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New England District

REMOVAL ACTION MEMORANDUM
CONTAMINATED SOIL REMOVAL
FOR AREA OF CONTAMINATION (AOC) 57
DEVENS, MASSACHUSETTS

CONTRACT DACA-31-94-D-0061
DELIVERY ORDER NO. 0001

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
CONCORD, MASSACHUSETTS

JANUARY 1999

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DEVENS, MASSACHUSETTS

Prepared for:

U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

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Portland, Maine
Project No. 9144-03

January 1999

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1.0 PURPOSE

The purpose of this Action Memorandum is to document the decision to perform a removal action in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended, at Area 3 of Area of Contamination (AOC) 57 at Devens, Massachusetts. The removal action entails removal of petroleum contaminated soils from within a defined disposal area which is acting as a source of downgradient contamination. This Action Memorandum was prepared in accordance with current U.S. Environmental Protection Agency (USEPA) guidance (USEPA, 540/P-90/004, December 1990).

2.0 SITE CONDITIONS AND BACKGROUND

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) states that a removal action may be conducted at a site where a threat to human health and welfare or the environment is established. An appropriate removal action is taken to abate, minimize, stabilize, mitigate, or eliminate the release or threat of release at the site. The following subsections briefly describe the history of AOC 57 Area 3 as well as the results of the investigations at this site.

2.1 SITE DESCRIPTION

AOC 57; which consists of Areas 1,2, and 3, is located south of Barnum Road, on the former Main Post of Fort Devens (hereafter referred to as Devens) (Figures 2-1 and 2-2). A storm drain outfall which collects rainfall from the paved areas around Building 3713 has been designated Area 1. Area 2 is located 800 feet northeast of Area 1 adjacent to a vehicle storage yard associated with the former motor repair shops located in Buildings 3757 and 3758. Area 2 formerly consisted of an eroded drainage ditch created by precipitation runoff. The area was regraded in conjunction with a 1994 soil removal and a permanent drainage swale was installed. Area 3 is located approximately 600 feet northeast of Area 2 on a strip of land between fenced in motor pools to the north and the forested Cold Spring Brook floodplain to the south. Historical photographs and previous investigations have shown that this area was the site of past disposal of vehicle and maintenance related wastes.

2.2 PREVIOUS INVESTIGATIONS

The following subsections summarize the previous investigations performed at AOC 57 Area 3 along with a brief summary of the analytical data derived from each investigation. For the purposes of this Action Memorandum the discussion will focus on the contaminant concentrations and analytical results obtained from the source area. A more thorough discussion of the 1998 analytical data will be provided in the AOC 57 Final RI Report. Complete documentation of the previous investigations and removal actions performed at Areas 1,2, and 3 are provided in the AOC 57 Draft Remedial Investigation (RI) Report (ABB-ES, 1997). A more thorough discussion of the 1998 analytical data will be provided in the AOC 57 Final RI Report.

2.2.1 1995, 1996, and 1998 Task 1 Remedial Investigation and Addendum

The initial field investigation at Area 3 was performed in August and September of 1995 as part of a Remedial Investigation (RI) being performed at Area 2. Explorations were conducted at Area 3 based upon potential soil staining observed in historical photographs. Because of contamination detected during the 1995 RI, further investigation was planned and performed at Area 3 during the fall of 1996 to characterize the contaminant source area and define contaminant distribution. Based upon regulatory comments additional sampling

was performed in the spring of 1998 to further delineate the downgradient extent of contamination.

2.2.1.1 RI Field Analytical Soil Results. A total of eight test pits were excavated at Area 3, 57E-95-21X through 57E-95-24X in 1995 and 57E-96-28X through57E-96-31 X in 1996. Forty soil samples were collected from the test pits for on-site analysis of BTEX select VOCs, and TPHC. Soil samples were collected based upon visual evidence and/or PID screening.

Detected VOCs included chlorobenzene, ethylbenzene, m/p-xylene, o-xylene, chloroform and naphthalene (technically an SVOC but calibrated for in the field lab). The VOCs were detected mainly in the vicinity of test pits 57E-95-24X and 57E-96-28X through 57E-96-31X. The maximum observed VOC concentrations were found in the 10 feet below ground surface (bgs) sample from 57E-96-31X with ethylbenzene reported at 8,800 µg/kg, m/p-xylene at 26,000 µg/kg, o-xylene at 9,900 µg/kg, and naphthalene at an estimated ("J" qualified) concentration of 12,000 µg/kg.

Soil samples from AOC 57 Area 3 were also analyzed for total petroleum hydrocarbon (TPHC) (USEPA Method 418.1) and gasoline range organics (GRO) (1995 samples only). TPHC was detected in 26 soil samples with a maximum concentration that exceeded the detection limit of 63,000 mg/kg at 4 feet bgs in 47E-96-31X.

Between 1995 and 1996 a total of 87 soil samples were collected from 20 TerraProbe points, six soil borings and one monitoring well boring to aid in the delineation of horizontal and vertical contaminant distribution, determine the source of contamination, and confirm monitoring well placement.

Detected VOCs included ethyl benzene, toluene, chlorobenzene, m/p-xylene, o-xylene, naphthalene, 1,1-DCE, 1,2-DCB, and 1,4-DCB. Naphthalene and the dichlorobenzene suite were not calibrated for until after commencement of the 1996 sampling program; therefore, soil samples from TerraProbe points 57R-96-07X through 57R-96-12X at 6 feet bgs were not analyzed in the field for these compounds.

Naphthalene was detected in the soil borings 57B-96-07X (0, 5 and 10 feet bgs) and 57B-96-12X at 5 feet bgs as well as the TerraProbe points 57R-96-13X (3 and 5 feet bgs), 57R-96-14X (3 feet bgs), 57R-96-15X (3, 5, and 9 feet bgs), 57R-96-16X (3 feet bgs), and 57R-96-19X (9 feet bgs). Estimated naphthalene concentrations ranged between 440 µg/kg and 27,000 µg/kg in the 10 and 5 foot bgs samples from 57B-95-07X. 1,2-DCB and 1,4-DCB were detected in four samples; 57B-96-07X (5 feet bgs), 57R-96-15X (5 and 9 feet bgs), and 57R-96-19X (1,2-DCB only at 9 feet bgs). The maximum observed concentrations of 1,2-DCB and 1,4-DCB were 46,000 and 14,000 µg/kg in the 5 foot bgs sample from 57B-95-07X. DCB hits were found coincident with the higher concentrations of naphthalene, ethylbenzene and xylenes.

Other detected VOCs included 1,1-DCE at 370 µg/kg in the 10 foot bgs sample from 57B-96-09X and an estimated concentration of 5.4 µg/kg in the surficial sample from

57R-95-01X. Chlorobenzene was detected in 57B-96-12X at 5 feet bgs at a concentration of 4,700 µg/kg, in 57R-95-04X at 10 feet at a concentration of 49 µg/kg, and the 10 feet bgs duplicate sample from 57R-96-10X at a concentration of 300 µg/kg.

TPHC were detected in 37 of the soil samples collected in 1995 and 1996 from Area 3 soil borings and TerraProbe points. The maximum observed concentration was 39,000 mg/kg in the 5 feet bgs sample from 57R-96-13X. Other significant detections (e.g., in excess of 500 mg/kg) include the 0 and 5 feet bgs samples from 57B-96-07X at 12,000 and 14,000 mg/kg, respectively, the 5 feet bgs sample from 57B-96-11X at 7,400 mg/kg, the 5 feet bgs sample from 57B-96-12X at 13,000 mg/kg, the 4 feet bgs sample from 57R-95-05X at 4,500 mg/kg, the 3 and 5 feet bgs samples from 57R-96-13X at 9,400 mg/kg, the 3, 5, and 9 feet bgs samples from 57R-96-15X at 12,000, 12,000, and 14,000 mg/kg, respectively, and the 9 feet bgs sample from 57R-96-19X at 700 mg/kg. TPHC contamination is approximately coincident with the VOC contamination and is located from the vicinity of test pit 57E-95-24X to the soil boring 57B-96-12X.

In May of 1998 an additional 12 soil samples were collected from six downgradient sampling points to aid in defining the downgradient contaminant distribution. The soil samples were screened at the on-site laboratory for TPHC by IR. The maximum detected concentration was 2,900 mg/kg from the surficial sample collected at 57S-98-14X. The TPHC concentrations for theses samples were significantly lower that those samples collected in proximity to the source area.

2.2.1.2 RI Off-Site Analytical Soil Results. In 1995 and 1996 five total soil samples were collected from the Area 3 test pits 57E-95-24X, 57E-96-28X, 57E-96-29X, 57E-96-30X and 57E-96-31X. Soil samples were selected for off-site analysis based upon visual evidence, PID screening, and on-site analytical results. Samples were collected from depths ranging from 4 to 11 feet bgs and analyzed at the off-site laboratory for PAL VOCs, SVOCs, inorganics, pesticides/PCBs, and TPHC as well as petroleum fingerprinting in 1996.

Inorganic analytes detected in exceedance of established background concentrations consisted of antimony, cadmium, calcium, copper, lead, sodium and zinc. Sodium was in excess of background in all of the samples. The majority of the remaining exceedances occurred in the 4 feet bgs sample from 57E-95-24X which is located in the center of the disposal area.

Ethylbenzene, xylenes, and / or PCE were detected in three of the soil samples from Area 3 test pits. The identified laboratory contaminants 2-hexanone and trichlorofluoromethane (freon) were also detected in the soil samples. PCE was observed at 0.0094 µg/g in the 10 feet bgs sample from 57E-96-28X and 0.0018 µg/g in the 4 feet bgs sample from 57E-95-24X. Ethylbenzene and xylenes were detected in the 10 feet bgs sample from 57E-96-28X at 0.0042 µg/g and 0.066 µg/g respectively. The 6 feet bgs sample from 57E-96-30X was shown to contain 0.13 µg/g of xylenes.

SVOC compounds were detected in all four of the soil samples collected form the test pits excavated in 1996 (57E-96-28X through 57E-96-31X). The bulk of the detections

occurred in the 10 feet bgs sample from 57E-96-28X. Detected SVOC analytes consist of 1,2,4-trichlorobenzene at 0.5 µg/g, 1,2-dichlorobenzene at 6 µg/g, 1,4-dichlorobenzene at 4 µg/g, 2-methylnaphthalene at 0.4 µg/g, fluoranthene at 1 µg/g, fluorene at 0.3 µg/g, chrysene at 1 µg/g, naphthalene at 2 µg/g, phenanthrene at 0.4 µg/g, and pyrene at 3 µg/g.

The pesticide aldrin was detected in the 4 feet bgs sample from 57E-95-24X at 0.0255 µg/g. Chlordane-alpha was found in 57E-95-28X at 0.0103 µg/g. In addition, chlordane-alpha and heptachlor epoxide were detected in 57E-95-31X at 0.068 and 0.00691 µg/g respectively. PCBs were detected in three of the test pit soil samples. The highest observed concentration of PCBs, 3.6 µg/g of PCB 1248 and 10 µg/g of PCB 1260, was found in 57E-95-24X at 4 feet bgs. 1.7 µg/g of PCB 1260 was also found in the 10 feet bgs sample from 57E-96-28X.

TPHC was detected in all of the Area 3 test pit soil samples at concentrations ranging between 64,900 µg/g at 57E-95-24X and 262 µg/g at 57E-96-29X. Petroleum fingerprinting performed on samples collected in 1996 showed that all samples were below detection limit for the gasoline, diesel, and aviation gas patterns.

Eleven soil samples were collected for off-site analysis from five soil borings at AOC 57 Area 3 as part of the 1995 and 1996 field investigations (57B-96-07X through 57B-96-11X). Soil samples were collected from the soil borings to confirm field analytical results and delineate horizontal and vertical distribution of contaminants. Samples were collected from depths ranging from the 0 to 10 feet bgs and analyzed at the off-site laboratory for PAL VOCs, SVOCs, inorganics, pesticides/PCBs, and TPHC as well as petroleum fingerprinting in 1996.

Inorganics analysis indicated that arsenic, barium, calcium, cadmium, copper, lead, manganese, silver, sodium, and zinc were present in concentrations that exceeded established background concentrations for Fort Devens soils. Sodium was detected in excess of background concentrations in every sample. Inorganic concentrations in soils do not appear to be related to sample depth. The greatest number of reported exceedances were found in the surficial sample from 57B-96-07X.

Analysis for VOCs indicated that six of the samples contained toluene. The majority of the toluene concentrations are consistent with it being reported as a potential laboratory or sampling contaminant. However, the highest detected concentration, 0.31 µg/g at 5 feet bgs in 57B-96-07X, is substantiated by a detection of ethylbenzene at 1.2 µg/g and xylenes at 22 µg/g. PCE was detected in one sample, the surficial sample from 57B-96-07X at a concentration of 0.0057.

SVOC compounds were detected in two soil boring samples from Area 3. The 5 foot bgs sample from 57B-96-07X contained 31.3 µg/g of SVOCs including 8 µg/g of 1,2-dichlorobenzene, 2 µg/g of 1,4-dichlorobenzene, 9 µg/g of 2-methylnaphthalene, and 9 µg/g of naphthalene. The surficial sample from 57B-96-09X contained 0.448 µg/g of total SVOCs.

Pesticides were detected in two of the soil boring samples. The surficial sample from 57B-96-09X was shown to contain 0.0081 µg/g of 4,4'-DDE and 4,4'-DDT at concentrations of 0.0081 and 0.0121 µg/g respectively. The five feet bgs sample from 57B-96-11X contained 0.017 µg/g of 4,4'-DDE.

Three of the samples contained PCBs. The surficial sample from 57B-96-07X had detections of 1242 PCB and 1260 PCB at 3.4 and 8 µg/g respectively. The 5 feet bgs sample from the same boring contained 2.6 µg/g of PCB 1242 and 6.1 µg/g of PCB 1260. PCB 1260 was also detected at a concentration of 7.4 µg/g at 5 feet bgs in boring 57B-96-11X.

Five samples were shown to contain measurable levels of TPHC. Three of these samples contained significant amounts (e.g., in excess of 100 µg/g); the surficial sample from 57B-96-07X contained 41,400 µg/g, the 5 feet bgs sample from the same boring contained 31,600 µg/g, and the 5 feet bgs sample from 57B-96-11X was found to contain 4,250 µg/g. Petroleum fingerprinting of the soil samples indicated that the TPHC contamination was consistent with a motor oil pattern.

Three of the 12 soil samples collected in 1998 were sent to the off-site laboratory for analysis of VOC, SVOC, pesticides/PCBs, TPHC by IR, select inorganics, and EPH. Analytical results from this downgradient area show much lower contaminant concentrations than the source area to the north.

2.2.1.3 Summary of Soil Impacts. Soil sampling from test pits, TerraProbes, and soil borings at Area 3 indicated that concentrations of soil contaminants are highest in the vicinity of test pit 57E-95-24X to the soil boring 57B-96-07X. A historic disposal site located from the surface to 5 feet bgs was located by test pits 57E-96-28X through 57E-96-31X. Advective transport and sorption appears to have aided in the southerly migration of soil contamination.

The most significant observed soil contaminants include the SVOCs naphthalene, 1,2-DCB, and 1,4-DCB. Elevated levels of PCBs in soil were encountered in proximity to the defined source area

Elevated levels of TPHCs were observed coincident with the SVOC contamination.

2.2.1.4 RI Field Analytical Groundwater Results. Thirty-three groundwater samples were collected from TerraProbe points, monitoring well borings, and soil borings. All of the groundwater samples were analyzed in the field for BTEX, select VOCs, and GRO (1995 samples only

BTEX, chlorobenzene, PCE, and GRO were detected in groundwater samples collected from six TerraProbe points in 1995, 57R-95-01X through 57R-95-06X. The highest concentrations of BTEX compounds were found in the groundwater sample from 57R-95-05X including 110 µg/l of benzene, 240 µg/l of toluene, 410 µg/l of ethylbenzene, and

1,650 µg/l of xylenes. This sample also contained 43,000 µg/l of GRO, which was in excess of the detection limit. PCE was detected in two samples, 2.1 µg/l in 57R-95-02X and 2.5 µg/l in 57R-95-04X.

Field analysis of groundwater samples collected in 1996 showed concentrations of TEX, 1,2-DCB, 1,4-DCB, 1,1-DCE, PCE, and naphthalene. Notable detections include 3.2 µg/l of PCE at 57B-96-08X, 110 µg/l of 1,2-DCB and 130 µg/l of naphthalene in 57R-96-19X, and 95 µg/l of 1,1-DCE in 57B-96-09X.

2.2.1.5 RI Off-Site Analytical Groundwater Results. Groundwater samples were collected using low-flow sampling protocols in November of 1996 from seven monitoring wells at AOC 57 Area 3 (G3M-92-07X, 57M-95-03X, 57M-96-09X, 57M-96-10X, 57M-96-11X, 57M-96-12X, and 57M-96-13X). Two rounds of samples were collected from G3M-92-07X and 57M-95-03X in conjunction with the Area 2 groundwater sampling which was performed using conventional purge and bail sampling in the fall of 1995 and winter of 1996.

Arsenic, barium, cadmium, calcium, iron, manganese, potassium, sodium, sodium, and zinc were identified at concentrations in excess of established Fort Devens background concentrations. Two of these compounds were detected at levels in excess of MCLs, cadmium at 8.67 µg/l in 57M-95-03X and arsenic at 170 µg/l in the normal and duplicate samples from 57M-96-11X.

VOCs were detected in 57M-95-03X, 57M-96-11X, 57M-96-12X, and 57M-96-13X. Toluene was found in all of these samples with a maximum concentration of 19 µg/l in 57M-95-03X. Toluene, at 1.1 µg/l, was the only VOC detected in 57M-96-12X. 57M-96-13X contained toluene at 2.9 µg/l, ethylbenzene at 2.8 µg/l, and the only detection of styrene with 8 µg/l. Chlorinated solvents comprised the majority of the detections in 57M-95-03X and 57M-96-11X. 57M-95-03X contained 4.5 µg/l of carbon tetrachloride, 10 µg/l of chloroform, 2.9 µg/l of dichloromethane, 0.59 µg/l of TCE, 2.6 µg/l of PCE, as well as 46 µg/l of ethylbenzene and 200 µg/l of xylenes. 57M-96-11X contained 0.89 µg/l of 1,2-DCE (cis and trans), 1.1 µg/l of TCE, and 4.8 µg/l of PCE. This sample also contained 0.86 µg/l of toluene, 4.6 µg/l of ethylbenzene, and 6.8 µg/l of xylenes.

The majority of SVOC detections occurred at 57M-95-03X and 57M-96-11X. 57M-95-03X, located immediately downgradient of the identified source area contained 9.8 µg/l of 1,2-DCB, 5.6 µg/l of 1,4-DCB, 4.4 µg/l of 2-methylnaphthalene, 1.5 µg/l of 4-methylphenol, and 20 µg/l of naphthalene. The duplicate sample from 57M-96-11X, the furthestmost downgradient well contained 3.4 µg/l of 1,2-DCB, 3.3 µg/l of naphthalene, and 6.7 µg/l of bis(2-ethylhexyl) phthalate. Other SVOC detections include 5 µg/l of methylphenol in 57M-96-13X and 12 µg/l of bis(2-ethylhexyl) phthalate in the sample from the upgradient well G3M-92-07X.

No pesticides, PCBs, or TPHC were detected in Area 3 groundwater.

2.2.1.6 Summary of Groundwater Impacts. Area 3 groundwater contamination occurs primarily from the source area located immediately north of 57M-95-03X to the furthestmost downgradient monitoring well 57M-96-11X. Contaminants observed in this area include inorganics, VOCs and SVOCs.

Elevated levels of cadmium and arsenic were observed in 57M-95-03X and 57M-96-11X, respectively.

Detected VOCs include TEX, TCE, and PCE. Additional VOCs detected in the source area well 57M-95-03X include carbon tetrachloride and chloroform. Additional VOCs detected at the downgradient well consist of the chlorinated degradation product 1,2-DCE.

SVOCs are significant groundwater contaminants at Area 3. SVOCs detected consist of 1,2-DCB, 1,4-DCB, and naphthalene. These SVOCs were detected at both the source area well 57M-95-03X and the downgradient well 57M-96-11X.

Field screening and off-site analyses of groundwater samples indicate that the groundwater contamination is located primarily from the source area in the vicinity of test pit 57E-95-24X south to the monitoring well 57M-96-11X.

No pesticides, PCBs, or TPHC were detected in Area 3 groundwater.

2.3 STATE AND LOCAL AUTHORITIES ROLE

This Action Memorandum for AOC 57 Area 3 at Devens, Massachusetts, will be submitted to the USEPA and to the Massachusetts Department of Environmental Protection (MADEP) for review.

3.0 THREATS TO HUMAN HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTOHORITIES

Section 300.415 of the NCP outlines factors to be considered in establishing the appropriateness of a removal action. This section evaluates factors for AOC 57 Area 3.

3.1 THREATS TO PUBLIC HEALTH AND WELFARE

3.1.1 Actual Or Potential Exposure to Hazardous Substances or Pollutants or Contaminants by Nearby Populations of the Food Chain

This Action Memorandum outlines the removal of an approximately 40 foot square historical disposal area at AOC 57 Area 3. The area was apparently used for disposal of vehicle maintenance related wastes and is acting as the source of contaminants detected at Area 3. It is estimated that approximately 1,300 cubic yards of petroleum contaminated soils will be removed.

Human health risks related to exposure to Area 3 surface and subsurface soils have been calculated. Soils in the vicinity of the disposal/source area have been shown to pose a human health risk based upon concentrations of TPHC and PCBs.

A complete human health risk assessment for AOC 57 Area 3 will be provided in the AOC 57 Final RI report.

3.1.2 Actual Or Potential Contamination Of Drinking Water Supplies

Groundwater at Area 3 varies in depth from approximately 16 feet bgs at the northern perimeter of the site to 0 feet bgs in the Cold Spring Brook floodplain to the south. Groundwater quality is monitored by six monitoring wells and two piezometers installed and sampled as part of the RI. In addition, surface water has been sampled from areas fed by groundwater discharge at Area 3.

AOC 57 Area 3 does not lie within a delineated Zone II and no known drinking water supply wells or sources have been affected by the contamination associated with Area 3.

3.1.3 Hazardous Substances, Pollutants, Or Contaminants In Drums, Barrels, Tanks, Or Other Bulk Storage Containers That May Pose A Threat Of Release

Other than the disposal/source area which consists of contaminated soils and debris, no hazardous substances, pollutants, or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release have been identified at or near AOC 57 Area 3.

3.1.4 High Levels Of Hazardous Substances Or Pollutants Or Contaminants In Soils Largely At Or Near The Surface That May Migrate

TPHC and petroleum related contamination is present near and at the surface in the proximity of the disposal/source area. There is no protective cover or barrier (e.g., pavement) which would prevent direct contact. The source area soil removal is expected to mitigate the risk of contaminant migration.

3.1.5 Weather Conditions That May Cause Hazardous Substances Or Pollutants Or Contaminants to Migrate Or Be Released

Heavy precipitation or snowmelt has the potential to cause migration of contaminants at AOC 57 Area 3. Groundwater recharge in the form of precipitation infiltration could cause leaching of contaminants in the unsaturated soil above the water table. In addition, heavy precipitation or snowmelt may cause erosion and transport of contaminated surface and near-surface soils.

3.1.6 Threat of Fire Or Explosion

No threat of fire or explosion associated with contamination has been identified at AOC 57 Area 3.

3.2 THREATS TO THE ENVIRONMENT

3.2.1 Actual Or Potential Exposure To Hazardous Substances Or Pollutants Or Contaminants By Nearby Populations Or The Food Chain

There are no observed effects to plant or animal populations or the food chain from the soil and groundwater contamination at AOC 57 Area 3. Toxicitiy testing performed on samples collected from Cold Spring Brook have shown that local populations are not adversely affected.

A conservative risk analysis indicates that soil contamination at AOC 57 Area 3 may have the potential to pose a risk to nearby plant and animal populations or the food chain. This is a very conservative conclusion, and there are significant uncertainties associated with some of the risk assumptions.

A complete ecological risk assessment will be presented in the AOC 57 Final RI report.

3.2.2 Actual Or Potential ContaminationOf Sensitive Ecosystems

The wetlands within the Cold Spring Brook Floodplain represent a sensitive ecosystem at AOC 57 Area 3. The source area soil contamination has the potential to continue to contribute to groundwater contamination, which will ultimately discharge to the wetlands.

3.2.3 Hazardous Substances, Pollutants, Or Contaminants in Drums, Barrels, Tanks, Or Other Bulk Storage Containers That May Pose A Threat Of Release

Other than the disposal/source area which consists of contaminated soils and debris, no hazardous substances, pollutants, or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release have been identified at or near AOC 57 Area 3.

3.2.4 High Levels Of Hazardous Substances Or Pollutants Or Contaminants In Soils Largely At Or Near The Surface That May Migrate

TPHC and petroleum related contamination is present near and at the surface in the proximity of the disposal/source area. There is no protective cover or barrier (e.g., pavement) which would prevent direct contact. The source area soil removal is expected to mitigate the risk of future contaminant migration.

3.2.5 Weather Conditions That May Cause Hazardous Substances Or Pollutants Or Contaminants To Migrate Or Be Released

Heavy precipitation or snowmelt has the potential to cause migration of contaminants at AOC 57 Area 3. Groundwater recharge in the form of precipitation infiltration could cause leaching of contaminants in the unsaturated soil above the water table. In addition, heavy precipitation or snowmelt may cause erosion and transport of contaminated surface and near-surface soils.

3.2.6 Threat Of Fire Or Explosion

No threat of fire or explosion associated with contamination has been identified at AOC 57 Area 3.

4.0 ENDANGERMENT DETERMINATION

A need has been identified for a source area soil removal action at AOC 57 Area 3 located at Devens, Massachusetts. The action will entail the excavation and removal of approximately 1,300 cubic yards of petroleum contaminated soil from within the defined source area. Actual or threatened releases of pollutants and contaminants from this site if not addressed by implementing the response action selected in this Action Memorandum, may pose an unacceptable risk to human health and welfare and/or present a risk to the environment.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

5.1 PROPOSED ACTION

The response action to be performed at AOC 57 Area 3 consists of the removal of a historic vehicle maintenance and garage waste disposal site which is acting as a source of soil and groundwater contamination at Area 3. The source area removal will consist of the excavation and off-site disposal of approximately 1,300 cubic yards of petroleum contaminated soils. The removal action is expected to reduce risks posed by contaminated soils and potential future groundwater contamination. The results of the removal action will be incorporated into the AOC 57 Final RI report.

5.1.1 Mobilization And Site Preparation

This Action Memorandum documents the decision to perform a source area soil removal at AOC 57 Area 3, and describes the technical approach and objectives of the work.

The work will be conducted in accordance with this Action Memorandum, and in conformance to the methods, procedures, and requirements set forth in the Devens Final Project Operations Plan (POP) (ABB-ES, 1995) and the Devens Health and Safety Plan (HASP), Vol. II of the POP (ABB-ES, 1995). In addition, an HLA representative will complete the Health and Safety Plan Addendum (Attachment 1) prior to commencement of work. The Health and Safety Plan Addendum establishes safety guidelines for the work operations, and includes key personnel, medical surveillance, training, site control, hazardous waste operations, equipment operations, personal protection, and construction safety.

Prior to excavation activities, HLA will coordinate utility clearances and all field work with appropriate Devens Commerce Commision, US Army Corps of Engineers (USACE,NAE), and Devens personnel. A representative of the USACE,NAE will be on-site during the removal action.

Erosion control measures will be implemented using silt screen fencing and hay bales to be positioned so as to protect against erosion and siltation into the floodplain area.

Temporary facilities, including a portable decontamination pad , will be established at the site.

Health and safety equipment such as fire extinguishers, first aid kits, eye wash station will be made available at the site. A construction safety work fence will be erected around the work site and staging area to prevent unauthorized access to the area.

Excavation of contaminated soil will be accomplished using a Caterpillar 330 excavator and/or CAT 426 backhoe or equivalents. The excavated soil will be temporarily

stockpiled at the fenced-in, paved parking lot behind Building 3773 located within the former Army Reserve Center at Devens. The soil will be placed on polyethylene sheeting. Upon completion, the soil pile will be covered with polyethylene sheeting to prevent infiltration of precipitation. The stockpiled soil will be removed for disposal following completion of analytical testing of soil samples and as allowed by weather conditions.

5.1.2 Source Area Removal

The source area soil removal will consist of excavating an estimated 1,300 cubic yards of petroleum contaminated soil. The boundaries of the excavation are shown in Figure 2-3. The excavation is anticipated to be approximately 10 feet deep the northern edge and approximately 5 feet deep at the southern boundary. The boundary of the excavation was determined based upon the known location of the disposal area as defined by test pits 57E-95-24X, 57E-96-28X, 57E-96-29X, 57E-96-30X, and 57E-96-31X. The Massachusetts Contingency Plan (MCP) Method 1 S-2/GW-3 Soil Standards will be used as a removal goal for the northern, eastern, and western portions of the source area removal (Table 5-1). It may not be possible to achieve the S-2/GW-3 cleanup level on the southern (downgradient) side of the excavation due to field conditions. The removal goal for the southern portion of the excavation is therefore based upon the calculated human health risk based concentrations provided in Table 5-1. This approach will help to ensure that the site will not pose an unacceptable risk to either human health or the environment. Analytical data gathered during the previous investigations were used as a guide for boundary placement.

Adequate engineering controls such as barricades, dust minimization, erosion controls, and sloping sidewalls will be administered during excavation activities.

Any contamination observed on or in groundwater during excavation activities will be removed either using a vacuum truck or sorbent pads and booms.

Waste characterization samples will be collected from the excavated soil at a frequency of one sample per 100 cubic yards. Soil samples collected for waste characterization will undergo the following laboratory analyses:

- Volatile Organic Compounds (VOCs)
- Semivolatile Organic Compounds (SVOCs)
- Corrosivity
- Reactivity
- Ignitability
- Priority Pollutant Metals
- TPHC
- Pesticides/PCBs
- Full TCLP

Duplicates, MS/MSDs, rinsate blanks, and trip blanks will be collected at the frequencies outlined in the Devens POP (ABB-ES, 1995a).

Contaminated decontamination water, personal protective equipment, and any oily sorbent pads or booms will be properly containerized, characterized, and disposed at an off-site licensed facility.

Upon completion of the source area soil removal, HLA will prepare a Closeout Report documenting the results of the removal action.

Long term groundwater monitoring will be included as part of the Area 3 Record of Decision to ensure that any residual contamination will not pose a risk to either human health or the environment.

5.1.3 Confirmatory Soil Sampling

Upon completion of the excavation to the specified boundaries, confirmatory soil samples will be collected from the floor and sidewalls. The soil samples will be sent to a certified off-site laboratory and analyzed for EPH, VPH, pesticides, and PCBs. It is estimated that as many as six off-site samples will be collected, four from the sidewalls and two from the excavation floor. Duplicates, MS/MSDs, rinsate blanks, and trip blanks will be collected at the frequencies outlined in the Devens POP (ABB-ES, 1995).

5.1.4 Site Restoration

Once analytical results for confirmation soil samples indicate that the contaminant source area has been removed, the excavation will be backfilled and compacted.

5.2 ESTIMATED PROJECT COST

The removal actions described in this Action Memorandum for AOC 57 Area 3 are estimated to cost approximately $75,000.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the source removal action is not taken, the release may cause an impact to human health or the environment.

7.0 OUTSTANDING POLICY ISSUES

No outstanding policy issues relative to this Action Memorandum were identified.

8.0 ENFORCEMENT

The Department of the Army is the lead agency for Devens. The removal action will not be financed through CERCLA; all funding will be provided by the Department of Defense. Therefore, enforcement strategies do not apply to this source removal action.

9.0 RECOMMENDATION

This decision document represents the selected removal action for AOC 57 Area 3 at Devens, Massachusetts, and was developed in accordance with CERCLA, as amended. The removal action is consistent with the NCP and site conditions meet the criteria (40 CFR 300.415) for a removal action. The removal action is expected to reduce risks posed by contaminated soils, and to reduce future groundwater contamination levels. Therefore, the soil removal is recommended.

James C Chambers — 25 JAN 99

James C. Chambers
BRAC Environmental Coordinator
U.S. Army Devens Reserve Forces Training Area

Date

ABB Environmental Services, Inc., (ABB-ES), 1997. "Draft Remedial Investigation Report, Area of Contamination 57"; Prepared for U.S. Army Corps of Engineers, New England District; Prepared by ABB-ES, Inc. Portland, Maine, March 1997.

ABB Environmental Services, Inc., (ABB-ES), 1995. "Final Project Operations Plan for Site Investigations and Remedial Investigations, Fort Devens, Massachusetts, Volumes I, II, and III"; Data Item A005/A008; Prepared for Commander, U.S. Army Environmental Center; Prepared by ABB-ES, Inc., Portland, Maine, May 1995.

Code of Federal Regulations, 40 CFR Part 300

MADEP, 1997. "Massachusetts Contingency Plan, 310 CMR 40.0000, September 1996 and Proposed Revisions, January 1997.

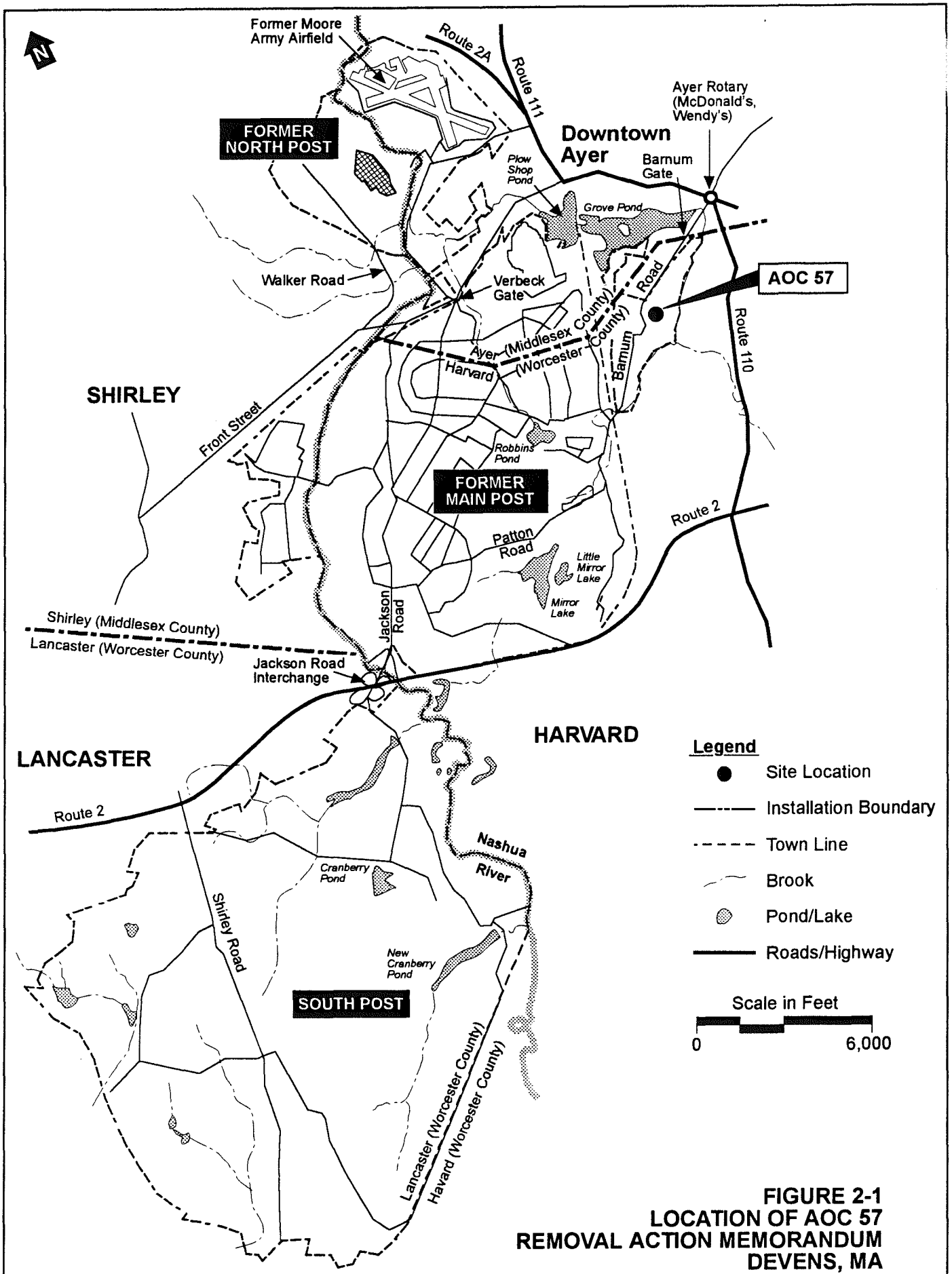

FIGURE 2-1
LOCATION OF AOC 57
REMOVAL ACTION MEMORANDUM
DEVENS, MA

Harding Lawson Associates

W9901011

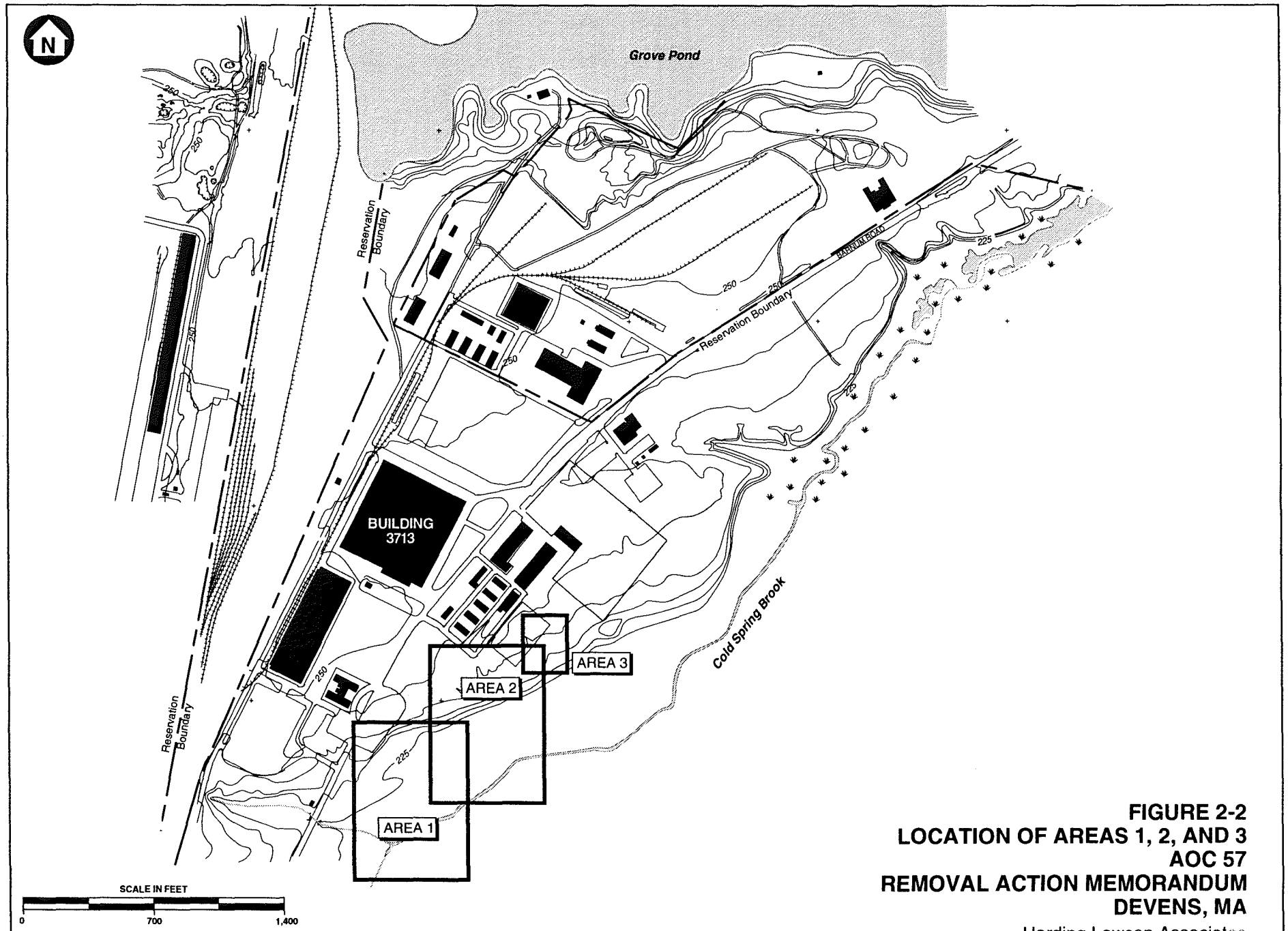

FIGURE 2-2
LOCATION OF AREAS 1, 2, AND 3
AOC 57
REMOVAL ACTION MEMORANDUM
DEVENS, MA

Harding Lawson Associates

9702002D(a) 5 8

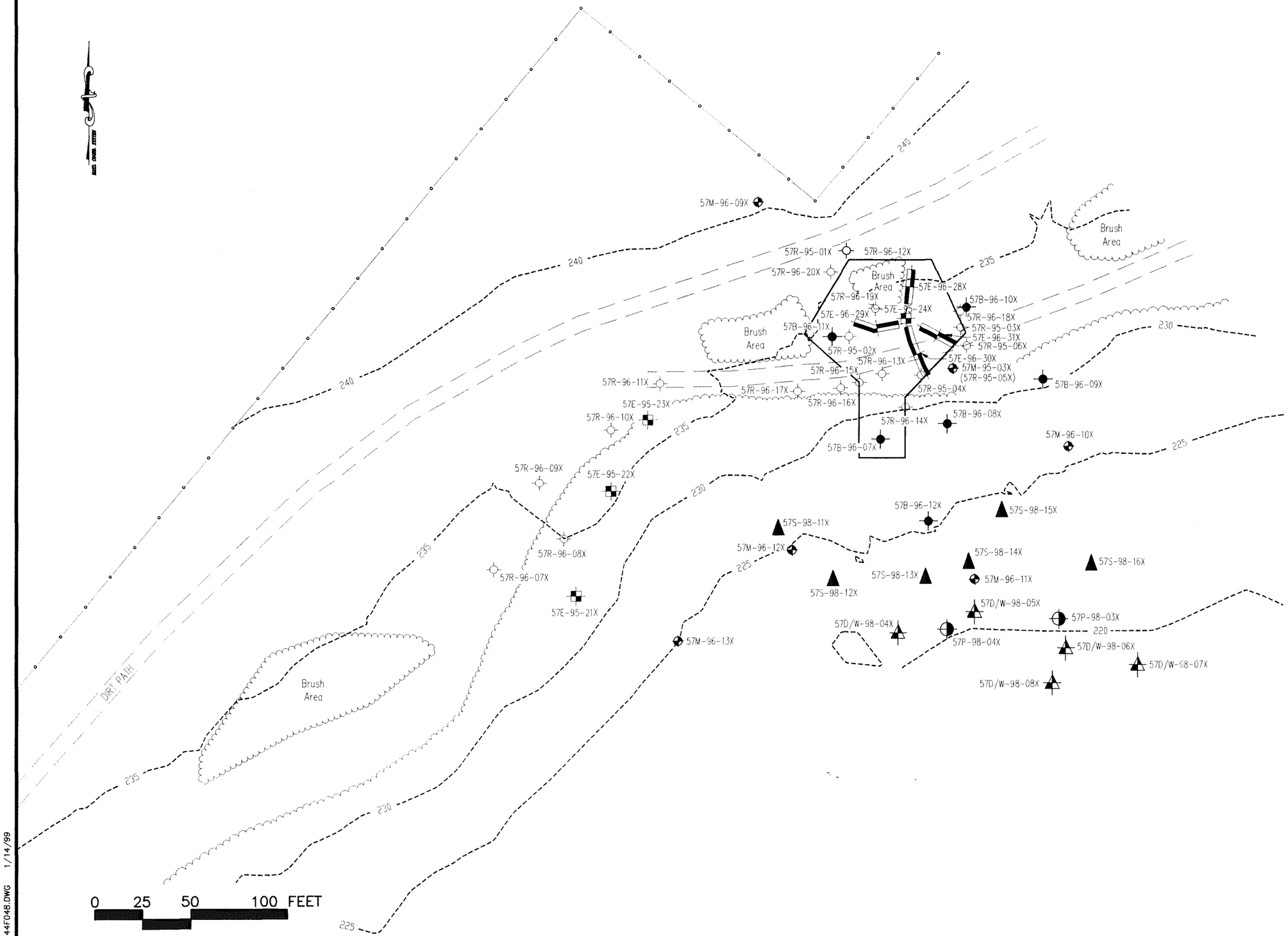

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FIGURE 2-3
RI EXPLORATION LOCATIONS
AOC 57/AREA 3
REMOVAL ACTION MEMORANDUM
DEVENS, MA
Harding Lawson Associates

TABLE 5-1
RISK BASED REMEDIATION GOALS
SURFACE SOIL AND SUBSURFACE SOIL
AOC 57 AREA 3 SOURCE REMOVAL ACTION
DEVENS, MASSACHUSETTS

Contaminants of Concern	Risk Based Remedial Goal				Minimum Remedial Goal	
	Surface Soil		Subsurface Soil		Surface and Subsurface Soil	
	Remedial Goal (ug/g)	Basis of Goal	Remedial Goal (ug/g)	Basis of Goal	Remedial Goal (ug/g)	Basis of Goal
C9 - C18 Aliphatic Hydrocarbons	None Required [a]	NA	None Required [a]	NA	2500	S-2/GW-3
C19 - C36 Aliphatic Hydrocarbons	20000	UCL	20000	UCL	5000	S-2/GW-3
C11 - C22 Aromatic Hydrocarbons	5000	Risk-based	10000	UCL	2000	S-2/GW-3
TPH	18000	[a]	30000	[a]	7400	[a]
PCBs (total among all congeners)	2	Risk-based	4	Risk-based	2	S-2/GW-3

Notes:
[a] Calculated from EPH remedial goals using EPH percent-composition data. These values are for comparison to OFF-SITE analytical data.
NA = Not applicable

HEALTH AND SAFETY PLAN ADDENDUM

Harding Lawson Associates
Health and Safety Plan Addendum For AOC 57 Area 3, Devens, MA

Site:_____ Contact:_____

Street Address:_____

Proposed Date(s) of Investigation:_____ Job Number:_____

Prepared by:_____ Date:_____

*Approved by:_____ Date:_____

Proposed Activity(s):_____

Known or Suspected Chemicals (include PELs):_____

*Approval also serves as certification of a Hazard Assessment as required by 29 CFR 1910.132

HAZARD EVALUATION (Check all that apply):

Overall Hazard Estimation:	☐ Serious	☐ Moderate	☐ Low	☐ Unknown	☐ None
Major Exposure Route(s):	☐ Dermal	☐ Inhalation	☐ Ingestion	☐ Puncture	
Contaminant Location(s):	☐ Surface ☐ Tank	☐ Underground ☐ Other (list):_____	☐ Soil	☐ Sediment	☐ Water
Health Hazard(s):	☐ Liquid ☐ Volatile	☐ Solid ☐ Radioactive	☐ Sludge ☐ Reactive	☐ Corrosive ☐ Unknown	☐ Ignitable
Safety Hazard(s):	☐ Height ☐ Near Water ☐ Lifting	☐ Equipment ☐ Confined Space ☐ Slips/Falls	☐ Cold Stress ☐ Heat Stress ☐ Other (list):_____	☐ Noise ☐ Machinery	☐ Eye ☐ Burns

EQUIPMENT (check all that apply): Initial Level of Personal Protection:_____

PPE Selected:	☐ Cartridge Respirator ☐ Escape Respirator ☐ Safety Boots/Shoes ☐ Chemical Resistant Boots ☐ Disposible Boot Covers ☐ Other (list):_____	☐ Coveralls ☐ Safety Glasses ☐ Face Shield ☐ Hard Hat ☐ Ear Protection	Gloves ☐ ·inner ☐ ·outer Tyveks ☐ ·regular ☐ ·coated
Monitoring Equipment:	☐ Combustible Gas/Oxygen Meter ☐ Hydrogen Sulfide Meter ☐ Radiation Alert Meter ☐ Dosimeter Badge	☐ Explosimeter ☐ Draeger Tubes ☐ ·list:_____ ☐ Other (list):_____	☐ OVA ☐ PID
Emergency Equipment:	☐ First Aid Kit ☐ Other (list):_____	☐ Fire Extinguisher	☐ Eye Wash

CONTAMINANT LEVELS FOR MODIFICATION OF PROTECTIVE EQUIPMENT:_____

DECONTAMINATION/DISPOSAL: All personnel and/or equipment leaving contaminated sites are subject to decontamination. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the site prior to decontamination. The decontamination procedures to be used at the site are as follows: _____

_____

_____

EMERGENCY MEDICAL TREATMENT/FIRST AID: First aid will be rendered to any person injured on-site, as appropriate. The injured person will then be transported to a medical facility for further examination and/or treatment. An ambulance will be used to transport the injured person to the hospital unless one is not readily available or could result in excessive delay. In this case, other transport is authorized. Under no circumstances will injured persons transport themselves to a medical facility for for emergency treatment.

EMERGENCY EVACUATION: In the event of an emergency requiring evacuation, the HSO assumes the role of on-site coordinator. Evacuation responses will occur at three levels: (1) withdraw from the immediate work area (100+ feet upwind); (2) site evacuation; and (3) evacuation of surrounding area. If the residences and commercial operations require evacuation, the local agencies will be notified and assistance requested. Designated on-site personnel will initiate evacuation of the immediate off-site area without delay.

EMERGENCY TELEPHONE NUMBERS:

Local Police Department	( ) -
Local Fire Department	( ) -
Local Rescue Service	( ) -
Primary Hospital: _____	( ) -
Secondary Hospital: _____	( ) -
Health Resources - Dr. Winters	(800) 350-4511
- Pager (leave area code and telephone number)	(800) 455-0964
National Poison Control Center	(800) 492-2414
Chemical Manufacturing Association-Chemical Referral Center	(800) 262-8200
Health and Safety Manager: Cindy Sundquist	(207) 775-5401 (w)
	(207) 892-4402 (h)

AUTHORIZED PERSONNEL:

_____ _____

_____ _____

_____ _____

* Current First-aid Certification

+ Current CPR Certification

FIELD TEAM REVIEW: I have read and reviewed the health and safety information in the HASP. I understand the information and will comply with the requirements of the HASP.

Name:_____	Date:_____
Name:_____	Date:_____
Name:_____	Date:_____
Name:_____	Date:_____
Name:_____	Date:_____
Name:_____	Date:_____

ROUTES TO EMERGENCY MEDICAL FACILITIES

PRIMARY HOSPITAL:

Facility Name:_____

Address:_____

Telephone Number_____

DIRECTIONS TO PRIMARY HOSPITAL (attach map):

ALTERNATE HOSPITAL:

Facility Name:_____

Address:_____

Telephone Number_____

DIRECTIONS TO ALTERNATE HOSPITAL (attach map):