingency plan/emergency response plan □ Readily available □ Up to date □ N/A
Remarks: **Documents maintained in the Kemron field office**

3. **O&M and OSHA Training Records** **x Readily available** **x Up to date** □ N/A
Remarks: **Documents maintained in the Kemron field office**

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**X N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**X N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**X N/A**
	☐ Other permits_____	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
	_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**X N/A**
	☐ Water (effluent)	☐ Readily available	☐ Up to date	**X N/A**
	Remarks_____			
10.	**Daily Access/Security Logs**	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Completed on a weekly basis**			
	IV. O&M COSTS – none associated with HTW			
	V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A			
A. Fencing				
1.	**Fencing damaged** ☐ Location shown on site map **x Gates secured** ☐ N/A			
	Remarks_____			
B. Other Access Restrictions				
1.	**Signs and other security measures** ☐ Location shown on site map ☐ N/A			
	Remarks_____			

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) **Self reporting**
Frequency _____
Responsible party/agency **U.S. Department of Army**
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No **x N/A**
Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A
Violations have been reported ☐ Yes **x No** ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks: **No problems reported**

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident
Remarks: **Vandalism and Trespassing**

2. **Land use changes on site** ☐ N/A
Remarks **No**

3. **Land use changes off site: x N/A**
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads damaged** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks

B. Other Site Conditions **X N/A**

VII LANDFILL COVERS ☐ Applicable **x N/A**

VIII VERTICAL BARRIER WALLS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES □ Applicable **x N/A**	
X. OTHER REMEDIES □ Applicable **x N/A**	
XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **A drive-by visual survey was conducted of several areas that were remediated and were at various stages of habitat restoration. The habitat restoration appeared successful.**
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. **NA**
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. **NA**
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. **NA**

E. Additional Questions/Comments

1. What is your current role as it relates to the site?

The interviewee's role is that of On-site Senior Manager.

2-A. Explain the purpose of the system and list what contaminants it is treating for?

Excavate soil with unacceptable levels of COCs (e.g., lead, TNT, HMX, and RDX) and restore the site in accordance with the habitat restoration requirements.

2-B. What is your overall impression of the system with regards to safety, efficiency and effectiveness?

Objectives are being met.

2-C. Have any system enhancements been made since the 2012 five year review? If so, explain. **NA**

2-C. Are there any improvements you recommend to system operation to improve these areas? **No**

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)? **No**

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?

Weekly

3-C. Describe routine O&M activities.

Drive-by visual inspections

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change. **No**

E. Additional Questions/Comments - continued

3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five-year review? **NA**

4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset. **NA**

4-B. When was the last time these controls were inspected/tested and documented? **Weekly**

4-C. Has there been any unintended release of untreated water since the last five-year review? If so, describe nature of release, lessons learned and changes to system and/or SOPs as a result. **No**

5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site? **No**

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 39 (HTW)
Photograph Date: July 13, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 13, 2016

Site: Site 39

Description:
Range 43, no further BRA action required.

Photograph No. 2

Date: July 13, 2016

Site: Site 39

Description:
Site photo (typical). Re-establishment of vegetation after range clearance.

APPENDIX B

Site 33

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Five-Year Review Site Inspection Checklist
Fort Ord: Site – Site 33

I. SITE INFORMATION	
Site name: Site 33	**Date of inspection:** July 14, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment
☐ Access controls
x Institutional controls
☐ Groundwater pump and treatment
☐ Surface water collection and treatment
☐ Other: **Site restricted to non-residential use.**
☐ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **X Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **David Eisen** (Name) **USACE MMR Program Manager** (Title) **July 14, 2016** (Date)
   Interviewed ☐ at site **x at office** ☐ by phone Phone no. **831.393.9692**
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   ☐ O&M manual ☐ Readily available ☐ Up to date **x N/A**
   ☐ As-built drawings ☐ Readily available ☐ Up to date **x N/A**
   ☐ Maintenance logs ☐ Readily available ☐ Up to date **x N/A**
   Remarks_____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date **x N/A**
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date **x N/A**
   Remarks_____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date **x N/A**
   Remarks_____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x N/A**
	☐ Water (effluent)	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			

IV. O&M COSTS ☐ Applicable **x N/A**

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map ☐ Gates secured ☐ N/A

Remarks: **The site is fenced and gated. As this is an operating Golf Course maintenance yard the gate was opened, but the inspection Team was met by the grounds manager.**

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks: **No signs restricting entry were observed.**

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) **Self reporting and periodic site visits**

Frequency _____

Responsible party/agency **U.S. Department of Army**

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No **x N/A**

Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No **x N/A**

Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A

Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**

Remarks_____

2. **Land use changes on site** ☐ N/A

Remarks **No**

3. **Land use changes off site** ☐ N/A

Remarks **No**

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A

Remarks_____

B. Other Site Conditions

Remarks: **The site is used by the Bayonet/Blackhorse Golf Course grounds and grounds equipment maintenance facility. There is a washing station for the maintenance equipment that drains into a small area where the wash water can accumulate.**

VII. LANDFILL COVERS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x N/A**

X. OTHER REMEDIES □ Applicable **x N/A**			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
XI. OVERALL OBSERVATIONS			
A.	**Implementation of the Remedy**		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
B.	**Adequacy of O&M:**	□ Applicable	**X N/A**
C.	**Early Indicators of Potential Remedy Problems:**	□ Applicable	**X N/A**
D.	**Opportunities for Optimization:**	□ Applicable	**X N/A**
E.	**Additional Questions/Comments**:	□ Applicable	**X N/A**
F.	**System Condition**:	□ Applicable	**X N/A**
G.	**General Treatment System Inspection**:	□ Applicable	**X N/A**

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 33
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: July 14, 2016

Site: Site 33

Description:
Site 33 entrance (gated with a lock).

Photograph No. 2

Date: July 14, 2016

Site: Site 33

Description:
Working area within Site 33 (typical).

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 33
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 14, 2016

Site: Site 33

Description:
Site 33 Looking from the golf course maintenance washout work area; wash water accumulates in an unlined pond.

Photograph No. 4

Date: July 14, 2016

Site: Site 33

Description:
Site 33 perimeter fence.

APPENDIX B

Site 3

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Five-Year Review Site Inspection Checklist
Fort Ord: Site – Site 3

I. SITE INFORMATION

Site name: Site 3	**Date of inspection:** July 14, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ **Access controls**
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other_____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☒ **Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager**: **Bart Kowalski** (Name) **Chenega Wildlife Biologist** (Title) **July 14, 2016** (Date)
   Interviewed ☒ **at site** ☐ at office ☐ by phone Phone no. **831.242.7918**
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone, Phone no. _____
   Problems, suggestions; ☐ Report attached _____
   _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ **N/A**
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ **N/A**
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ **N/A**

Remarks_____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ **N/A**
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ **N/A**
   Remarks_____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ **N/A**
   Remarks_____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x** N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x N/A**
	☐ Water (effluent)	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			

IV. O&M COSTS – None Identified

V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map **x Gates secured** ☐ N/A

Remarks: **Gates used to restrict sites access and barrier wires are used to control the direction of personal traffic. Signs/markers are in place to indicate areas closed or restricted.**

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks: Signs were evident and are used to direct visitors to trails and site restrictions.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **Self reporting (drive-by inspections)**
Frequency: Irregular frequency
Responsible party/agency:
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No **x N/A**
Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No **x N/A**
Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**
Remarks:

2. **Land use changes on site** ☐ N/A
Remarks: **No change**

3. **Land use changes off site** ☐ N/A
Remarks: **No change**

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads damaged** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks

B. Other Site Conditions

Remarks: **Site appears to be in good condition.**

VII. LANDFILL COVERS ☐ Applicable **x N/A**

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x N/A**

X. OTHER REMEDIES □ Applicable x N/A			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
XI. OVERALL OBSERVATIONS			
A.	**Implementation of the Remedy**		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **Remedy appears to be functioning as intended. The gates restrict vehicle access and barrier wire indicates where the public can access the area. Marker are in place indicate status of area (open/closed). Vegetation at the site appears to be healthy and in good condition.**			
B.	**Adequacy of O&M:**	□ Applicable	**X N/A**
C.	**Early Indicators of Potential Remedy Problems:**	□ Applicable	**X N/A**
D.	**Opportunities for Optimization:**	□ Applicable	**X N/A**
E.	**Additional Questions/Concerns as related to O&M:**	□ Applicable	**X N/A**
F.	**System Condition:**	□ Applicable	**X N/A**
G.	**General Treatment System Inspection:**	□ Applicable	**X N/A**

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 3
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 1

Date: Site 3

Site: July 14, 2016

Description:
Site 3 looking west showing typical sand dunes with vegetation.

Photograph No. 2

Date: Site 3

Site: July 14, 2016

Description:
Site 3 looking west showing typical sand dunes with vegetation.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 3
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: Site 3

Site: July 14, 2016

Description:
Site 3 looking west showing typical sand dunes with fenced access trail.

Photograph No. 4

Date: Site 3

Site: July 14, 2016

Description:
Site 3 looking west showing typical sand dunes with vegetation.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord Site 3
Photograph Date: July 14, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 5

Date: Site 3

Site: July 14, 2016

Description:
Site 3 looking in an easterly direction showing former range facilities (fenced with open gate) and end of access road (right-hand side of photograph).

Photograph No. 6

Date: Site 3

Site: July 14, 2016

Description:
Same as Photograph with emphasis on the assess road.

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APPENDIX B

Operable Unit Carbon Tetrachloride Plume

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Five-Year Review Site Inspection Checklist
Fort Ord: Operable Unit Carbon Tetrachloride Plume

I. SITE INFORMATION	
Site name: Operable Unit Carbon Tetrachloride Plume	**Date of inspection:** July 12, 2016
Location and Region: Former Fort Ord, California	**EPA ID:** CA7210020676
Agency, office, or company leading the five-year review: U.S. Department of the Army	**Weather/temperature:** Partly Cloudy mid-50s-60s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- **x Institutional controls**
- **x Groundwater pump and treatment**
- ☐ Surface water collection and treatment
- ☐ Other_____
- **x Monitored natural attenuation**
- **x Groundwater containment**
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** **Derek Lieberman** (Name) **Ahtna Project Manager** (Title) **07/12/2016** (Date)
   Interviewed ☐ at site **x at office** ☐ by phone Phone no. **831-384-3735**
   Problems, suggestions; ☐ Report attached _____

2a. **O&M staff** **Eric Schmidt** (Name) **Ahtna Task Lead** (Title) **07/12/2016** (Date)
   Interviewed ☐ **at site x** ☐ by phone Phone no. **831-384-3735**
   Problems, suggestions; ☐ Report attached _____

2b. **O&M staff** (Name) (Title) (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

x O&M manual	**x Readily available**	**x Up to date**	☐ N/A
x As-built drawings	**x Readily available**	**x Up to date**	☐ N/A
x Maintenance logs	**x Readily available**	**x Up to date**	☐ N/A

Remarks: **Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**

2.	**Site-Specific Health and Safety Plan**	**x Readily available**	**x Up to date**	☐ N/A
	Contingency plan/emergency response plan	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Accident Prevention Plan in accordance with EM 385-1-1 Safety and Health Requirements Manual maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**			
3.	**O&M and OSHA Training Records**	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Documents maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
	☐ Other permits:_____	☐ Readily available	☐ Up to date	**x N/A**
	Remarks_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks:			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks:			
7.	**Groundwater Monitoring Records**	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office and in the Fort Ord Data Integration System.**			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	x N/A
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☐ N/A
	x Water (effluent)	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**			
10.	**Daily Access/Security Logs**	**x Readily available**	**x Up to date**	☐ N/A
	Remarks: **Records maintained in the U.S. Department of the Army contractor's OU2 GWTP office.**			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house **x Contractor for Federal Facility**
☐ Other_____

2. **O&M Cost Records**

☐ Readily available **x Up to date**
X Funding mechanism/agreement in place
Original O&M cost estimate **$500,000/yr per OUCTP ROD** ☐ Breakdown attached

Total annual cost by year for review period if available

From	**1/1/12** Date	**To 12/31/12** Date	$478,000 Total cost	☐ Breakdown attached
From	**1/1/13** Date	**To 12/31/13** Date	$487,000 Total cost	☐ Breakdown attached
From	**1/1/14** Date	**To 12/31/14** Date	$595,000 Total cost	☐ Breakdown attached
From	**1/1/15** Date	**To 12/31/15** Date	$1,079,000 Total cost	☐ Breakdown attached
From	**1/1/16** Date	**To 12/31/16** Date	$674,000 Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: **NA**

V. ACCESS AND INSTITUTIONAL CONTROLS **x Applicable** ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A

Remarks: **GWTP compound fenced; fencing in good condition.**

B. Other Access Restrictions

1. Signs and other security measures ☐ Location shown on site map ☐ N/A

Remarks:

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	**x No**	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	**x No**	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **Site inspections, self-reporting**
Frequency: **Annually**
Responsible party/agency: **U.S. Department of the Army**
Contact: _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date	**x Yes**	☐ No	☐ N/A
Reports are verified by the lead agency	**x Yes**	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	**x Yes**	☐ No	☐ N/A
Violations have been reported	☐ Yes	**x No**	☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**
Remarks

2. **Land use changes on site** **x N/A**
Remarks

3. **Land use changes off site** **x N/A**
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks: **Roads are in good condition**.

B. Other Site Conditions x N/A

VII. LANDFILL COVERS ☐ Applicable **x N/A**

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES **x Applicable** ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines **x Applicable** ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   x Good condition **x All required wells properly operating** ☐ Needs Maintenance ☐ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   x Good condition ☐ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   x Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable **x N/A**

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks_____

C. Treatment System **x Applicable** ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation **x Bioremediation**
   ☐ Air stripping **x Carbon adsorbers**
   ☐ Filters_____
   x Additive (*e.g.*, chelation agent, flocculent): **sodium lactate substrate**
   ☐ Others_____
   x Good condition ☐ Needs Maintenance
   x Sampling ports properly marked and functional
   x Sampling/maintenance log displayed and up to date
   x Equipment properly identified
   x Quantity of groundwater treated annually: 22.6 million gallons (Upper 180-Foot Aquifer only)
   ☐ Quantity of surface water treated annually_____
   Remarks: **Quantity of groundwater treated annually for the A-Aquifer and the Lower 180-Foot Aquifer cannot be determined due to the nature of the remedies – enhanced in situ bioremediation and natural attenuation, respectively.**

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A **x Good condition** ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A **x Good condition** **x Proper secondary containment** ☐ Needs Maintenance
   Remarks_____

4.	**Discharge Structure and Appurtenances** ☐ N/A **x Good condition** ☐ Needs Maintenance Remarks
5.	**Treatment Building(s)** ☐ N/A **x Good condition (esp. roof and doorways)** ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks
6.	**Monitoring Wells** (pump and treatment remedy) **x Properly secured/locked** **x Functioning** **x Routinely sampled** **x Good condition** **x All required wells located** ☐ Needs Maintenance ☐ N/A Remarks
D. Monitoring Data	
1.	Monitoring Data **x Is routinely submitted on time** **x Is of acceptable quality**
2.	Monitoring data suggests: ☐ Groundwater plume is effectively contained **x Contaminant concentrations are declining**
E. Monitored Natural Attenuation	
1.	**Monitoring Wells** (natural attenuation remedy) **x Properly secured/locked** **x Functioning** **x Routinely sampled** **x Good condition** **x All required wells located** ☐ Needs Maintenance **x N/A** Remarks
X. OTHER REMEDIES	
	If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The goal of the OUCTP groundwater remedy is to comply with federal and state laws and regulations by returning groundwater to a condition that will allow beneficial uses to occur, including potential future use as a source for drinking water, industrial water and agricultural water. Specifically, the objective is to remediate chemicals of concern (COCs) in the A-Aquifer, Upper 180-Foot Aquifer and Lower 180-Foot Aquifer to federal or State drinking water Maximum Contaminant Levels (MCLs) or lower for some COCs. These goals are accomplished through enhanced *in situ* bioremediation (EISB) and monitored natural attenuation (MNA) in the A-Aquifer, hydraulic control and containment of contaminated groundwater through extraction and treatment of groundwater exceeding ACLs in the Upper 180-Foot Aquifer, and MNA in the Lower 180-Foot Aquifer. The OUCTP groundwater plume is characterized by the presence of eight COCs in groundwater in the A-Aquifer, one COC in the Upper 180-Foot Aquifer, and two COCs in the Lower 180-Foot Aquifer at concentrations above their respective ACLs. The OUCTP groundwater remedies are generally functioning in accordance with system design and modification criteria. Based on monitoring and evaluation reports, EISB is reducing groundwater contamination in the A-Aquifer, operation of an extraction well (EW-OU2-09-180) connected to the OU2 groundwater treatment system is capturing and reducing groundwater contamination in the Upper 180-Foot Aquifer, and COC concentrations are declining in the Lower 180-Foot Aquifer as indicated by MNA data.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
Current O&M procedures are consistent with approved O&M plans and are effective in maintaining long-term operations.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. **None identified.**

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
The A-Aquifer OUCTP groundwater remedy is EISB performed in six deployment areas (Pilot Study, 1A, 1B, 1C, 2A, and 2B) from 2007 to 2012, and MNA. In June 2015 eight new OUCTP A-Aquifer groundwater monitoring wells were installed to delineate the carbon tetrachloride plume in the southeastern portion of the estimated plume. The work is described in the *Operable Unit Carbon Tetrachloride Plume Evaluation Technical Memorandum, A-Aquifer, Former Fort Ord, California* (OUCTP Evaluation Tech Memo; Ahtna, 2015g), which includes a recommendation for a new EISB deployment area due to the CT plume migrating further east and north than previously defined and the potential for further migration. It is anticipated that new EISB Deployment Area 3A may begin construction and operation in 2016 following completion of a remedial action work plan (in progress). The operation of EW-OU2-09-180 does not seem to be affecting the overall carbon tetrachloride concentration trend for nearby MW-OU2-64-180 in the Upper 180-Foot Aquifer. A new OUCTP Upper 180-Foot Aquifer extraction well should be considered to enhance containment and control of the OUCTP in the Upper 180-Foot Aquifer.

E. Additional Questions/Comments

1. What is your current role as it relates to the site?
Derek Lieberman – Project Manager

2-A. Explain the purpose of the system and list what contaminants it is treating for?
Protect human health and comply with federal and state law by returning groundwater to a condition that will allow beneficial uses to occur, including potential future use as a drinking water source. Specifically, the objective is to remediate COCs in the A-Aquifer, Upper 180-Foot Aquifer, and Lower 180-Foot Aquifer to federal or State drinking water MCLs or lower for some COCs. These goals are accomplished through EISB and MNA in the A-Aquifer, hydraulic control and containment of contaminated groundwater through extraction and treatment of groundwater exceeding ACLs in the Upper 180-Foot Aquifer, and MNA in the Lower 180-Foot Aquifer. The OUCTP in the A-Aquifer is characterized by the presence of eight COCs in groundwater at concentrations above their respective ACLs: chloroform, 1,1-DCE, carbon tetrachloride, methylene chloride, total 1,2-DCE, PCE, TCE, and vinyl chloride. The OUCTP in the Upper 180-Foot Aquifer is characterized only by the presence of carbon tetrachloride in groundwater at concentrations above its ACL. The OUCTP in the Lower 180-Foot Aquifer is characterized by the presence of 1,2-DCA and carbon tetrachloride in groundwater at concentrations above their respective ACLs.

2-B. What is your overall impression of the system with regards to safety, efficiency and effectiveness?
The systems are safely, efficiently and effectively operated and maintained.

2-C. Have any system enhancements been made since the 2012 five-year review? If so, explain.
The A-Aquifer remedy will be modified in 2016 to add an additional EISB deployment area.

2-D. Are there any improvements you recommend to system operation to improve these areas?
A new OUCTP Upper 180-Foot Aquifer extraction well should be considered to enhance containment and control of the OUCTP in the Upper 180-Foot Aquifer.

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)?
There is not a continuous on-site O&M presence; however, the GWTS is monitored remotely through the supervisory control and data acquisition (SCADA) system during non-business hours. Additionally, the operators receive alarms via SCADA in the event of a system shutdown or other

critical issue.

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?
Monday through Friday 0700 to 1730.

3-C. Describe routine O&M activities.
Routine O&M activities related to the A-Aquifer remedy are described in the *Draft Final Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan Addendum, Former Fort Ord, California* (Administrative Record Number OUCTP-0073A).

Routine O&M activities related to the Upper 180-Foot Aquifer remedy are described in the *Final Operations and Maintenance Manual, Volume I, Operable Unit 2 (OU2) Groundwater Remedy, Former Fort Ord, California* (Administrative Record Number BW-2479C).

Routine O&M activities related to the Lower 180-Foot Aquifer remedy are described in the *Quality Assurance Project Plan, Former Fort Ord, California, Volume I, Appendix A, Final Revision 4, Groundwater Remedies and Monitoring at Operable Unit 2, Sites 2 and 12, and Operable Unit Carbon Tetrachloride Plume* (Administrative Record Number BW-2785A).

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change. **None.**

E. Additional Questions/Comments - continued

3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review?
None.

4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset.
Secondary containment of GWTP equipment and conveyance piping, leak detection systems, and automatic shutdown via SCADA protocols.

4-B. When was the last time these controls were inspected/tested and documented?
In accordance with the O&M Manual, secondary containment and other mechanical systems are inspected and documented at least semi-annually, and an integrity check of the leak detection systems, including SCADA protocols, is performed at least annually.

4-C. Has there been any unintended release of untreated water since the last five-year review? If so, describe nature of release, lessons learned and changes to system and/or SOPs as a result. **No.**

5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site? **No.**

F. System Condition

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, what is the well maintenance protocol:
Yes. The maintenance program consists of maintenance activities as described in Section 12.0 of the OU2 Groundwater Remedy O&M Manual, the OUCTP RAWP Addendum, and the Groundwater QAPP.

b) Can the prescribed well maintenance be carried out given the layout of the well and the available personnel and equipment? **Yes**.

c) When were the well(s) last developed and when will it (they) be redeveloped?
Last developed upon installation. There are no current plans for redevelopment.

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?
Yes. The maintenance program is described in Section 12.0 of the O&M Manual and is documented in the operator's logbook and daily progress reports. Excessive pump wear due to sediments has not been observed.

e) Are all of the flow meters/totalizers in good working order? **Yes.**
f) Is there an inventory of appropriate spare parts for the pumps and related equipment? **Yes.**
g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well? **Yes.**

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime).
For A-Aquifer EISB Deployment Area 3A: continuous operation (24 hours/day) of injection and extraction wells until sodium lactate is distributed throughout the deployment area (approximately 150 days of operation). Minimum influent flow is to be determined, maximum influent flow is estimated to be 120 gpm. Influent concentrations are to be determined. Expected downtime is unknown.

For Upper 180-Foot Aquifer groundwater extraction and treatment via EW-OU2-09-180 connected to the OU2 GWTS: Minimum influent flow = 45 gpm; maximum influent flow = 66 gpm; average influent concentration over last five years is 1.2 micrograms/liter; operates 24 hours/day; expected downtime is less than 438 hours per year (i.e., 95% operability).

Not applicable for Lower 180-Foot Aquifer MNA.

b) What is the average total of treated water annually? **332 million gallons since startup in 1995.**

c) What are the average total hours of down time annually? **72 hours since 2011.**

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon). **Approximately 80,000 pounds of activated carbon annually at the OU2 GWTP.**

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).
Approximately 80,000 pounds of spent activated carbon annually at the OU2 GWTP.

f) Are all ancillary equipment (pumps, blowers, valves, etc.) are maintained per manufacturers recommendations? **Yes.**
h) Do any pumps, blowers or ancillary equipment produce excessive noise? **No.**

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)?
Minor surface rust on some exterior metal components.

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OUCTP
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Tom Ghigliotto

Photograph No. 1

Date: August 21, 2016

Site: OUCTP

Description: 3A Deployment Area Injection Well

Photograph No. 2

Date: August 21, 2016

Site: OUCTP

Description: EW-BW-169A Injection Well and Power Boxes

Photographic Documentation

Client: US Dept. of Army
Location: Former Fort Ord OUCTP
Photograph Date: July 12, 2016

Prepared by: CESAM
Photographer: Brad Jackson

Photograph No. 3

Date: July 12, 2016

Site: OUCTP

Description:
OUCTP locked monitoring well (typical).

Photograph No. 4

Date: July 12, 2016

Site: OUCTP

Description:
OUCTP locked monitoring well (typical).

APPENDIX B

Interim Action Munitions Response Sites

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Five-Year Review Site Inspection Checklist
Fort Ord: Interim Action Munitions Response Sites

I. SITE INFORMATION	
Site name: Interim Action Munitions Response Sites (Ranges 43-48 South, Range 30A, & MRS 16)	**Date of inspection:** **August 26, 2016 for MRS-16**
Location: MRS-16	**EPA ID: CA7210020676**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature: Overcast in the morning becoming sunny in the afternoon. Cool.**

Remedy Includes: (Check all that apply)

☐ Landfill cover/containment	☐ Monitored natural attenuation
☐ Access controls	☐ Groundwater containment
☐ Institutional controls	☐ Vertical barrier walls
☐ Groundwater pump and treatment	**x Vegetation clearance via prescribed burns**
☐ Surface water collection and treatment	**x MEC Remedial Action (surface & subsurface removal)**
☐ Other Liquid Phase Carbon	**x MEC detonation using Engineering Controls**

Attachments: ☐ Inspection team roster attached **x Site inspection photo attached**

II. INTERVIEWS – NA – Visual Inspection Only

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	**x N/A**
☐ As-built drawings	☐ Readily available	☐ Up to date	**x N/A**
☐ Maintenance logs	☐ Readily available	☐ Up to date	**x N/A**

Remarks: _____

2. **Site-Specific Health and Safety Plan** **x Readily available** **x Up to date** ☐ N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks: Documents maintained in the BRAC and contractor offices_____

3. **O&M and OSHA Training Records** **x Readily available** **x Up to date** ☐ N/A
   Remarks: Documents maintained in the BRAC and contractor offices_____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**

   Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date **x N/A**
   Remarks: _____

6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: _____			
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x N/A**
	☐ **Water (effluent)**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: _____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	**x N/A**
	Remarks: _____			
	IV. O&M COSTS			
	☐ Applicable **x N/A**			
	None identified for Interim Action Munitions Response Sites			
	V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable **x N/A**			
	VI. GENERAL SITE CONDITIONS			
A. Roads	**x** Applicable ☐ N/A			
1.	**Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A			
	Remarks: _____			
B. Other Site Conditions				
	VII. LANDFILL COVERS ☐ Applicable **x N/A**			
	VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**			
	IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x N/A**			
	X. OTHER REMEDIES ☐ Applicable **x N/A**			

XI. OVERALL OBSERVATIONS		
A.	**Implementation of the Remedy**	
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **Remarks: <u>The MRS-16 site was observed to be in good condition.</u>**	
B.	**Adequacy of O&M**	**x N/A**
C.	**Early Indicators of Potential Remedy Problems**	**x N/A**
D.	**Opportunities for Optimization**	**x N/A**
E.	**Additional Questions/Comments**	**x N/A**
F.	**System Condition**	**x N/A**

Client: US Dept. of Army
Location: Interim Action Munitions Response Sites
Photograph Dates: August 26, 2016,

Prepared by: KEMRON/Gilbane
Photographers:
Rebecca Pisha and Maggie Sheatzley

Photograph No. 1

Date: August 26, 2016

Site: MRS-16

Description:
Representative open space site conditions at MRS-16.

APPENDIX B

Track 3 Impact Area MRA

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Five-Year Review Site Inspection Checklist
Fort Ord: Track 3 Impact Area MRA

I. SITE INFORMATION	
Site name: Track 3 Impact Area MRA	**Date of inspection: August 3, 4, and 10, 2016**
Location: Impact Area MRA Perimeter	**EPA ID: CA7210020676**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature: Overcast and cool**

Remedy* Includes: (Check all that apply)

☐ Landfill cover/containment	☐ Groundwater containment
x Access controls	☐ Vertical barrier walls
x Institutional controls	**x Vegetation clearance via prescribed burns**
☐ Groundwater pump and treatment	**x Technology-aided surface MEC removal**
☐ Surface water collection and treatment	**x Subsurface MEC removal in selected areas**
☐ Other Liquid Phase Carbon	**x Digital geophysical mapping survey**
☐ Monitored natural attenuation	**x Land use controls**

*** Remedial action implementation is in progress**.

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS – NA – Visual Inspection Only

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	**x N/A**
☐ As-built drawings	☐ Readily available	☐ Up to date	**x N/A**
☐ Maintenance logs	☐ Readily available	☐ Up to date	**x N/A**

Remarks:

2. **Site-Specific Health and Safety Plan** **x Readily available** **x Up to date** ☐ N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks: Documents maintained in the BRAC and contractor offices

3. **O&M and OSHA Training Records** **x Readily available** **x Up to date** ☐ N/A
   Remarks: Documents maintained in the BRAC and contractor offices

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	**x N/A**
☐ Effluent discharge	☐ Readily available	☐ Up to date	**x N/A**
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x N/A**
☐ Other permits_____	☐ Readily available	☐ Up to date	**x N/A**

Remarks:

5. **Gas Generation Records** ☐ Readily available ☐ Up to date **x N/A**
   Remarks:

6.	**Settlement Monument Records** Remarks:	☐ Readily available	☐ Up to date	**x N/A**
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records** Remarks:	☐ Readily available	☐ Up to date	**x N/A**
8.	**Leachate Extraction Records** Remarks:	☐ Readily available	☐ Up to date	**x N/A**
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x N/A**
	☐ **Water (effluent)** Remarks:	☐ Readily available	☐ Up to date	**x N/A**
10.	**Daily Access/Security Logs** Remarks:	☐ Readily available	☐ Up to date	**x N/A**
	IV. O&M COSTS ☐ Applicable **x N/A** **None identified for Impact Area MRA**			
	V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable_____ ☐ N/A			
A. Fencing				
1.	**Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A **Remarks: <u>Some sections of the perimeter security fence had an overgrowth of vegetation that engulfed the fencing. An overgrowth of vegetation will likely aid in the hindrance of trespassers.</u>**			
B. Other Access Restrictions				
1.	**Signs and other security measures** ☐ Location shown on site map ☐ N/A **Remarks**: **<u>In one location, the overgrowth of vegetation blocked danger signage. Additionally, several signs were faded; however, "Danger" and "No Trespassing" were still clearly visible.</u>**			

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes **x No** ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x No** ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): **Visual Inspections of the fencing and signage condition conducted from motor vehicle and documented through self-reporting**
Frequency: **_weekly_____**
Responsible party/agency: **_US Department of the Army_____**
Contact **_Natalie Gordon_(Chenega Support Services)** **__MMRM___** **831-242-7919__**
Name Title Phone no.

Reporting is up-to-date* ☐ Yes ☐ No **x N/A**
Reports are verified by the lead agency ☐ Yes ☐ No **x N/A**

Specific requirements in deed or decision documents have been met **x Yes** ☐ No ☐ N/A
Violations have been reported ☐ Yes **x No** ☐ N/A
Other problems or suggestions: ☐ Report attached
* note that fencing/signage monitoring and maintenance are documented in the MRS Security Program Annual Reports.

2. **Adequacy** **x ICs are adequate** ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x No vandalism evident**
Remarks:

2. **Land use changes on site** **x N/A**
Remarks:

3. **Land use changes off site** **x N/A**
Remarks:

VI. GENERAL SITE CONDITIONS

A. Roads **x Applicable** ☐ N/A

1. **Roads** ☐ Location shown on site map **x Roads adequate** ☐ N/A
Remarks:

B. Other Site Conditions

Remarks:

VII. LANDFILL COVERS ☐ Applicable **x N/A**

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x N/A**

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x N/A**

X. OTHER REMEDIES □ Applicable **x N/A**		
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.		
XI. OVERALL OBSERVATIONS		
A.	**Implementation of the Remedy**	
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). **Remarks: <u>The perimeter security fence is intact and functioning as intended to prevent unauthorized access to the site.</u>**		
B.	**Adequacy of O&M**	**x N/A**
C.	**Early Indicators of Potential Remedy Problems**	**x N/A**
D.	**Opportunities for Optimization**	**x N/A**
E.	**Additional Questions/Comments**	**x N/A**
F.	**System Condition**	**x N/A**

Client: US Dept. of Army
Location: Interim Action Sites
Photograph Dates: August 3 and 10, 2016 and February 15, 2017

Prepared by: KEMRON/Gilbane
Photographer: Rebecca Pisha

Photograph No. 1

Date: August 3, 2016

Site: Impact Area MRA

Description: Typical fence and gate along the Impact Area MRA perimeter boundary. Notice the barbed wire, concertina wire, lock, and signage. Facing southwest.

Photograph No. 2

Date: February 15, 2017

Site: Impact Area MRA

Description: Typical fence along the Impact Area MRA perimeter boundary with warning signage. Facing northwest.

Client: US Dept. of Army
Location: Interim Action Sites
Photograph Dates: August 3 and 10, 2016 and February 15, 2017

Prepared by: KEMRON/Gilbane
Photographer: Rebecca Pisha

Photograph No. 3

Date: February 15, 2017

Site: Impact Area MRA

Description: Impossible Canyon North gated access point with signage located along the Impact Area MRA perimeter boundary. Photograph taken facing south.

APPENDIX B

CSUMB Off-Campus MRA (ESCA Group 2)

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Five-Year Review Site Inspection Checklist
Fort Ord: CSUMB Off-Campus MRA (ESCA Group 2)

I. SITE INFORMATION	
Site name: CSUMB Off-Campus MRA	**Date of inspection:** 9-14-16
Location: North-central portion of the former Fort Ord; bordered by Inter-Garrison Road to the north, County North MRA to the east and southeast, Parker Flats MRA to the south, and 8th Avenue and CSUMB campus property to the west and southwest	**EPA ID:**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature:** Clear; 70F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- x Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other Liquid Phase Carbon
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS – Not Applicable – Visual Inspection Only

1. **O&M site manager** Stan Cook (Name) — FORA ESCA Program Manager (Title) — 9-14-16 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone **Phone no. (831) 883-3672**
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Maintenance logs — ☐ Readily available — ☐ Up to date — x N/A

   Remarks: _____.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date x N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date x N/A
   Remarks: _____.

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date x N/A
   Remarks: MEC Recognition and Safety Training records are maintained by the ESCA RP Team on behalf of FORA.

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x** N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x** N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x** N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x** N/A
	☐ **Water (effluent)**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	**x** Readily available	**x** Up to date	☐ N/A
	Remarks: FORA was the property owner for the CSUMB Off-Campus MRA during the Fourth Five-Year Review reporting period and at the time this inspection was completed. Right of Entry (ROE) permits are required for projects conducted on the MRA. ROE permits are issued by FORA and are kept on record at FORA offices.			
	IV. O&M COSTS – Not Applicable – None identified			
1.	**O&M Organization**			
	☐ State in-house	☐ Contractor for State		
	☐ PRP in-house	☐ Contractor for PRP		
	☐ Federal Facility in-house	☐ Contractor for Federal Facility		
	☐ Other _____			
2.	**O&M Cost Records**			
	☐ Readily available ☐ Up to date			
	☐ Funding mechanism/agreement in place			
	Original O&M cost estimate __ ☐ Breakdown attached			
	Total annual cost by year for review period if available			
	From_____ To_____ __$--_____ _____ ☐ Breakdown attached Date Date Total cost			
3.	**Unanticipated or Unusually High O&M Costs During Review Period**			
	Describe costs and reasons: _____			

V. ACCESS AND INSTITUTIONAL CONTROLS **x Applicable** ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map ☐ Gates secured **x** N/A
Remarks: MRA is not restricted by fencing.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: Access management measures are not a requirement of the Group 2 ROD; however, the following describes the signs and barricades present at the MRA. Signs are in place along MRA boundary on the south side of Inter-Garrison Road. Barricades and signs are in place along the western MRA boundary on the east side of 8th Avenue (see photo). Signs are installed at line of sight along the boundary of the MRA and at trailheads.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes **x** No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x** No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): self-reporting
Frequency: Annually
Responsible party/agency: CSUMB
Contact Stan Cook (Name) FORA ESCA Program Manager (Title) 9-14-16 (831) 883-3672 (Date Phone no.)

Reporting is up-to-date **x** Yes ☐ No ☐ N/A
Reports are verified by the lead agency **x** Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met **x** Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes **x** No ☐ N/A
Other problems or suggestions: ☐ Report attached
CSUMB submitted annual LUC inspection reports to FORA for fiscal years 2011-2012, 2012-2013, 2013-2014, and 2014-2015. No violations were identified.

2. **Adequacy** **x** ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x** No vandalism evident
Remarks: No signs of vandalism or trespassing observed.

2. **Land use changes on site** ☐ N/A
Remarks: The 8th Avenue and Inter-Garrison Road Roundabout construction project is currently being conducted by CSUMB within the CSUMB Off-Campus MRA in the northwestern portion of USACE property transfer Parcel S1.3.2 and two soil laydown areas in the northern portion of Parcel S1.3.2. The project is consistent with the land use described in the Base Reuse Plan and the Group 2 ROD.

3. **Land use changes off site** **x** N/A
Remarks: _____

VI. GENERAL SITE CONDITIONS
A. Roads ☐ Applicable **x** N/A
1. **Roads** ☐ Location shown on site map ☐ Roads adequate ☐ N/A Remarks: _____
B. Other Site Conditions
Remarks: The site is in good condition with good vegetation coverage. The site is predominantly vacant and there are no signs of inappropriate activity. Inter-garrison and 8th Avenue Roundabout construction work is being done with approved Right of Entry, UXO Construction Support Plan, workers are receiving UXO Awareness Training and soils are staying on site.
VII. LANDFILL COVERS ☐ Applicable **x** N/A
VIII. VERTICAL BARRIER WALLS ☐ Applicable **x** N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x** N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually: _____
   ☐ Quantity of surface water treated annually: _____
   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks:_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks:
_____

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: _____

X. OTHER REMEDIES – Not Applicable

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The objectives of the remedy (land use controls) are: (1) to ensure that land users involved in ground-disturbing or intrusive activities are educated about the possibility of encountering MEC, (2) to ensure that land users involved in ground-disturbing or intrusive activities stop the activity when encountering potential MEC and report to the appropriate authority, (3) to ensure projects involving ground-disturbing or intrusive activities are coordinated with UXO-qualified personnel so discoveries of potential MEC items will be handled appropriately, and (4) to ensure that any proposals to allow residential development or modifications to residential restrictions are approved by EPA and Army in coordination with DTSC.

The site is in good condition with no evidence of trespassing or vandalism. Land use controls appear to be effective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Not applicable.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None identified.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None identified.
E.	**Additional Questions/Comments – Not Applicable**
	1. What is your current role as it relates to the site? 2-A. Explain the purpose of the system and list what contaminants it is treating for 2-A. What is your overall impression of the system with regards to safety, efficiency and effectiveness? 2-B. Have any system enhancements been made since the 2012 FYR? If so, explain. 2-C. Are there any improvements you recommend to system operation to improve these areas? 3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)? 3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations? 3-C. Describe routine O&M activities. 3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change.

E.	**Additional Questions/Comments – Continued**
	3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review? 4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset. 4-B. When was the last time these controls were inspected/tested and documented? 4-C. Has there been any unintended release of untreated water since the last 5 year review? If so describe nature of release, lessons learned and changes to system and/or SOPs as a result. 5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?

F. System Condition – Not Applicable

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, What is the well maintenance protocol:

b) Can the prescribed well maintenance be carried out given the layout of the well and the available Personnel and equipment?

c) When were the well(s) last developed and when will it (they) be redeveloped?

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?

e) Are all of the flow meters/totalizers in good working order?

f) Is there an inventory of appropriate spare parts for the pumps and related equipment?

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime)

b) What is the average total of treated water annually?

F.	**System Condition – Continued**

c) What are the average total hours of down time annually?

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).

f) Are all ancillary equipment (pumps, blowers, valves, etc) are maintained per manufacturers recommendations?

h) Do any pumps, blowers or ancillary equipment produce excessive noise?

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)?

Photographic Documentation

Client: Fort Ord Reuse Authority
Location: CSUMB Off-Campus MRA
Photograph Dates: 14-Sep-16, 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: J. Thompson, N. Handley
Project Number:

Photograph No. 1

Date: 14-Sep-16

Site: ESCA Group 2 CSUMB Off-Campus MRA

Description:
View from 8th Avenue facing East. Barricade with No Trespassing and No Dumping signs on western boundary of MRA.

Photograph No. 2

Date: 17-Oct-16

Site: ESCA Group 2 CSUMB Off-Campus MRA

Description:
View facing South from Inter-Garrison Road. No Trespassing sign along northern boundary of MRA. Signs are installed at line of sight along the boundary of the MRA and at trailheads.

Client: Fort Ord Reuse Authority
Location: CSUMB Off-Campus MRA
Photograph Dates: 14-Sep-16, 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: J. Thompson, N. Handley
Project Number:

Photograph No. 3

Date: 17-Oct-16

Site: ESCA Group 2 CSUMB Off-Campus MRA

Description:
View facing South from Inter-Garrison Road. No Trespassing sign along northern boundary of MRA. Signs referencing vehicle codes are located at trail heads for trails wide enough to potentially be accessed by vehicle.

APPENDIX B

Del Rey Oaks/Monterey MRA (ESCA Group 3)

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Five-Year Review Site Inspection Checklist
Fort Ord: Del Rey Oaks/Monterey MRA (ESCA Group 3)

I. SITE INFORMATION	
Site name: Del Rey Oaks/Monterey MRA	**Date of inspection:** 9-14-16, 10-17-16
Location: Southwestern portion of former Fort Ord; to the southwest of and includes portion of South Boundary Road	**EPA ID:**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature:** Clear; 70F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- x Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other Liquid Phase Carbon
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS – Not Applicable – Visual Inspection Only

1. **O&M site manager** Stan Cook (Name) — **FORA ESCA Program Manager** (Title) — 10-17-16 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone **Phone no.** (831) 883-3672_
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Maintenance logs — ☐ Readily available — ☐ Up to date — x N/A

   Remarks: _____.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date x N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date x N/A
   Remarks: _____.

3. **O&M and OSHA Training Records** ☐ **Readily available** ☐ **Up to date** x N/A
   Remarks: MEC Recognition and Safety Training records are maintained by the ESCA RP Team on behalf of FORA.

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — x N/A

   Remarks: _____

5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x** N/A
	☐ **Water (effluent)**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	**x** Readily available	**x** Up to date	☐ N/A
	Remarks: FORA was the property owner for the Del Rey Oaks/Monterey MRA during the Fourth Five-Year Review reporting period and at the time this inspection was completed. Right of Entry (ROE) permits are required for projects conducted on the MRA. ROE permits are issued by FORA and are kept on record at FORA offices.			
	IV. O&M COSTS – Not Applicable – None identified			
1.	**O&M Organization**			
	☐ State in-house	☐ Contractor for State		
	☐ PRP in-house	☐ Contractor for PRP		
	☐ Federal Facility in-house	☐ Contractor for Federal Facility		
	☐ Other _____			
2.	**O&M Cost Records**			
	☐ Readily available ☐ Up to date			
	☐ Funding mechanism/agreement in place			
	Original O&M cost estimate __ ☐ Breakdown attached			
	Total annual cost by year for review period if available			
	From_____ To_____ __$--_____ _____ ☐ Breakdown attached			
	Date Date Total cost			
3.	**Unanticipated or Unusually High O&M Costs During Review Period**			
	Describe costs and reasons: _____			
	V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A			
A. Fencing				
1.	**Fencing** ☐ Location shown on site map ☐ **Gates secured** ☐ N/A			
	Remarks: Access management measures are not a requirement of the Group 3 ROD; however, fencing at the MRA consists of two segments of four-strand barbed wire along northeast boundary, to the southwest of South Boundary Road.			

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map **x** N/A
   Remarks: _____.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
   Site conditions imply ICs not properly implemented ☐ Yes **x** No ☐ N/A
   Site conditions imply ICs not being fully enforced ☐ Yes **x** No ☐ N/A

   Type of monitoring (*e.g.*, self-reporting, drive by): self-reporting
   Frequency: Annually
   Responsible party/agency: City of Del Rey Oaks and City of Monterey
   Contact Stan Cook (Name) FORA ESCA Program Manager (Title) 9-14-16 (831) 883-3672 (Date Phone no.)

   Reporting is up-to-date **x** Yes ☐ No ☐ N/A
   Reports are verified by the lead agency **x** Yes ☐ No ☐ N/A

   Specific requirements in deed or decision documents have been met **x** Yes ☐ No ☐ N/A
   Violations have been reported ☐ Yes **x** No ☐ N/A
   Other problems or suggestions: ☐ Report attached
   Jurisdictions submitted annual LUC inspection reports to FORA for fiscal years 2011-2012, 2012-2013, 2013-2014, and 2014-2015. FORA compiled and submitted the reports to the Army (ESCA-0312, -0313, and -0319). No violations were identified.

2. **Adequacy** **x** ICs are adequate ☐ ICs are inadequate ☐ N/A
   Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x** No vandalism evident
   Remarks: No signs of vandalism or trespassing was observed.

2. **Land use changes on site** **x** N/A
   Remarks: _____

3. **Land use changes off site** **x** N/A
   Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads **x** Applicable ☐ N/A

1. **Roads** ☐ Location shown on site map **x** Roads adequate ☐ N/A
   Remarks: Portion of South Boundary Road included in the MRA is in good condition.

B. Other Site Conditions

Remarks: The site is in good condition with good vegetation coverage. The site is vacant and there are no signs of inappropriate activity.

VII. LANDFILL COVERS ☐ Applicable **x** N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x** N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x** N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually: _____
   ☐ Quantity of surface water treated annually: _____
   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks:_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks:
_____

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: _____

X. OTHER REMEDIES – Not Applicable

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The objectives of the remedy (land use controls) are: (1) to ensure that land users involved in ground-disturbing or intrusive activities are educated about the possibility of encountering MEC, (2) to ensure that land users involved in ground-disturbing or intrusive activities stop the activity when encountering potential MEC and report to the appropriate authority, (3) to ensure projects involving ground-disturbing or intrusive activities are coordinated with UXO-qualified personnel so discoveries of potential MEC items will be handled appropriately, and (4) to ensure that any proposals to allow residential development or modifications to residential restrictions are approved by EPA and Army in coordination with DTSC.

The site is in good condition with no evidence of trespassing or vandalism. Land use controls appear to be effective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Not applicable.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None identified.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None identified.
E.	**Additional Questions/Comments – Not Applicable**
	1. What is your current role as it relates to the site? 2-A. Explain the purpose of the system and list what contaminants it is treating for 2-A. What is your overall impression of the system with regards to safety, efficiency and effectiveness? 2-B. Have any system enhancements been made since the 2012 FYR? If so, explain. 2-C. Are there any improvements you recommend to system operation to improve these areas? 3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)? 3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations? 3-C. Describe routine O&M activities. 3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change.

E.	**Additional Questions/Comments – Continued**
	3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review? 4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset. 4-B. When was the last time these controls were inspected/tested and documented? 4-C. Has there been any unintended release of untreated water since the last 5 year review? If so describe nature of release, lessons learned and changes to system and/or SOPs as a result. 5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?

F. System Condition – Not Applicable

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, What is the well maintenance protocol:

b) Can the prescribed well maintenance be carried out given the layout of the well and the available Personnel and equipment?

c) When were the well(s) last developed and when will it (they) be redeveloped?

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?

e) Are all of the flow meters/totalizers in good working order?

f) Is there an inventory of appropriate spare parts for the pumps and related equipment?

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime)

b) What is the average total of treated water annually?

F.	**System Condition – Continued**

c) What are the average total hours of down time annually?

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).

f) Are all ancillary equipment (pumps, blowers, valves, etc) are maintained per manufacturers recommendations?

h) Do any pumps, blowers or ancillary equipment produce excessive noise?

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)?

Client: Fort Ord Reuse Authority
Location: Del Rey Oaks/Monterey MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 1

Date: 17-Oct-16

Site: ESCA Group 3
Del Rey Oaks/Monterey MRA

Description:
View facing southeast from South Boundary Road. Four-strand barbed wire fence at boundaries of MRA along South Boundary Road. Fence is only located along the road and does not surround the MRA.

APPENDIX B

Laguna Seca Parking MRA (ESCA Group 3)

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Five-Year Review Site Inspection Checklist
Fort Ord: Laguna Seca Parking MRA (ESCA Group 3)

I. SITE INFORMATION	
Site name: Laguna Seca Parking MRA	**Date of inspection:** 10-17-16
Location: South-central portion of former Fort Ord; bordered by Barloy Canyon Road and the historical impact area to the west, South Boundary Road and Laguna Seca Raceway to the south, and additional former Fort Ord BLM property to the east and north	**EPA ID:**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature:** Sunny; 70F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- x Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other Liquid Phase Carbon
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS – Not Applicable – Visual Inspection Only

1. **O&M site manager** **Stan Cook** (Name) **FORA ESCA Program Manager** (Title) **10-17-16** (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone **Phone no. (831) 883-3672**
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	x N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	x N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	x N/A

   Remarks: _____.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date x N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date x N/A
   Remarks: _____.

3. **O&M and OSHA Training Records** ☐ **Readily available** ☐ **Up to date** x N/A
   Remarks: MEC Recognition and Safety Training records are maintained by the ESCA RP Team on behalf of FORA.

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	**x** N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	**x** N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	**x** N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x** N/A
	☐ **Water (effluent)**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	**x** Readily available	**x** Up to date	☐ N/A
	Remarks: FORA was the property owner for the Laguna Seca Parking MRA during the Fourth Five-Year Review reporting period and at the time this inspection was completed. Right of Entry (ROE) permits are required for projects conducted on the MRA. ROE permits are issued by FORA and are kept on record at FORA offices. The County of Monterey has an ROE with FORA to operate the site as it has historically as parking for Laguna Seca events.			
	IV. O&M COSTS – Not Applicable – None identified			
1.	**O&M Organization**			
	☐ State in-house	☐ Contractor for State		
	☐ PRP in-house	☐ Contractor for PRP		
	☐ Federal Facility in-house	☐ Contractor for Federal Facility		
	☐ Other _____			
2.	**O&M Cost Records**			
	☐ Readily available ☐ Up to date			
	☐ Funding mechanism/agreement in place			
	Original O&M cost estimate __ ☐ Breakdown attached			
	Total annual cost by year for review period if available			
	From_____ To_____ __$--_____ _____ ☐ Breakdown attached Date Date Total cost			
3.	**Unanticipated or Unusually High O&M Costs During Review Period**			
	Describe costs and reasons: _____			

V. ACCESS AND INSTITUTIONAL CONTROLS **x Applicable** ☐ N/A

A. Fencing

1. **Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A
Remarks: Access management measures are not a requirement of the Group 3 ROD; however, the following describes the fencing, barricades, and gates present at the MRA. Fencing, barricades, and gates are intact, including: locked gates and barricades across South Boundary Road restricting access to the MRA from the south; locked gates across Barloy Canyon Road at the intersection with Eucalyptus Road restricting access into the MRA from the north; locked gates across Barloy Canyon Road at Laguna Seca Raceway; and the western side of the MRA, along Barloy Canyon Road, is bounded by barbed-wire fencing. The eastern boundary of the MRA is not restricted by fencing. South Boundary Road and Barloy Canyon Road are not usually open to vehicle traffic; however, the roadways are opened to controlled vehicle traffic during events at the Laguna Seca Raceway.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: Access management measures are not a requirement of the Group 3 ROD; however, warning and no trespassing signs are posted on the gates, barriers, and fencing at the MRA.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes **x** No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x** No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): self-reporting
Frequency: Annually
Responsible party/agency: County of Monterey
Contact Stan Cook (Name) FORA ESCA Program Manager (Title) 10-17-16 (831) 883-3672 (Date Phone no.)

Reporting is up-to-date **x** Yes ☐ No ☐ N/A
Reports are verified by the lead agency **x** Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met **x** Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes **x** No ☐ N/A
Other problems or suggestions: ☐ Report attached
Jurisdiction submitted annual LUC inspection reports to FORA for fiscal years 2011-2012, 2012-2013, 2013-2014, and 2014-2015. FORA compiled and submitted the reports to the Army (ESCA-0312, -0313, and -0319). No violations were identified. No violations were identified.

2. **Adequacy** **x** ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x** No vandalism evident
Remarks: No signs of vandalism or trespassing observed.

2. **Land use changes on site** **x** N/A
Remarks: _____

3.	**Land use changes off site** **x** N/A **Remarks:** _____
VI. GENERAL SITE CONDITIONS	
A. Roads	**x** Applicable ☐ N/A
1.	**Roads** ☐ Location shown on site map **x** Roads adequate ☐ N/A Remarks: Dirt roads within MRA are intact. No signs of erosion.
B. Other Site Conditions	
	Remarks: The site is in good condition with good vegetation coverage. Fuel breaks have been cut within the MRA. The site is vacant and there are no signs of inappropriate activity.
VII. LANDFILL COVERS ☐ Applicable **x** N/A	
VIII. VERTICAL BARRIER WALLS ☐ Applicable **x** N/A	

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x** N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually: _____
   ☐ Quantity of surface water treated annually: _____
   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks:_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

5. **Treatment Building(s)**
   ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks:
_____

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: _____

X. OTHER REMEDIES – Not Applicable

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The objectives of the remedy (land use controls) are: (1) to ensure that land users involved in ground-disturbing or intrusive activities are educated about the possibility of encountering MEC, (2) to ensure that land users involved in ground-disturbing or intrusive activities stop the activity when encountering potential MEC and report to the appropriate authority, (3) to ensure projects involving ground-disturbing or intrusive activities are coordinated with UXO-qualified personnel so discoveries of potential MEC items will be handled appropriately, and (4) to ensure that any proposals to allow residential development or modifications to residential restrictions are approved by EPA and Army in coordination with DTSC.

The site is in good condition with no evidence of trespassing or vandalism. Land use controls appear to be effective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Not applicable.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None identified.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None identified.
E.	**Additional Questions/Comments – Not Applicable**
	1. What is your current role as it relates to the site? 2-A. Explain the purpose of the system and list what contaminants it is treating for 2-A. What is your overall impression of the system with regards to safety, efficiency and effectiveness? 2-B. Have any system enhancements been made since the 2012 FYR? If so, explain. 2-C. Are there any improvements you recommend to system operation to improve these areas? 3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)? 3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations? 3-C. Describe routine O&M activities. 3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change.

E.	**Additional Questions/Comments – Continued**
	3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review? 4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset. 4-B. When was the last time these controls were inspected/tested and documented? 4-C. Has there been any unintended release of untreated water since the last 5 year review? If so describe nature of release, lessons learned and changes to system and/or SOPs as a result. 5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?

F. System Condition – Not Applicable

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, What is the well maintenance protocol:

b) Can the prescribed well maintenance be carried out given the layout of the well and the available Personnel and equipment?

c) When were the well(s) last developed and when will it (they) be redeveloped?

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?

e) Are all of the flow meters/totalizers in good working order?

f) Is there an inventory of appropriate spare parts for the pumps and related equipment?

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime)

b) What is the average total of treated water annually?

F.	**System Condition – Continued**

c) What are the average total hours of down time annually?

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).

f) Are all ancillary equipment (pumps, blowers, valves, etc) are maintained per manufacturers recommendations?

h) Do any pumps, blowers or ancillary equipment produce excessive noise?

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)?

Client: Fort Ord Reuse Authority
Location: Laguna Seca Parking MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 1

Date: 17-Oct-16

Site: ESCA Group 3 Laguna Seca Parking MRA

Description:
View facing South on Barloy Canyon Road at the intersection with Eucalyptus Road. Locked gate at northern boundary of the roadway portion of the MOUT Site MRA. This portion of roadway leads to the northern boundary of Laguna Seca Parking MRA.

Photograph No. 2

Date: 17-Oct-16

Site: ESCA Group 3 Laguna Seca Parking MRA

Description:
View facing West from Barloy Canyon Road, North of South Boundary Road. Locked gate at entrance to Laguna Seca Raceway and signage and four-strand barbed wire fence along Barloy Canyon Road.

Client: Fort Ord Reuse Authority
Location: Laguna Seca Parking MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 3

Date: 17-Oct-16

Site: ESCA Group 3 Laguna Seca Parking MRA

Description:
View facing West from Barloy Canyon Road. No Trespassing sign and four-strand barbed wire fence along road.

Photograph No. 4

Date: 17-Oct-16

Site: ESCA Group 3 Laguna Seca Parking MRA

Description:
View facing northwest from Lookout Ridge Road and fire break located to the East of Barloy Canyon Road.

APPENDIX B

MOUT Site MRA (ESCA Group 3)

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Five-Year Review Site Inspection Checklist
Fort Ord: MOUT Site MRA (ESCA Group 3)

I. SITE INFORMATION	
Site name: MOUT Site MRA	**Date of inspection:** 10-17-16
Location: Central portion of former Fort Ord; south of Eucalyptus Road; includes MRS-28 and portion of Barloy Canyon Road	**EPA ID:**
Agency, office, or company leading the five-year review: US Department of the Army	**Weather/temperature:** Sunny; 70F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- x Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other Liquid Phase Carbon
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached **x Site inspection photos attached**

II. INTERVIEWS – Not Applicable – Visual Inspection Only

1. **O&M site manager** Stan Cook (Name) — FORA ESCA Program Manager (Title) — 10-17-16 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone **Phone no.** (831) 883-3672
   Problems, suggestions; ☐ Report attached _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	x N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	x N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	x N/A

Remarks: _____.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date x N/A
   Contingency plan/emergency response plan ☐ Readily available ☐ Up to date x N/A
   Remarks: _____.

3. **O&M and OSHA Training Records** ☐ **Readily available** ☐ **Up to date** x N/A
   Remarks: MEC Recognition and Safety Training records are maintained by the ESCA RP Team on behalf of FORA.

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	x N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	x N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	x N/A
☐ Other permits_____	☐ Readily available	☐ Up to date	x N/A

Remarks: _____

5.	**Gas Generation Records**	☐ Readily available10	☐ Up to date	**x** N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
	III. ON-SITE DOCUMENTS & RECORDS VERIFIED (continued)			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	**x** N/A
	☐ **Water (effluent)**	☐ Readily available	☐ Up to date	**x** N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	**x** Readily available	**x** Up to date	☐ N/A
	Remarks: FORA was the property owner for the MOUT Site MRA during the Fourth Five-Year Review reporting period and at the time this inspection was completed. Right of Entry (ROE) permits are required for projects conducted on the MRA. ROE permits are issued by FORA and are kept on record at FORA offices.			
	IV. O&M COSTS – NA – None identified			
1.	**O&M Organization**			
	☐ State in-house	☐ Contractor for State		
	☐ PRP in-house	☐ Contractor for PRP		
	☐ Federal Facility in-house	☐ Contractor for Federal Facility		
	☐ Other _____			
2.	**O&M Cost Records**			
	☐ Readily available ☐ Up to date			
	☐ Funding mechanism/agreement in place			
	Original O&M cost estimate __ ☐ Breakdown attached			
	Total annual cost by year for review period if available			
	From_____ To_____ __$--_____ _____ ☐ Breakdown attached Date Date Total cost			
3.	**Unanticipated or Unusually High O&M Costs During Review Period**			
	Describe costs and reasons: _____			
	V. ACCESS AND INSTITUTIONAL CONTROLS x Applicable ☐ N/A			
A. Fencing				
1.	**Fencing** ☐ Location shown on site map **x Gates secured** ☐ N/A			
	Remarks: Access management measures are not a requirement of the Group 3 ROD. Army owned and maintained Inland Range fencing and locked gate at entry to Impossible Canyon Road from Eucalyptus Road are intact.			

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: Access management measures are not a requirement of the Group 3 ROD; however, signs, barbed wire, and concertina wire on the gate to Impossible Canyon from Eucalyptus Road are in good condition.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
Site conditions imply ICs not properly implemented ☐ Yes **x** No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes **x** No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): self-reporting
Frequency: Annually
Responsible party/agency: County of Monterey
Contact Stan Cook (Name) FORA ESCA Program Manager (Title) 10-17-16 (831) 883-3672 (Date Phone no.)

Reporting is up-to-date **x** Yes ☐ No ☐ N/A
Reports are verified by the lead agency **x** Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met **x** Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes **x** No ☐ N/A
Other problems or suggestions: ☐ Report attached
Jurisdiction submitted annual LUC inspection reports to FORA for fiscal years 2011-2012, 2012-2013, 2013-2014, and 2014-2015. FORA compiled and submitted the reports to the Army (ESCA-0312, -0313, and -0319). No violations were identified.

2. **Adequacy** **x** ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map **x** No vandalism evident
Remarks: No signs of vandalism or trespassing observed. Two trespass incidents at the MOUT Site were previously reported; one in 2013 and one in 2015.

2. **Land use changes on site** **x** N/A
Remarks: _____

3. **Land use changes off site** **x** N/A
Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads **x** Applicable ☐ N/A

1. **Roads** ☐ Location shown on site map **x** Roads adequate ☐ N/A
Remarks: Roads in good condition. No signs of erosion.

B. Other Site Conditions

Remarks: The site is in good condition. The site continues to be used for Army and law enforcement training and there are no signs of inappropriate activity.

VII. LANDFILL COVERS ☐ Applicable **x** N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable **x** N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable **x** N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually: _____
   ☐ Quantity of surface water treated annually: _____
   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks:_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐ Good condition ☐ Needs Maintenance
   Remarks: _____

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks:
_____

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: _____

X. OTHER REMEDIES – Not Applicable

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The objectives of the remedy (land use controls) are: (1) to ensure that land users involved in ground-disturbing or intrusive activities are educated about the possibility of encountering MEC, (2) to ensure that land users involved in ground-disturbing or intrusive activities stop the activity when encountering potential MEC and report to the appropriate authority, (3) to ensure projects involving ground-disturbing or intrusive activities are coordinated with UXO-qualified personnel so discoveries of potential MEC items will be handled appropriately, and (4) to ensure that any proposals to allow residential development or modifications to residential restrictions are approved by EPA and Army in coordination with DTSC.

The site is in good condition with no evidence of trespassing or vandalism. Land use controls appear to be effective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Not applicable.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None identified.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None identified.

E. Additional Questions/Comments – Not Applicable

1. What is your current role as it relates to the site?

2-A. Explain the purpose of the system and list what contaminants it is treating for

2-A. What is your overall impression of the system with regards to safety, efficiency and effectiveness?

2-B. Have any system enhancements been made since the 2012 FYR? If so, explain.

2-C. Are there any improvements you recommend to system operation to improve these areas?

3-A. Is there a continuous on-site O&M presence or is there the ability to monitor the system remotely (If so describe)?

3-B. If there is not continuous onsite presence, how often are personnel on-site during routine operations?

3-C. Describe routine O&M activities.

3-D. Have there been any significant changes in O&M requirements, maintenance schedule and activities, or sampling routines since the last five-year review (September 2012)? If so please explain changes and reasons for change.

E.	**Additional Questions/Comments – Continued**
	3-E. Have there been unexpected O&M difficulties or costs changes at the site since the last five year review? 4-A. Please describe what controls in place to prevent or reduce the impact of an unintended release of untreated water in the event of system upset. 4-B. When was the last time these controls were inspected/tested and documented? 4-C. Has there been any unintended release of untreated water since the last 5 year review? If so describe nature of release, lessons learned and changes to system and/or SOPs as a result. 5. Are you aware of any community concerns or complaints regarding the site or operation of the remediation treatment systems at the site?

F. System Condition – Not Applicable

1. Extraction, Injection & Monitor Wells

a) Is there a regular well maintenance program? If so, What is the well maintenance protocol:

b) Can the prescribed well maintenance be carried out given the layout of the well and the available Personnel and equipment?

c) When were the well(s) last developed and when will it (they) be redeveloped?

d) Is there a maintenance schedule for the pump and how is it documented? Has there been excessive pump wear noticed due to sediments?

e) Are all of the flow meters/totalizers in good working order?

f) Is there an inventory of appropriate spare parts for the pumps and related equipment?

g) Is there an up-to-date logbook for recording performance & maintenance for each extraction well?

2. General Treatment System Inspection

a) What is the design basis for the above-ground portion of the water treatment system? (e.g., minimum and maximum influent flow, influent concentrations, operating hours per day, expected downtime)

b) What is the average total of treated water annually?

F.	**System Condition – Continued**

c) What are the average total hours of down time annually?

d) List the amounts of consumable materials used in the treatment processes (e.g., acid, caustic, sequestering agents, coagulants, activated carbon).

e) What are the quantities of secondary waste products generated (e.g., sludge, spent activated carbon).

f) Are all ancillary equipment (pumps, blowers, valves, etc) are maintained per manufacturers recommendations?

h) Do any pumps, blowers or ancillary equipment produce excessive noise?

i) Are there any signs of wear or corrosion present on system components (i.e. ion exchange vessels, air stripper towers, vapor phase carbon vessels, pipes and/or ductwork)?

Client: Fort Ord Reuse Authority
Location: MOUT Site MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 1

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing South from Eucalyptus Road. Locked gate with concertina wire and Danger, Explosives Area, sign at entrance to Impossible Canyon on northern boundary of MRA.

Photograph No. 2

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing South on Barloy Canyon Road at the intersection with Eucalyptus Road. Locked gate at northern boundary of the roadway portion of the MOUT Site MRA. This portion of roadway leads to the northern boundary of Laguna Seca Parking MRA.

Client: Fort Ord Reuse Authority
Location: MOUT Site MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 3

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing northeast from access road within the MOUT Site.

Photograph No. 4

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing South from access road. MOUT Site structures.

Client: Fort Ord Reuse Authority
Location: MOUT Site MRA
Photograph Dates: 17-Oct-16

Prepared by: Arcadis US, Inc.
Photographer: N. Handley
Project Number:

Photograph No. 5

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing North from access road. MOUT Site structures.

Photograph No. 6

Date: 17-Oct-16

Site: ESCA Group 3 MOUT Site MRA

Description:
View facing northeast from access road. MOUT Site strucures.

APPENDIX C

Community Survey Responses

Appendix C includes:

State and Local Authorities Survey Responses

Community Members Survey Responses

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APPENDIX C

State and Local Authorities Survey Responses

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: Elizabeth Caraker

Affiliation: City of Monterey

Date/Time: 8-26-16 12:00 pm

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

No concerns

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

At times the burning has been a concern but otherwise it seems to be positive in that the land is prepared for re-use.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

No. none.

EC1

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

No. None

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No. None

EC2

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

No

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

No

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time!

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Names: __Lena Chang and Mark Ogonowski_____

Affiliation: _____U.S. Fish and Wildlife Service, Ventura Field Office_____

Date/Time: _21 September 2016/2:50 PM_

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

The Army has continued to make progress on its cleanup activities while coordinating with our office to ensure federally listed species are protected and managed for.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

The cleanup operations have provided the community with a safer environment by cleaning up contaminants and unexploded ordnance. In addition, it provides the community with future preserved open spaces to enjoy for recreation.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

Yes. Our office has been in regular communication with the Army on their cleanup activities

FWS1

for coordination regarding impacts to federally listed species. The purpose of the communications have been to ensure the impacts of the cleanup activities on federally listed species were avoided and minimized to the greatest extent possible. The Army has developed measures to achieve this and further monitoring of these species and habitats. Our office issued a biological opinion to the Army on their cleanup activities on May 28, 2015.

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

N/A

5. Do you feel well informed about the site's activities and progress?

Yes. The Army ensures timely communication regarding the activities and progress via email, phone, and on their website. Army staff are available and responsive when we have inquiries.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

FWS2

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

See #3 above

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

See #4 above

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _ _ (Optional)

Thank you for your time!

FW33

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: Gage Dayton

Affiliation: UC Santa Cruz Fort Ord Natural Reserve

Date/Time: 8/3/16

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Positive

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

I think overall that it has been positive as progress is being made

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

Yes. The Army and contractors have been in routine communication

GD1

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

No.

5. Do you feel well informed about the site's activities and progress?

Yes.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Continue to ensure USFWS Biological Opinions and associated short and long term mitigations are implemented.

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: ERIC MORGAN

Affiliation: BLM

Date/Time: 8/23/2016 1200

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

There has been some evolution of clean up standards due to changes of personnel and interpretations of policy. The local BRAC team has alot dedicated professionals who try their best.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

The surrounding community has been kept informed on the need for cleanup and seems to have a respect for the mission of the program.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

The BRAC team keeps the BLM team well informed and communication is very good

EM1

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

Only complaint is that POM police takes no ownership or responsibility for lands the Army still oversees. This causes some security issues.

5. Do you feel well informed about the site's activities and progress?

We are kept well informed

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

There needs to be more coordination and service from the Army at higher levels for the local clean up effort. Document reviews at higher levels illustrate a disjunct betwen local BRAC office and higher levels. Document reviews take too long.

EM2

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

Yes, the BLM is informed about pertinent issues.

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time!

EM3

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: David J. Stoldt

Affiliation: Monterey Peninsula Water Management District

Date/Time: September 8, 2016

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Cleanup seems to be progressing according to plans.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Continued cleanup has had a positive effect on surrounding communities. Customers of Marina Coast Water District have better confidence in their source of water. Closing of the popular trails in the ESCA area was discouraging to users, but the necessity is understood. The MPWMD is beginning to see the benefits of redevelopment in the City of Marina for residential and commercial sectors of the community.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

MPWMD operates two wells on property (easements) from the Army on General Jim Moore Blvd. The wells are part of the District's Aquifer Storage and Recovery Project, and are used to store "excess" water from the Carmel River during wet periods and recover water during dry periods. The process involves a great deal of water quality sampling and maintenance, so there are often District employees at the site.

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

There has been one property owner in Seaside who complained of noise during recovery operations in past years, but the existing temporary soundwall seems to have alleviated his concerns. There have been a couple of trespassers who entered the site while District staff was present and they were told to leave. Video surveillance of the site has been on-going for about two years and has failed to detect any unlawful entry to the site.

5. Do you feel well informed about the site's activities and progress?

Yes, we receive a newsletter and e-mails updating us on the status of the cleanup efforts.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

We continue to have difficulty working with the local jurisdictions who will ultimately receive property from the Army and FORA. Coordination between the Army, FORA and local jurisdictions is slow.

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

See number 3 above. Also, MPWMD staff participates in the FORA Technical Advisory Committee to keep abreast of any issues at the site.

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

See number 4 above.

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ____ (Optional)

Thank you for your time!

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: KEITH L. WINGO

Affiliation: MONTEREY COUNTY SHERIFF'S OFFICE

Date/Time: 9/28/16

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I AM IMPRESSED WITH THE WORK / CLEANUP THAT HAS ALREADY OCCURRED.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

I BELIEVE THE CLEAN UP OPERATIONS HAVE GONE EXTREMELY WELL. FOR THE MOST PART, THE COMMUNITY UNDERSTANDS THE NEED FOR THE OPERATIONS AND WILL BENEFIT WHEN THE AREAS ARE COMPLETELY SAFE.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

DEPUTIES CONDUCT REGULAR PATROLS AROUND THE EFFECTED AREAS AND COMMUNICATE WITH THE PROPER AUTHORITIES IF ANY ISSUES ARE FOUND. WE HAVE BEEN IN COMMUNICATION W/ FORA & OTHER LAW ENFORCEMENT AGENCIES IN THE PAST TWO YEARS IN AN ATTEMPT TO STOP SOME TRESPASSING IN CLOSED / UNSAFE AREAS.

KW1

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

AS PREVIOUSLY MENTIONED, WE HAVE RESPONDED TO SEVERAL TRESPASSING CALLS WITHIN THE CLOSED/UNSAFE AREAS. MOST OF THE TIME, THE SUSPECTS HAVE FLED PRIOR TO DEPUTIES ARRIVAL. DEPUTIES HAVE BEEN INSTRUCTED TO ISSUE CITATIONS IF A VIOLATION HAS OCCURRED IN THEIR PRESENCE.

5. Do you feel well informed about the site's activities and progress?

YES

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

NO

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

_____

_____

_____

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

_____

_____

_____

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ___ (Optional)

Thank you for your time!

KW 3

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APPENDIX C

Community Members Survey Responses

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Public / Downwind impacted resident

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Okay

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

See Item 2 - S.O.A.R.'s response
Unhealthy smoke impact from burning former ranges, etc. containing waste from UXO, OE, (MEC), etc. and unsightly from poison oak.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Adverse Health impacts from planned burns still concern me same as for the last burns, especially out of control ones.

(1 of 2)

9/6/2016 Public / Downwind Resident / S.O.A.R.

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Unknown, except as reported at Technical or Community meetings ~ if at all.

5. Do you feel well informed about the site's activities and progress?

Okay
Need current burn notification materials as requested for myself & daughter;

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

- No Toxic burning on the former FORT ORD - A Superfund site
- Why are questionnaire's different? - To manage answers & responses? Public vs. Group State/Local Authorities - Same as always.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

(2 of 2)

9/6/2016 Public & S.O.A.R Downwind Resident

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – State and Local Authorities

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: _____

Affiliation: S.O.A.R.

Date/Time: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Okay

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

unhealthy smoke impact from burning former ranges, etc. containing waste from UXO, OE, (MEC) etc. and unhealthy from poison oak.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

Ongoing - many past comments & input since 1992 or so, especially due to burns & their adverse health impacts.

9/16/2016 S.O.A.R. Downwind Resident & Public Member

4. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give details of the events and results of the responses.

Many violations of EPA & DTSC Standards & laws (i.e. burning of toxic waste) since 1993 or so. Don't dumb down it is Still a Superfund Site for cleanup. Numerous comments submitted &/or made especially to the SMART team, FORA, EPA & CA DTSC.

5. Do you feel well informed about the site's activities and progress?

Okay
Need current burn notification materials as requested for myself & daughter, Shawn Millerick.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No Toxic burning on the former Fort ORD-A Superfund site.

4/6/2016 5.0, AR & Public

These questions may be pertinent for local officials:

1. Has there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe the purpose and results.

See Item 3 on 5 year review

Not considered an "official"

2. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please summarize the events and results.

see Item 4, on 5 year review. S.O.A.R. submitted many comments & responses & attended years of meetings regarding Toxic burning at Former Fort Ord - especially to the JSMART team, FORA, EPA & DTSC.

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number _____ (Optional)

Thank you for your time!

9/6/2016

S.O.A.R. Questionnaire

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Fort Ord Superfund Site

Five-Year Review 2017

Five-Year Review Interview Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name:

Affliliation: Community Member

Date/Time: 10/17/16 at 1320 PST

Location of Interview: Telephone Interview conducted by Rachel Hess of KEMRON/Gilbane, Army subcontractor

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

   Very well done.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

   The main effect is the disturbance to the community during the day from the smoke caused by the burn. The affect is minimal since it only lasts for the day (24 hours).

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

   The primary concern for the community is over the burns. The majority of community believe that cleanup at Fort Ord continues and will ultimately be completed. As to the pace of the clean up progress, there are two camps: environmentalist who want cleanup to slow down and those interested in

development who want to see cleanup happen faster. The Del Rey Oaks development is moving slow and community is anxious for development to happen.

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

   No. People have used some areas to dump trash but not high on the concern list.

5. Do you feel well informed about the site's activities and progress?

   Yes. I make a point to participate in the annual tours of Fort Ord and find the tours very informative. Prior to boarding the bus for the tour, participants are allowed to meet in a conference room that has poster boards of information of the various cleanup activities/areas with every stage of the cleanup provided. This is very helpful in providing an understanding of the site when the physical tour occurs.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   Would like to see the areas that have already been cleaned up and cleared for development, be turned over to the cities so the cities can start implementing their development plans – specifically areas for Seaside and Del Rey Oaks. There seems to be delays in getting development started by the cities.

   Would also like to see more money allocated towards the burns faster; so there are no delays in completing all the remaining burns. Hopeful that at some point the extra administration provided by FORA can be absorbed by the cities and BLM and reduce the extra administrative costs currently incurred.

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

would be nice if the clean up included removing the falling down buildings

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

not sure

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Not happy that part of the former Fort Ord land will be made into a horse race park.

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Have heard of people being found dead in some of the old buildings. Have heard of some buildings being intentionally set on fire

5. Do you feel well informed about the site's activities and progress?

somewhat informed on the progress

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No comments.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

CM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: neighbor

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I think it's a good thing. Please do all you can to help clean up the area.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Only helped! Please do all you can for the future!

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No But Please do all you can to clean up the area for the future gereration.

GM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

So - so

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Please clean it all up.

Build housing for vets! Important!

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

GM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): ____

Affiliation: None

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Very slow

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Burning air quality

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

It's the Monterey Peninsula. You will never please everyone.

NGI

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No, but I only go to S^th and Gigling VV

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Open up new areas and new trails. To many people in a small area. Mainly at S^th + Gigling & Creekside

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ____ _ ____ (Optional)

Thank you for your time and effort!

NGZ

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): [redacted]

Affiliation: long time permanent residents of PG

Date/Time (for Interviews): 9/5/2016

Location of Interview: Self conducted @ home

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Good progress

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Enhancing environment, removing potential hazards to people & wildlife

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Some friends in Skyline Forest always complain about burn days (possibly because they see the smoke), but no one else thinks much about it

RBD1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes. We get the online news and upcoming activity bulletins, as well as invitations for tours and clean up activities

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Try to get more publicity about completion of projects and their positive impacts. We know its hard to get people to say nice things (complainers are louder). Keep up the good work - your children and grandchildren will thank you for it.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number (Optional)

Thank you for your time and effort!

RBD2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Well done

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Made area safer

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

GBI

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Keep up the good work. The bus tour was very informative

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

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Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

GB2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: mountain biker user

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

That it is proceeding glacially.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

little, if none, except on burn days. No properties have been cleared and in use to my.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No. There is controlled trespassing but
not that required emergency response

5. Do you feel well informed about the site's activities and progress?

Mostly. Not overall but
very informed. For example perhaps there
is a piece of ground in the today that was
previously depicted of munitions.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Give the contractors a bonus
for beating a deadline.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

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Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

CM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Community member

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

After going on bus tour of the Fort Ord area I was impressed by the cleanup work being done. It is a huge project. Hopefully it will be completed soon.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

DN 1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No.

5. Do you feel well informed about the site's activities and progress?

Yes.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Please continue the good work.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

DN2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): __

Affiliation: UNKNOWN ?

Date/Time (for Interviews): 9/2/16

Location of Interview:

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

ONGOING MUNITION CLEANUP, GROUNDWATER WORK; PRESCRIBED BURNS APPEAR TO BE CONTINUING, NOT AWARE OF ANY PROBLEMS

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

NOT AWARE OF MUCH IMPACT

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

NO

NC1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Reasonably well informed for casual community member – attend open houses when schedule permits and receive mailing updates

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Not at this time

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

NC2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: SELF, MARINA CALIFORNIA RESIDENT

Date/Time (for Interviews): 8-30-16

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

   GOOD JOB, TOO SLOW A PROCESS

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

   BRINGS IN REVENUE TO CITY OF MARINA ADDS NEW BUSINESSES & RESIDENTS

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

   WILD LIFE IS SHOWING UP IN OUR YARDS MORE FREQUENTLY (SKUNKS, OPOSSUM etc.

WEI

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

NO / NA

5. Do you feel well informed about the site's activities and progress?

YES

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

REMOVAL OF OLD HOUSING BEHIND PATTON PKWY IN MARINA. 4 HAVE BURNED DOWN IN 2 YEARS.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

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Phone number: _____ (Optional)

Thank you for your time and effort!

WE2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: lived on Frt Ord since 1994 (CSUMB & E. Garrison)

Date/Time (for Interviews): Sep 28, 2016

Location of Interview: East Garrison / Marina

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Good, I am happy there is progress to make the area environmentally safer & safe for public use.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Positive, I know many people who use recreational trails & live on Frt Ord

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Only one. I was aware of and opposed to was a horse track. Very happy to see other additions. I do have a concern about how many more horse will be built for water & traffic reasons.

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Not in last 5 years.

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I am just very glad for clean up when I moved here in 1994 my college roomies nephews found a granaide while hiking. We kept in in our kitchen until her dad came for a visit to inform us the pin was in it and it was an active grenade. which she turned into local CSUMB Police. So I am well aware of what was here before clean up.

Thank you —

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

_____

_____

_____

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

_____

_____

_____

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Keep remaining ordinance. Keep development out - let it all be open space.

_____

_____

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

_____

_____

_____

5. Do you feel well informed about the site's activities and progress?

_____

_____

_____

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

_____

_____

_____

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

CMZ

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Monterey Bay Equestrians

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

The number of derelect buildings has improved. The problem with public dumping has improved.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

More people are using the area to recreate, both locals and out of area. Access is very limited and tends to be confusing. 8th & Giggling has a very confrontational group of users.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

There is much confusion regarding access from 8th & Giggling. There are specific user groups who are taking down signs and being aggressive about who may & may not have access. Many people feel that since they had free access and use in the past, they have a feeling of entitlement about present use.

PM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes, FORA - ESCA is sending out regular e-mails to interested users and groups especially about 8th & Gigling.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Better long range notice regarding community input meetings is needed. The local equestrian community is not being included.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

PM2

Fort Ord Superfund Site

Five-Year Review 2017

Five-Year Review Interview Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name: _____

Affiliation: Pacific Grove Resident / Reimer Associates Consulting

Date/Time: September 27, 2016

Location of Interview: Home in Pacific Grove

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

The Army have been focused on efforts to close out the environmental sites that have had active remediation for many years. They have been working with the physical constraints of geographic area for example working within the burn windows allowed. It also seems that since 2012, the Army has gone back to review some of the previous work and has reinitiated new work.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

The Army continues to work with the local community on outreach issues. Since 2012, it seems they have focused on more access to the communities through their bus tour program and nature walks that allows the community to understand what is involved with the cleanup operations. In terms of impacts to the community probably the most noticeable one occurs when they burn in advance of the clean-up. However, the Army has been gotten that effort down to a science and the impacts to the community are modest.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

I have heard concern expressed over residual hazards that the Army has left in the ground such as lead in soils or other chemicals of concern. However, I also understand that the Army works very closely with regulatory agencies who are focused on these issues.

KR1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

I have heard about trespassing events that were associated both the mountain biking and dirt biking community and posting of off-road events to social media. I believe that there was some investigation of these activities as they occurred in the historic inland range where the Army is activity cleaning up munitions. I also believe that there is an on-going trespassing issue to the historic range area.

5. Do you feel well informed about the site's activities and progress?

Yes very well informed through emails, social media and newspapers. Also the Army expanded their information events to incorporate more "hands on" information sharing which is now the bi-annual bus tours. The Army had previously focused lots of effort on evening informational meetings which were well run but not well attended.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

The Administrative Record is a very important resource for the local community and the Army needs to continue to be dedicated to this service. The document search functions are very good. There used to be more interactive mapping functions which I do miss as a means to get information. The Parcel Search function on the website is a good feature, but I believe that Army needs to continue to invest in and expand on the capabilities for more on-line interactive mapping tools. This will significantly benefit the local communities as they will be able to share critical information and data concerning the cleanup, property boundaries, and habitat related information. In the long run, this also helps the Army in the reporting requirements.

Please return this by September 30, 2016 to:

US ARMY FORT ORD BASE REALIGNMENT AND CLOSURE OFFICE

Five-Year Review Questionnaire P.O. Box 5008 Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number:_ Optional)

KR2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Exceptional work to protect the public health and environment

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Demonstrates a commitment to the cleanup of historical contamination.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Concerns remain about the impact of burning of vegetation in connection with the cleanup.

VS1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Continue current level of community outreach.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

V52

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: The Parks at Monterey Bay

Date/Time (for Interviews): 8/26/16 @ 3:19 P.M.

Location of Interview: Business -

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I feel that it has made a tremendous difference to the overall appearance to the property; more inviting and the implementation of Jobs and Educational promise

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

It's been a high positive affect on the environment with the ongoing removal of hazardous materials

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

not aware of any

DMR1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Not to my knowledge

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No comments, just continue looking forward to the progress and the anticipation of it's completion

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

PMB2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Docent in Lighthouse Tours

Date/Time (for Interviews): _____

Location of Interview: Marina

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Very well done and detailed job

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Offers tours to educate the public most were "behind the scene"

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

More than most locals

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

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Phone number: _____ (Optional)

Thank you for your time and effort!

CM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: None

Date/Time (for Interviews): NA

Location of Interview: NA

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Like running a marathon a long slow process.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Very little concern, but necessary.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Yes, for the past 10 yrs. and aware the FORA could be terminated in the near future.

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No not aware

5. Do you feel well informed about the site's activities and progress?

Yes, I receive updates

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Nothing specific

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

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Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

CM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: CNPS Volunteer including in the impact area

Date/Time (for Interviews): NA

Location of Interview: NA

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Overall impression is that they are doing a fabulous job. The number of events inviting Community members to view and learn about the clean up process and the need for burns has →

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

We inventory plants on the former Ft Ord and are driving + walking all over the area. We endeavor to show respect for walkers + cyclists too and to explain what we are doing →

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Given the extent that preparations are made for a safe, controlled burn with minimal effect on the surrounding community, it is hard to understand that community members have any reason to complain. The only exception is for genuine medical conditions adversely affected by any amount of smoke + ash.

#1. Continued increased over time. These events have been well attended by various people. Having participated in some of these, I feel that they have been very successful in garnering support for the needed burns. The community members are made aware of the care the Brac Fire personnel are extending to ensure the burns are done in a way to ~~minimize~~ minimize the smoke to residential areas.

#3 Overwhelmingly, users are enthusiastic and appreciative of the trails, roads and habitats. The personnel working in the impact area have little effect on the people walking or riding bicycles outside the impact area. They do, however, frequently ask when the removal work will be finished and the area opened for their use.

JS2

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Personally I have observed one vandalism. A gate bordering the Del Rey Oaks property had been broken open. Some one vandalized the Del Rey Oaks's fence in order to walk in and do the vandalism.

5. Do you feel well informed about the site's activities and progress?

Very much so. As I indicated previously, we inventory plants & birds within the impact area.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

They are doing a great job. Keep up the good work!

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US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: (_____) _____ (Optional)

Thank you for your time and effort!

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Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is as a part of the Fourth Five-Year Review covering the period from the completion of the previous review to the current completion of this review in 2017.

Director of Fund Development
girl scouts of california's central coast

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I believe you are doing a commendable job completing a project while being transparent to the public's concerns.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

I live in the north segment of the county, so I have not heard any complaints.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

N/A

MBI

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No; but sadly, I'm sure all of the above occurs.

5. Do you feel well informed about the site's activities and progress?

From you, absolutely?!

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I appreciate the conscientious choices you make. The land is so beautiful and I want us all to share in that beauty. Open space is crucial, as well as the natural habitat.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

MB2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: local resident

Date/Time (for Interviews): 8/24/2016

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

ridiculously slow & expensive

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

delays land use

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

yes, there are bike & walk trails that only some people get to use & access is limited for no good reasons. up open parking! especially beaches & trails.

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

never no - that was a sham to not use housing.

5. Do you feel well informed about the site's activities and progress?

the maps are confusing

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

yes - open up access / parking & finish the job!

Please return this by September 30, 2016 to:

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Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

CM2

Broadston, Melissa M CTR (US) Community member

From:
Sent: Wednesday, August 31, 2016 2:04 PM
To: Broadston, Melissa M CTR (US)
Subject: [Non-DoD Source] Anicetti Fort Ord 5 year plan

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Ms. Broadston,
These are my responses to the survey. I am not near a printer, and my scanner isn't talking to my computer today....

Affilation, Neighbor of Fort Ord
Date and Time interviewed 10/31/16, 1:55 pm My impression is that the cleanup is progressing carefully. But, that all the closed trails signs indicate areas are being protected for future land uses, and that public opinion is a perfunctory thing, not neccessarily going to be listened to.
2. The ongoing cleanup has reduced use of hiking and biking trails that may eventually be lost to new development. That is sad because they could be used now and because new development should first be in places with derelict old and ugly barracks. There is already so little wildlife because of the drought. I see very few animals out there anymore.
3. The community as a whole is not mobilizing in Seaside Highlands, but, many many people go hiking at the top of Coe every day. Please maintain open spaces near Seaside, Del Rey Oaks.
4. I only notice repeated dumping at the corner of south boundary and General Jim. Maybe a motion activated camera could be set there?

5. I am not well-informed other than about prescribed burns.
6. Maintain open spaces fit for wildlife near Seaside and Del Rey Oaks. Don't allow a horse track and make the area safe from old ordinance.
--

MA 1

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Community Member

ston, Melissa M CTR (US)

From:
Sent: Wednesday, August 31, 2016 1:24 PM
To: Broadston, Melissa M CTR (US)
Subject: [Non-DoD Source] Fort Ord Superfund Site: Five-Year Review 2017

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

Please share with all appropriate and interested parties.

My biggest concern is that trail-building and mountain biking are allowed, thereby destroying wildlife habitat (or making it unusable, which amounts ot the same thing).

Bicycles should not be allowed in any natural area. They are inanimate objects and have no rights. There is also no right to mountain bike. That was settled in federal court in 1996:
Caution-http://mjvande.info/mtb10.htm . It's dishonest of mountain bikers to say that they don't have access to trails closed to bikes. They have EXACTLY the same access as everyone else -- ON FOOT! Why isn't that good enough for mountain bikers? They are all capable of walking....

A favorite myth of mountain bikers is that mountain biking is no more harmful to wildlife, people, and the environment than hiking, and that science supports that view. Of course, it's not true. To settle the matter once and for all, I read all of the research they cited, and wrote a review of the research on mountain biking impacts (see Caution-http://mjvande.info/scb7.htm). I found that of the seven studies they cited, (1) all were written by mountain bikers, and (2) in every case, the authors misinterpreted their own data, in order to come to the conclusion that they favored. They also studiously avoided mentioning another scientific study (Wisdom et al) which did not favor mountain biking, and came to the opposite conclusions.

Those were all experimental studies. Two other studies (by White et al and by Jeff Marion) used a survey design, which is inherently incapable of answering that question (comparing hiking with mountain biking). I only mention them because mountain bikers often cite them, but scientifically, they are worthless.

Mountain biking accelerates erosion, creates V-shaped ruts, kills small animals and plants on and next to the trail, drives wildlife and other trail users out of the area, and, worst of all, teaches kids that the rough treatment of nature is okay (it's NOT!). What's good about THAT?

To see exactly what harm mountain biking does to the land, watch this 5-minute video: Caution-http://vimeo.com/48784297.

In addition to all of this, it is extremely dangerous:
Caution-http://mjvande.info/mtb_dangerous.htm .

For more information: Caution-http://mjvande.info/mtbfaq.htm .

The common thread among those who want more recreation in our parks is total ignorance about and disinterest in the wildlife whose homes these parks are. Yes, if humans are the only beings that matter, it is simply a conflict among

MV1

. even then, allowing bikes on trails harms the MAJORITY of park users -- hikers and equestrians -- who can safely and peacefully enjoy their parks).

The parks aren't gymnasiums or racetracks or even human playgrounds.
They are WILDLIFE HABITAT, which is precisely why they are attractive to humans. Activities such as mountain biking, that destroy habitat, violate the charter of the parks.

Even kayaking and rafting, which give humans access to the entirety of a water body, prevent the wildlife that live there from making full use of their habitat, and should not be allowed. Of course those who think that only humans matter won't understand what I am talking about -- an indication of the sad state of our culture and educational system.

--

I am working on creating wildlife habitat that is off-limits to humans ("pure habitat").
Want to help? (I spent the previous 8 years fighting auto dependence and road construction.)

Wildlife must be given top priority, because they can't protect themselves from us.

Please don't put a cell phone next to any part of your body that you are fond of!

Caution-http://mjvande.info

MV2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Member, Monterey Bay Equestrians

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Thank you for the work to clean up Ft Ord, thereby making it safer for wildlife and for the public.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

The clean up work has had minimal impact. There have been some trails blocked. This is OK when there is a wide area, but when single-tracks are blocked there should be a "work ahead" sign posted at nearby intersections so folks can safely navigate around the work.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Please post more signs during clean up operations, so we know you are out there. We used to get very good info from the volunteer horse patrol, but that has been disbanded by the rangers at Ft Ord. Please bring horse & bike patrol back, as they provide safety and good information to those who use the trails.

MQ1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

No

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Post more signs during clean-up operations.

Please bring horse & bike patrol back, as they provide safety and good information to those who use the trails.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

MS2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: Community member

Date/Time (for Interviews): 8/31/16

Location of Interview: Email

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

As far as I know, all the cleanup work is behind locked gates, so I have no impression of the work.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

None

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

It is ~~very difficult to know which parts of Fort Ord~~ are handled by which agencies, so it's hard to answer this question. There remains a lot of concern about proscribed burns and a lot of concern about public use of the land.

DW1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

I feel informed about proscribed burns, but I do not feel informed about the over all progress of clean-up and I do not fee well informed about what will happen to Fort Ord when the cleanup is complete. I do not feel well informed about whether cleanup efforts to date are considered successful from a scientific, ecological, or financial point of view.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I would like to have objective (third-party) asessments of clean-up work to date.

Please return this by September 30, 2016 to:

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Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

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Phone numbe _____ (Optional)

Thank you for your time and effort!

DW 2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

_____

_____

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

_____

_____

_____

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

_____

_____

_____

AB1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No. I have not seen or heard of any such things.

5. Do you feel well informed about the site's activities and progress?

Yes. I go on all the bus tours. I feel they are very informative.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No. I think they do very well.

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Five-Year Review Questionnaire

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Monterey, CA 93944-5008

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Your phone number will not be published in the Five-Year Review.

Phone number: (Optional)

Thank you for your time and effort!

ABZ

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: Years ago Sgt, Headquarters co. 6th INF - FORT ORD

Date/Time (for Interviews): 11AM TO 3PM Weekdays

Location of Interview: My home - by phone or Bill Collins office -

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

#1

An outstanding effort has been done on the ground "clean-up." But ground water below the impact area has been ignored. This needs to be reviewed as the Watkins Gate Well is by far the worst quality water from the Marina Coast Water District's active wells.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

#2

Very positive above the ground - very poor for ground water. How this "challenge" could be ignored is a bad mistake.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

#3

Unbelievable that the contaminated water has not been addressed.

The insalubrious quality is now being delivered to new home owners.

T121

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required
#4 emergency response from local authorities? If so, please give details.

I have no knowledge of any negative activities. Please see my attached letter on ground water.

#5 5. Do you feel well informed about the site's activities and progress?

Both Melissa Broadston and Bill Collins have been outstanding concerning the surface clean-up. Ground water "challenges" from the Watkins Gate Well seem to have been forgotten.

6. Do you have any comments, suggestions, or recommendations regarding the
#6 site's management or operation?

Complete omission of the "challenge" of the impact area's effect on the quality of the water from the Watkins Gate Well that supplies a large supply of the water for the East Garrison Subdivision. The variety of munitions including artillery and mortar projectiles, rockets, guided missiles and rifle as well as hand grenades that were used from 1940 to 1994 caused unintended damage.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ___ ___ (Optional)

Thank you for your time and effort! you are welcome —

TB2

Monday, August 29, 2016

William K. Collins
Fort Ord Army Base Realignment and Closure
P.O. Box 5008, Building 4463 Gigling Road
Monterey, California 93944-5008

A very pleasant good day,

I was pleased to receive the survey for the former Fort Ord five year review of the work done under the Superfund Site in my recent mail. I was once a Sergeant in the Headquarter's Company, Sixth Infantry Division and stationed at Fort Ord. I must have contributed a very small amount of what now is being cleaned up and restored to the original condition by the efforts of this superfund.

Now, I once again live on the site of what was Fort Ord. It is a new subdivision named East Garrison. My service at Fort Ord was from the spring of 1952 to that same time in 1954. The climate is the same as I remember it. Fort Ord was a "winter uniform" post for all the twelve months of the year. Now, I fail to need the bugle call that was the alarm clock when I was wearing the "olive drab" uniform.

I was recently able to take the free tour of the Fort Ord Impact Area and was pleased to get to know Melissa Broadston. She was kind enough to provided me with multiple copies of the invitation to tour the Fort Ord National Monument. I then was able to share those with my neighbors that live in our new subdivision.

Certainly a great amount of effort has gone into the work of cleaning up the ground that was used from at least 1940 to 1994 as an area for multiple weapons that fired larger ammunition than bullets.

There is one item that I feel has been overlooked, and may be impossible to correct. When our guide had us stop at a now cleaned-up impact area, a comment was made that I am sure is accurate. "With all the ammunition that was used for all those years, and with the sandy soil, you can imagine what happened to the underground water table."

TB3

My neighbors and I are owners of homes that receives it's water from the Watkins Gate Well. That well is located where the water has been contaminated. We now have water that is above the levels that are acceptable for the tankless water heaters that have been installed in the new homes.

The total hardness is to be below 200 mg/L, yet that well produces water that can go as high as 240 mg/L. The dissolved solids the installed water heater is able to handle is up to 500 mg/L, yet that well has documented 600 mg/L in official tests.

I am a member of a committee working with, and for, the Marina Coast Water District that supplies our water. I have access to two of the recent tests per the National Secondary Drinking Water Regulations. That well has the highest rating for "challenges" of those shown on those tests. The tests cover two consecutive years and were done in July of 2015 and again in July of 2016.

As of today, there is nothing that Marina Coast Water District can do but continue to use the Watkins Gate Well. The water demand with the increased number of family homes must be met. Old Fort Ord had a prime location and when the government allowed parcels to be sold for residential homes no consideration was made for the water quality.

is there anything that the superfund can do to assist we home owners that unknowing purchased homes that have to continue to be supplied with this insalubrious water? I am eagerly waiting for the courtesy of a reply to this correspondence. Thank you again for including my name in this survey.

Sincerely,

Copies to:

- Attached to the completed survey.
- Melissa Broadston at the above address.
- Stan Cook of the Fort Ord Reuse Authority, 920 2nd Avenue, Suite A, Marina, CA 93933.
- James Fletcher of Benchmark Homes, 99 Alamaden Blvd, Suite 400, San Jose, CA 95113.
- Ralph Baja of Benchmark, 99 Alamaden Blvd, Suite 400, San Jose, CA 95113.

T12,4

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

The remediation process and clean up is well coordinated and complete The process seems inordinately slow and behind schedule

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

It has successfully provided open space and restored Coastal Chaparral habitat.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No.

M51

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Some outreach via newspapers or local news would serve to inform the community better

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

MS2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: CSUMB

Date/Time (for Interviews): Friday mornings

Location of Interview: BRAC office

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Not sure. Don't have specific information regarding the clean up.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

It is a necessity in order for the ord Community to move forward.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Development of Monterey Downs is a concern with local community members.

AM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

I have seen a lot of Grafitti - spray paint.

5. Do you feel well informed about the site's activities and progress?

not sure.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

needs more community involvement and response. Perhaps volunteers to get involved with clean up.

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Phone number: _____ (Optional)

Thank you for your time and effort!

AM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): N/A

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

While the outreach efforts of the U.S. Army has been outstanding on providing status on cleanup remedies of the Fort Ord Superfund Site in Monterey County, due to a demanding workload and professional interest I have kept apprised of only Sites 2 and 12. While a plethora of information has been available me relative to the entire Superfund Site, I have intentionally limited the documentation for my review. That said, my overall impression of Sites 2 and 12 is that the Army has performed its due diligence and has done a phenomenal job!

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

From my perspective, the continued cleanup operations has had significant effect on Sites 2 and 12. Since April 1999, ground water treatment systems have pumped and treated over 1.7 billion gallons of water. Further, over 460 pounds of contaminants have been removed. I am very pleased with the ongoing remediation efforts.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

As a member of the Marina community, I am not aware of any concerns regarding both sites or its operation and administration.

CMI

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

As a member of the Marina community, I am not aware of any negative incidents on Site 2 and 12.

---

5. Do you feel well informed about the site's activities and progress?

As a member of the Marina community I feel well informed on Sites 2 and 12.

---

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I believe that the U.S. Army has implemented a good outreach program informing the community of the cleanup remedies for the Fort Ord Superfund Site in Monterey County, as they have provided numerous opportunities to engage the general public.

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Five-Year Review Questionnaire

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Monterey, CA 93944-5008

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Your phone number will not be published in the Five-Year Review.

Phone number: N/A (Optional)

Thank you for your time and effort!

You are welcome!

CMZ

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

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Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Work seems to have slowed in the last couple of years due to lack of burn activity. Otherwise, the quality of work is good

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Neutral. There has been progress in getting property transferred, but other projects seem to be eternally delayed.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

CM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

Yes - The newsletter is generally sufficient. The website is useful and informative

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Provide a Business Reply envelope with the survey. You might get more responses

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CM2

Fort Ord Superfund Site: Five-Year Review 2017

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Name (Optional): _____

Affiliation: DES

Date/Time (for Interviews): N/A

Location of Interview: N/A

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I have no overall impression.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

None - actually, see #3.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

I am aware of only one ongoing concern - and that relates to the controlled burns that take place from time to time

DES1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

I am not aware of any such events, incidents or activities.

5. Do you feel well informed about the site's activities and progress?

Somewhat.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No.

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Phone number: _____ (Optional)

Thank you for your time and effort!

DES2

Fort Ord Superfund Site: Five-Year Review 2017

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Name (Optional): _____

Affiliation: Pacific Grove resident

Date/Time (for Interviews): _____

Location of Interview: Telephonic

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

It appears to be very comprehensive and following CERCLA protocol.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

I think there is a general sentiment that the cleanup will open up opportunities in the cleanup area.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

I believe the greatest concern comes from Fort Ord veterans who are disappointed that there are no or may not be any remaining structures saluting all those who served at Ord.

RE1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

None

5. Do you feel well informed about the site's activities and progress?

Generally aware, yes.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

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Phone number: _____ ___ (Optional)

Thank you for your time and effort!

RE2

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Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I SEE A LOT OF PROGRESS IN THE AREA

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

THIS COMMUNITY IS IMPROVING AND MOST OF THE LAND IS BEING RECLAIMED LIKE CSUMB.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

NO I'M NOT AWARE OF ANY

M1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

No Really I Know There are a Lot of Groups That Touch This Project.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I'm Glad To See That This Program is Still Running and The Community is able To Put Alot Land into Play.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ ____ (Optional)

Thank you for your time and effort!

M2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the

Th completion of this review in 2017.

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FORT ORD HISTORICAL SOCIETY
P.O. BOX 242, MARINA, CA 93933
FORTORDHS@GMAIL.COM
FORTORDHS.ORG

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Slow but steady.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Mixed. It is good overall; however, the fires have been problematic. I would suggest no burns until the drought is over.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

People with breathing issues (I among them) are concerned with air quality and toxins being released into the air during burning sessions.

EH1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Not in the clean-up areas; however, dumping, vandalism, and trespassing are occurring all over the base on a daily basis.

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No burn days until the drought is over. Better controls/ safeguards when burning resumes such as fire breaks and fire helos on stand-by alert.

Please return this by September 30, 2016 to:

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Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ___ ___ ____ (Optional)

Thank you for your time and effort!

EH2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): ____________________

Affiliation: live in custer old housing area

Date/Time (for Interviews): ____________________

Location of Interview: ____________________

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

not enough done
Still many many abandoned buildings

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

any cleanup is positive

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

NO

GR1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

NO

5. Do you feel well informed about the site's activities and progress?

NO

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

More public education about plans - time line for continued clean up

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

GR2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Former Ft. Ord TASKFORCE (REMEDIATION)

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

It has been moving Forward to a sucessful conclusion. The Question is When Complete?

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

No permitted entry by public - Necessary safety Requirement.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No, Not aware of any —

RD 1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No, Not aware of any-

5. Do you feel well informed about the site's activities and progress?

YES - Information is AVAILABLE.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Keep up the good work and informational update meetings.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ___ (Optional)

Thank you for your time and effort!

FP2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Live and own home in Marina

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

My impression is that it has been organized and in a timely manner with all things considered.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

A positive effect because most people know about it and there is a sense of safe, community feel and wanting to get involved.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Not to my knowledge.

P.M.1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Not to my knowledge.

5. Do you feel well informed about the site's activities and progress?

Yes. :)

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Thank-you for keeping the community informed on an ongoing basis. It is exciting in a positive way for all you have done. Again, thank-you for all your efforts over the years. You are appreciated

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _ Optional)

Thank you for your time and effort!

CM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Monterey resident

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Very well done

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Little impact other than one berm went beyond specified area causing an unanticipated smoke condition

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

DH1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Unknown

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Well done

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Community Member

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Do not know what has been done

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

None

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

JE1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

No

5. Do you feel well informed about the site's activities and progress?

No

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

More frequent communication in various media

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: ___ ___ (Optional)

Thank you for your time and effort!

JIZ

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: 1995 TASK Force - (De-Construction)

Date/Time (for Interviews): 8-26-16- 7:00 AM

Location of Interview: home.

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Great Job

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

More at ease.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Plumes have come up in Discussion at the Grocery Store.

TL1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

None

5. Do you feel well informed about the site's activities and progress?

Yes. Good Job. of Community outreach.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Great Job. folks.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

TL2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): Marina, CA 93933

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Good

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

More housing for middle class

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

No

RW1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

NO

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Not at present Time

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

RW2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I FEEL THE CLEANUP WAS ABOVE AVERAGE.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

THE COMMUNITY IS THANKFUL FOR YOUR COMMITMENTS

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

I AM NOT AWARE OF ANY NEGATIVE COMMENTS.

E01

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

N/A

5. Do you feel well informed about the site's activities and progress?

YES

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

WOULD LIKE TO RECEIVE E-MAIL.

Done M. Bradstan

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _ _____ _(Optional)

Thank you for your time and effort!

E02

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Fort Ord Youth Hostel

Date/Time (for Interviews): 08/31/2016 ~Noon

Location of Interview: Internet

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Slow but thorough - expected more of Monument Area to be cleared and open by now.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Perception continues that area is more polluted and dangerous than I think it is.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

I've heard lots of concerns about potable water contamination, especially in the Marina area

FOYH1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Nothing major - abandoned vehicles, unauthorized removal of copper gutters, graffiti on abandoned and some occupied buildings, etc.

5. Do you feel well informed about the site's activities and progress?

Yes, based on emails and FORA communication.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Perception would be vastly improved if more abandoned & derelict buildings were removed.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

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Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

FOYH2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: Monterey resident & TV Producer on Amp ch 24

Date/Time (for Interviews): 9/15/16

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

I feel we, the public, are not listened to on how best to clean up. Example: the burning issue, in my opinion not a solution - leave brush so toxic materials won't escape - use metal detectors to locate mines.

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Unperceived effects on health from water & fire. no way to know except that Monterey County has one of the highest percentages of cancer in nation according to 1991 Champs study.

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

Live, Water concerns

LM1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Fire - controlled burns.

5. Do you feel well informed about the site's activities and progress?

yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Use mushrooms to clean up toxic metrid sites. search - on google "mushrooms cleaning up toxic dump sites."

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____ (Optional)

Thank you for your time and effort!

LM2

Fort Ord Superfund Site: Five-Year Review 2017

Five-Year Review Interview/Questionnaire – Community Members

The purpose of the five-year review is to evaluate the implementation and performance of the remedy, and to confirm that human health and the environment continue to be protected by the remedial action that have been performed at the site. This interview is being conducted as a part of the Fourth Five-Year Review for the Fort Ord Superfund Site, covering the period from the completion of the Third Five-Year Review in 2012 to the current completion of this review in 2017.

Name (Optional): _____

Affiliation: _____

Date/Time (for Interviews): _____

Location of Interview: _____

1. What is your overall impression of the cleanup work conducted at the Fort Ord Site since the period of the third five-year review in 2012?

Mostly positive

2. From your perspective, what effect has continued cleanup operations at the site had on the surrounding community?

Other than the "controlled burns" the cleanup operations have been mostly positive

3. Are you aware of any ongoing community concerns regarding the site or its operation and administration? If so, please give details.

The current administration (management) seems to want to not work with the community over their concerns — they would rather dismiss the public and listen only to the elected officals

NS1

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or anything that required emergency response from local authorities? If so, please give details.

Yes - management seems to put drastic rules in place rather than explaining the circumstances - then call for emergency response

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

The management needs to listen to all aspects of the community rather than only the FORA aspect.

Please return this by September 30, 2016 to:

US Army Fort Ord BRAC Office

Five-Year Review Questionnaire

P.O. Box 5008

Monterey, CA 93944-5008

Please include your phone number so that we may contact you if we have any questions.

Your phone number will not be published in the Five-Year Review.

Phone number: _____

Thank you for your time and effort!

NS2

APPENDIX D

Glossary of Military Munitions Response Program Terms

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Appendix D. Glossary of Military Munitions Response Program Terms

Construction Support: Assistance provided by DoD explosive ordnance disposal (EOD) or UXO-qualified personnel and/or by personnel trained and qualified for operations involving chemical agent (CA), regardless of configuration, during intrusive construction activities on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), or munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to ensure the safety of personnel or resources from any potential explosive or CA hazards. Source: (7).

Discarded Military Munitions (DMM): Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710 (e)(2)). For the purposes of the Military Munitions Response Program being conducted at the former Fort Ord, DMM does not include small arms ammunition .50 caliber and below.

Engineering Control (EC): The management of facility operations using engineering principles (e.g., facility design, operation sequencing, equipment selection, or process limitations). Source: (7).

Explosive Ordnance Disposal (EOD) Personnel: Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal ; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform render safe procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices. Source: (7).

Expended: The state of munitions debris in which the main charge has been expended leaving the inert carrier. Source: (1).

Feasibility Study (FS): A study undertaken to develop and evaluate alternatives for remedial action. Source: (3).

Impact Area: The impact area consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and North-South Road to the west. Source: (1).

Institutional Control (IC): (a) Non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use; (b) are generally to be used in conjunction with, rather than in lieu of, engineering measures such as waste treatment or containment; (c) can be used during all stages of the cleanup process to accomplish various cleanup-related objectives; and (d) should be "layered" (i.e., use multiple ICs) or implemented in a series to provide overlapping assurances of protection from contamination. Source: (6).

Land Use Controls (LUCs): Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination, or physical barriers to limit access to real property, such as fences or signs. Source: (7).

Magnetometer: An instrument used to detect ferromagnetic (iron-containing) objects. Total field magnetometers measuring the strength of the earth's natural magnetic field at the magnetic sensor location. Gradient magnetometers, sensitive to smaller near-surface metal objects, use two sensors to

measure the difference in magnetic field strength between the two sensor locations. Vertical or horizontal gradients can be measured. Source: (4).

Material Documented as Safe (MDAS): MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (7).

Material Documented as an Explosive Hazard (MDEH): MPPEH that cannot be documented as MDAS, that has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (7).

Material Potentially Presenting an Explosives Hazard (MPPEH): Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or potentially contains a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within the DoD established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions. Source: (7).

Military Munitions: Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. The term does not include wholly inert items, improvised explosive devices, or nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)).

Military Munitions Response Program (MMRP): The MMRP is a program under which munitions responses are conducted. Source: (1)

Mortar: Mortars typically range from approximately 1 inch to 11 inches in diameter or larger, and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. Source: (2).

Munitions Constituents (MC): Any materials originating from UXO, DMM, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710(e)(3)).

Munitions Debris: Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal. Source: (7).

Munitions and Explosives of Concern (MEC): A term distinguishing specific categories of military munitions that may pose unique explosives safety risks: UXO, as defined in 10 U.S.C. 101(e) (5); DMM, as defined in 10 U.S.C. 2710(e)(2)); or munitions constituents (e.g., TNT,

cyclotrimethylenetrinitramine [RDX]), as defined in 10 U.S.C. 2710(e)(3)), present in high enough concentrations to pose an explosive hazard. Source: (7). For the purposes of the Military Munitions Response Program being conducted for the former Fort Ord, MEC does not include small arms ammunition .50 caliber and below.

Munitions Response: Munitions response means response actions, including investigation, removal actions, and remedial actions, to address the explosives safety, human health, or environmental risks presented by UXO, discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

Munitions Response Area (MRA): Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. An MRA is comprised of one or more munitions response sites. Source: (7).

Munitions Response Site (MRS): A discrete location within an MRA that is known to require a munitions response. Source: (7).

MEC Sampling: Performing MEC searches within a site to determine the presence of MEC. Source: (1).

Operating Grids: Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by GPS, marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or MEC sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. They are identified sequentially using an alphanumeric system (e.g., E-5). Source: (1).

Projectile: An object projected by an applied force and continuing in motion by its own inertia, such as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. Source: (2).

Range-Related Debris: Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material). Source: (7).

Remedial Investigation (RI): Process undertaken to determine the nature and extent of the problem presented by a release which emphasizes data collection and site characterization. The RI is generally performed concurrently and in an interdependent fashion with the feasibility study. Source: (3).

Removal Depth: The depth below ground surface to which all ordnance and other detected items are removed. Source: (1).

SiteStats/GridStats (SS/GS): Programs developed by QuantiTech for the Huntsville USACE to predict the density of ordnance on sites with spatially random dispersal of ordnance. Source: (5).

Surface Removal: Removal of MEC from the ground surface by UXO teams using visual identification sometimes aided by magnetometers. Source: (1).

Technology-Aided Surface Removal: A removal of UXO, DMM, or CWM on the surface (i.e., the top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM, or CWM, or other factors make visual detection difficult. Source: (7).

Track 0 Areas: Areas of the former Fort Ord that contain no evidence of MEC and have never been suspected of having been used for military munitions-related activities of any kind. This definition has been clarified in the Explanation of Significant Differences, Final Record of Decision, No Action

Regarding Ordnance-related Investigations (Track 0 ROD), former Fort Ord, California (March 2005) to include areas not suspected as having been used for military munitions-related activities of any kind, but where incidental military munitions have been discovered. Source: (1).

Track 1 Sites: Sites at the former Fort Ord where military munitions were suspected to have been used, but based on the results of the Munitions Response Remedial Investigation/Feasibility Study (MR RI/FS) each site falls into one of the following three categories: Category 1: There is no evidence to indicate military munitions were used at the site (i.e., suspected training did not occur); or Category 2: The site was used for training, but the military munitions items used do not pose an explosive hazard (i.e., training did not involve explosive items); or Category 3: The site was used for training with military munitions, but military munitions items that potentially remain as a result of that training do not pose an unacceptable risk based on site-specific evaluations conducted in the Track 1 OE RI/FS. Field investigations identified evidence of past training involving military munitions, but training at these sites involved only the use of practice and/or pyrotechnic items that are not designed to cause injury. In the unlikely event that a live item of the type previously observed at the site is found, it is not expected that the item would function by casual contact (i.e., inadvertent and unintentional contact). Source: (1).

Track 2 Sites: Sites at the former Fort Ord where MEC items were present, and a MEC removal has been conducted. These areas are evaluated in area-specific RI/FSs to assess whether they are in a protective state based on their reasonably anticipated future land uses. Possible outcomes of a Track 2 RI/FS and ROD could include no further action, land use controls, and/or additional MEC removal. Source: (1).

Track 3 Sites: Track 3 Sites are those areas where MEC is suspected or known to exist, but investigations are not yet complete or need to be initiated, or any area identified in the future. Source: (1).

Unexploded Ordnance (UXO): Military munitions that: (A) Have been primed, fuzed, armed, or otherwise prepared for action; (B) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materials; and (C) Remain unexploded, whether by malfunction, design, or any other cause. (10 U.S.C. 101 (e) (5)). For the purpose of the Military Munitions Response Program being conducted for the former Fort Ord, UXO does not include small arms ammunition .50 caliber and below.

UXO-Qualified Personnel: Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor. Source: (7).

UXO Technician: Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III. Source: (7).

Sources of the Above Definitions:

(1) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.

(2) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.

(3) Technical Guidance for Military Munitions Response Actions, Environmental and Munitions Center of Expertise Interim Guidance Document (IGD) 14-01, dated December 20, 2013.

(4) Survey of Munitions Response Technologies, June 2006. ITRC (Interstate Technology and Regulatory Council) with ESTCP (Environmental Security and Technology Certification Program) and SERDP (Strategic Environmental Research and Development Program).

(5) Evaluation of Statistical Methodologies used in U.S. Army Ordnance and Explosive Work. September 1999. Ostrouchov, George, Zimmerman, Gregory P., Beauchamp, John J., Federov, Valerii V., and Downing, Darryl J. Prepared by Oak Ridge National Laboratory for the U.S Army Engineering and Support Center.

(6) Institutional Controls: A Site Managers' Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups. US EPA Office of Solid Waste and Emergency Response (OSWER) 9355.0-74FS-P, EPA 540-F-00-005. September 2000.

(7) Department of Defense Manual Number 6055.09-M, Volume 8, February 29, 2008, Administratively Reissued August 4, 2010; Change 1, March 12, 2012.

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APPENDIX E

Operable Unit 1 Human Health Risk Calculations

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Table E5.1
Values Used for Daily Intake Calculations
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Potable Water Well
Receptor Population: Child Resident
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cw	Chemical Concentration in Water	mg/L			Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate	L/day	0.78	EPA, 2014	Cw x IR x EF x ED / (BW x AT-N)
	EF	Exposure Frequency	days/year	350	EPA, 1991	
	ED	Exposure Duration	years	6	EPA, 1991	
	BW	Body Weight	kg	15	EPA, 1991	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	
Dermal Absorption	Cw	Chemical Concentration in Water	mg/L			CDI = Devent x SA x ED x EF/(BW x AT-N)
	CF	Conversion Factor	L/cm3	0.001		
	SA	Skin Surface Area Available for Contact	cm2/event	6,365	EPA, 2014	For inorganics:
	Devent	Dermally Absorbed Dose per Event	mg/cm2-event	calculated	EPA, 2004	Devent = Cw x CF x Kp x tevent
	tevent	Exposure time	hours/event	0.54	EPA, 2014	
	EF	Exposure Frequency	events/year	350	EPA, 1991	
	ED	Exposure Duration	years	6	EPA, 1991	For organics:
	FA	Fraction absorbed	unitless	chem specific	EPA, 2004	If tevent < or = t*, then
	Kp	Permeability Coefficient	cm/hr	chem specific for metals calculated for organics	EPA, 2004	$Devent = 2 \times FA \times Kp \times Cw \times CF \times (6 \times tau_{event} \times tevent \times 1/pi)^{1/2}$
	tau_{event}	Lag time per event	hr/event	calculated	EPA, 2004	If tevent > t*, then
	B	Dimensionless constant	unitless	calculated	EPA, 2004	$Devent = FA \times Kp \times CF \times Cw \times \{tevent/(1+B) + 2 \times tau_{event} \times [1+3B+3B^2/(1+B)^2]\}$
	t*	Time to reach steady-state	hrs	calculated	EPA, 2004	
	BW	Body Weight	kg	15	EPA, 1991	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	

Table E5.1
Values Used for Daily Intake Calculations
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Potable Water Well
Receptor Population: Child Resident
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Cw	Chemical Concentration in Water	mg/L			
	EF	Exposure Frequency	days/year	350	EPA, 1991	CDI = Cw x ET x EF x ED x K/ (AT)
	ET	Exposure Time	hours/day	24	EPA, 1991	
	ED	Exposure Duration	years	6	EPA, 1991	
	K	Volatilization Factor	L/m3	0.5	Andelman 1990	
	AT-N	Averaging Time (Non-Cancer)	hours	52,560	EPA, 1989	
	AT-C	Averaging Time (Cancer)	hours	613,200	EPA, 1989	

Notes:

cm2 /event = square centimeter per event
cm/hr = centimeter per hour
hrs = hours
hr/event = hour per event
kg = kilogram
L/cm3 = liters per cubic centimeter
L/day = liters per day
L/m3 = liters per cubic meter
mg/L = milligrams per liter
mg/cm2 -event = milligram per square centimeter per event
RME =

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2004: Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005, July 2004.

EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120.

Table E5.2
Values Used for Daily Intake Calculations
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Potable Water Well
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Cw	Chemical Concentration in Water	mg/L			Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate	L/day	2.5	EPA, 2014	Cw x IR x EF x ED / (BW x AT-N)
	EF	Exposure Frequency	days/year	350	EPA, 1991	
	ED	Exposure Duration	years	20	EPA, 2014	
	BW	Body Weight	kg	80	EPA, 2014	
	AT-N	Averaging Time (Non-cancer)	days	7,300	EPA, 2014	
Dermal Absorption	Cw	Chemical Concentration in Water	mg/L			CDI = Devent x SA x ED x EF/(BW x AT-N)
	CF	Conversion Factor (CF)	L/cm3	0.001		
	SA	Skin Surface Area	cm2/event	19,652	EPA, 2014	For inorganics:
	Devent	Dermally Absorbed Dose per Event	mg/cm2-event	calculated	EPA, 2004	Devent = Cw x CF x Kp x tevent
	tevent	Exposure time	hours/event	0.71	EPA, 2014	
	EF	Exposure Frequency	events/year	350	EPA, 1991	
	ED	Exposure Duration	years	20	EPA, 2014	For organics:
	FA	Fraction absorbed	unitless	chem specific	EPA, 2004	If tevent < or = t*, then
	Kp	Permeability Coefficient	cm/hr	chem specific for metals calculated for organics	EPA, 2004	$Devent = 2 \times FA \times Kp \times Cw \times CF \times (6 \times tau_{event} \times tevent \times 1/pi)^{1/2}$
	tau_{event}	Lag time per event	hr/event	calculated	EPA, 2004	If tevent > t*, then
	B	Dimensionless constant	unitless	calculated	EPA, 2004	$Devent = FA \times Kp \times CF \times Cw \times \{tevent/(1+B) + 2 \times tau_{event} \times [1+3B+3B^2/(1+B)^2]\}$
	t*	Time to reach steady-state	hrs	calculated	EPA, 2004	
	BW	Body Weight	kg	80	EPA, 2014	
	AT-N	Averaging Time (Non-cancer)	days	7,300	EPA, 2014	

Table E5.2
Values Used for Daily Intake Calculations
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Potable Water Well
Receptor Population: Resident
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Cw	Chemical Concentration in Water	mg/L			
	EF	Exposure Frequency	days/year	350	EPA, 1991	CDI = Cw x ET x EF x ED x K/ (AT)
	ET	Exposure Time	hours/day	24	EPA, 1991	
	ED	Exposure Duration	years	20	EPA, 1991	
	K	Volatilization Factor	L/m3	0.5	Andelman 1990	
	AT-N	Averaging Time (Non-Cancer)	hours	175,200	EPA, 1989	
	AT-C	Averaging Time (Cancer)	hours	613,200	EPA, 1989	

Notes:

cm2 /event = square centimeter per event
cm/hr = centimeter per hour
hrs = hours
hr/event = hour per event
kg = kilogram
L/cm3 = liters per cubic centimeter
L/day = liters per day
L-year/kg-day = liters per year per kilograms per day
L/m3 = liters per cubic meter
mg/L = milligrams per liter
mg/cm2 -event = milligram per square centimeter per event
mg/m3 = milligrams per cubic meter

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2004: Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005, July 2004.
EPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120.

Table E5.3
Non-Cancer Toxicity Data - Oral/Dermal
OU-1, Former Fort Ord, California

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY) [3]
1,1,1-Trichloroethane	Chronic	2.0E+00	mg/kg-day	1	2.0E+00	mg/kg-day	Body weight	1000/1	IRIS	Aug-14
1,1-Dichloroethane	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Kidneys	3000	PPRTV	Aug-14
1,1-Dichloroethene	Chronic	5.0E-02	mg/kg-day	1	5.0E-02	mg/kg-day	Liver	100/1	IRIS	Aug-14
1,2-Dichloroethane	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	Kidneys	10,000	PPRTV, Appendix	Aug-14
1,2-Dichloroethene	Chronic	2.0E-03	mg/kg-day	1	2.0E-03	mg/kg-day	Kidneys	3000/1	IRIS	Aug-14
Benzene	Chronic	4.0E-03	mg/kg-day	1	4.0E-03	mg/kg-day	Blood	300/1	IRIS	Aug-14
Chloroform	Chronic	1.0E-02	mg/kg-day	1	1.0E-02	mg/kg-day	Liver	100/1	IRIS	Aug-14
Methyl ethyl ketone	Chronic	6.0E-01	mg/kg-day	1	6.0E-01	mg/kg-day	Fetal development	1000/1	IRIS	Aug-14
Tetrachloroethene	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	Neurological	1000/1	IRIS	Aug-14
Trichloroethene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Heart, Immune system	10 - 1000	IRIS	Aug-14

Notes:

IRIS = Integrated Risk Information System

mg/kg-day = milligrams per kilogram per day

NV = no toxicity value

PPRTV = Provisional Peer-Reviewed Toxicity Value

RfD = reference dose

(1) EPA 2004. RAGS Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).

(2) Oral RfD*Oral to Dermal Adjustment Factor = Adjusted Dermal RfD

(3) Date that online database was searched

cis-1,2-Dichloroethene reference values used for 1,2-dichloroethene (total)

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Table E5.4
Non-Cancer Toxicity Data - Inhalation
OU-1, Former Fort Ord, California

Chemical of Concern	Chronic/ Subchronic	RfC Value	RfC Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfC: Target Organ (MM/DD/YY) [1]
1,1,1-Trichloroethane	Chronic	1.0E+00	mg/m3	Nervous System		CalEPA	Feb-15
1,1-Dichloroethane		NV	mg/m3				
1,1-Dichloroethene	Chronic	7.0E-02	mg/m3	Liver		CalEPA	Feb-15
1,2-Dichloroethane	Chronic	7.0E-03	mg/m3	Neurological	3000	PPRTV	Aug-14
1,2-Dichloroethene		NV	mg/m3				
Benzene	Chronic	3.0E-03	mg/m3	Blood, nervous system, development		CalEPA	Feb-15
Chloroform	Chronic	9.8E-02	mg/m3	Liver	100	ATSDR	Aug-14
Methyl ethyl ketone	Chronic	5.0E+00	mg/m3	Development	300/1	IRIS	Aug-14
Tetrachloroethene	Chronic	3.5E-02	mg/m3	Liver, kidneys		CalEPA	Feb-15
Trichloroethene	Chronic	2.0E-03	mg/m3	Heart, Immune system	10 - 100	IRIS	Aug-14

Notes:

ATSDR = Agency for Toxic Substance and Disease Registry

CalEPA = Calfiornia Environmental Protection Agency

IRIS = Integrated Risk Information System

mg/m3 = milligram per cubic meter

NV = no toxicity value

PPRTV = EPA's Provisional Peer-Reviewed Toxicity Value

RfC = reference concentration

(1) Dates the online database was searched.

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Table E5.5
Cancer Toxicity Data - Oral/Dermal
OU-1, Former Fort Ord, California

Chemical of Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY) [3]
1,1,1-Trichloroethane	NV	1	NV	$(mg/kg\text{-}day)^{-1}$			
1,1-Dichloroethane	5.7E-03	1	5.7E-03	$(mg/kg\text{-}day)^{-1}$		CalEPA	Aug-14
1,1-Dichloroethene	NV	1	NV	$(mg/kg\text{-}day)^{-1}$	C	IRIS	Aug-14
1,2-Dichloroethane	9.1E-02	1	9.1E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Aug-14
1,2-Dichloroethene	NV	1	NV	$(mg/kg\text{-}day)^{-1}$			
Benzene	1.0E-01	1	1.0E-01	$(mg/kg\text{-}day)^{-1}$	A	CalEPA	Feb-15
Chloroform	1.9E-02	1	1.9E-02	$(mg/kg\text{-}day)^{-1}$		CalEPA	Aug-14
Methyl ethyl ketone	NV	1	NV	$(mg/kg\text{-}day)^{-1}$			
Tetrachloroethene	5.4E-01	1	5.4E-01	$(mg/kg\text{-}day)^{-1}$	Likely carcinogenic	CalEPA	Jun-17
Trichloroethene	4.6E-02	1	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic	IRIS	Aug-14

Notes:

CalEPA = California Environmental Protection Agency

IRIS = Integrated Risk Information System

mg/kg-day = milligrams per kilogram per day

NV= No toxicity value

(1) EPA 2004. RAGS Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).

(2) ORAL CSF/ Oral to Dermal Adjustment Factor = Adjusted Dermal CSF

(3) Date that the onlline database was searched

Weight of Evidence:

A - Human carcinogen

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

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Table E5.6
Cancer Toxicity Data - Inhalation
OU-1, Former Fort Ord, California

Chemical of Concern	Inhalation Unit Risk (per ug/m^3)	Inhalation Unit Risk per mg/m3	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY) [1]
1,1,1-Trichloroethane	NV	NV			
1,1-Dichloroethane	1.6E-06	1.6E-03		CalEPA	Aug-14
1,1-Dichloroethene	NV	NV	C	IRIS	Aug-14
1,2-Dichloroethane	2.6E-05	2.6E-02	B2	IRIS	Aug-14
1,2-Dichloroethene	NV	NV			
Benzene	2.9E-05	2.9E-02	A	CalEPA	Feb-15
Chloroform	2.3E-05	2.3E-02	B2	IRIS	Aug-14
Methyl ethyl ketone	NV	NV			
Tetrachloroethene	6.1E-06	6.1E-03	Likely carcinogenic	CalEPA	Jun-17
Trichloroethene	4.1E-06	4.1E-03	Carcinogenic	IRIS	Aug-14

Notes:

CalEPA = California Environmental Protection Agency

IRIS = Integrated Risk Information System

NV = no toxicity value

(1) Date that online database was searched

Weight of Evidence:

A - Human carcinogen

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

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Table E5.7
Devent Calculations
OU-1, Former Fort Ord, California

Chemical	Conc (mg/L)	t* (hours)	tevent (hours)	Kp (cm/hour)	tau	B	FA	Devent (mg/cm2-event)
Benzene - adult exposure	2.00E-04	0.7	0.71	1.5E-02	0.29	0.1	1	3.85E-09
Benzene - child exposure	2.00E-04	0.7	0.54	1.5E-02	0.29	0.1	1	3.28E-09
Chloroform - adult exposure	9.50E-05	1.19	0.71	6.8E-03	0.5	0	1	1.06E-09
Chloroform - child exposure	9.50E-05	1.19	0.54	6.8E-03	0.5	0	1	9.28E-10
Trichloroethene - adult exposure	3.90E-03	1.39	0.71	1.2E-02	0.58	0.1	1	8.30E-08
Trichloroethene - child exposure	3.90E-03	1.39	0.54	1.2E-02	0.58	0.1	1	7.24E-08
1,1,1-Trichloroethane - adult exposure	2.00E-04	1.43	0.71	1.3E-02	0.6	0.1	1	4.69E-09
1,1,1-Trichloroethane - child exposure	2.00E-04	1.43	0.54	1.3E-02	0.6	0.1	1	4.09E-09
1,1-Dichloroethane - adult exposure	2.00E-04	0.92	0.71	6.7E-03	0.38	0	1	1.92E-09
1,1-Dichloroethane - child exposure	2.00E-04	0.92	0.54	6.7E-03	0.38	0	1	1.68E-09
1,1-Dichloroethene - adult exposure	2.00E-04	0.89	0.71	1.2E-02	0.37	0	1	3.40E-09
1,1-Dichloroethene - child exposure	2.00E-04	0.89	0.54	1.2E-02	0.37	0	1	2.97E-09
1,2-Dichloroethane - adult exposure	2.50E-04	0.92	0.71	4.2E-03	0.38	0	1	1.51E-09
1,2-Dichloroethane - child exposure	2.50E-04	0.92	0.54	4.2E-03	0.38	0	1	1.31E-09
1,2-Dichloroethene - adult exposure	9.50E-05	0.89	0.71	7.7E-03	0.37	0	1	1.04E-09
1,2-Dichloroethene - child exposure	9.50E-05	0.89	0.54	7.7E-03	0.37	0	1	9.04E-10
Methyl ethyl ketone - adult exposure	4.00E-04	0.65	0.71	9.6E-04	0.27	0	1	4.80E-10
Methyl ethyl ketone - child exposure	4.00E-04	0.65	0.54	9.6E-04	0.27	0	1	4.05E-10
Tetrachloroethene - adult exposure	2.00E-04	2.18	0.71	3.3E-02	0.91	0.2	1	1.47E-08
Tetrachloroethene - child exposure	2.00E-04	2.18	0.54	3.3E-02	0.91	0.2	1	1.28E-08

Notes:

B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis

Conc = Concentration

cm/hour = centimeters per hour

FA = fraction absorbed water

Kp = dermal permeability coefficient of compound in water

mg/L = milligrams per liter

t* = time to reach steady-state

tevent = event duration

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Table E5.8
Calculation of Non-Cancer Hazards
Groundwater, Future Child Resident
Ingestion, Dermal Contact, and Inhalation Pathways
Risk Calculations with December 2015 Data
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Concern	EPC		Non-cancer Risk Calculations				
							Intake		RfD / RfC		
					Value	Units	Value	Units	Value	Units	Hazard Quotient
Groundwater	Water	Tap	Ingestion								
				1,1,1-Trichloroethane	2.0E-04	mg/L	1.0E-05	mg/kg-day	2.0E+00	mg/kg-day	0.000005
				1,1-Dichloroethane	2.0E-04	mg/L	1.0E-05	mg/kg-day	2.0E-01	mg/kg-day	0.00005
				1,1-Dichloroethene	2.0E-04	mg/L	1.0E-05	mg/kg-day	5.0E-02	mg/kg-day	0.0002
				1,2-Dichloroethane	2.5E-04	mg/L	1.2E-05	mg/kg-day	6.0E-03	mg/kg-day	0.002
				1,2-Dichloroethene	9.5E-05	mg/L	4.7E-06	mg/kg-day	2.0E-03	mg/kg-day	0.002
				Benzene	2.0E-04	mg/L	1.0E-05	mg/kg-day	4.0E-03	mg/kg-day	0.002
				Chloroform	9.5E-05	mg/L	4.7E-06	mg/kg-day	1.0E-02	mg/kg-day	0.0005
				Methyl ethyl ketone	4.0E-04	mg/L	2.0E-05	mg/kg-day	6.0E-01	mg/kg-day	0.00003
				Tetrachloroethene	2.0E-04	mg/L	1.0E-05	mg/kg-day	6.0E-03	mg/kg-day	0.002
				Trichloroethene	3.9E-03	mg/L	1.9E-04	mg/kg-day	5.0E-04	mg/kg-day	0.4
			Exp. Route Total								0.4
Groundwater	Water	Bath	Dermal contact								
				1,1,1-Trichloroethane	2.0E-04	mg/L	1.7E-06	mg/kg-day	2.0E+00	mg/kg-day	0.000001
				1,1-Dichloroethane	2.0E-04	mg/L	6.8E-07	mg/kg-day	2.0E-01	mg/kg-day	0.000003
				1,1-Dichloroethene	2.0E-04	mg/L	1.2E-06	mg/kg-day	5.0E-02	mg/kg-day	0.00002
				1,2-Dichloroethane	2.5E-04	mg/L	5.4E-07	mg/kg-day	6.0E-03	mg/kg-day	0.0001
				1,2-Dichloroethene	9.5E-05	mg/L	3.7E-07	mg/kg-day	2.0E-03	mg/kg-day	0.0002
				Benzene	2.0E-04	mg/L	1.3E-06	mg/kg-day	4.0E-03	mg/kg-day	0.0003
				Chloroform	9.5E-05	mg/L	3.8E-07	mg/kg-day	1.0E-02	mg/kg-day	0.00004
				Methyl ethyl ketone	4.0E-04	mg/L	1.6E-07	mg/kg-day	6.0E-01	mg/kg-day	0.0000003
				Tetrachloroethene	2.0E-04	mg/L	5.2E-06	mg/kg-day	6.0E-03	mg/kg-day	0.001
				Trichloroethene	3.9E-03	mg/L	2.9E-05	mg/kg-day	5.0E-04	mg/kg-day	0.06
			Exp. Route Total								0.06
			Inhalation								
				1,1,1-Trichloroethane	2.0E-04	mg/L	9.6E-05	mg/m^3	1.0E+00	mg/m^3	0.0001
				1,1-Dichloroethane	2.0E-04	mg/L	9.6E-05	mg/m^3	NV	mg/m^3	NV
				1,1-Dichloroethene	2.0E-04	mg/L	9.6E-05	mg/m^3	7.0E-02	mg/m^3	0.001
				1,2-Dichloroethane	2.5E-04	mg/L	1.2E-04	mg/m^3	7.0E-03	mg/m^3	0.02
				1,2-Dichloroethene	9.5E-05	mg/L	4.6E-05	mg/m^3	NV	mg/m^3	NV
				Benzene	2.0E-04	mg/L	9.6E-05	mg/m^3	3.0E-03	mg/m^3	0.03
				Chloroform	9.5E-05	mg/L	4.6E-05	mg/m^3	9.8E-02	mg/m^3	0.0005
				Methyl ethyl ketone	4.0E-04	mg/L	1.9E-04	mg/m^3	5.0E+00	mg/m^3	0.00004
				Tetrachloroethene	2.0E-04	mg/L	9.6E-05	mg/m^3	3.5E-02	mg/m^3	0.003
				Trichloroethene	3.9E-03	mg/L	1.9E-03	mg/m^3	2.0E-03	mg/m^3	0.9
			Exp. Route Total								1
	Exposure Medium Total										1

Notes:

EPC = exposure point concentration
mg/L = milligram per liter
NV = no toxicity value
mg/kg-day = milligrams per kilogram per day
mg/m3 = milligrams per cubic meter
RfD / RfC = reference dose / reference concentration

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Table E5.9
Calculation of Non-Cancer Hazards
Groundwater, Future Adult Resident
Ingestion, Dermal Contact, and Inhalation Pathways
Risk Calculations with December 2015 Data
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Concern	EPC		Non-cancer Risk Calculations				
							Intake		RfD		
					Value	Units	Value	Units	Value	Units	Hazard Quotient
Groundwater	Water	Tap	Ingestion								
				1,1,1-Trichloroethane	2.0E-04	mg/L	6.0E-06	mg/kg-day	2.0E+00	mg/kg-day	0.000003
				1,1-Dichloroethane	2.0E-04	mg/L	6.0E-06	mg/kg-day	2.0E-01	mg/kg-day	0.00003
				1,1-Dichloroethene	2.0E-04	mg/L	6.0E-06	mg/kg-day	5.0E-02	mg/kg-day	0.0001
				1,2-Dichloroethane	2.5E-04	mg/L	7.5E-06	mg/kg-day	6.0E-03	mg/kg-day	0.001
				1,2-Dichloroethene	9.5E-05	mg/L	2.8E-06	mg/kg-day	2.0E-03	mg/kg-day	0.001
				Benzene	2.0E-04	mg/L	6.0E-06	mg/kg-day	4.0E-03	mg/kg-day	0.001
				Chloroform	9.5E-05	mg/L	2.8E-06	mg/kg-day	1.0E-02	mg/kg-day	0.0003
				Methyl ethyl ketone	4.0E-04	mg/L	1.2E-05	mg/kg-day	6.0E-01	mg/kg-day	0.00002
				Tetrachloroethene	2.0E-04	mg/L	6.0E-06	mg/kg-day	6.0E-03	mg/kg-day	0.001
				Trichloroethene	3.9E-03	mg/L	1.2E-04	mg/kg-day	5.0E-04	mg/kg-day	0.2
			Exp. Route Total								0.2
Groundwater	Water	Bath	Dermal contact								
				1,1,1-Trichloroethane	2.0E-04	mg/L	1.1E-06	mg/kg-day	2.0E+00	mg/kg-day	0.000001
				1,1-Dichloroethane	2.0E-04	mg/L	4.5E-07	mg/kg-day	2.0E-01	mg/kg-day	0.000002
				1,1-Dichloroethene	2.0E-04	mg/L	8.0E-07	mg/kg-day	5.0E-02	mg/kg-day	0.00002
				1,2-Dichloroethane	2.5E-04	mg/L	3.6E-07	mg/kg-day	6.0E-03	mg/kg-day	0.0001
				1,2-Dichloroethene	9.5E-05	mg/L	2.4E-07	mg/kg-day	2.0E-03	mg/kg-day	0.0001
				Benzene	2.0E-04	mg/L	9.1E-07	mg/kg-day	4.0E-03	mg/kg-day	0.0002
				Chloroform	9.5E-05	mg/L	2.5E-07	mg/kg-day	1.0E-02	mg/kg-day	0.00003
				Methyl ethyl ketone	4.0E-04	mg/L	1.1E-07	mg/kg-day	6.0E-01	mg/kg-day	0.0000002
				Tetrachloroethene	2.0E-04	mg/L	3.5E-06	mg/kg-day	6.0E-03	mg/kg-day	0.001
				Trichloroethene	3.9E-03	mg/L	2.0E-05	mg/kg-day	5.0E-04	mg/kg-day	0.04
			Exp. Route Total								0.04
			Inhalation								
				1,1,1-Trichloroethane	2.0E-04	mg/L	9.6E-05	mg/m^3	1.0E+00	mg/m^3	0.0001
				1,1-Dichloroethane	2.0E-04	mg/L	9.6E-05	mg/m^3	NV	mg/m^3	NV
				1,1-Dichloroethene	2.0E-04	mg/L	9.6E-05	mg/m^3	7.0E-02	mg/m^3	0.001
				1,2-Dichloroethane	2.5E-04	mg/L	1.2E-04	mg/m^3	7.0E-03	mg/m^3	0.02
				1,2-Dichloroethene	9.5E-05	mg/L	4.6E-05	mg/m^3	NV	mg/m^3	NV
				Benzene	2.0E-04	mg/L	9.6E-05	mg/m^3	3.0E-03	mg/m^3	0.03
				Chloroform	9.5E-05	mg/L	4.6E-05	mg/m^3	9.8E-02	mg/m^3	0.000
				Methyl ethyl ketone	4.0E-04	mg/L	1.9E-04	mg/m^3	5.0E+00	mg/m^3	0.00004
				Tetrachloroethene	2.0E-04	mg/L	9.6E-05	mg/m^3	3.5E-02	mg/m^3	0.003
				Trichloroethene	3.9E-03	mg/L	1.9E-03	mg/m^3	2.0E-03	mg/m^3	0.9
			Exp. Route Total								1
	Exposure Medium Total										1

Notes:

EPC = exposure point concentration
mg/kg-day = milligrams per kilogram per day
mg/L = milligram per liter
mg/m3 = milligrams per cubic meter
NV = no toxicity value
RfD = reference dose

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Table E5.10
Calculation of Cancer Risks
Groundwater, Future Age-Adjusted Resident
Ingestion, Dermal Contact, and Inhalation Pathways
Risk Calculations with December 2015 Data
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Age-Adjusted Resident

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Concern	EPC Value	EPC Units	Cancer Risk Calculations: Intake Value	Intake Units	CSF/Unit Risk Value	CSF/Unit Risk Units	Cancer Risk
Groundwater	Water	Tap	Ingestion								
				1,1,1-Trichloroethane	2.0E-04	mg/L	2.6E-06	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				1,1-Dichloroethane	2.0E-04	mg/L	2.6E-06	mg/kg-day	5.7E-03	$(mg/kg-day)^{-1}$	1E-08
				1,1-Dichloroethene	2.0E-04	mg/L	2.6E-06	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				1,2-Dichloroethane	2.5E-04	mg/L	3.2E-06	mg/kg-day	9.1E-02	$(mg/kg-day)^{-1}$	3E-07
				1,2-Dichloroethene	9.5E-05	mg/L	1.2E-06	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				Benzene	2.0E-04	mg/L	2.6E-06	mg/kg-day	1.0E-01	$(mg/kg-day)^{-1}$	3.E-07
				Chloroform	9.5E-05	mg/L	1.2E-06	mg/kg-day	1.9E-02	$(mg/kg-day)^{-1}$	2E-08
				Methyl ethyl ketone	4.0E-04	mg/L	5.1E-06	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				Tetrachloroethene	2.0E-04	mg/L	2.6E-06	mg/kg-day	5.1E-02	$(mg/kg-day)^{-1}$	1E-07
				Trichloroethene	3.9E-03	mg/L	See Table 5.10a				3E-06
			Exp. Route Total								4E-06
Groundwater	Water	Shower	Dermal contact								
				1,1,1-Trichloroethane	2.00E-04	mg/L	4.6E-07	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				1,1-Dichloroethane	2.00E-04	mg/L	1.9E-07	mg/kg-day	5.7E-03	$(mg/kg-day)^{-1}$	1E-09
				1,1-Dichloroethene	2.00E-04	mg/L	3.3E-07	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				1,2-Dichloroethane	2.50E-04	mg/L	1.5E-07	mg/kg-day	9.1E-02	$(mg/kg-day)^{-1}$	1E-08
				1,2-Dichloroethene	9.50E-05	mg/L	1.0E-07	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				Benzene	2.0E-04	mg/L	3.7E-07	mg/kg-day	1.0E-01	$(mg/kg-day)^{-1}$	4E-08
				Chloroform	9.5E-05	mg/L	1.0E-07	mg/kg-day	1.9E-02	$(mg/kg-day)^{-1}$	2E-09
				Methyl ethyl ketone	4.00E-04	mg/L	4.6E-08	mg/kg-day	NV	$(mg/kg-day)^{-1}$	NV
				Tetrachloroethene	2.00E-04	mg/L	1.4E-06	mg/kg-day	5.1E-02	$(mg/kg-day)^{-1}$	7E-08
				Trichloroethene	3.9E-03	mg/L	See Table 5.10a				5E-07
			Exp. Route Total								7E-07
			Inhalation								
				1,1,1-Trichloroethane	2.0E-04	mg/L	3.6E-05	mg/m^3	NV	$(mg/m^3)^{-1}$	NV
				1,1-Dichloroethane	2.0E-04	mg/L	3.6E-05	mg/m^3	1.6E-03	$(mg/m^3)^{-1}$	6E-08
				1,1-Dichloroethene	2.0E-04	mg/L	3.6E-05	mg/m^3	NV	$(mg/m^3)^{-1}$	NV
				1,2-Dichloroethane	2.5E-04	mg/L	4.5E-05	mg/m^3	2.6E-02	$(mg/m^3)^{-1}$	1E-06
				1,2-Dichloroethene	9.5E-05	mg/L	1.7E-05	mg/m^3	NV	$(mg/m^3)^{-1}$	NV
				Benzene	2.0E-04	mg/L	3.6E-05	mg/m^3	2.9E-02	$(mg/m^3)^{-1}$	1E-06
				Chloroform	9.5E-05	mg/L	1.7E-05	mg/m^3	2.3E-02	$(mg/m^3)^{-1}$	4E-07
				Methyl ethyl ketone	4.0E-04	mg/L	7.1E-05	mg/m^3	NV	$(mg/m^3)^{-1}$	NV
				Tetrachloroethene	2.0E-04	mg/L	3.6E-05	mg/m^3	5.9E-03	$(mg/m^3)^{-1}$	2E-07
				Trichloroethene	3.9E-03	mg/L	See Table 5.10a				4E-06
			Exp. Route Total								7E-06
	Exposure Medium Total										1E-05

Notes:

CSF = cancer slope factor
EPC = exposure point concentration
mg/kg-day = milligrams per kilogram per day
mg/L = milligram per liter
NV = no toxicity value
mg/m3 = milligrams per cubic meter
ROD = record of decision

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Table E5.10a
Calculation of TCE Cancer Risks
Groundwater, Future Age-Adjusted Resident
Ingestion, Dermal Contact, and Inhalation Pathways
Risk Calculations with December 2015 Data
OU-1, Former Fort Ord, California

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Age-Adjusted Resident

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Concern	EPC		Cancer Risk Calculations								
							Intake		CSF/Unit Risk - Kidneys		ADAF for	CSF/Unit Risks - NHL and Liver		Age-Dependent	Cancer Risk
					Value	Units	Value	Units	Value	Units	Kidneys	Value	Units	Cancer Risk	
Groundwater	Water	Tap	Trichloroethene	Ingestion	3.90E-03	mg/L									3.E-06
				Age 0 -2 years			5.6E-06	mg/kg-day	9.3E-03	(mg/kg-day)-1	10	3.7E-02	(mg/kg-day)-1	7.2E-07	
				Age 2 - 6 years			1.1E-05	mg/kg-day	9.3E-03	(mg/kg-day)-1	3	3.7E-02	(mg/kg-day)-1	7.2E-07	
				Age 6 - 16 years			1.7E-05	mg/kg-day	9.3E-03	(mg/kg-day)-1	3	3.7E-02	(mg/kg-day)-1	1.1E-06	
				Age 16 - 26 years			1.7E-05	mg/kg-day	9.3E-03	(mg/kg-day)-1	1	3.7E-02	(mg/kg-day)-1	7.7E-07	
				Dermal Contact	3.90E-03	mg/L									5.E-07
				Age 0 -2 years			8.4E-07	mg/kg-day	9.3E-03	(mg/kg-day)-1	10	3.7E-02	(mg/kg-day)-1	1.1E-07	
				Age 2 - 6 years			1.7E-06	mg/kg-day	9.3E-03	(mg/kg-day)-1	3	3.7E-02	(mg/kg-day)-1	1.1E-07	
				Age 6 - 16 years			2.8E-06	mg/kg-day	9.3E-03	(mg/kg-day)-1	3	3.7E-02	(mg/kg-day)-1	1.8E-07	
				Age 16 - 26 years			2.8E-06	mg/kg-day	9.3E-03	(mg/kg-day)-1	1	3.7E-02	(mg/kg-day)-1	1.3E-07	
				Inhalation	1.95E+00	ug/m3									4.E-06
				Age 0 -2 years			5.3E-02	ug/m3	1.0E-06	$(ug/m^3)^{-1}$	10	3.1E-06	$(ug/m^3)^{-1}$	7.0E-07	
				Age 2 - 6 years			1.1E-01	ug/m3	1.0E-06	$(ug/m^3)^{-1}$	3	3.1E-06	$(ug/m^3)^{-1}$	6.5E-07	
				Age 6 - 16 years			2.7E-01	ug/m3	1.0E-06	$(ug/m^3)^{-1}$	3	3.1E-06	$(ug/m^3)^{-1}$	1.6E-06	
				Age 16 - 26 years			2.7E-01	ug/m3	1.0E-06	$(ug/m^3)^{-1}$	1	3.1E-06	$(ug/m^3)^{-1}$	1.1E-06	

Notes:

ADAF = age-dependent absorbtion factor
CSF = cancer slope factor
EPC = exposure point concentration
mg/kg-day = milligrams per kilogram per day
NHL =Non-Hodgkin Lymphoma
µg/m3 = micrograms per cubic meter
ROD = record of decision
TCE = Trichloroethene

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APPENDIX F

Figures for the ESCA Areas

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CSUMB Off-Campus MRA

County North MRA

Parker Flats MRA

Future East Garrison MRA

Interim Action Ranges MRA

Seaside MRA

MOUT Site MRA

Laguna Seca Parking MRA

Del Rey Oaks/ Monterey MRA

Legend

Former Fort Ord Boundary

Group 1 MRAs

Seaside MRA
Parker Flats MRA

Group 2 MRAs

CSUMB Off-Campus MRA

County North MRA

Group 3 MRAs

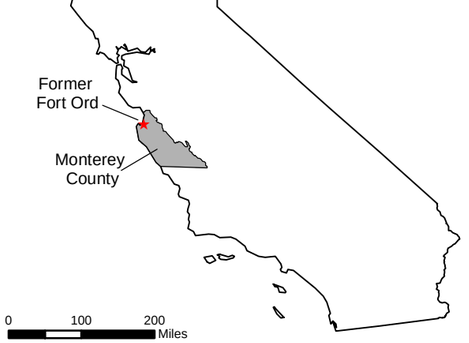
MOUT Site MRA
Del Rey Oaks/Monterey MRA
Laguna Seca Parking MRA

Interim Action Ranges MRA

Group 4 MRA

Future East Garrison MRA

Former Fort Ord Location Map



N

0 3,000 6,000 Feet

ARCADIS

WESTON SOLUTIONS

WESTCLIFFE ENGINEERS

ESCA Munitions Response Areas

FORA ESCA RP
Monterey County, California

DRAFT

Figure 1

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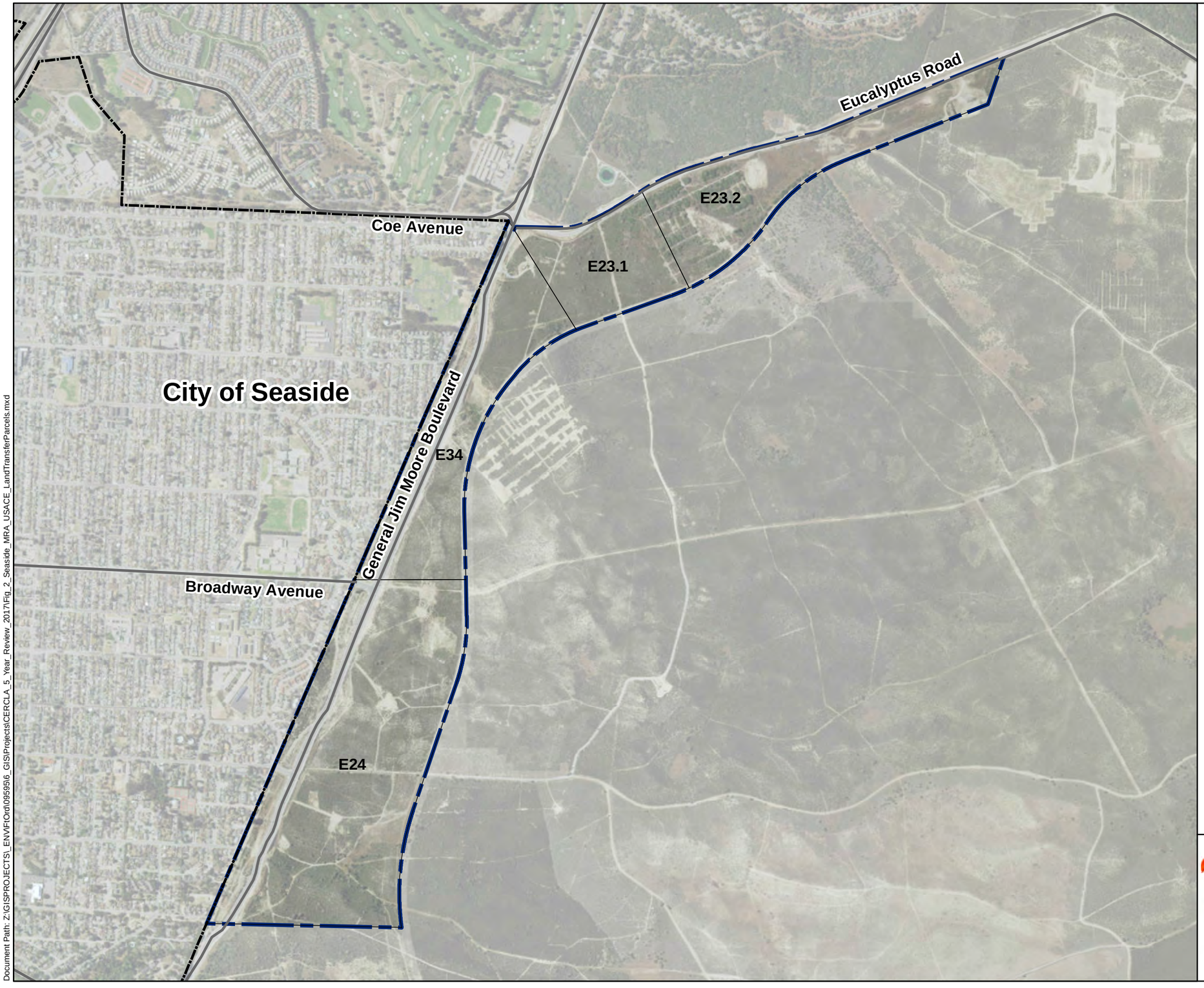
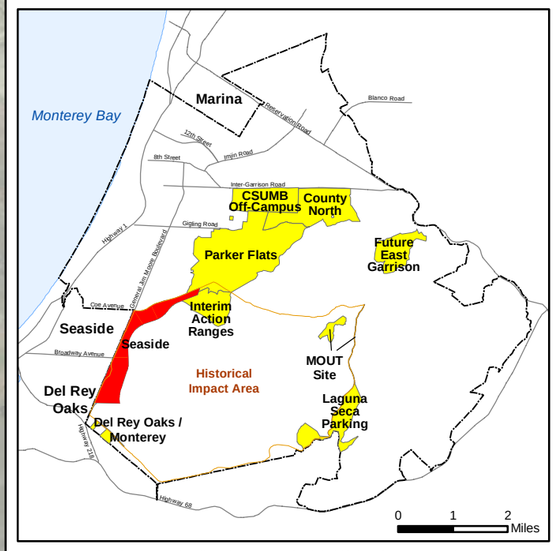


Legend

- Munitions Response Area
- Major Road
- E23.2 — USACE Parcel
- Former Fort Ord Boundary



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

0 1,250 2,500 Feet

ARCADIS
WESTON SOLUTIONS
WESTCLIFFE ENGINEERS

Seaside MRA USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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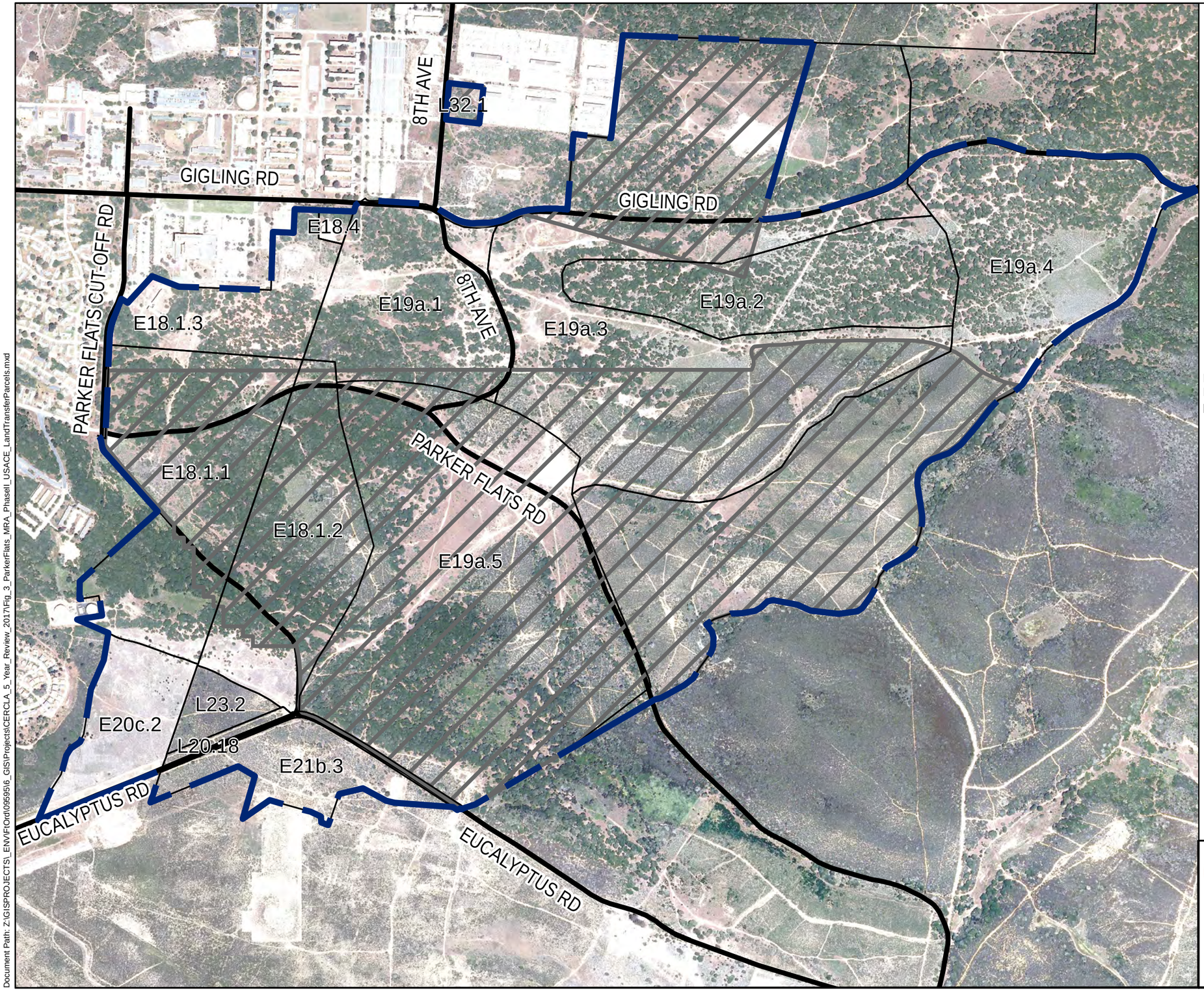
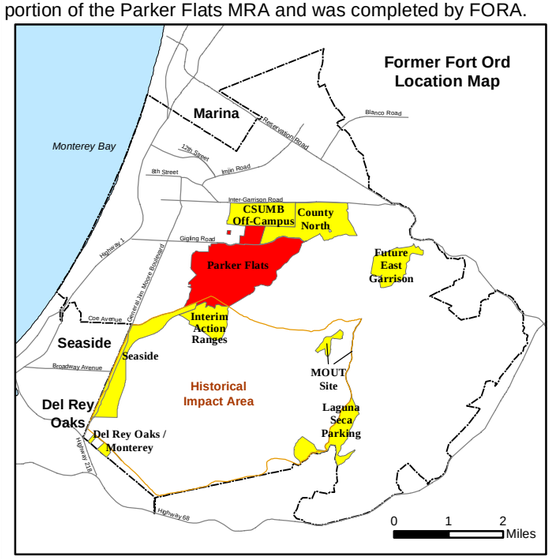
Figure 2



Legend

- Munitions Response Area
- Major Road
- Phase I Removal Action Area Completed by Army
- E19a.1 — USACE Parcel

Note: The Phase I area was completed by the Army. The Phase II Remedial Investigation area encompassed the remaining portion of the Parker Flats MRA and was completed by FORA.



N

0 1,000 2,000 Feet

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WESTCLIFFE ENGINEERS

Parker Flats MRA Phase II
USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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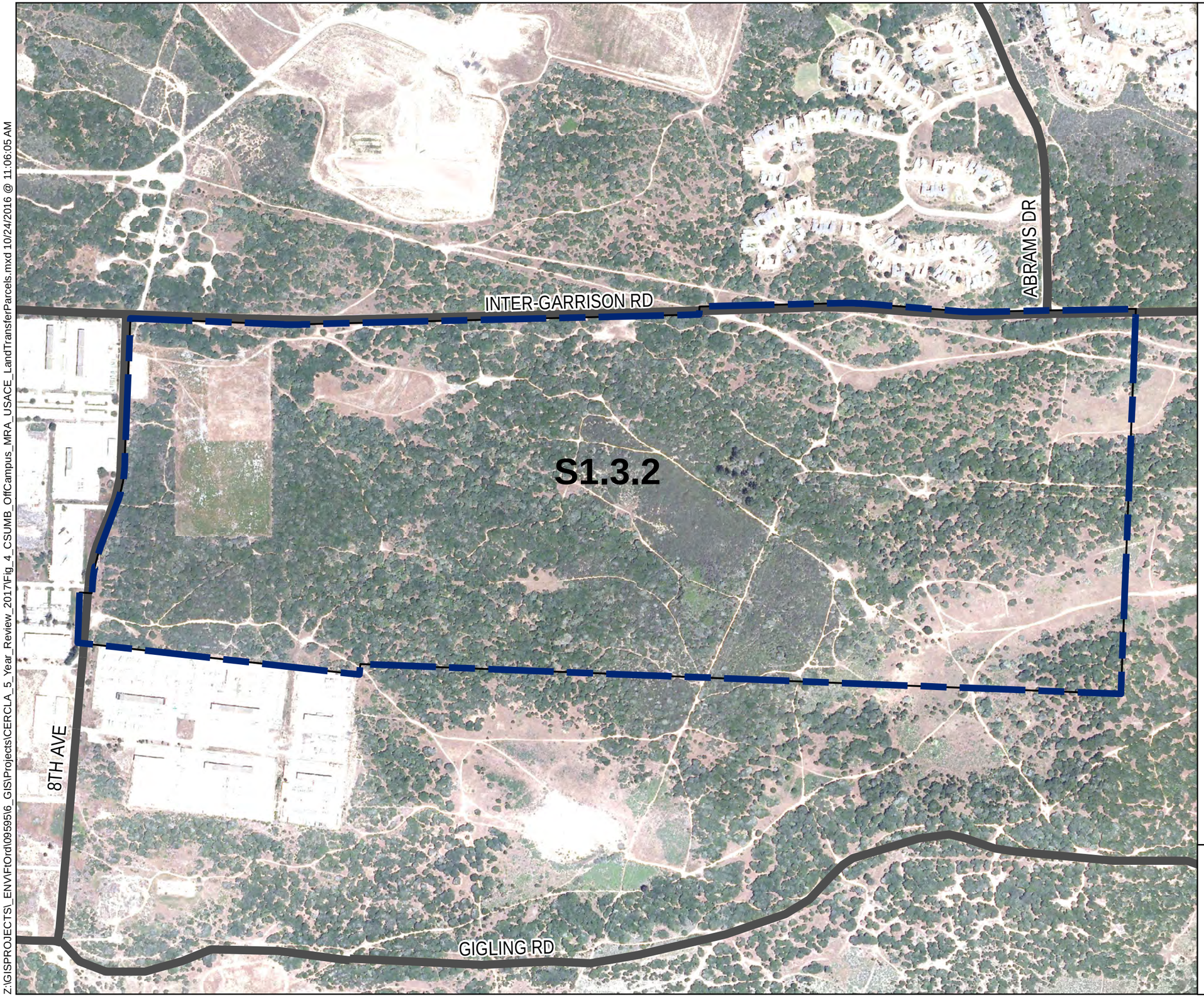
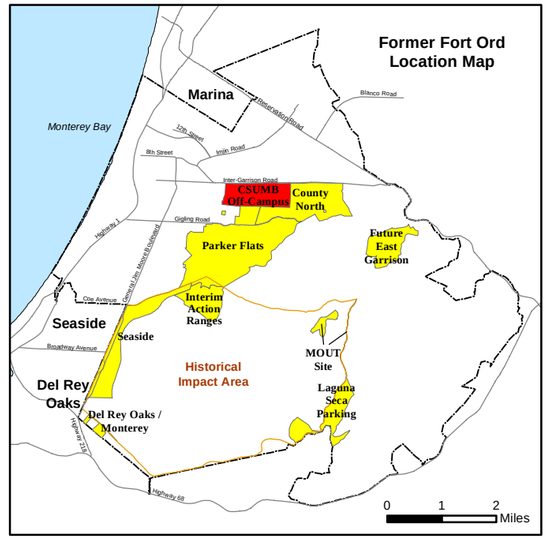
Document Path: Z:\GISPROJECTS_ENV\FtOrd\095916_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_3_ParkerFlats_MRA_PhaseII_USACE_LandTransferParcels.mxd



Legend

- Munitions Response Area
- Major Road
- S1.3.2 — USACE Parcel



N

0 600 1,200 Feet

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CSUMB Off-Campus MRA
USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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Figure 4

Z:\GISPROJECTS_ENVFtOrd\095916_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_4_CSUMB_OffCampus_MRA_USACE_LandTransferParcels.mxd 10/24/2016 @ 11:06:05 AM

ABRAMS RD

INTER-GARRISON RD

L5.7

L20.2.1

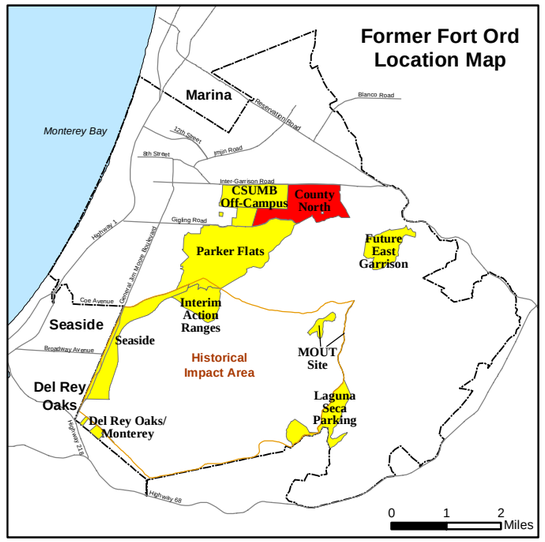
E19a.4

E19a.3

GIGLING RD

Legend

- Munitions Response Area
- Major Road
- L20.2.1 — USACE Parcel



N

0 800 1,600 Feet

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WESTCLIFFE ENGINEERS

County North MRA USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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Figure 5

L20.13.1.2

L6.2

South Boundary Road

L20.13.3.1

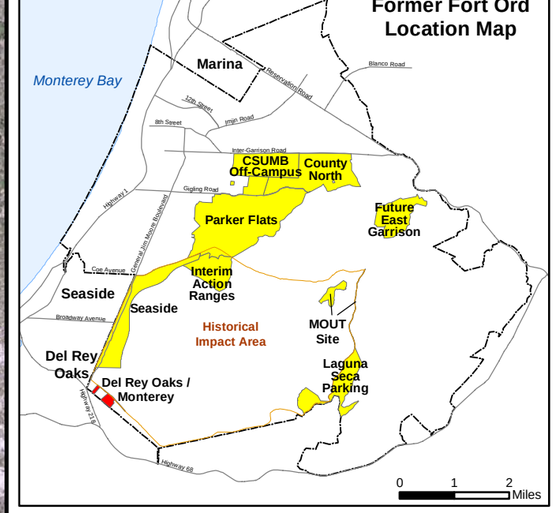
E29.1

Highway 218

Legend

- Munitions Response Area
- Major Road
- Former Fort Ord Boundary
- E29.1 — USACE Parcel

Former Fort Ord Location Map



N

0 300 600 Feet

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Del Rey Oaks/Monterey MRA USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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Figure 6

Document Path: Z:\GISPROJECTS_ENVFtOrd\0959956_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_6_DelReyOaks_Monterey_MRA_USACE_LandTransferParcels.mxd

Barloy Canyon Road

L20.5.1

L20.3.1

L20.3.2

L20.5.2

L20.5.4

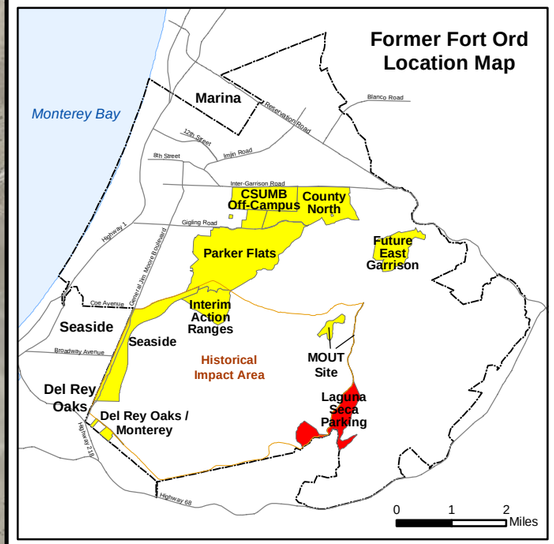
Laguna Seca Raceway

L20.5.3

South Boundary Road

Legend

- Munitions Response Area
- Major Road
- Former Fort Ord Boundary
- L20.5.1 — USACE Parcel



N

0 800 1,600 Feet

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Laguna Seca Parking MRA
USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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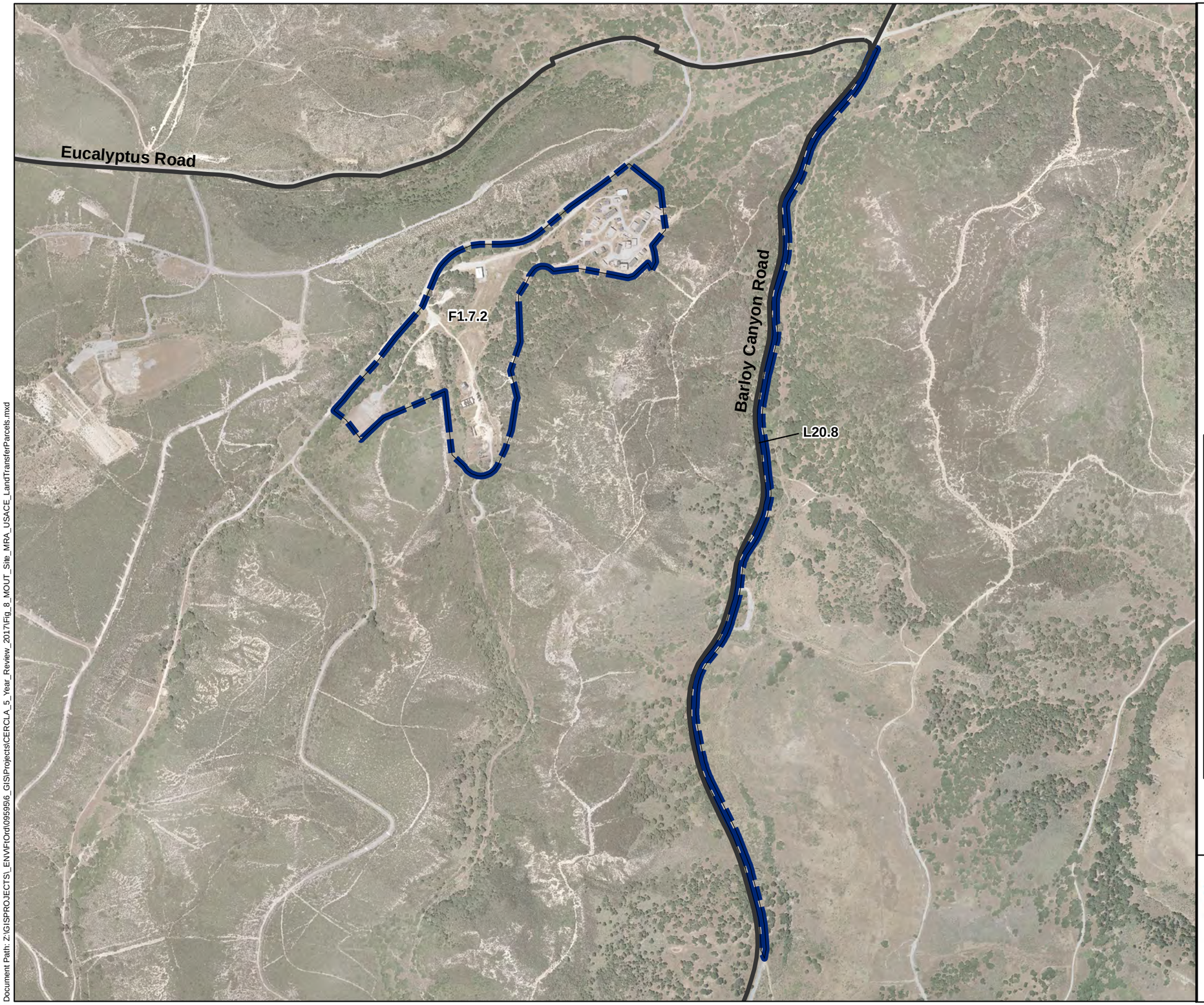
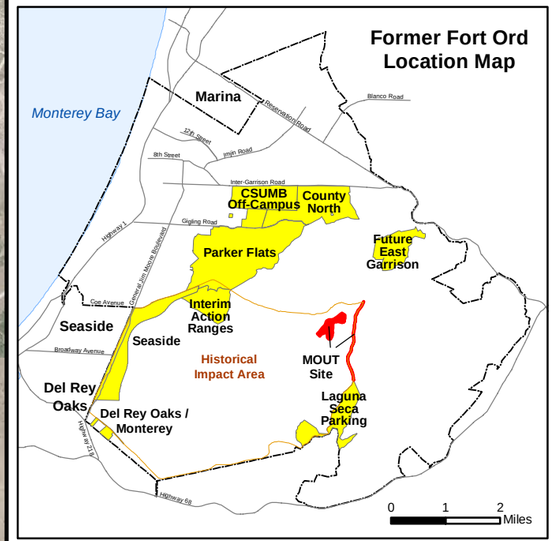
Figure 7

Document Path: Z:\GISPROJECTS_ENVFlOrd\0959\6_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_7_LagunaSecaParking_MRA_USACE_LandTransferParcels.mxd



Legend

- Munitions Response Area
- Major Road
- F1.7.2 — USACE Parcel



N

0 800 1,600 Feet

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MOUT Site MRA USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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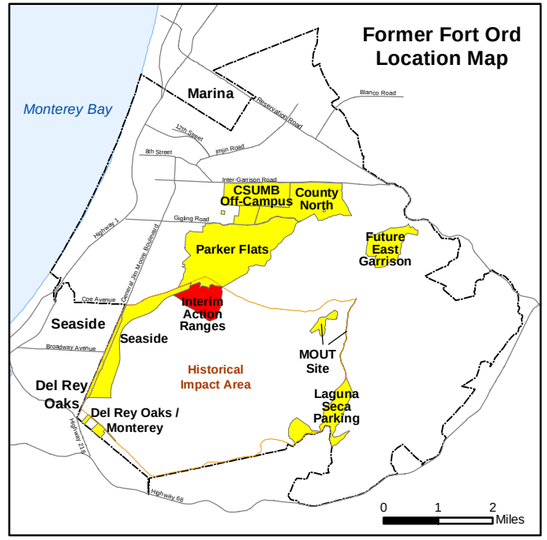
Figure 8

Document Path: Z:\GISPROJECTS_ENVFfOrd\0959\6_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_8_MOUT_Site_MRA_USACE_LandTransferParcels.mxd

Legend

- Munitions Response Area
- Major Road
- E40 — USACE Parcel



N

0 400 800
Feet

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Interim Action Ranges MRA
USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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Figure 9

Document Path: Z:\GISPROJECTS_ENVFIOrd\095956_GIS\Projects\CERCLA_5_Year_Review_2017\Fig_9_InterimActionRanges_MRA_USACE_LandTransferParcels.mxd

L20.19.1.1
(Roadway Parcel)

E11b.8

E11b.6.1

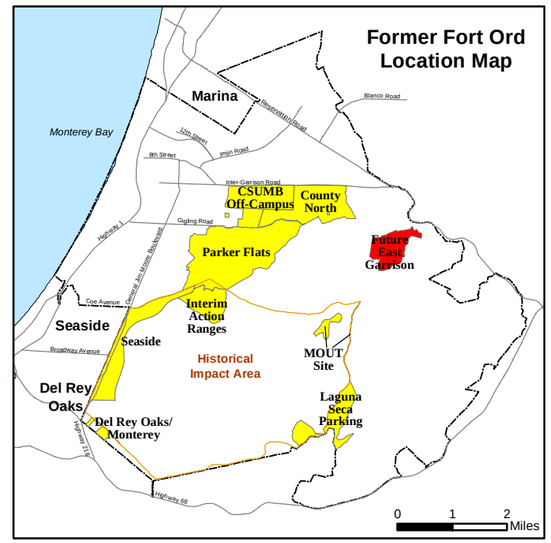
E11b.7.1.1

Barloy Canyon Road

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Munitions Response Area
- Major Road
- L20.2.1 — USACE Parcel



N

0 500 1,000 Feet

ARCADIS
WESTON SOLUTIONS
WESTCLIFFE ENGINEERS

Future East Garrison MRA
USACE Land Transfer Parcels

FORA ESCA RP
Monterey County, California

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Figure 10