



DEPARTMENT OF THE ARMY
FORT ORD OFFICE, ARMY BASE REALIGNMENT AND CLOSURE
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MONTEREY, CA 93944-5008

MAY 13 2009

REPLY TO
ATTENTION OF:

Fort Ord BRAC Office

Grant Himebaugh
California Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906

Approval Memorandum
Proposed No Action
Site HA-121 – Rifle Grenade Range
Former Fort Ord, California

Dear Mr. Himebaugh:

This letter presents the approval memorandum for No Action (NoA) at Site HA 121 – Rifle Grenade Range, also designated as MRS-19, former Fort Ord, California. Copies of this letter have been sent to the United States Environmental Protection Agency (EPA), and departments of the California Environmental Protection Agency (Cal/EPA), including the Central Coast Regional Water Quality Control Board (RWQCB) and the Department of Toxic Substances Control (DTSC).

No further action for chemical contamination in soil is proposed for site HA-121. Site HA-121 meets the criteria specified in the approved *No Action Plug-In Record of Decision, Fort Ord, California* (NoA ROD) dated February 1995. The NoA ROD outlined a process and established necessary criteria for identifying and approving sites for NoA. NoA sites at Fort Ord are either Category 1 sites that are already in a protective state and pose no current or potential threat to human health or the environment, or Category 2 sites where CERCLA does not provide authority to take any remedial action. This approval memorandum provides a description of the site and completed investigations, and demonstrates the site's conformance with the NoA criteria for Category 1 sites established in the NoA ROD. This memo evaluates the risk of the chemicals present in soil, and does not address possible physical hazards related to munitions and explosives of concern (MEC). The MEC hazards are being addressed as part of the former Fort Ord Munitions Response Remedial Investigation/Feasibility Study (RI/FS) program.

CHARACTERIZATION REPORT SUMMARY

The Army has documented the results of the HA-121 characterization in the *Comprehensive Basewide Range Assessment Report Revision 1C* dated November 2006. The results of the characterization are summarized below.

Site HA-121 is located in the eastern portion of the former Fort Ord, just west of the East Garrison. This area was identified for sampling to evaluate areas where smoke producing

items were used during training, and to identify whether chemicals associated with the drums are present in the soil.

This site (Plate 1) was used as a rifle grenade range and there is evidence that it may have also been used for flame field expedient (FFE) or fougas training as reported in the *Revised Archives Search Report* dated 1997. Twelve randomly located 100 x 100 ft grids were sampled by munitions response contractor CMS Environmental (CMS) during June-July 1996, during which 111 live small arms rounds were found (not shown on Plate). Site reconnaissance conducted in August 2001 identified three foxholes, three firing points, one soil pit, four empty 55-gallon drums, four signal flares (model and conditions not identified), seven areas of blank small arms casings, and 18 military munitions items. Munitions items included smoke pots, grenade fuzes (model and condition not identified), and 40mm casings (model and condition not identified). The former contents of the 55-gallon drums were not identified.

Field Program

Eighteen soil samples were collected at nine locations in July 2002, for semivolatile organic compounds (SVOCS), explosive, and perchlorate. Sample locations and concentrations of detected analytes are shown on Plate 2. Total petroleum hydrocarbons as diesel, motor oil, and gasoline (TPHd, TPHmo, and TPHg) were analyzed at all of the nine locations. Eight samples were analyzed for volatile organic compounds (VOCs) at three out of the nine locations. The sample locations for VOCs were selected to evaluate the potential for VOCs where the drums were found and to evaluate the potential for VOCs related to possible fougas training. Surface soil samples were collected from all locations and samples from one and two foot depths below ground surface were collected at locations HA121SI0003, HA121SI0005, and HA121SI0009.

Subsurface Conditions

In general, subsurface soil at HA-121 consists predominately of light brown silty sand to a depth of 2.0 feet bgs (the maximum depth explored). Most of the sand was classified as loose, dry, and fine- to medium-grained. No groundwater was encountered during soil sampling procedures. Depth to groundwater at the site is approximately 250 feet bgs.

Analytical Results

A comparison of maximum detected concentrations of chemicals in soil at HA-121 with preliminary remediation goals (PRGs) is provided on Table 1. PRGs are chemical concentrations in soil expected to result in acceptable cancer risks (i.e. one-in-one-million) and noncancer health effects. Based on historical use of the site as a rifle grenade range and possibly as a flame field expedient (FFE) or fougas training area, the chemicals analyzed for were VOCs by EPA Method 8260, SVOCs by EPA Method 8270C, explosives by EPA Method 8330, and TPHd, TPHmo, and TPHg by EPA Method 8015. The majority of the surface soil TPH detections were located near the empty 55 gallon drum locations which provides a plausible connection for the results. Trichlorofluoromethane (HA121SI0005 at 2ft), TPHd (HA121SI0006 at ground surface), TPHg (HA121SI0009 at ground surface) and TPHmo (HA121SI0003 at ground surface) were the only organic compounds detected at HA-121 at maximum concentrations of 0.0066 mg/kg, 4.7 mg/kg, 1.1 mg/kg, and 26 mg/kg, respectively, which are below their PRGs of 390 mg/kg, 500 mg/kg, 500 mg/kg, and 500 mg/kg,

respectively. Trichlorofluoromethane, TPHd, TPHg, and TPHmo were retained as site-related chemicals (SRCs).

Screening Risk Evaluation

MACTEC conducted a screening risk evaluation (SRE) based on the site characterization data presented in Table 1. The SRE consisted of the following:

- Comparing concentrations of chemicals detected in soil at HA-121 with chemical-specific PRGs to evaluate the need for further action at the site;
- Evaluating potential impacts to groundwater; and
- Providing a qualitative discussion of ecological receptors.

The NoA ROD identified Category 1 sites as sites where the level of contamination is below the levels required for protection of human health (e.g., PRGs) and the environment. PRGs were developed specifically for Fort Ord and represent soil concentrations considered to result in estimated daily doses (1) associated with an estimated one-in-one-million probability that an exposed individual would develop cancer (i.e., 10^{-6} cancer risk) or (2) expected to be without appreciable risk of deleterious noncancer health effects (i.e., hazard quotient less than 1). The methodology and assumptions used to develop PRGs were presented in the *Draft Final Technical Memorandum, Preliminary Remediation Goals*, dated June 24, 1994. EPA Region 9 PRGs were used for chemicals that do not have Fort Ord specific PRGs. Following review of soil sample analytical results from HA-121, trichlorofluoromethane, TPH-diesel, TPH-gasoline, and TPH-motor oil were identified as site related chemicals (SRCs) at HA-121, which are chemicals that may be present as a result of Army activities at the site. Background concentrations were not established for trichlorofluoromethane and the TPHs because they are automatically assumed to be site-related chemicals.

Comparison of Site Soil Data with PRGs

PRGs for chemicals detected in the soil at HA-121 were compared with site-specific data by calculating ratios of chemical concentrations to PRGs (Table 2). The chemical concentrations used in these ratios include maximum detected site concentration (MSC), which are the same as maximum concentration attributed to site activities (MSRC).

A chemical-specific ratio of 1 or less indicates that the maximum detected or calculated concentration is less than or equal to the PRG and, therefore, substantial health risks are not likely to be associated with that chemical. A ratio greater than 1 indicates that the concentration of the chemical exceeds the health-based PRG. To evaluate possible exposure to multiple chemicals, the effects of multiple chemicals were assumed to be additive, and the ratios were added together to calculate a ratio sum (RS). An RS less than 1 indicates that substantial health risks are not likely to be associated with exposure to the multiple chemicals evaluated; an RS greater than 1 indicates further action may be necessary.

Site-Related Chemicals

The site-related components of SRCs evaluated at HA-121 were compared to PRGs (MSC/PRG and MSRC/PRG ratios, Table 2). The chemical-specific MSC and MSRCs for trichlorofluoromethane, TPH-diesel, TPH-gasoline, and TPH-motor oil evaluated at HA-121 are below the PRGs, as indicated by the MSC/PRG and MSRC/PRG ratios of less than 1.0 (Table 2). The site-related RS total for the SRCs are 0.06 (Table 2). This analysis indicates that health risks from possible exposure to the site-related components of the SRCs evaluated at HA-121 are acceptably low.

Potential Groundwater Impacts

The potential for TPHd at 500 mg/kg to impact groundwater was modeled using an EPA vadose zone leaching (VLEACH) and a groundwater mixing model as part of the *Draft Technical Memorandum: Approach to Evaluating Potential Groundwater Quality Impacts, Fort Ord, California* dated July 29, 1993. The results of modeling indicated that unknown TPHd at a concentration of 500 mg/kg in near surface soil is relatively immobile with negligible chemical mass reaching the uppermost aquifer. The concentrations of the three surrogates (dodecane, naphthalene, and chrysene) used to model TPHd were below detection limits for the chemicals. Based on the modeling results presented in the Technical Memorandum and described above, TPH detected at HA-121 at a maximum concentration of 26 mg/kg for TPHmo is unlikely to impact groundwater at this site. All TPH concentrations are also below the Monterey County Action Level of 100 mg/kg, which is considered protective of groundwater. Trichlorofluoromethane is also unlikely to impact groundwater at the concentrations seen at HA-121. The concentrations are well below the EPA Region 9 PRG of 390 mg/kg.

Ecological Receptors

A qualitative ecological SRE was conducted for trichlorofluoromethane, TPHd, TPHg, and TPHmo at HA-121 using the findings from the *Basewide RI/FS Ecological Risk Assessment (BERA)* dated October 1995, and the *Ecological Risk Assessment for Site 39 Ranges, Habitat Areas, Impact Area, Former Fort Ord, California (ERA)* dated October 31 2007. The BERA included a thorough evaluation of chemicals of potential ecological concern (COPECs) and the risks to ecological receptors associated with COPECs. Several chemicals were identified, sampled for in the Remedial Investigation (RI), and evaluated as COPECs in the BERA. That evaluation indicated that the only chemicals which showed the potential for risk to ecological receptors were lead and the explosive compound cyclotetramethylene tetranitramine (HMX). TPH was found to be a risk driver for human health only. The TPH concentrations at HA-121 were also compared to the Monterey County Action Level of 100 mg/kg. The concentrations of TPHd, TPHg, and TPHmo were one order of magnitude to four times lower than the action level. The maximum concentration of trichlorofluoromethane at 0.0066 mg/kg is four orders of magnitude lower than the EPA Region 5 ecological screening levels (ESLs) published in *Risk Assessment Information System (RAIS)* dated 2008 of 16.4 mg/kg. Therefore, no additional action is needed to address ecological receptors at HA-183.

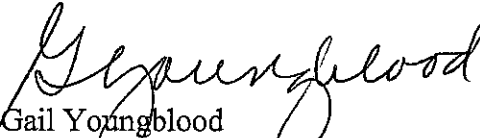
RECOMMENDED ACTION

On the basis of investigations completed and summarized above, no further action at HA-121 is recommended.

Please feel free to contact me at (831) 242-7918 with any questions you may have regarding the proposed No Action. Notification of the proposed No Action will be placed in a major local newspaper within 2 weeks of approval of this memorandum.

Your prompt attention to this proposed No Action approval Memorandum is sincerely appreciated.

Sincerely,


Gail Youngblood
BRAC Environmental Coordinator

Enclosures:

Table 1	Soil Analytical Results for HA-121
Table 2	Comparison of Maximum Detected HA-121 Chemical Concentrations and Preliminary Remediation Goals
Plate 1	Site Location Map
Plate 2	Investigation Results

Table 1. Soil Analytical Results for HA-121
 No Action Approval Memorandum
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Sample Location	Sample Date	Sample Depth (feet bgs)	TPH-Diesel mg/kg		TPH-Gasoline mg/kg		TPH-Motor Oil mg/kg		Trichlorofluoromethane mg/kg	
HA121SI0001	7/9/2002	0.08	1.4	J / A	ND(1.4)	U / A	6.6	J / A	NT	
Duplicate	7/9/2002	0.08	ND(10)	U / A	ND(1.1)	U / A	6.8	J / A	NT	
HA121SI0002	7/9/2002	0.08	ND(10)	U / A	ND(1.1)	U / A	3.7	J / A	NT	
HA121SI0003	7/9/2002	0.08	2	J / A	ND(1.3)	U / A	26	J / A	NT	
Duplicate	7/9/2002	1.08	ND(10)	U / A	ND(1.1)	U / A	3.1	J / A	0.0023	J / J+
	7/9/2002	1.08	ND(10)	U / A	ND(1)	U / A	2.8	J / A	ND(0.0049)	U / A
	7/9/2002	2.08	ND(10)	U / A	ND(0.95)	U / A	ND(51)	U / A	0.0047	J / J+
HA121SI0004	7/9/2002	0.08	ND(10)	U / A	ND(1.1)	U / A	5.6	J / A	NT	
HA121SI0005	7/9/2002	0.08	2.4	J / J+	ND(1.1)	U / A	8.2	J / J+	NT	
	7/9/2002	1.08	1.3	J / A	ND(1)	U / A	2.4	J / A	ND(0.0049)	U / A
	7/9/2002	2.08	1.2	J / A	ND(1)	U / A	1.9	J / A	0.0066	/ J+
HA121SI0006	7/9/2002	0.08	4.7	J / A	ND(1.1)	U / A	9.2	J / A	NT	
HA121SI0007	7/9/2002	0.08	2.6	J / A	ND(1.3)	U / A	14	J / A	NT	
HA121SI0008	7/9/2002	0.08	4.4	J / A	ND(1.3)	U / A	15	J / A	NT	
HA121SI0009	7/9/2002	0.08	1.6	J / A	1.1	/ A	8.3	J / A	NT	
	7/9/2002	1.08	ND(10)	U / A	ND(0.98)	U / A	ND(51)	U / A	0.0017	J / J+
	7/9/2002	2.08	ND(10)	U / A	ND(1)	U / A	ND(52)	U / A	0.0034	J / J+
Duplicate	7/9/2002	2.08	ND(10)	U / A	ND(0.96)	U / A	ND(51)	U / A	0.0049	/ J+
Preliminary Remediation Goals ^a			500		500		500		390	

Abbreviations:

feet bgs = Feet below ground surface.

mg/kg = Milligram per kilogram.

ND = Not detected.

NT = Not analyzed.

J / A = Laboratory qualifier / validation qualifier.

Laboratory Qualifiers:

J = Result is detected below the reporting limit, but greater than the method detection limit.

U = Compound was analyzed for but not detected.

Validation Qualifiers:

A = Data were subjected to routine data validation.

J+ = Data are qualified as estimated with a high bias likely to occur; false positives or false negatives are unlikely to have been reported.

 = maximum detected concentration.

^a The Preliminary Remediation Goals (PRGs) for TPH-d, TPH-g, and TPH-mo are from the No Action Plug-In Record of Decision, Fort Ord, California (Army, 1995). The Preliminary Remediation Goals (PRGs) for Trichlorofluoromethane are from the United States Environmental Protection Agency (EPA) Region 9 PRGs (EPA, 2004). These were used for chemicals that do not have a Fort Ord specific PRG.

Table 2. Comparison of Maximum Detected HA-121 Soil Chemical Concentrations with Background Concentrations and Preliminary Remediation Goals
 No Action Approval Memorandum
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Chemical	Maximum Detected Site Concentration (MSC) (mg/kg)	Maximum Background Concentration in Soil (MBC) ^a (mg/kg)	Maximum Site-Related Concentration (MSRC) ^b (mg/kg)	Preliminary Remediation Goal (PRG) ^c (mg/kg)	Chemical Total MSC/PRG ^d Ratio	Background-Related MBC/PRG ^{e,f} Ratio	Site-Related MSRC/PRG ^g Ratio
Site-Related Chemicals							
TPH-Diesel	4.7	NA	NA	500	0.009	NA	0.009
TPH-Gasoline	1.1	NA	NA	500	0.002	NA	0.002
TPH-Motor Oil	26	NA	NA	500	0.052	NA	0.052
Trichlorofluoromethane	0.0066	NA	NA	390	0.00002	NA	0.00002
Ratio Sum Total (site-related)					0.06	NA	0.06

Abbreviations:

MSC = Maximum detected site concentration.
 mg/kg = Milligram per kilogram.
 MBC = Maximum background concentration in soil.
 MSRC = Maximum site-related concentration.
 PRG = Preliminary Remediation Goal.
 NA = Not applicable.

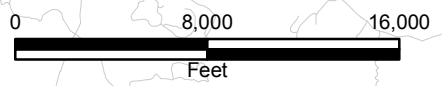
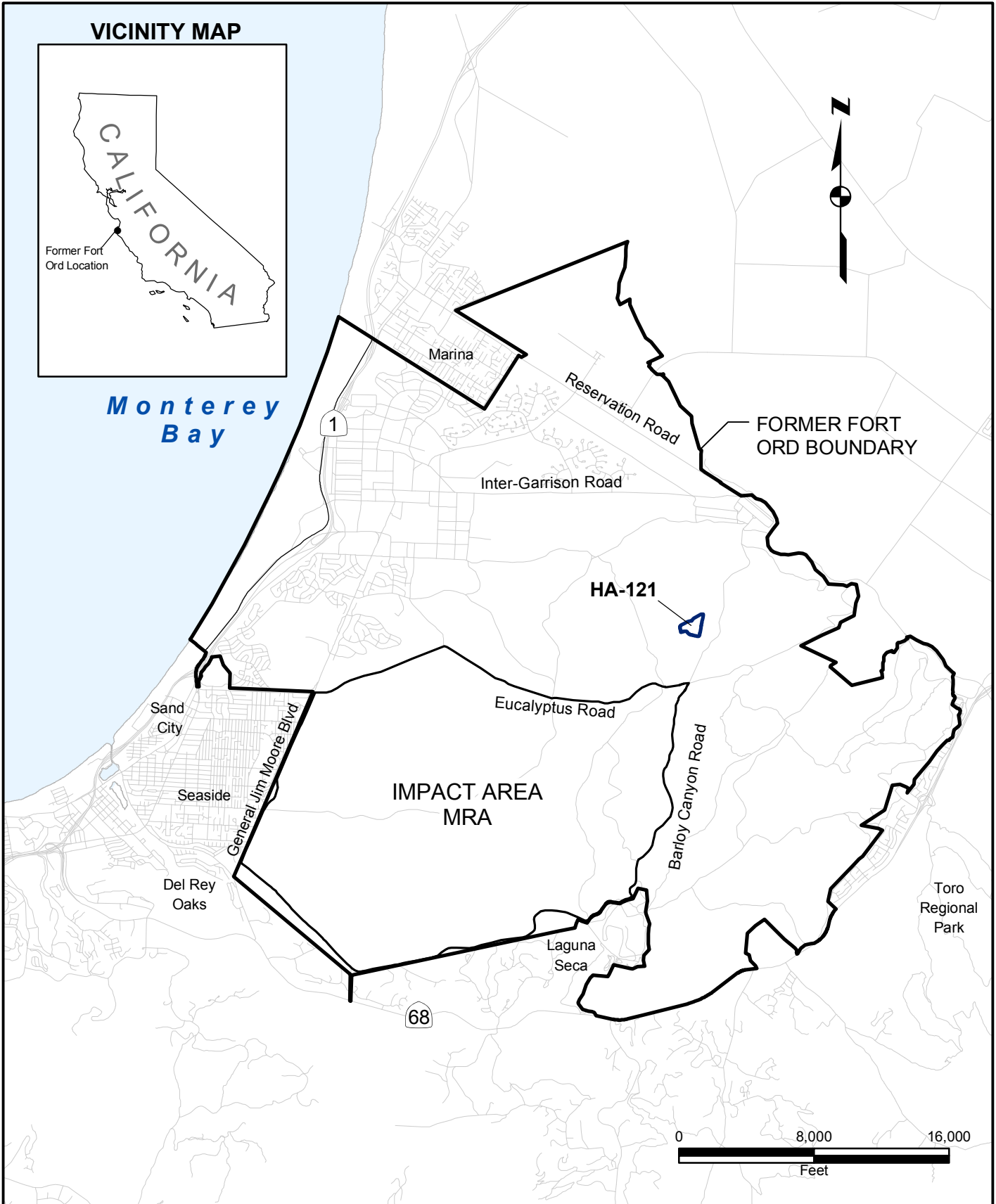
Footnotes:

- ^a Background concentrations in soil are from *Basewide Remedial Investigation/Feasibility Study, Fort Ord, California, Volume II - Remedial Investigation, Basewide Background Soil Investigation, Final* (HLA, 1995).
- ^b MSRC = MSC - MBC
- ^c The Preliminary Remediation Goals (PRGs) for TPH-d, TPH-g, and TPH-mo are from the *No Action Plug-In Record of Decision, Fort Ord, California* (Army, 1995). The Preliminary Remediation Goals (PRGs) for Trichlorofluoromethane are from the United States Environmental Protection Agency (EPA) Region 9 PRGs (*EPA, 2004*). These were used for chemicals that do not have a Fort Ord specific PRG.
- ^d Chemical Total = MSC ÷ PRG.
- ^e Background-Related = MBC ÷ PRG.
- ^f For background-related chemicals (antimony and copper) this value is the same as the chemical-related ratio because the site related component is assumed to be zero.
- ^g Site-Related = MSRC ÷ PRG.

VICINITY MAP



Monterey Bay



Site Location Map
Approval Memorandum
Site HA-121 - Rifle Grenade Range
Former Fort Ord, California

PLATE

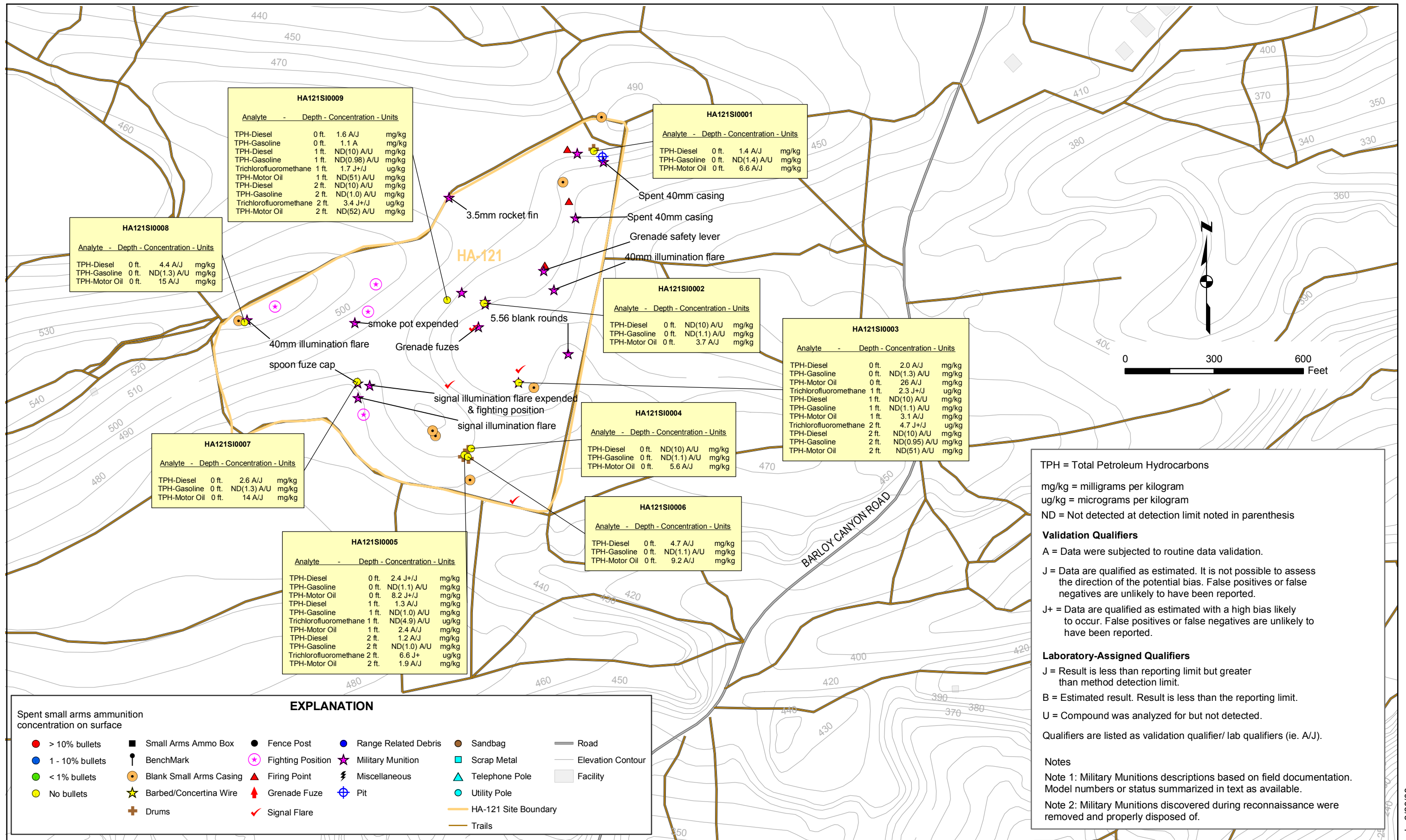
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DRAWN
TJH

JOB NUMBER
4084075127 01

CHECKED CHECKED DATE

APPROVED APPROVED DATE
2/2008



HA121SI0009

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	1.6 A/J	mg/kg
TPH-Gasoline	0 ft.	1.1 A	mg/kg
TPH-Diesel	1 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	1 ft.	ND(0.98) A/U	mg/kg
Trichlorofluoromethane	1 ft.	1.7 J+/J	ug/kg
TPH-Motor Oil	1 ft.	ND(51) A/U	mg/kg
TPH-Diesel	2 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	2 ft.	ND(1.0) A/U	mg/kg
Trichlorofluoromethane	2 ft.	3.4 J+/J	ug/kg
TPH-Motor Oil	2 ft.	ND(52) A/U	mg/kg

HA121SI0001

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	1.4 A/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.4) A/U	mg/kg
TPH-Motor Oil	0 ft.	6.6 A/J	mg/kg

HA121SI0008

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	4.4 A/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.3) A/U	mg/kg
TPH-Motor Oil	0 ft.	15 A/J	mg/kg

HA121SI0002

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	0 ft.	ND(1.1) A/U	mg/kg
TPH-Motor Oil	0 ft.	3.7 A/J	mg/kg

HA121SI0003

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	2.0 A/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.3) A/U	mg/kg
TPH-Motor Oil	0 ft.	26 A/J	mg/kg
Trichlorofluoromethane	1 ft.	2.3 J+/J	ug/kg
TPH-Diesel	1 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	1 ft.	ND(1.1) A/U	mg/kg
TPH-Motor Oil	1 ft.	3.1 A/J	mg/kg
Trichlorofluoromethane	1 ft.	4.7 J+/J	ug/kg
TPH-Diesel	2 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	2 ft.	ND(0.95) A/U	mg/kg
TPH-Motor Oil	2 ft.	ND(51) A/U	mg/kg

HA121SI0007

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	2.6 A/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.3) A/U	mg/kg
TPH-Motor Oil	0 ft.	14 A/J	mg/kg

HA121SI0004

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	ND(10) A/U	mg/kg
TPH-Gasoline	0 ft.	ND(1.1) A/U	mg/kg
TPH-Motor Oil	0 ft.	5.6 A/J	mg/kg

HA121SI0005

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	2.4 J+/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.1) A/U	mg/kg
TPH-Motor Oil	0 ft.	8.2 J+/J	mg/kg
TPH-Diesel	1 ft.	1.3 A/J	mg/kg
TPH-Gasoline	1 ft.	ND(1.0) A/U	mg/kg
Trichlorofluoromethane	1 ft.	ND(4.9) A/U	ug/kg
TPH-Motor Oil	1 ft.	2.4 A/J	mg/kg
TPH-Diesel	2 ft.	1.2 A/J	mg/kg
TPH-Gasoline	2 ft.	ND(1.0) A/U	mg/kg
Trichlorofluoromethane	2 ft.	6.6 J+	ug/kg
TPH-Motor Oil	2 ft.	1.9 A/J	mg/kg

HA121SI0006

Analyte	Depth	Concentration	Units
TPH-Diesel	0 ft.	4.7 A/J	mg/kg
TPH-Gasoline	0 ft.	ND(1.1) A/U	mg/kg
TPH-Motor Oil	0 ft.	9.2 A/J	mg/kg

TPH = Total Petroleum Hydrocarbons
 mg/kg = milligrams per kilogram
 ug/kg = micrograms per kilogram
 ND = Not detected at detection limit noted in parenthesis

Validation Qualifiers
 A = Data were subjected to routine data validation.
 J = Data are qualified as estimated. It is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
 J+ = Data are qualified as estimated with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

Laboratory-Assigned Qualifiers
 J = Result is less than reporting limit but greater than method detection limit.
 B = Estimated result. Result is less than the reporting limit.
 U = Compound was analyzed for but not detected.

Qualifiers are listed as validation qualifier/ lab qualifiers (ie. A/J).

Notes
 Note 1: Military Munitions descriptions based on field documentation. Model numbers or status summarized in text as available.
 Note 2: Military Munitions discovered during reconnaissance were removed and properly disposed of.

EXPLANATION

● > 10% bullets	■ Small Arms Ammo Box	● Fence Post	● Range Related Debris	● Sandbag	— Road
● 1 - 10% bullets	● BenchMark	● Fighting Position	● Military Munition	■ Scrap Metal	— Elevation Contour
● < 1% bullets	● Blank Small Arms Casing	● Firing Point	● Miscellaneous	● Telephone Pole	■ Facility
● No bullets	● Barbed/Concertina Wire	● Grenade Fuze	● Pit	● Utility Pole	— HA-121 Site Boundary
● Drums	● Signal Flare			— Trails	

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ENGINEER:	SCALE: AS SHOWN
CHECKED:	APPROVED:
DATE: 1/2008	DATE:



Approval Memorandum
 Site HA-121 - Rifle Grenade Range
 Former Fort Ord, California

Investigation Results
 HA-121