ACTION MEMORANDUM

REMOVAL ACTION

STUDY AREA 50

(WORLD WAR II AIRCRAFT FUEL SYSTEM)

FORT DEVENS, MASSACHUSETTS

Final

November 1992

Prepared by:

United States Army Toxic and
Hazardous Materials Agency

ACTION MEMORANDUM, STUDY AREA 50
FORT DEVENS, MASSACHUSETTS

TABLE OF CONTENTS

Section Title Page Number

ACTION MEMORANDUM, STUDY AREA 50
FORT DEVENS, MASSACHUSETTS

LIST OF FIGURES

LIST OF TABLES

I. PURPOSE

The purpose of this Action Memorandum is to document the decision to perform a removal action at Study Area (SA) 50 at Fort Devens Massachusetts. This Action Memorandum identifies a removal action to address the removal of Underground Storage Tanks (UST) and associated piping and distribution facilities as well as possible contaminated soil at SA 50.

II. SITE CONDITIONS AND BACKGROUND

The National Contingency Plan (NCP) states that a removal action may be conducted at a site when a threat to human health or the environment is determined. An appropriate removal action is undertaken to abate, minimize, stabilize, mitigate, or eliminate the release or threat of release at a site.

At the suggestion of EPA and with Massachusetts DEP concurrence, removal actions are being executed at agreed upon sites in the interest of accelerating clean-up of known residual contamination.

The following subsections provide a physical description of Fort Devens and SA 50 and information on the characteristics of SA 50.

A. SITE DESCRIPTION

1. Removal Site Evaluation

Fort Devens is located in the State of Massachusetts approximately 35 miles northwest of the City of Boston. Fort Devens is located within the towns of Ayer, Harvard, Lancaster, and Shirley and comprises approximately 9,280 acres of land area. Since 1917, Fort Devens has been used for a variety of training missions. The current mission of Fort Devens is to command and train its assigned units and support various tenant activities.

On 21 December, 1989, Fort Devens was placed on the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). In addition, under Public Law 101-510, the Base Realignment and Closure (BRAC) Act of 1990, Fort Devens was selected for cessation of operations and closure.

During development of the Master Environmental Plan (MEP) (USATHAMA, 1991) and the Enhanced Preliminary Assessment (PA) (USATHAMA, 1992a), 59 SAs were identified. SA 50 was labeled as " World War (WW) II

Aircraft Fuel System".

During the routine environmental compliance activities, development of the MEP (USATHAMA, 1991) and development of the Work Plan for Site Investigations (SI) at Groups 3, 5, and 6 Study Areas (USATHAMA, 1992b), the distribution network for WW II aircraft at Moore Army Air Field (MAAF) was identified as a potential site of contamination. Preliminary results from the SI indicate petroleum-derived compound contamination in the form of Total Petroleum Hydrocarbons (TPHC) in the vicinity of the WW II distribution system. The proposed removal action would remove a continuing source for contamination through the removal of the USTs, piping, associated hardware, and contaminated soil.

2. Physical Location and Site Characteristics

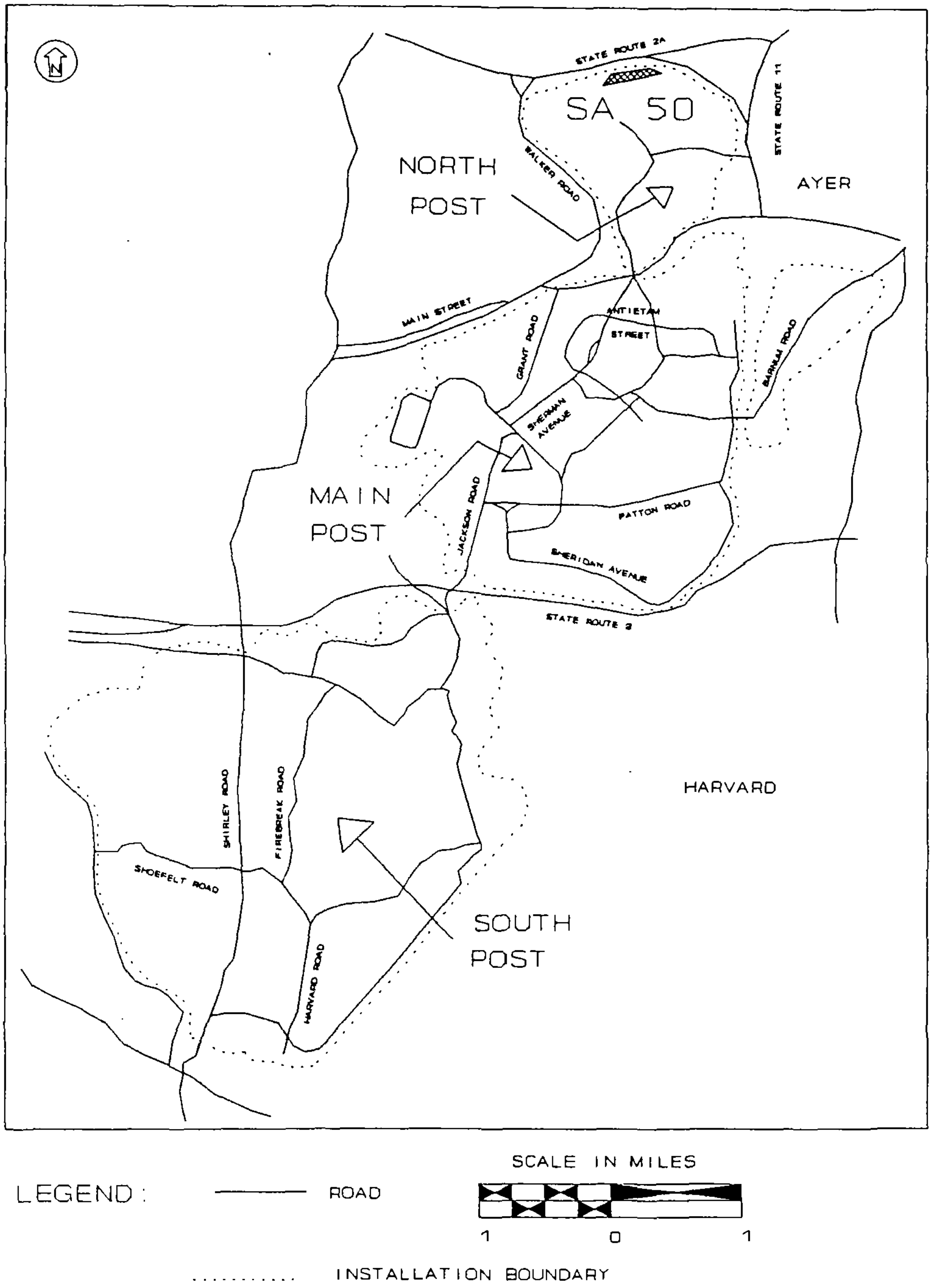
SA 50 is located in the northeast portion of the north post area, south of State Route 2A (Figures 1 and 2). SA 50 was identified in the MEP as piping, two groups of aircraft fuel tanks, fuel points and truck and aircraft fill stands. These facilities were used during the WW II era to receive fuel from rail cars, distribute the fuel to the airfield, and perform refueling of aircraft and trucks. Reports indicate that no fueling activities associated with the distribution system have occurred since the late 1940s (USATHAMA 1991).

3. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

SA 50 was identified as a potential site of contamination due to the presence of WW II era fueling systems. As described above, the system included three, 25,000 gallon USTs, a water control and water separator pit, a truck fill stand, a hose pit, a gasoline pump pit, and associated piping. These components were located to the east of what is now Building T-3803 (Figure 3), and are addressed by the proposed removal action. The system also included two 25,000 gal USTs, a truck fill stand, and four aircraft fueling stations east and south of Building T-3818, which are not included in this removal action.

The field work for the SI of SA 50 was begun in June of 1992 by ABB Environmental Services, Inc., under contract to the United States Army Toxic and Hazardous Materials Agency (USATHAMA). Preliminary results indicate petroleum-derived contamination, as indicated

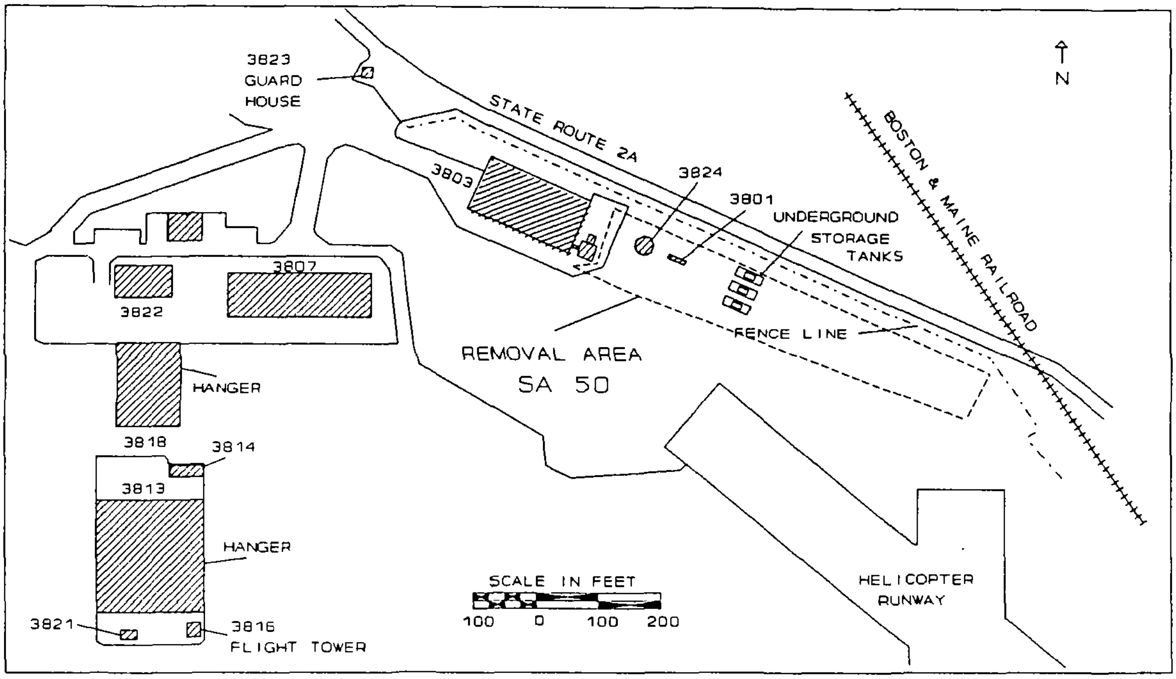
FIGURE 1, FORT DEVENS



by TPHC in the soils.

Analysis of the soils included Volatile Organic Compounds (VOC), Lead, and TPHC (Figure 3). With the exception of two hits of Tetrachloroethene in boring

FIGURE 2, LOCATION OF REMOVAL ACTION SA 50



50B-92-08X (depth 0 feet, 6 parts per billion (ppb), depth 10 feet, 236 ppb) no VOCs were detected above the detection limits, including Benzene, Toluene, Ethylbezene, and Xylene (BTEX). The lead levels (3.03 - 19.8 parts per million (ppm)) were all within the background range for Fort Devens. The results for TPHC ranged from less than 28.0 to 162.0 ppm and are tabulated in Table 1.

Analysis of the groundwater samples from wells G6M-92-10X and G6M-92-11X included VOC, semi-VOC, Inorganics, TPHC, and Anions/Cations. No VOCs (including BTEX), TPHC, or semi-Vocs were detected above detection limits. With the exception of Sodium, levels of Inorganics and Anion/Cations were below Maximum Contaminant Levels (MCLs) and within a range that would be expected to normally occur. These wells are upgradient, but very close to the fueling system. Downgradient wells also do not indicate petroleum derived groundwater contamination. This indicates that if the USTs and associated hardware have contaminated the groundwater with petroleum-derived compounds, the groundwater in the areas of wells G6M-92-10X and G6M-92-11X has not yet been affected.

FIGURE 3, SAMPLING LOCATIONS AND PROPOSED REMOVAL

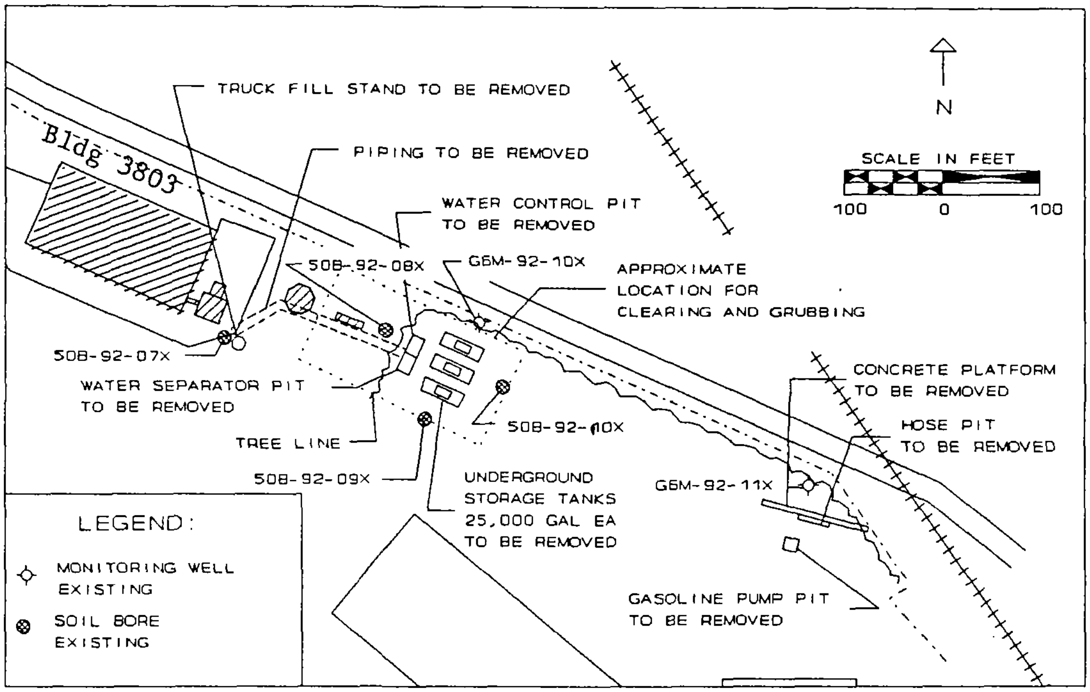


TABLE 1, SI RESULTS, TPHC

Sample ID	Depth (feet)	TPHC (ppm)
50B-92-07X	0.0	< 28.8
50B-92-07X	5.0	48.8
50B-92-07X	10.0	39.3
50B-92-08X	0.0	46.3
50B-92-08X	5.0	41.5
50B-92-08X	10.0	55.8
50B-92-09X	0.0	109.0
50B-92-09X	10.0	54.0
50B-92-09X	15.0	162.0
50B-92-10X	0.0	71.8
50B-92-10X	5.0	42.7
50B-92-10X	10.0	44.5
G6M-92-10X	0.0	38.5
G6M-92-10X	5.0	< 33.0
G6M-92-10X	10.0	< 35.7
G6M-92-11X	0.0	53.8
G6M-92-11X	5.0	36.4
G6M-92-11X	12.0	51.5
G6M-92-11X	12.0	47.3

B. OTHER ACTIONS TO DATE

To date, there have been no other actions taken to abate, minimize, stabilize, or eliminate the release of contamination from SA 50.

C. STATE AND LOCAL AUTHORITIES' ROLE

The proposed removal action and corresponding documents for SA 50 will be reviewed by the U.S. Environmental Protection Agency (USEPA) Region I and the Massachusetts Department of Environmental Protection (MDEP) prior to implementation. To date, no emergency response action or requests for USEPA assistance have been made.

III. THREATS TO HUMAN HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415 of the NCP outlines factors to be considered to determine the appropriateness of a removal action. This section evaluates factors for SA 50.

A. THREATS TO HUMAN HEALTH OR WELFARE

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain

The recommendation for removal action documented in this action memorandum is based upon qualitative analysis of the potential sources as well as preliminary sampling results from the SI. The actual and possible location of compounds and their concentrations as well as potential pathways and receptors for the contamination were considered. The primary threat for human exposure is through contact with surface contaminated soils. Due to fencing and controlled access, the potential receptors are restricted to soldiers and civilians working in the area. Secondary threats include contact with subsurface soils during the removal operations. Potential receptors include personnel conducting the removal. Due to the short duration of exposure, the threat to these receptors is considered to be low and will be managed through proper health and safety procedures during removal actions. While virgin petroleum products are not defined as a CERCLA Hazardous Waste, there is the possibility that some volatile and semi-volatile constituents, though not detected during the SI, could present a threat to human welfare through ingestion, inhalation, or dermal contact. The proposed removal action would eliminate the threat through removal of the soils. To date, no exposure to chemicals at SA 50 has been documented.

2. Actual or potential contamination of drinking water supplies

The potential for contamination of present drinking water supplies is considered to be low. The results of sampling and analysis (Section II.A.3.) do not show any indication of contamination of the groundwater with petroleum derived compounds. The closest drinking water supply well is the Fort Devens MacPherson well, (registration number 2270000-03) located approximately 1.25 miles to the south of SA 50. The inferred groundwater flow direction from SA 50 is to the south and west, not towards MacPherson well. The presence of TPHC in the surface and subsurface soils does, however, indicate a potential for groundwater contamination by infiltration through contamination in the unsaturated zone into the saturated zone. To confirm the presence or absence of petroleum-derived contamination in the groundwater, additional wells may be installed in conjunction with the removal action. Surface flow directly into receiving water bodies is not considered a threat because there are no surface water bodies in the area which presently serve as a drinking water source.

3. Hazardous substances, pollutants, or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release

There are three, 25,000 gallon USTs which contain what is inferred to be gasoline contaminated water at SA 50. During the removal, the contents will be tested, treated on site and discharged in compliance with NPDES regulations.

4. High levels of hazardous substances, pollutants or contaminants in soils at or near he surface that may pose a threat of release

As mentioned in Section III.A.1. and Section III.A.2., TPHC has been detected in the surface soils. There is a potential of release through infiltration of surface water into the groundwater. The proposed removal action would mitigate this threat through removal of the source.

5. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

None Identified.

6. Threat of fire or explosion

A threat of fire or explosion will be encountered during the actual UST removal. This threat will be minimized through strict adherence to all applicable UST removal, safety, and health regulations.

B. THREATS TO THE ENVIRONMENT

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain

As discussed, the recommendation for removal action is based upon qualitative analysis of the risk. The primary threat for ecological exposure is through contact with the surface contaminated soils. The potential receptors include native flora and fauna. While virgin petroleum products are not defined as a CERCLA Hazardous Waste, there is the possibility that some volatile and semi-volatile constituents could present a threat to the environment through plant uptake and subsequent ingestion throughout trophic levels as well as direct ingestion, inhalation, or dermal contact. The proposed removal action would mitigate risks associated with contaminated soils at SA 50. In this manner, exposure of contaminants to ecological receptors would be controlled.

2. Actual or potential contamination of drinking water supplies

As discussed in Section III.A.2., the potential for contamination of groundwater is low, but will be evaluated further during the removal action. Due to the high permeability of the soils in the area, most surface water infiltrates directly into the subsurface, with little or no surface run-off. This virtually eliminates the potential for direct contamination of surface waters, resulting in little or no threat to ecological receptors from contaminated surface water.

3. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release

As discussed in Section II.A.3, there are three, 25,000 gallon USTs which contain what is inferred to be gasoline contaminated water at SA 50. During the removal, the contents will be tested and disposed of along with the USTs themselves.

4. High levels of contaminants or pollutants or contaminants in soils at or largely near the surface that may migrate

As discussed in section III.A.4., TPHC has been detected in the surface soils. The proposed removal action would mitigate the threat of release through removal of the source.

5. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate

None identified.

6. Threat of fire or explosion

As discussed in Section III.A.5., a threat of fire or explosion will be encountered during the actual UST removal. This threat will be minimized through strict adherence to all applicable UST removal, safety, and health regulations.

C. STATUTORY OR REGULATORY AUTHORITY

RCRA statutory requirements demand removal of abandoned USTs.

IV. ENDANGERMENT DETERMINATION

A time critical removal action to facilitate the rapid removal of USTs and contaminated soils at SA 50 has been identified. Actual or threatened releases of pollutants and contaminants from this site, if not addressed by implementing the response action described in this Action Memorandum, may endanger human health and welfare and/or may present a risk to the environment.

V. EXEMPTION FROM STATUTORY LIMITS

The removal action described in this Action Memorandum will meet the "consistency" criterion as defined by the USEPA's "Superfund Removal Procedures, Action Memorandum Guidance" (December 1990; USEPA 540/P-90/004) (i.e., continued response actions are otherwise appropriate and consistent with the remedial action to be taken) for several reasons. First, the removal action is consistent with the ongoing SI at SA 50 and would support a follow-on Remedial Investigation (RI), if required Second, the removal action is necessary to prevent potential migration of contamination from the surface and subsurface soils into the underlying soil and groundwater. Third, the removal action is appropriate because it will mitigate any threat to human health and the environment and contribute to the overall remediation of the site.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. PROPOSED ACTION

1. Proposed action description

The proposed action at SA 50 consists of the removal of three, 25,000 gallon USTs and associated hardware, the excavation of contaminated soil, confirmatory sampling at the excavations, and disposal/recycling of the soil. The removal action would be protective of human health and the environment and would be cost effective. Since the removal action will be completed as a time-critical removal, an Engineering Evaluation/Cost Analysis will not be prepared. Specific tasks (Figure 3) are described below:

(1) Clearing and grubbing of approximately two acres of land to permit access to USTS and associated hardware.

(2) Removal of contents of three 25,000 gallon USTs, sampling of the removed liquid and sludge, on-site treatment of liquid with granular activated carbon (GAC), discharge of GAC system effluent into Nashua River (with appropriate permitting and monitoring), and off-site disposal of the sludge and carbon in an approved disposal facility.

(3) Excavation, removal, cleaning, and disposal of:

- **(a)** Three 25,000 gallon USTs.
- **(b)** One water separator pit and associated hardware.
- **(c)** One water control pit and associated hardware.
- **(d)** One truck filling stand and associated hardware.
- **(e)** One hose pit and associated hardware.
- **(f)** One gasoline pit and associated hardware.
- **(h)** Distribution piping.

(4) Excavation of visibly stained soil and other soil until field screening using Photoionization Detector (PID) indicate Total Organic Volatiles (TOV) less than 10 ppm. Excavated soil will be stored on polyethylene sheeting and covered with a water-proof tarpaulin until disposed of.

(5) Collection of a minimum of one soil sample per excavated soil pile and analysis for Geotechnical Classification and Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) extractable metals. This will determine if the soil will be disposed of as hazardous or non-hazardous material.

(6) Treatment, Storage or Disposal of Contaminated soils. If treatment of soils on-site is not permitted by the State or space is not available, the non-RCRA contaminated soils will be manifested and disposed of in an approved landfill. Any soil determined to be contaminated with RCRA metals will be manifested and disposed of in a licensed disposal facility.

(7) Collection and analysis of confirmatory soil samples from excavations in accordance with (IAW) Appendix A, Sampling and Analysis.

(8) If water is encountered in tank excavation, collection and analysis of excavation water IAW Appendix A.

(9) If, based upon results of field screening and laboratory analysis of soil samples, it is determined that contamination remains in the soil and represents a potential threat to human health and/or the environment, soil bores may be installed and soil samples collected and analyzed to determine the extent of contamination in the soil. If required, the number of bores and samples and types of analytes collected will be determined based upon field screening, lab analysis, and SI results. Collection and analysis of samples will be performed IAW Appendix A. The results of these samples will be used in conjunction with the SI results to determine appropriate further remedial actions.

(10) If, based upon results of soil analysis, analysis from water encountered in the tank excavations, and/or analysis of results from the SI, it is determined that contamination potentially exists in the groundwater, groundwater monitoring wells may be installed and groundwater samples collected and analyzed to determine the extent of contamination in the groundwater. If required, the number of wells installed and samples collected will be determined based upon the lab analysis and SI results. Collection and analysis of samples will be IAW Appendix A. The results of these samples will be used in conjunction with the SI results to determine appropriate further remedial actions.

(11) Backfilling and compaction of all excavations with approved fill material after confirmation of removal of all contaminated soil.

2. Contribution to Remedial Performance

The removal of USTs, associated hardware, and contaminated soil at SA 50 would remove a potential continuing source for deeper soil and groundwater contamination. Therefore, the removal action would be appropriate for any long term remedial action that may be required for this site, based upon the results of analysis conducted in conjunction with the removal, the ongoing SI and subsequent RI, if required.

3. Description of alternative technologies

Since the removal action described in this Action memorandum will be conducted as a time-critical action, alternative technologies were not considered.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

ARARs have not yet been developed for these sites. The removal action will follow appropriate state and federal guidelines.

5. Project Schedule

The proposed removal action will require approximately two months to accomplish.

B. ESTIMATED COST

The removal actions for SA 50 described in this Action Memorandum will cost approximately $250,000 - $500,000.

VII. OUTSTANDING POLICY ISSUES

None Identified.

VIII. EXPECTED CHANGE IN THE SITUATION SHOULD NO ACTION BE TAKEN OR ACTION DELAYED

If the proposed action is delayed or not implemented, the USTs and associated hardware could potentially serve as a continuing source of contamination. Contaminants could potentially infiltrate into the underlying soil and groundwater.

IX. ENFORCEMENT

The Department of the Army (DA) is the lead agency for Fort Devens. The removal action will not be financed through Superfund; all funding will be provided by the Department of Defense (DOD) through DA and Fort Devens. Therefore, enforcement strategies do not apply to this removal action.

X. RECOMMENDATION:

This document presents proposed removal action for three Underground Storage Tanks, associated hardware and piping, and contaminated soil at SA 50 (WW II Aircraft Fuel System), Fort Devens, Massachusetts, developed in accordance with CERCLA as amended by SARA and is consistent with the NCP.

Conditions at this site meet the NCP Section 300.416(b)(2) criteria for a removal action. Therefore, the removal action is recommended for SA 50.

RICHARD W. HOOVER
Colonel, U.S. Army
Installation Commander

24 NOV 92
Date

GLOSSARY OF ACRONYMS

BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chain of Custody
DA	Department of the Army
DOD	Department of Defense
MAAF	Moore Army Airfield
MCL	Maximum Contaminant Level
MDEP	Massachusetts Department of Environmental Protection
MEP	Master Environmental Plan
NCP	National Contingency Plan
NDIR	Non-Dispersive Infrared
NPL	National Priority List
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
ppb	parts per billion
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SA	Study Area
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
TCLP	Toxicity Characteristic Leaching Procedure

GLOSSARY OF ACRONYMS (continued)

TOV	Total Organic Volatile Compounds
TPHC	Total Petroleum Hydrocarbons
USATHAMA	United States Army Toxic and Hazardous Materials Agency
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WW	World War

REFERENCES

USATHAMA, 1991, final Master Environmental Plan, Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland, September

USATHAMA, 1992a, final Enhanced Preliminary Assessment, Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland, April

USATHAMA, 1992b, draft final Task Order Work Plan, Site Investigation - Groups 3, 5, and 6, Fort Devens, Massachusetts, Aberdeen Proving Ground, Maryland, June

APPENDIX A TO ACTION MEMORANDUM, REMOVAL ACTION,
STUDY AREA 50, FORT DEVENS, MASSACHUSETTS
SAMPLING AND ANALYSIS

1. Sample Collection: All samples for all media will be collected in accordance with (IAW) United States Environmental Protection Agency (USEPA) Manual SW-846. A brief description of collection methodology is provided below.

All samples actually collected must be accompanied by proper CHAIN of CUSTODY (COC) forms and proper COC information. This is required, in part, to accurately identify the lab analysis with the sample location and matrix.
This correlation is vital to all RCRA and CERCLA activities.

a. Surface Soils (Laboratory/Confirmatory Analysis): Samples will be taken from location of the highest field screening results at a depth 0 to 6 inches in the excavation walls or floor, as appropriate. The following procedures will be followed:

- Care will be taken that the appropriate number of pre-cleaned sample bottles, including preservatives, will be transported to the field.

- Labels will be placed on pre-cleaned bottles prior to collection. Sample labels will be filled out with waterproof ink and include: sampler name; sample identification; sample location; date; and analysis to be performed. The actual time of collection will be added after collection.

- A clean, stainless steel spoon will be used to scrape soils from the excavation surface to a depth of six inches over an area large enough to fill the required volume of samples.

- Leaves, roots, sticks, and rocks will be avoided.

- Soils for Volatile Organic Compounds (VOC) (including Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and Methyl tert-butyl ether (MTBE)), and Total Petroleum Hydrocarbon (TPH) will be collected first and placed immediately into their containers. The matrix for the remaining samples (Lead) will be homogenized in a decontaminated stainless steel bowl prior to being placed in sample jars.

- Stainless steel spoons and bowls will be discarded or decontaminated to avoid cross contamination.

- Any observable physical characteristics of the soil as it is being sampled (e.g., color, odor, physical state) will be recorded in the field book.

- All pertinent weather information at the time of sampling, such as air temperature, wind and sky conditions, and precipitation will be recorded in the field log book.

b. Subsurface Soils (Laboratory/Confirmatory Sampling, if required based upon results of tank removal): At a minimum, one split spoon sample will be taken and logged for geological characteristics every five feet of depth. This minimum interval may be adjusted based upon anticipated contamination or geological conditions, or continuous split spoon sampling may be used in areas of extensive contamination. Samples for laboratory analysis will be taken at intervals based upon observations and results from the tank removal (e.g. expected depths of contamination, depths greater than excavation depth, etc.). Additionally, all split spoon samples will be field screened for Volatile Organic Compounds (VOC) using a Photo-ionization Detector (PID) or a Flame-ionization Detector (FID). A log of VOC readings vs. depth will be recorded when VOC readings are above background. This field screening for VOC will also be used to determine the areas of highest concentration which will then be chosen for sampling for laboratory analysis. The following sampling collection procedures will be followed:

- Care will be taken that the appropriate number of pre-cleaned sample bottles, including preservatives, will be transported to the field.

- Labels will be placed on pre-cleaned bottles prior to collection. Sample labels will be filled out with waterproof ink and include: sampler name; sample identification; sample location; date; and analysis to be performed. The actual time of collection will be added after collection.

- Steel split spoons, advanced in front of the advancing auger, or a steel and auger, will be used as the sampling tools. The split spoons and hand augers will be decontaminated after each use.

- The sample tool will be removed from the drilling area and the soil will be removed. The sample will be field screened for VOC using a PID/FID and the results recorded in the field log book.

- The lithology and other observable physical characteristics (e.g., color, odor, physical state) of the entire sample will be noted along with visual observations of contamination in the field log book.

- If a laboratory sample is to be taken, the sample jar will be filled using a stainless steel spoon

- Soils for VOCs (including BTEX and MTBE), and TPH will be collected first and placed immediately into their containers. Thee remaining samples (Lead) will then be placed in a sample jar.

- Stainless steel spoons will be discarded or decontaminated to avoid cross contamination.

- All pertinent weather information at the time of sampling, such as air temperature, wind and sky conditions, and precipitation will be recorded in the field log book.

c. Surface Water Sampling (if required): If water is encountered in any excavation that water will be sampled following the below procedures:

- Care will be taken that the appropriate number of pre-cleaned sample bottles, including preservatives, will be transported to the field.

- Labels will be placed on pre-cleaned bottles prior to collection. Sample labels will be filled out with waterproof ink and include: sampler name; sample identification; sample location; date; and analysis to be performed. The actual time of collection will be added after collection.

- A pre-cleaned, wide mouthed glass bottle will be used for sample collection and will be dipped into the excavation water and rinsed three times. The bottle will again be dipped into the excavation water to collect the sample and transfer it into the respective sample containers, with minimal turbulence and aeration. Water samples will contain only liquids (no sludges or sediments). Preservatives will not be added prior to rinsing.

APPENDIX A TO ACTION MEMORANDUM, REMOVAL ACTION, STUDY AREA 50, FORT DEVENS, MASSACHUSETTS

SAMPLING AND ANALYSIS

- Samples will be collected in such a manner to prevent agitation of the water, which promotes the loss of VOCs and increases the dissolved oxygen content.

- Samples to be analyzed for VOCs (including BTEX and MTBE) and TPH will be handled as little as possible. The sample vials (40 ml septum-sealed) will be immersed directly into the medium to be sampled and filled. Once the vial cap is secure, invert it, gently tap and check for any air bubbles. If any are present discard sample and resample. Preservatives will be added in such a way as the appropriate pH will be met prior to capping.

- After collection of VOC and TPH samples, samples for Lead will be collected.

- To avoid agitation of the sample and possible cross contamination, preservation of the sample to the appropriate pH will be checked using a separate bottle prior to the actual sampling for VOC and TPH analysis. A representative sample for the matrix and site will be collected, an appropriate amount of preservative added (i.e. two to three drops for VOC and one to two milliliters (ml) for TPH), the container shaken, and the pH tested using pH paper. Once the proper amount of preservative for each bottle type is determined, that amount of preservative will be added to the rinsed VOC or TPH sample bottle. For other analysis (Lead), the proper preservative will be added, the sample capped and shaken, and the pH checked by pouring a very small amount of sample into a sperate, disposable container and using pH paper on the sample aliquot.

- The temperature and pH of the excavation water will be measured in the field and recorded in the field log book.

- Any observable physical characteristics of the water (e.g., color, odor, turbidity) will be recorded in the field log book as the sample is being taken.

- Sample bottles will be wiped dry after being capped and placed in plastic bags to be shipped for analysis. Samples will be iced down in a cooler chest to remain at 4 deg. C, the Chain of Custody form will be taped to the underside of the lid and the lid taped shut.

- All pertinent weather information at the time of sampling, such as air temperature, wind and sky conditions, and precipitation will be recorded in the field log book.

d. Groundwater Sampling (if required): The following general procedures will be followed prior to and during the collection of groundwater samples from new and existing monitoring wells:

- Prior to the collection of a sample from a groundwater monitoring well, the well will be purged of static water to ensure a representative groundwater sample is taken. A minimum of five times the static water volume (including the saturated annulus) will be purged from the well prior to the collection of samples. Purging will be done using either dedicated teflon bailers or low flow pumps. The water removed from the well during the purging process will initially be containerized and observed visually and with monitoring instruments. If visual contamination is observed or the PID/FID monitoring instrument detects VOC more than 10 parts per million (ppm) above background, the drums will be retained for RCRA characterization and potential disposal as hazardous waste. If PID/FID readings are less than or equal to background and no visual contamination is observed, the water will be disposed of at the well site.

- A separate teflon bailer and rope will be dedicated to each well to prevent cross contamination.

- Care will be taken that the appropriate number of pre-cleaned sample bottles, including preservatives, will be transported to the field.

- Labels will be placed on pre-cleaned bottles prior to collection. Sample labels will be filled out with waterproof ink and include: sampler name; sample identification; sample location; date; and analysis to be performed. The actual time of collection will be added after collection.

- The pre-cleaned glass sampling bottles will be triple rinsed with sampling water in order to fill up any unused ionic bonds on the glass surface. Water samples will contain only liquids (no sludges, etc).

- The samples will be collected in such a manner as to prevent agitation of the water, which prompts the loss of VOCs and increases the dissolved oxygen content.

- Samples for VOC analysis will not have any headspace (bubbles) in the sample jar upon inversion and will be handled as little as possible.

- Samples for VOC and TPH analysis will be collected first, followed by samples for Lead.

- Preservatives to be used include: hydrochloric acid (for purgeable organics and TPH); nitric acid (for lead). All samples will have their pH < 2.

- Hydrochloric acid will be added to the VOC and TPH sample containers prior to collection. All other preservatives will be added after collection.

- The temperature, pH, and specific conductance of the water will be measured in the field an noted in the field log book.

- Any observable physical characteristics of the water (e.g., color, odor, turbidity) will be recorded in the field log book as the sample is being taken.

- Sample bottles will be wiped dry after being capped and placed in plastic bags to be shipped for analysis.

- All pertinent weather information at the time of sampling, such as air temperature, wind and sky conditions, and precipitation will be recorded in the field log book.

2. Field Screening: Field screening will be performed for VOC. VOC field screening will be performed using either a Photo-ionization Detector (PID) or a Flame-ionization Detector (FID) to measure Total Organic Volatiles (TOV) in parts per million (ppm, volume/volume) as benzene. A description of the field screening method follows:

PID/FID Field Screening (TOV):

- The PID/FID instrument will be calibrated in accordance with the manufacturer's instructions at least daily.

- Samples will be placed in glass containers and filled approximately 2/3 full. The container mouth will be covered with aluminum foil and the cap placed on the container.

- Samples will be allowed to stabilize at a temperature of 20 degrees Celsius (68 degrees Fahrenheit) for at least 20 minutes.

- The sample container lid will be removed, exposing the inner, aluminum foil cover. The foil cover will be pierced with the PID/FID probe to measure the TOV in the sample headspace.

3. Groundwater Monitoring Well Installation (if required): A typical detail for groundwater monitoring well installation is provided in Figure A-1. All wells will be completed in the unconsolidated glacial overburden above bedrock. The following procedures will be followed in monitoring well installation and construction:

- Drilling will be accomplished through the use of rotary drill rigs and hollow stem augers. Split spoon sampling will be performed in front of advancing auger, as required, IAW section 1.b. The only lubricant used on the drilling augers shall be teflon tape or vegetable oil.

- Monitoring well borings shall be drilled to a depth of 5 to 10 feet below the groundwater surface.

- The well shall be constructed of two inch (2") inside diameter (i.d.) threaded, flush joint, polyvinyl chloride (PVC) riser, a ten foot (10') section of 2" i.d. flush joint PVC well screen with 0.010 inch slots, and a threaded PVC cap.

- The bottom of the boring will be filled with a sufficient amount of clean and washed silica sand so that the water table intersects approximately the center of the well screen.

- The sand filter pack will extend at least one foot (1') above the top of the well screen. Above this will be a minimum two feet (2') thick bentonite seal. The remainder of the annular space will be grouted to within one foot (1') of the ground surface with a mixture of 30% bentonite, sand, and water using a tremie pipe.

- A protective steel casing rising two to three feet (2'-3') above the ground surface will placed in a concrete collar extending, at a minimum, one foot (1') into the ground surface. The casing shall be fitted with a locking cap. The PVC riser shall be fitted with a threaded vent cap which prevents material from entering the monitoring well.

- During well construction, all material that has a field screening result above background using a PID/FID will either be containerized or placed in the appropriate excavated soil pile until characterized and disposed of.

- Well logs for each well will be prepared and will include:

  - Name of project.

  - Hole number, hole designation, and elevation to top of hole (and or PVC riser).

  - Make and manufacturer's model designation of equipment used in exploration.

  - Name of driller, helper and field inspector/geologist.

  - Type of drilling and sampling operation by depth.

  - Depths at which samples were recovered or attempts made to sample. Classification or description by depths of soil penetrated, including soil type, moisture conditions, color, and other engineering considerations. Records of penetration resistance such as drive hammer blows per foot of penetration will also be recorded.

  - Percentage of sample or soil recovered per run.

  - Depth at which groundwater is encountered and depth of water in drill hole at beginning and end of each work day.

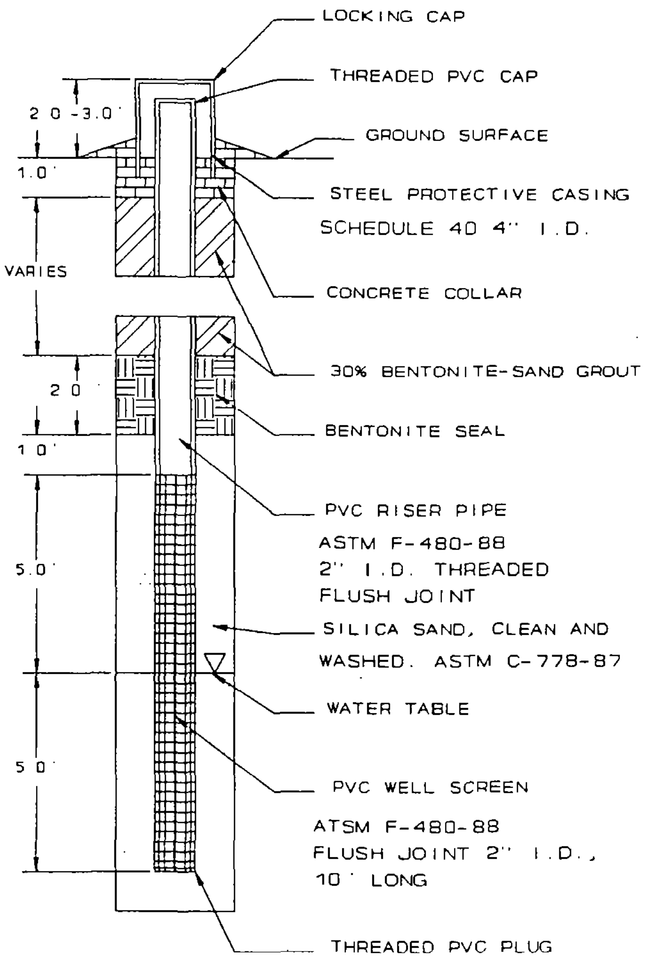
  - Depth to bottom of hole.

  - Depth to refusal (if encountered).

- Location sketch, including reference to at least three existing features.

FIGURE A-1

ELEVATION OF TYPICAL GROUNDWATER MONITORING WELL



- After completion, all wells will be developed to improve efficiency, remove any foreign matter introduced during drilling, and to reduce turbidity. Well development will be done for a minimum of one hour using a variable flow submersible pump. The following minimum factors will also be achieved during well development:

- The well water will be clear to the unaided eye.
- The sediment thickness remaining in the well will be less than one percent of the total screen length.
- The total volume of water removed from the well will be equal to five times the volume of drilling fluid lost plus five times the standing water volume in the well, including the saturated annulus.
- The turbidity, measured with a nephelometer, reaches an approximately steady number (no longer decrease with additional development).

4. Laboratory Analysis: All laboratory analysis shall be performed at a laboratory certified by the Commonwealth of Massachusetts for the analytes being tested for. All analysis shall be IAW USEPA Manual SW-846. Specific analytes and acceptable procedure numbers (SW-846) are listed below:

TABLE A-1, ANALYTES AND METHODS

Media	Analyte	Method (SW-846)
Soil	Total Petroleum Hydrocarbons (TPH)	modified 418.1
	Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)	8020 or 8240
	Methyl tert-butyl ether (MTBE)	8020 or 8240
	Lead (Pb)	6010, 7020, or 7021
Water	Total Petroleum Hydrocarbons (TPH)	418.1
	Benzene, Toluene, Ethylbenzene, and Xylene (BTEX)	8020 or 8240
	Methyl tert-butyl ether (MTBE)	8020 or 8240
	Lead (Pb)	6010, 7020, or 7021

5. Sample Numbers and Location: Sample numbers and locations

listed below are estimated only. The actual number may vary based upon conditions encountered in the field. Location referenced are shown in Figure 3.

a. Field Screening: Numbers and locations are specified in Table A-2, below:

TABLE A-2, FIELD SCREENING SAMPLING LOCATIONS

General Location	Total Number	Specific Locations	Analytes
UST Excavation (3 each)	30 (10 per UST excavation)	2 each wall 2 floor	TOV (PID/FID)
Water Control/Water Separator Pit	10	2 each wall 2 floor	TOV (PID/FID)
Truck Fill Stand	6	1 each wall 2 floor	TOV (PID/FID)
Pipe Line Between Water Control/Separator Pit and Truck Fill Stand	6	2 each wall 2 floor	TOV (PID/FID)
Hose Pit	6	1 each wall 2 floor	TOV (PID/FID)
Gasoline Pump Pit	6	1 each wall 2 floor	TOV (PID/FID)
Background	4	Unaffected by UST system	TOV (PID/FID)
Total	70		70 TOV

b. Confirmatory/Laboratory Samples: All samples are grab-type. The confirmatory laboratory samples will be from the locations of highest field screening results, or if field screening is below detection level of instrument, one sample each from the floor and a wall of the excavation. Sample numbers and locations are provided in Table A-3, below:

APPENDIX A TO ACTION MEMORANDUM, REMOVAL ACTION, STUDY AREA 50, FORT DEVENS, MASSACHUSETTS
SAMPLING AND ANALYSIS

TABLE A-3, CONFIRMATORY/LABORATORY SAMPLING LOCATIONS

Location	Number of Samples	Analytes
UST Excavations (3 each)	6 (2 per excavation)	TPH, BTEX, MTBE, Pb
Water Control/Water Separator Pit	2	TPH, BTEX, MTBE, Pb
Truck Fill Stand	2	TPH, BTEX, MTBE, Pb
Pipe Line Between Water Control/Separator Pit and Truck Fill Stand	2	TPH, BTEX, MTBE, Pb
Hose Pit	2	TPH, BTEX, MTBE, Pb
Gasoline Pump Pit	2	TPH, BTEX, MTBE, Pb
Total	16	16 TPH 16 BTEX 16 MTBE 16 Pb

6. <u>Quality Assurance/Quality Control</u>: The Quality Assurance/Quality Control consists of both field and laboratory measures taken to protect the overall quality of the data produced from the sampling and analysis program. The laboratory program consists of compliance with laboratory specific methodologies specified in USEPA Manual SW-846 and the various requirements of State and USEPA certification. This should include, but is not limited to: laboratory blanks; surrogates (percent recovery); matrix spike/spike duplicates; etc. The number required will be specified in the SW-846 or the individual certification program. The field program consists of strict compliance to the sampling procedures specified in Section 1, and 2, strict compliance with the groundwater monitoring well installation procedures of Section 3, and strict compliance with the decontamination procedures of Section 7. Additionally, the following field samples will be taken and analyzed above those specified in Section 5:

- Trip Blanks are field blanks that are not exposed to field conditions, used to evaluate quality of VOC data. Their analytical results provide the overall level of contamination from everything except ambient field conditions. Trip blanks will be prepared at the laboratory prior to the sampling event and shipped along with the sampling bottles. They will be prepared by adding organic-free water to a 40 ml VOC vial containing 2 to 3 drops of hydrochloric acid and inverted to check for zero headspace. One trip blank will be used in every cooler of samples containing VOC samples, or one trip blank per ten VOC samples (regardless of matrix), whichever is greater. Each trip blank will be transported to the sampling location, handled like a sample, and returned with the samples to the laboratory for analysis without being opened in the field.

- Field Equipment/Rinsate Blanks are field blank samples designed to demonstrate that the sampling equipment was properly prepared and cleaned before fied use and the cleaning procedures between samples was sufficient to minimize cross-contamination. Rinsate will be prepared by passing analyte free water (de-ionized water) over the sampling equipment after decontamination, collecting a portion of the final water, and analyzing this sample for applicable parameters (TPH, BTEX, MTBE, Lead). Rinsate blanks will be collected at a frequency of one per 20 samples per decontamination event. Rinsate blanks will not be collected with sampling activities using dedicated equipment.

7. Decontamination: Decontamination consists of the proper cleaning of sampling equipment as well as well drilling and excavating equipment to prevent cross-contamination of samples and prevent the spread of possible contamination off of the site. A temporary equipment decontamination station will be constructed near the work site. This station will be used to decontaminate all equipment and will consist of an area approximately 12 feet by 12 feet square, with a defined perimeter at least 6 inches high and lined with heavy (at least 8 mil) impervious plastic sheeting to collect all water used in the decontamination process. the primary purpose of the station is to decontaminate equipment such as augers, well casings, split spoons, well screens, and excavator buckets. All collected water and sediment will be field screened for TOV using the headspace analysis method described in Section 2. If TOV is determined to be above background, the decontamination water will be containerized, tested for hazardous constituents, and disposed of properly.

- Decontamination of Drilling and Excavating Equipment:

All drilling equipment will be decontaminated daily at a minimum, or following the completion of a sampling location. All excavation equipment will be decontaminated daily at a minimum or after excavating a zone of obvious, extensive contamination. Equipment decontamination will follow the following general procedures:

  - High pressure cleaning (steam cleaning). Surfactants (non-phosphate containing detergents) may be added to high pressure cleaning system if equipment is obviously contaminated.
  - Scrubbing with brushes to remove remaining soil on equipment.
  - High Pressure rinsing with potable water.

- Decontamination of sampling equipment: Split spoons and other non-disposable sampling equipment will be decontaminated following each sampling event. The following procedures will be followed in decontaminating sampling equipment:
  - Rinsing with potable water.
  - Scrubbing with brushes to remove soil.
  - Washing/rinsing with phosphate-free surfactants or solvents if extensive contamination is encountered or believed to be remaining on sampling equipment.
  - Double rinsing with potable water.
  - Final rinsing with de-ionized water.
  - Air drying.

8. Waste Handling: All investigation derived waste (IDW, soil and water) and excavated soil will be handled in the same manner for characterization and disposal. The following minimum procedures will apply (certain disposal facilities may require more extensive characterization):

- All contaminated or potentially-contaminated excavated soil will be placed upon two 8 mil polyethylene sheets. Soil will be segregated into separate piles. One pile (highly contaminated) will receive all soil that field screens (IAW Section 2) above 1800 ppm for TOV using PID/FID methods. The second pile (potentially contaminated) will receive all soil that field screens (IAW Section 2) above background for TOV using PID/FID methods. The third pile (clean) will receive all soil that screens below background for TOV. The highly contaminated and potentially contaminated piles will be fully covered with 8 mil polyethylene to prevent rainwater or snowmelt infiltration and surrounded by petroleum adsorbent booms.

- The minimum sampling frequency (field screening) is as follows: for soils that will be disposed of in landfill (hazardous/non-hazardous), one grab sample every 20 cubic yards (cy); for soils that will be disposed of in either on-site or off-site recycling facility, one grab sample per 100 cy.

- The soil from the clean pile (field screen below background) will be treated as a solid waste.

- Soil from the contaminated and potentially-contaminated soil piles will be sampled for full Resource Conservation and Recovery Act (RCRA) characterization at a minimum frequency of one sample per 100 cy. Soil samples will be sampled for all 39 Toxicity Characteristic Leaching Procedure (TCLP) constituents IAW 40 CFR Part 261, Appendix II, Volume 55, No., 126, June 1990. Soil Samples will also be analyzed for Ignitability, Corrosivity, and Reactivity using USEPA Manual SW-846 procedures.

- All soil that characterizes as hazardous due to RCRA characterization will be transported and disposed of as hazardous waste. The Installation Environmental Management Office (IEMO), Fort Devens will sign all hazardous waste manifests as the generator. All soil classified as hazardous waste will be disposed of in a Treatment Storage and Disposal Facility (TSDF) licensed by the state of disposal.

- All soil that contains petroleum products but is not classified as hazardous waste will be disposed of as petroleum contaminated, non-hazardous waste. The IEMO will coordinate for signature on Bills of Lading for the transport of the soil. All soil that field screens above 1800 ppm TOV cannot be disposed of in a landfill.

It must either be treated or recycling. Petroleum contaminated, non-hazardous soil that field screened less than 1800 ppm TOV may be disposed of in an approved landfill, treated or recycled.

RESPONSE TO COMMENTS FROM USEPA REGION I
ON DRAFT ACTION MEMORANDUM FOR REMOVAL ACTION AT STUDY AREA 50

Comment 1) General Comment: Has a Health and Safety Plan (HASP) been created for these removal actions? Or will the existing Superfund/IRP HASP be used or modified?

Response: The removal contractor will be required to submit a Contamination/Hazardous Plan, detailing work procedures to be followed during the removal and disposal of contaminated/hazardous materials. Other areas such as excavation, backfilling, general equipment operations, etc. are contractually obligated through reference to appropriate Federal or State Regulation or Military Specification.

Comment 2) VI. PROPOSED ACTION, Pgs. 10, 11, & 12:

> **a. Will any sampling be performed in or around the water separator, water control pit, truck filling stands, hose pit, or gasoline pit? What about UST line excavations? It would appear necessary to sample these areas to fully characterize the extent of potential contamination.**
>
> Response: Soil sampling in accordance with (IAW) the agreements reached at the November 5, 1992 Underground Storage Tank (UST) Protocol meeting will be performed at all appurtenances (UST lines, water separators, water control pit, truck filling stand, hose pit and gasoline pit). Sampling will be for Total Petroleum Hydrocarbons (TPH, Environmental Protection Agency (EPA) Manual SW-846, Extraction Method 9071, Analysis Method 9073), Benzene, Toluene, Ethylbenzene, and Xylene (BTEX, EPA Manual SW-846, Analysis Method 8020), Methyl tert-butyl ether (MTBE, EPA Manual SW-846, Method 8020), and Lead (EPA Manual SW-846, Analysis method 6010, 7420, or 7421). Numbers of samples and analysis methods will be detailed in the final version of the Action Memorandum.
>
> **b. Regarding treatment of contaminated soils on site, please see section XI (permits) of the Federal Facilities Agreement concerning the requirements for on-site treatment/response actions under Superfund and the enclosed OSWER Directive.**
>
> Response: These factors will be considered when determining appropriate disposal method.

c. When sampling the UST excavations, UST line excavations, and resultant soil piles, the SAMPLING PROCEDURES outlined on Page 6 (Item #14) of the April 2, 1992 Fort Devens Underground Storage Tank Removal Protocol issued jointly by EPA and MDEP should be followed.

Response: The procedures agreed upon at the November 5, 1992 UST Protocol meeting will be followed.

d. For this removal action, more detail is needed concerning the sampling and analysis plan presented here. Please included the following information or references in the next version of the Action Memorandum: sample collection method, sample analysis method number, level of QA/QC to be performed, and decontamination procedures.

Response: More detail on sample numbers, methods, QA/QC, and decontamination will be provided in Appendix A to the Action Memorandum, which will be added and entitled Sampling and Analysis. Details are provided in the response to comment 2) a., above.

e. If disposed of off-site, where will the hazardous/non-hazardous waste be disposed of? Who will dispose of it; Fort Devens or the contractor performing the removal?

Response: The actual off-site disposal site is, at this time, undetermined. The contractor will perform the disposal and propose a site, which must be duly permitted will be subject to approval of Fort Devens. Fort Devens will provide generator signatures on Manifests for Hazardous Waste and provide coordination for signatures on Bills of Lading for non-hazardous waste.

f. When will the post-removal report and sampling results become available to EPA? This report should include copies of all manifests and/or shipping papers generated by the actions.

Response: Following the removal of the tank and localized contaminated soils and the receipt of confirmatory sampling results, a Post Removal Report will be provided. Anticipated dater is within 120 days of the initiation of the removal action. This report will include the tank and appurtenance locations, sampling locations and results, and all manifests and/or shipping papers.

NEWS FROM THE PUBLIC AFFAIRS OFFICE
FORT DEVENS, MASSACHUSETTS 01433
(508) 796-2159

FOR ADDITIONAL INFORMATION: Phil Morris

ARMY PULLS ABANDONED 25,000 GALLON FUEL TANKS

Three 25,000 gallon fuel tanks, remnants of a long abandoned World War II aircraft refueling station were pulled from the ground in the past two weeks at Fort Devens' Moore Army Airfield. Officials from the state's Department of Environmental Protection, as well as, Fort Devens officials were on hand to observe the tank pulling.

The incident went without mishap as the huge barrel shaped containers were slowly dragged from the earth that had housed them for 50 years. While originally filled with aviation gasoline, the tanks had more recently been filled with water. The water had been pumped out of the tanks before removal and the superstructures surrounding the tanks had been removed by a steamshovel owned by Zenone, Incorporated of Northboro, the Army contractors.

According to Devens' spokesman Phil Morris, the tanks were originally installed during World War II and were part of an intricate fueling system that utilized the adjacent railroad spur to deliver the fuel. It was pumped from railcars into the 25,000 gallon holding tanks and then transferred to dispensers located as far away as various locations on the airfield's tarmac. Some of the piping the dispensers are still in place according to Morris.

The refueling system was abandoned after the war and for many years lay forgotten. Devens' environmental people discovered the system during research of the site for possible contamination.

According to Jim Chambers, Fort Devens project officer, wells have been installed in the area adjacent to where the tanks were buried to monitor possible leakage and the effect it would have on the ground water. Soil samples are also being taken, Chambers said.

According to Bill Mullen, Fort Devens Superfund project manager, the removal of the 25,000 gallon tanks is part of an Army initiated removal action taken at a Superfund area. The Removal Action Memorandum that described what was scheduled to take place and the method of removal received regulatory concurrence, Mullen added. "This is significant," Mullen said, "Since this is our first removal action," Mullen said, "We are finally turning dirt as opposed to just studying sites." According to Mullen there are other removal actions pending.

Devens has been a Superfund site since November of 1989 when it was listed on the National Priorities List by the U.S. Environmental Protection Agency. Currently there are more than 50 potential sites listed on the installation.