



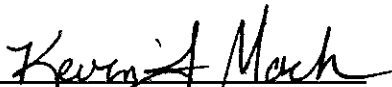
FINAL CLOSURE REPORT
STUDY AREA 37A
FORT DEVENS, MASSACHUSETTS

Prepared for:

U.S. Army Corps of Engineers
New England Division
Waltham, Massachusetts
Contract Number DACW45-89-D-0506

Prepared by:

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Hopkinton, Massachusetts


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August 4, 1995
OHM Job 16208

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EXECUTIVE SUMMARY

Fort Devens was placed on the National Priorities List (NPL) on December 21, 1989 under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, several studies have been conducted that address Study Area 37A, which was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

This closure report documents the historical information and investigation results leading to the recommendation to abandon existing monitoring wells in-place at Study Area 37A, the implementation of the monitoring well abandonment action, and the post-abandonment site conditions at Study Area 37A. The objective of the action was to abandon four existing monitoring wells that are no longer useful.

The monitoring wells that were abandoned are located adjacent to building 3622. According to the Master Environmental Plan (MEP), Building 3622 (Site Plan - Appendix B) was used for pesticide storage and mixing between 1976 and 1987. Pesticides such as Dursban, TGF, Daconil, and Antidrone Thinner Plus F were reportedly stored on site. The reports note that there may have been small rinse water discharges and small spills into the sanitary sewer system; however, specific information on discharges and spill was not provided. Site observations included in the MEP and Enhanced PA noted that torn bags of fertilizer were stored on wood pallets in the building and were spilling onto the wooden floor. Also, evidence of potential soil contamination was observed behind the building, associated with debris, empty paint cans, and old equipment scattered around the area.

The MEP and Enhanced PA also note that a 500-gallon underground storage tank (UST), last used for heating fuel, was removed from the site. The tank was determined to be structurally sound, and observed fuel staining was attributed to over spill at the fill-pipe or loose piping. Thirty cubic yards of contaminated soil were removed, but excavation of soil was discontinued due to the proximity of contamination to the building foundation. Four ground water monitoring wells were installed around the site at that time. However, these four monitoring wells are no longer useful so consequently, the NED of the USACE contracted OHM to abandon the wells in place.

Additional investigations of the former tank site are being conducted as part of the work on Area Requiring Environmental Evaluation (AREE) 63BP, Previously Removed Underground Storage Tanks, and will be reported in the Supplemental Site Evaluations Report, 14 Former Underground Storage Tank Sites (AREE 63), Fort Devens, Mass.

LIST OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ADL	Arthur D. Little
AEC	U.S. Army Environmental Center
AREE	Area Requiring Environmental Evaluation
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EMO	Environmental Management Office
ID	Inside Diameter
MADEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEP	Master Environmental Plan
NDIR	Non-Dispersive Infrared Spectroscopy
NED	New England Division
NPL	National Priorities List
PRE	Preliminary Risk Evaluation
PID	Photoionization Detector
PPM	Parts Per Million
PVC	Polyvinyl Chloride
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SSE	Supplemental Site Evaluation
SVOC	Semivolatile Organic Compound
TPH	Total Petroleum Hydrocarbon
ug/g	Micrograms per Gram
ug/L	Micrograms per Liter
USAEC	U.S. Army Environmental Center
UST	Underground Storage Tank
VOC	Volatile Organic Compound

SECTION 1.0

INTRODUCTION

Fort Devens was placed on the National Priorities List on December 21, 1989 under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act. Subsequently, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. This closure report has been prepared as part of the U.S. Department of Defense Base Realignment and Closure program to assess the nature and extent of contamination associated with site operations at Fort Devens. This report contains a summary of activities conducted at study area (SA) 37A.

In conjunction with the Army's Installation Restoration Program, Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consisted of assessments of the environmental status of SAs, specified necessary investigations, and provided recommendations for response actions, with the objective of identifying priorities for environmental restoration at Fort Devens. SA 37A was identified as a potential source of contamination in the MEP. At this study area, OHM was contracted by the NED to abandon in place four monitoring wells (3622W-01X, 3622W-02X, 3622W-03X, and 3622W-4X) that were deemed no longer useful. This closure report documents the historical findings leading to the response action recommendation and the measures taken at SA 37A.

1.1 SITE HISTORY AND BACKGROUND

SA 37A is located in the southern portion of the Main Post, off Patton Road. Building 3622 was used for pesticide storage and mixing. A 500-gal UST used for heating oil was removed from the north side of Building 3622 along with approximately 30 cy of contaminated soil by Franklin Environmental Services Inc., under the direction of Kurz Associates.

According to interviews and records searches conducted during the Main Post SI, Building 3622 was built in 1942, at which time it was titled Building 2522 and used for supply storage. The building construction included a concrete foundation with wood and vinyl siding. A bathroom was installed in 1963. Although minimal additional information was available for this location, it appears to have functioned as either the original golf course club house or a herbicide and pesticide storage area from 1965 to 1971. The history of this property from 1971 to 1980 is unclear. However, the records review indicates that pesticides were stored and/or mixed in the building in 1980 and 1981. The 10th Special Forces (Airborne) took possession of the building from 1988 to 1989 and operated it as a radio relay station.

1.2 PREVIOUS SITE INVESTIGATIONS

A historical review of underground storage tank removal activities was performed for SA 37 so that a Geoprobe sampling strategy could be developed in support of a petroleum hydrocarbon assessment. This review included interviews with staff of the Fort Devens Environmental Management Office (EMO) and a review of the January 21, 1991 report prepared by Kurz Associates for Franklin Environmental Services, Inc.

According to the Kurz report, one 500 gallon underground fuel oil storage tank was removed from approximately 2 feet north of Building 3622 in December 1989. Petroleum contamination was observed within the excavation and subsequent soil removal was performed. Approximately 30 cubic yards of contaminated soil was excavated from around the Building 3622 tank.

Four test borings were advanced by Enviro-tech Drilling (March 23, 1990) near the Building 3622 excavation. Ground water observation wells (2-inch ID; PVC) were installed in each of the borings and labelled 3622W-01, 3622W-02, 3622W-03, and 3622W-04. The borings ranged from 15.0 to 18.5 feet at T-3622. The depth to ground



water at these locations ranged from 6.0 to 9.0 feet below the surface.

According to the Kurz report, soil samples were collected from the ground surface and at 5.0-foot increments. These samples were analyzed for total volatile emissions through head space analysis using a PID. Analytical results are located in the Final Site Investigation Report prepared by Arthur D. Little, Inc., dated December 15, 1993. There were insufficient data in the Kurz report to allow correlation of analytical results with specific sampling locations. However, the data did suggest that additional hydrocarbon contamination remained in the excavation.

The investigation of SA-37 was done in conformance with the Final Supplemental Work Plan - Main Post Site Investigation (SI) - Fort Devens, MA (Revision 1) prepared by Arthur D. Little and dated April 28, 1993. The scope of work completed for the investigation of SA-37 included:

- Records review, visual inspections, and interviews
- Two exploratory borings at Building 3622.
- Two surface soil samples at Building 3622.
- Five interior wipe samples at Building 3622.
- Soil and ground water sampling near Building 3622 using the Geoprobe sampling technique to check for residual contamination associated with the previously removed UST.

Specific information on geologic conditions, hydrologic conditions, groundwater and sampling results is given in the Final Site Investigation Report prepared by Arthur D. Little, Inc., dated December 15, 1993.

Additional investigations of the former tank site are being conducted as part of the Area Requiring Environmental Evaluation (AREE) 63BP, Previously Removed Underground Storage Tanks. Information obtained from these investigations will be reported in the Supplemental Site Evaluations Report, 14 Former Underground Storage Tank Sites (AREE 63), Fort Devens, Mass.

SECTION 2.0 MONITORING WELL CLOSURES

OHM abandoned four monitoring wells (3622w-01,02,03,04) with depths of 15 to 18 feet. The order of work was as follows;

- July 18, 1994 Monitoring wells 3622w -01,02,03,04 were grouted with a tremie pipe from the bottom of the wells as per specification 02680 section 3.2. A set of three grout cubes were taken and measured for compressive strength per ASTM c109 (results are shown in Appendix A). Water levels in the wells and overall depth/volumes were recorded and are presented in the attached table (Appendix A).
- July 19, 1994 Monitoring wells were inspected for grout settlement; all levels were found to be acceptable. Soil was excavated from around the wells to prepare for riser cut off. Asphalt was cut at wells 3622w-01 and 02. Grout samples were collected and taken for analysis. All exposed openings were protected by barriers and hazard lights. All work was performed in accordance with the specification 02680.
- July 21, 1994 Risers were cut off one foot below grade for all four abandoned wells. Wells 3622w-03 and 04 were backfilled to grade with soil. Wells 3622w-01 and 02 were backfilled to be level with the underside of the asphalt. (cold patches to follow.)
- July 22, 1994 Asphalt cold patches were applied to monitoring wells 3622w01 and 02, completing task SA37A.

Daily quality control reports were completed to assure that all work was performed in accordance with specifications. All applicable appendices are attached as per scope of services section 15.2.5.

SECTION 3.0 CONCLUSIONS

Monitoring wells 1-4 were closed in accordance with MADEP and USACE requirements and no further action is required on these wells. Refer to Appendix B for photographs of the well grouting operation. Additional investigations of the former tank site are being conducted as part of the Area Requiring Environmental Evaluation (AREE) 63BP, Previously Removed Underground Storage Tanks, and will be reported in the Supplemental Site Evaluations Report, 14 Former Underground Storage Tank Sites (AREE 63), Fort Devens, Mass.

Appendix A

Sampling and Analysis Documentation and Results

YANKEE ENGINEERING & TESTING, INC.

Project #: 94000

Report #: 07184

Specimen Age: 1 & 16 Days

Project: OHM Remediation

Location: Ft. Devens Project

Client: OHM Remediation

General Contractor: _____

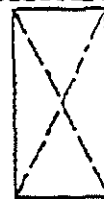
Sub-Contractor: _____

Concrete Supplier: _____

LOCATION: Unknown

Sample #	Mortar Cube	07184 C	07184 A	07184 B
Design Strength (psi) (normal/lightwgt concrete)		3000 psi mortar	3000 psi mortar	3000 psi mortar
Mix Weights - Per Cubic Yard			
Cement (lbs)				
Fine Aggregates (lbs)				
Coarse Aggregates (lbs)				
Water (gals)				
Admixtures (ounces)				
W/C Ratio (gals/sacks)				
Wet Density (lbs/cu.ft)C138				
Slump, inches (C143)				
Air Content (percent)C231				
Concrete Temp. (°F)				
Truck Number				
Ticket Number				
Condition of Specimen		good	good	good
Size of Specimen (inches)		2x2x2"	2x2x2"	2x2x2"
Area of Specimen (sq. inches)		4.0	4.0	4.0
Specimen Weight (lbs)		N/A	N/A	N/A
Type of Fracture		A	A	A
Total Load (lbs)C39		14,800	5,600	6,400
Unit Load (psi)		3700	1400	1600
Date Cast:		7-18-94	7-18-94	7-18-94
Date in Lab:		7-19-94	7-19-94	7-19-94
Date Tested:		8-3-94	7-19-94	7-19-94

Type of Fracture



Cone (a)



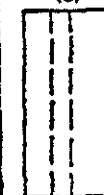
Cone and Split (b)



Cone and Shear (c)



Shear (d)



Columnar (e)

REMARKS: A & B = 1 day breaks 1,400 + 1,600 psi

C = 16 day break 3,700 psi

Prepared by: CBO (P. Mooney)

Tested by: Whitney Parker

MCIB# 01348A

Ft. Devens - OHM Project 16208
 Monitoring Well Abandonment
 Building 3622 LUST Site (SA 37A)

Well	Reported Depth (1)	Measured Depth (2)	Measured Depth to Top of Water (2)	Depth of Water in Well (3)	Sediment Thickness (4)	Well Bore Obstructions	Grouting Date	Initial Grout Volume (5)
3622W-01	18.5	16.36	15.37	0.99	2.1	None	18-Jul-94	0.4
3622W-02	15.0	13.28	12.84	0.44	1.7	None	18-Jul-94	0.3
3622W-03	15.0	13.68	12.66	1.02	1.3	None	18-Jul-94	0.3
3622W-04	15.0	12.99	8.18	4.81	2.0	None	18-Jul-94	0.3

NOTES:

- (1) From boring logs in feet
- (2) Measured in feet from top of PVC casing on 18-Jul-94
- (3) Measured Depth - Measured Depth to Top of Water
- (4) Reported Depth - Measured Depth
- (5) Approximate volume in cubic feet

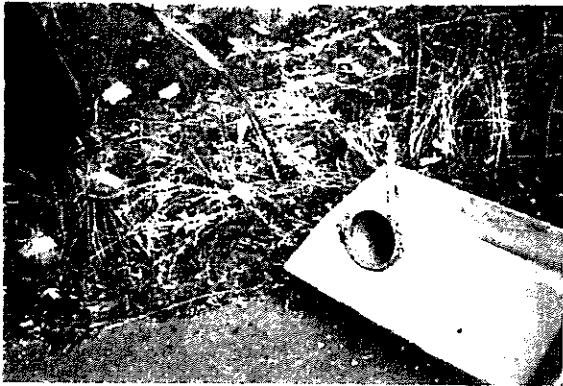
GENERAL NOTES:

The grout consisted of one 94-lb bag of Portland Type-I cement mixed with 2% by-weight Bentonite clay powder and 7 ~~10.8~~ gallons of water.

Grout was placed in each well starting at the bottom of the well bore using a 3/4-inch tremie pipe.

After removal of the tremie pipe, each well bore was topped off so that grout was flush with the top of the well riser.

Appendix B
Site Photographs



Introducing grout to monitoring well at SA 37A



Grouting of monitoring well completed



Grouting of monitoring well completed