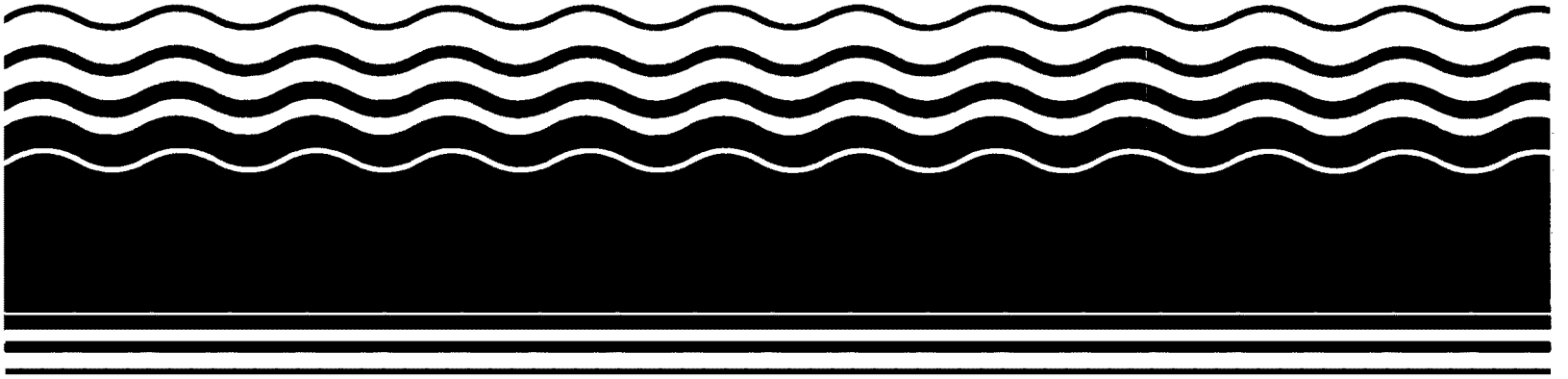
PB98-963911
EPA 541-R98-067
November1998

EPA Superfund
Record of Decision:

Letterkenny Army Depot
(PDO & SE Areas)
Chambersburg, Franklin County, PA
9/30/1998



LETTERKENNY ARMY DEPOT

PHASE I PARCELS

CHAMBERSBURG, FRANKLIN COUNTY, PENNSYLVANIA

RECORD OF DECISION

SEPTEMBER 28, 1998

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Letterkenny Army Depot
Chambersburg, Franklin County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Phase I Parcels at Letterkenny Army Depot (LEAD), Chambersburg, Pennsylvania, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document is based on the Administrative Record for this site.

The Commonwealth of Pennsylvania concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

This is the final action with regard to soils and an interim action with regard to groundwater, which together address the contamination at the Phase I Parcels at LEAD (the Phase I Parcels are a subset of the BRAC Parcel). There are three groundwater operable units (OUs) located in the BRAC Parcel - Property Disposal Office (PDO) OUs 2 and 4, and Southeastern Area (SE Area) OU 3. These OUs are being addressed separately and final measures with regard to groundwater contamination will be presented in the RODs for those OUs.

The selected remedy is the implementation of institutional controls.

Statutory Determinations

The selected final remedy with regard to soils is protective of human health and the environment, complies with Federal and state requirements that are legally applicable or relevant and appropriate (ARARs) to the remedial action and is cost-effective. This soils remedy utilizes permanent solutions and alternative treatment (or resource recovery) technology to the maximum extent practicable for the Phase I Parcels. With respect to groundwater contamination, the interim measure is protective of human health and the environment, waives Federal and state ARARs (ARARs will be addressed under the final measures presented in RODs for the relevant operable units) and is cost-effective. This portion of the action is interim and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Because this portion of the action does not constitute a final remedy for the groundwater, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed by the final groundwater response action.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within 5 years after the date of this ROD to ensure that the remedy continues to provide adequate protection of human health and the environment.

This 5-year review will also include an evaluation of the status of the groundwater remedy to determine if deed restrictions related to groundwater can be removed when groundwater response actions are completed.

Abraham Ferdas
Director, Hazardous Sites Cleanup Division
EPA, Region III

9/30/98
Date

Larry V. Gulledge
Deputy to the Commander
U.S. Army Industrial Operations Command

29 SEP 1998
Date

Final

Record of Decision for Phase I Parcels Letterkenny Army Depot

U.S. Army Corps of Engineers
Baltimore District

September 1998

TABLE OF CONTENTS

SECTION PAGE

TABLE OF CONTENTS
(Continued)

SECTION PAGE

TABLE OF CONTENTS
(Continued)

SECTION PAGE

LIST OF FIGURES

TITLE PAGE

LETTERKENNY ARMY DEPOT

PHASE I PARCELS

CHAMBERSBURG, FRANKLIN COUNTY, PENNSYLVANIA

RECORD OF DECISION

SEPTEMBER 28, 1998

SECTION 1
SITE NAME, LOCATION, AND DESCRIPTION

INFORMATION

Letterkenny Army Depot (LEAD) is located in Southcentral Pennsylvania in Franklin County, 5 miles north of the Borough of Chambersburg (see Figure 1). The Depot covers 19,243 acres, most of which is devoted to ammunition storage (16,895 acres). The industrial and maintenance areas, which are primarily located in the southeast corner of LEAD and encompass approximately 3,088 acres, are the focus of the Base Realignment and Closure (BRAC) initiative.

The BRAC Parcel is concentrated in the southeast portion of LEAD, which includes warehousing, vehicle storage, industrial/maintenance, administration and recreational activities, and housing. This entire area, with the exception of selected retained areas, has been designated for realignment (see Figure 2). The infrastructure of this area includes roads; permanent, semipermanent, and temporary structures; and utilities.

TOPOGRAPHY AND SURFACE DRAINAGE

LEAD is located in the Great Valley section of the Valley Ridge Province of the eastern United States, and referred to locally as the Cumberland Valley. The Cumberland Valley trends northeast to southwest through central Pennsylvania and is bordered to the west by the Appalachian Mountain Province. The South Mountain section of the Blue Ridge Province is situated east of Chambersburg and marks the eastern edge of the Cumberland Valley.

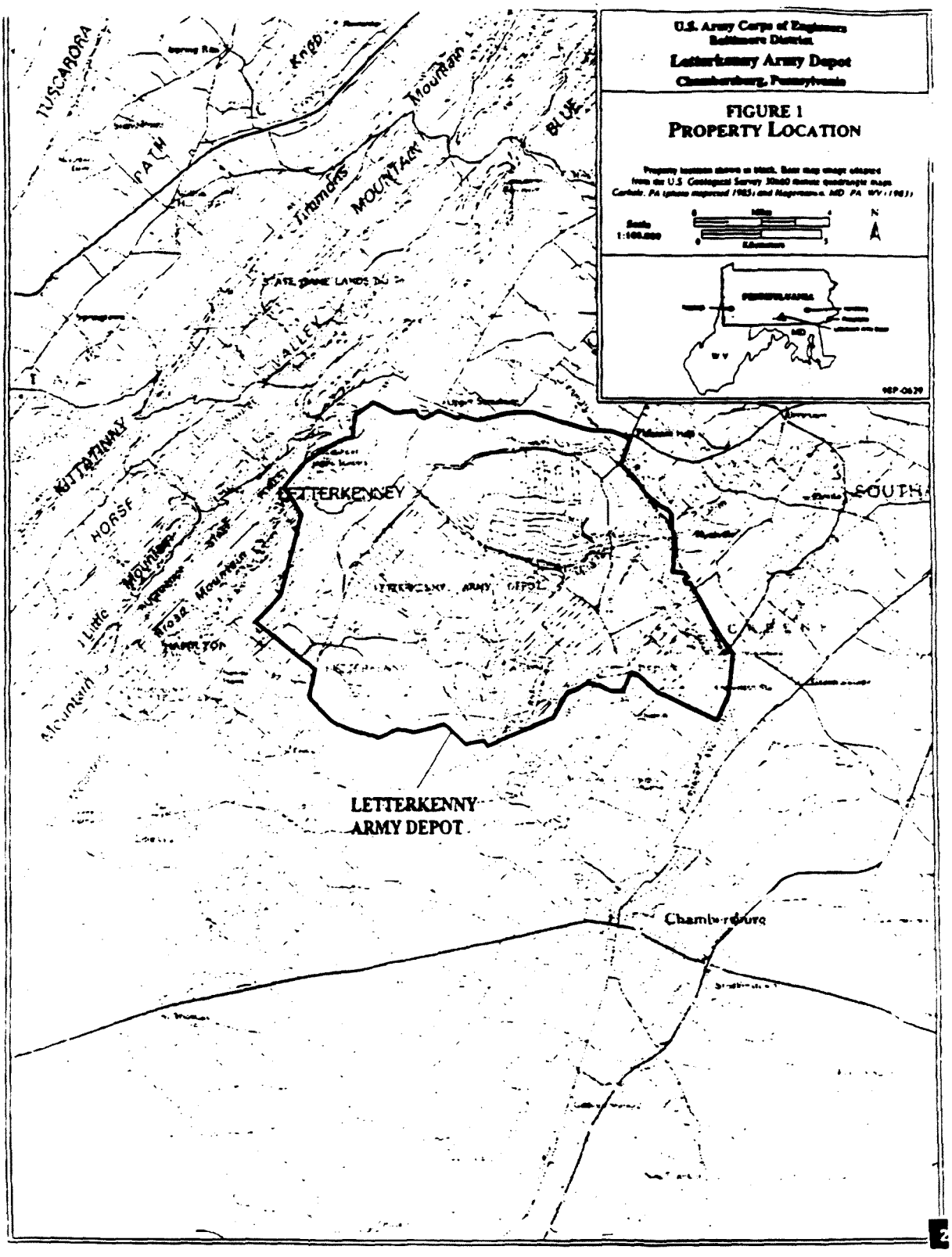
The Cumberland Valley is characterized by southwest-trending limestone ridges and valleys. The valley floors are filled with rocks of the Martinsburg Formation. Weathering of the folded and faulted underlying geologic formations imparts a gently rolling aspect to the local topography. The majority of LEAD is located within the Martinsburg Shale terrain, except for bands of carbonate rocks along the eastern and western edges of LEAD. The PDO Area and the Southeast Industrial Area (SIA) of LEAD are underlain by limestone. Surface elevations throughout LEAD range from approximately 600 to 750 feet above mean sea level (msl), except for the northwest portion of LEAD, where the elevation increases abruptly to more than 2,300 feet (ft) above msl in the vicinity of Broad Mountain (EA, 1991).

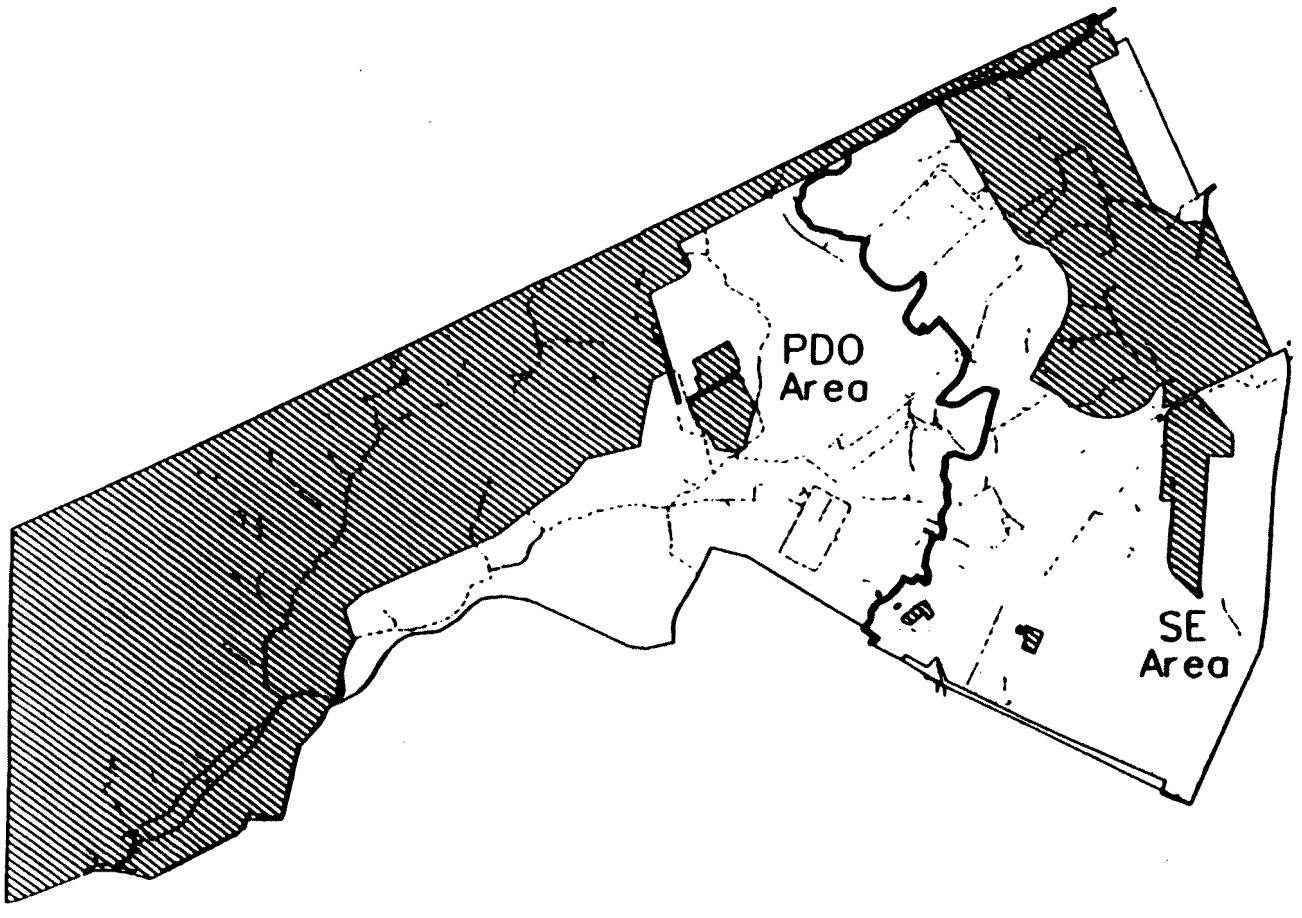
Streams cutting through the limestone terrain flow through broad, open valleys and are usually intermittent. In contrast to this, streams cutting through the upper shale units of the Martinsburg Formation usually meander in small, steep-walled valleys and are perennial. Surface drainage at LEAD is divided into two watersheds—the Susquehanna River to the northeast and the Potomac River to the southwest. Both the Susquehanna and Potomac Rivers eventually drain into the Chesapeake Bay.

Two major stormwater drainage systems serve the southeast portion of LEAD and contribute to local surface drainage. One system serves the area north of Coffey Avenue and discharges near the Industrial Wastewater Treatment Plant (IWTP) into the industrial plant outfall ditch (located north of the IWTP), which discharges to Rowe Run. The other system serves the southeast warehouse area. Water drains into the storm drain system, is discharged through the storm drain outfall, and joins other surface runoff flowing southward to Conococheague Creek (USATHAMA, 1980). Figure 3 illustrates the major drainage divides at LEAD.

GEOLOGY

LEAD straddles two major structural features—the South Mountain anticlinorium to the east and the Massanutten synclinorium to the west. The eastern portion of the Depot (underlain by carbonate rocks) is part of the anticlinorium, whereas the western portion of the Depot (underlain by shale) is part of the synclinorium. These structures resulted from folding


U.S. Army Corps of Engineers
Baltimore District
Letterkenny Army Depot
Chambersburg, Pennsylvania
FIGURE 1
PROPERTY LOCATION
N
LETTERKENNY
LETTERKENNY ARMY DEPOT
LETTERKENNY
ARMY DEPOT
Chambersburg



LEGEND:

Buildings

Roads

Drainage

Enclaved Areas

Transfer/Lease Back Areas

Dividing line between SE and PDO Areas

0 1800 3600
Feet

N

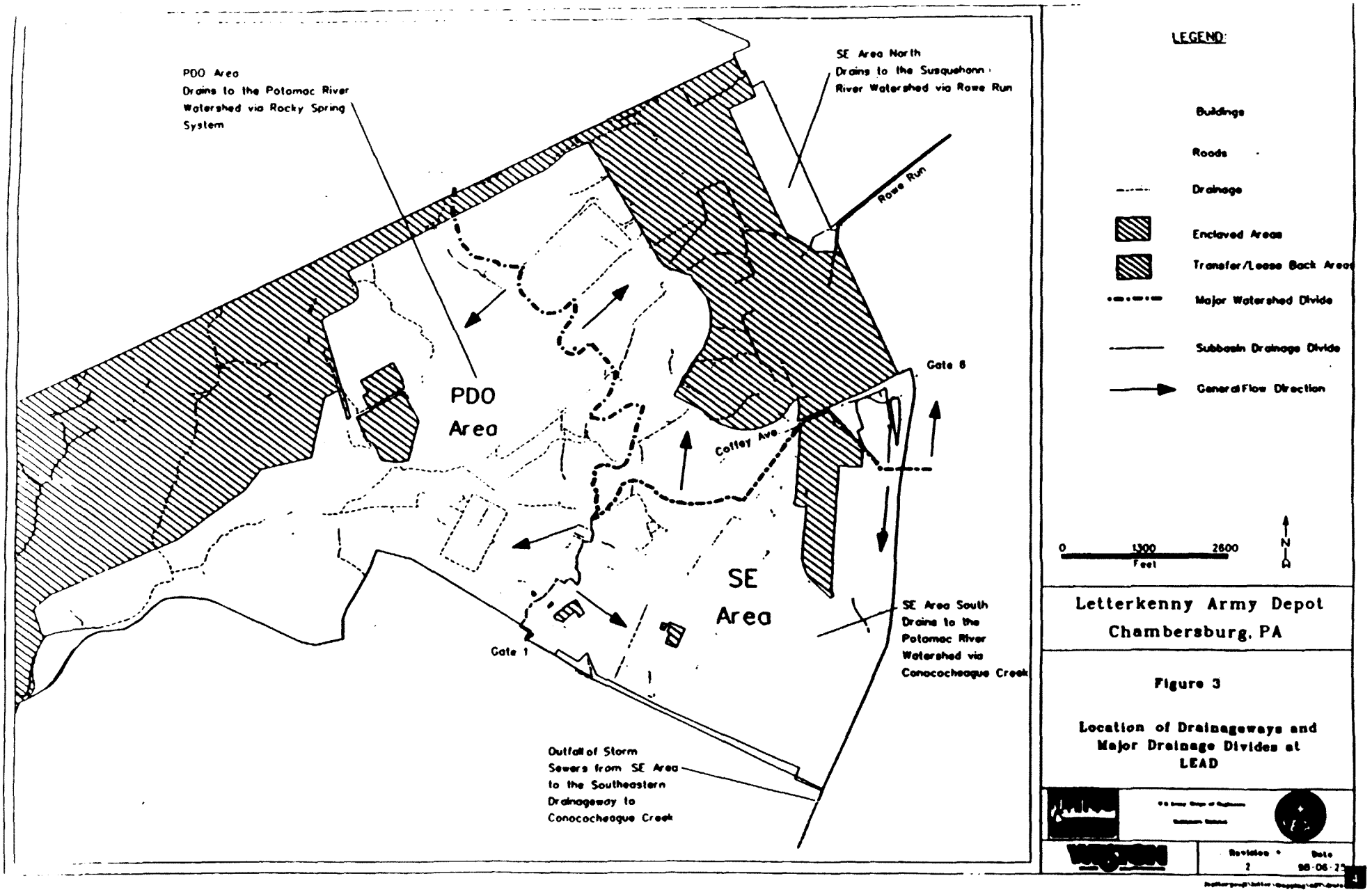
Letterkenny Army Depot
Chambersburg, PA

Figure 2

Location of SE, PDO, and Enclaved Areas at LEAD

Revision # 2

Date 98-06-25



Letterkenny Army Depot
Chambersburg, PA

Figure 3

Location of Drainageways and Major Drainage Divides at LEAD

Revision #	Date
2	98-06-25

that occurred during the close of the Paleozoic era. High-angle reverse faulting accompanied the folding of rocks in the eastern portion of LEAD. Several major faults, which strike north to northeast and dip to the southeast at fairly steep angles, cross the PDO Area (WESTON, 1984).

In the vicinity of LEAD, the Great Valley is floored by Ordovician age carbonate rock, as well as Ordovician age shale and greywacke of the Martinsburg Formation. The five formations occurring at LEAD are the shales of the Martinsburg Formation, the limestones of the Chambersburg Formation and the St. Paul Group, the limestones and dolomites of the Rockdale Run Formation, and the dolomites of the Pinesburg Station Formation. These geologic formations are fractured and deformed to varying degrees from past geologic activity (ESE, 1993).

Several faults extend through LEAD, including the Pinola and Letterkenny Faults. Although an east-to-west cross fault was identified between these two faults, both the position and surface trace are open to question (Becher and Taylor, 1982). Northeast of LEAD, the Pinola Fault truncates the Letterkenny Fault, indicating that the latter fault is older.

The Letterkenny Fault is one of the few faults in the region that parallels the tectonic grain, yet is an early formed, westward-dipping thrust that moved material from within the syncline to the west up onto the anticline to the east (EA, 1991).

The Pinola Fault, located to the west of the Letterkenny Fault, is considered to be an east-dipping, high-angle thrust fault (based on the fact that older beds are to the east of the fault). Because it is almost impossible to trace faults through the Martinsburg terrain, the fault trace is projected through the Martinsburg Formation on the basis of a ridge-forming unit that extends through it (Becher and Taylor, 1982).

HYDROGEOLOGY

The regional surface water flow system of Franklin County controls the general groundwater flow patterns within LEAD. The surface water drainage divide, discussed previously, also divides the groundwater flow system into two basins. Groundwater elevation contours within LEAD generally reflect surface topography. The water table is located at moderate depth in areas of topographic highs and is shallow near stream valleys and other topographic lows (ERM, 1995).

The shale and carbonate rock that underlie LEAD have been disturbed and faulted during deformational events that ultimately formed the Great Valley. The two major faults located within the confines of LEAD (the Pinola Fault and the Letterkenny Fault) influence groundwater flow. Where faulting is present and dissimilar rocks have been brought into contact, the fault tends to act as a barrier to groundwater movement, occasionally forcing water within the formation to discharge as a fault spring. Where similar rocks are in contact along a fault (i.e., two limestone units), the groundwater movement may be only minimally affected (ERM, 1995).

Fracture systems within the Martinsburg Formation are small and well connected, thus allowing groundwater to generally follow a regional flow path. Groundwater flow within the limestone of the Chambersburg Formation and St. Paul Group is more complex because it occurs predominantly through individual fractures and solution cavities typical of karst terrain. Fractures in the limestones are mostly aligned with the regional northeast tectonic grain and are much more irregular and widely spaced than those in the adjacent shales. Where solution cavities are present in the limestone, groundwater flow more closely resembles open channel flow rather than the fracture flow described above. The quantity and density of fractures within the limestone units increase with proximity to the bedrock surface. During seasonal periods when the water table is at its highest (early spring, late autumn), water levels commonly rise above the bedrock/surface material contact. Leaching or resuspension of any materials or potential contaminants buried in the surficial sediments may be enhanced during high water table conditions (ERM, 1995).

Groundwater recharge occurs primarily through precipitation. Recharge areas occur throughout the central part of LEAD, wherever sandstone, siltstone, or joints are close to the surface. Actual points of recharge for the limestone aquifers have not been determined; however, the many faults, joints, and sinkholes present at LEAD are the most likely routes (ERM, 1995).

Groundwater underlying LEAD generally occurs under unconfined conditions, with local areas of artesian conditions. These artesian conditions occur along a moderately steep slope located near the northwest edge of LEAD in the Ammo Area.

A groundwater study completed for the U.S. Army Corps of Engineers (USACE) in the 1950s concluded that there was not a viable source of groundwater available within LEAD boundaries to supply the Depot's industrial mission (Acker, 1995). The only use of groundwater in the area is outside LEAD, where some individual homes depend on groundwater for their domestic supply and others are connected to the Guilford Water Authority waterline. Groundwater is also used outside LEAD as a water supply for livestock. Any homes on well water that exceeded an applicable ARAR were initially supplied with bottled water, and later connected to public water.

NATURAL RESOURCES

The property included in the Phase I Parcels consists of primarily industrial and developed land, small stands of trees and open grassy areas, and agricultural areas. No wetlands

are located within the Phase I Parcels, and no Federal or state threatened or endangered species are known or suspected to have habitats within the Phase I Parcels.

SECTION 2
SITE HISTORY AND ENFORCEMENT ACTIONS

PROPERTY HISTORY

The Letterkenny Ordnance Depot was established in January 1942 as an ammunition storage facility. In subsequent years, the following missions were added:

- Reserve storage and export advance storage of parts, tools, supplies, and equipment for combat vehicles, artillery, small munitions, and vehicle fire control equipment (1943).
- Receipt and storage of hardware, heavy-duty trucks, and parts (1944).
- Establishment of transport and combat vehicle shops and expansion of the maintenance program (1947).
- Establishment of a rebuild system for guided missile ground control, launching, and handling equipment; missile propellant systems; and internal guidance systems (1954).
- Assignment of the special weapons mission (1958).
- Designation of the Depot as the Eastern Equipment Assembly Area (1959). This mission gave the Depot responsibility for the handling and shipment of equipment for guided missile and special weapons units to overseas locations.
- Acceptance and destruction of contaminated U.S. Air Force (USAF) missile fuel (1961).
- Letterkenny Ordnance Depot renamed as Letterkenny Army Depot (1962).
- Disposal of explosive ordnance generated from the Army as well as state and local police (1964).
- Maintenance and storage of USAF missiles (1966).
- Receipt, storage, and dispersal of batteries and tires to Army units (1972).
- Operation of a washout facility to reclaim explosives from munitions (1973).

These operations consisted of cleaning, stripping, painting, lubrication, and plating activities, which involved the use of solvents, blast media, paints, chemicals, petroleum products, and metals. Storage spills, releases, and disposal of these materials led to the current environmental concerns at LEAD.

Prior to the establishment of LEAD, the area consisted of agricultural and forest lands. The area was predominantly single-family farms used for both subsistence and commercial purposes.

The Base Closure and Realignment Act of 1988 (Public Law 100-526, 102 Stat. 2623) (BRAC 88) and the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510, 104 Stat. 1808) (BRAC 91, 93, 95) designated more than 100 Department of the Army facilities for closure and/or realignment. On 28 February 1995, the United States Secretary of Defense submitted a recommendation to Congress that LEAD be selected for realignment.

The BRAC Commission recommended "transferring the towed and self-propelled combat vehicle mission to Anniston Army Depot, Alabama; retain[ing] an enclave for conventional ammunition storage and tactical missile disassembly and storage; and change[ing] the 1993 [BRAC] Commission's decision regarding the consolidation of tactical missile maintenance at Letterkenny by transferring missile guidance system workload to Tobyhanna Army Depot (TYAD), Pennsylvania, or private sector commercial activities."

In anticipation of the realignment of the LEAD mission, an Environmental Baseline Survey (EBS) was conducted for the to-be-excessed property (Phase I, August 1996; Phase II, Draft, July 1997). The EBS process includes visual inspections of each property as well as record reviews and personnel interviews, which are used to document current and historical conditions with regard to use, storage, or release of hazardous substances and petroleum products. None of the parcels and buildings covered under this ROD were identified as having any significant environmental concerns, aside from the documented VOC groundwater contamination.

The Letterkenny Industrial Development Authority (LIDA) developed a list of priority buildings and parcels based on the potential for reuse and redevelopment planning. The Phase I Parcels represent those buildings and properties identified by LIDA that the Army deemed suitable to transfer at this time, as will be documented in the FOST for Phase I Parcels. The Phase I Parcels consist of the following:

- Parcels 1 and 2 (Open land near Gate 6)
- Parcels 3 and 4 (Buildings 6 and 9)
- Parcel 5 (Buildings S20-1 through S20-5)
- Parcel 6 (Open storage south of Parcel 7)
- Parcel 7 (Building 238)
- Parcel 8 (Buildings S26-1 through S26-4)
- Parcel 9 (Open storage east of Parcel 8)
- Parcels 10 through 13 (Sheds at Docks 35, 36, 45, and 46)
- Parcels 16 through 21 (Warehouses 34, 43, 44, 52, 53, and 54)

- Parcels 22 and 31 (Railroad Parcels)
- Parcel 23 (Buildings T410, 411, 412, 416-418, and T455)
- Parcel 24 (Building 500)
- Parcel 25 (Building 19)
- Parcel 26 (Building 581)
- Parcel 27 (Cargo Road Parcel)
- Parcel 28 (Building 524)
- Parcel 29 (Agricultural lease parcel)
- Parcels 33 and 34 (Buildings 637 and 639 and parking area)

These parcels are shown in Figure 4.

TENANT ACTIVITIES

One of the major tenant activities at LEAD that impacts environmental conditions at the Depot is the Defense Reutilization and Marketing Office (DRMO). This organization is responsible for the reuse, recycling, handling, and disposal of excess U.S. Department of Defense (DoD) property, including waste and hazardous waste.

There are four agricultural lease areas within the BRAC Parcel. One of these areas, land south of Vehicle Road and west of Scale House Road near the DRMO area, is leased by Mr. Douglas Bricker. This lease was recently extended to 30 December 2001. This parcel is Parcel 29, which included in the Phase I Parcel property.

CERCLA STATUS

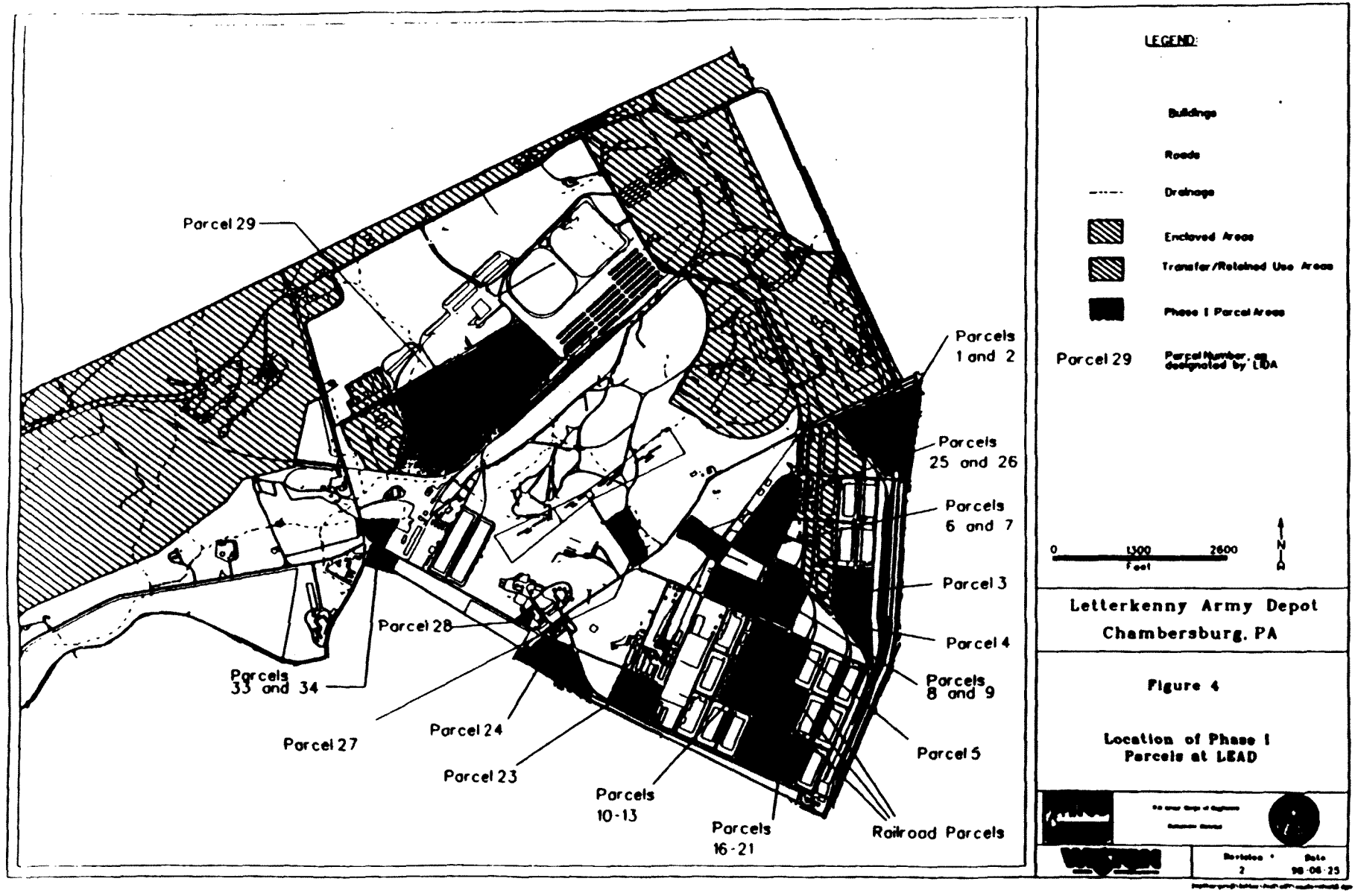
Between 1980 and 1998, numerous environmental investigation programs were conducted at LEAD to evaluate potential contamination in the soil and groundwater at the Depot. In 1986, the U.S. Environmental Protection Agency (EPA) ranked the LEAD Southeastern (SE) Area (including the Disposal Area [DA] and the Southeast Industrial Area [SIA]) and the PDO Area under the Uncontrolled Hazardous Waste Site Ranking System and proposed these two areas for inclusion on the National Priorities List (NPL). Figure 2 shows the general locations of the PDO and the SE Areas. As a result of the proposed NPL ranking, the U.S. Army Environmental Center (USAEC) took the initiative in conducting the response actions at LEAD in accordance with Executive Order 12316, signed on 14 August 1981 by President Reagan, which delegates to the Secretary of Defense the authority to take the lead on CERCLA activities at Federal facilities, and a Memorandum of Understanding (MOU) of 12 August 1983, between EPA and the DoD, which defines the relationship for Federal facilities to take the lead on such activities with EPA input.

Executive Order 12580 was signed in January 1987, which superseded Executive Order 12316. This Executive Order transferred authority for site investigations (SIs) and remedial actions (RAs) at Federal facilities to the secretaries of the applicable Federal agencies.

On 3 February 1989, a Federal Facilities Agreement (FFA) was reached under CERCLA Section 120 between the DoD, EPA, and Pennsylvania Department of Environmental Protection (PADEP). The Southeastern Area was added to the NPL in July 1987 with a Hazard Ranking System (HRS) score of 34.21, and the PDO Area was added to the NPL in March 1989 with an HRS score of 37.51. Remedial actions are underway at both NPL sites.

PDO AREA

The PDO Area encompasses approximately 1,490 acres in the southern portion of the Depot. It extends approximately from the combat vehicle test track and heads south to Rocky Spring Lake. The groundwater discharges at Rocky Spring, which flows into the Rocky Spring Branch of the Conococheague Creek.


Parcel 29
Parcels 1 and 2
Parcels 25 and 26
Parcels 6 and 7
Parcel 3
Parcel 4
Parcels 8 and 9
Parcel 5
Railroad Parcels
Parcels 16-21
Parcels 10-13
Parcel 23
Parcel 24
Parcel 27
Parcels 33 and 34
Parcel 28
LEGEND:
Buildings
Roads
Drainage
Enclaved Areas
Transfer/Retained Use Areas
Phase I Parcel Areas
Parcel 29
Parcel Number, as designated by LEDA
0
1300
2600
Feet
N
Letterkenny Army Depot
Chambersburg, PA
Figure 4
Location of Phase I Parcels at LEAD
Revision
2
Date
98-08-25

Analysis of soil, surface water, and groundwater samples collected during the investigatory programs conducted in the 1980s indicated concentrations of chlorinated solvents, such as trichloroethene (TCE), 1,1,1-trichloroethane (TCA), and their associated breakdown products. These constituents are consistent with those used at LEAD for degreasing and cleaning operations. Concentrations of total volatile organic compounds (VOCs) detected in Rocky Spring have averaged 50 to 80 parts per billion (ppb) during the period 1981 to 1995.

Based on the information collected to date for the PDO Area, six OUs have been created. These six OUs are:

- OU 1: Source Area Soils (soils from the Oil Burn Pit [OBP] and drum storage revetments).
- OU 2: PDO Area Groundwater and Surface Water.
- OU 3: Mercury Detections in Rocky Spring Lake.
- OU 4: Groundwater Divide at 81-5 and Off-PDO Groundwater (Ammunition Area and Off-Post Residential Wells).
- OU 5: PCB Investigation of the Rocky Spring System.
- OU 6: BRAC Waste Sites.

OUs 1 and 2 were originally established when the FFA was signed. OU 3 and OU 4 were created in December 1992 based on data obtained during remedial investigations (RIs) conducted in 1991. The creation of these two OUs permitted the continued remedial action at OUs 1 and 2, while further investigation was conducted at OUs 3 and 4. OU 5 was created in September 1995, with EPA and PADEP consent, based on the detection of PCBs in the sediments of Rocky Spring. OU 6 is composed of waste sites, located in the to-be-excessed part of the PDO Area, that were identified as part of the EBS process. PDO OU 2 underlies the following Phase I Parcels: 28, 29, 33, and 34. None of the other PDO OUs are located within the Phase I Parcels.

The main source areas of contamination identified in the PDO Area are the drum storage revetments (part of PDO OU 1), the PDO Oil Burn Pit (part of PDO OU 4), the Open Trench Landfill, and the DRMO Scrap Yard (PDO OU 5). None of these source areas are located within the Phase I Parcels.

SOUTHEASTERN AREA

The SE Area consists of the SIA and the DA and encompasses approximately 1,136 acres. Eight individual OUs have been created in the SE Area at LEAD:

- OU 1: K Area Contaminated Soils.
- OU 2: Industrial Wastewater Sewers and Contaminated Soils.
- OU 3: SE Area On-Post Contaminated Groundwater.
- OU 4: Storm Sewers and Contaminated Soils and Sediments.
- OU 5: Area A and Area B Contaminated Soils.
- OU 6: SE Area Off-Post Contaminated Groundwater.
- OU 7: Truck Open Storage Area (north of Buildings 32/33)/Waste Oil Sump.
- OU 8: BRAC Waste Sites.

SE OUs 2 and 3 underlie the following Phase I Parcels: 1-13, 16-21, and 23-27. Portions of SE OUs 2 and 4 are included in the Phase I Parcels.

The main sources of contamination in the SE Area are the K Areas (SE OU 1), the former industrial wastewater lagoons (addressed under the Resource Conservation and Recovery Act [RCRA]), and the leaking industrial wastewater sewers (IWWS) (SE OU 2). None of these source areas are located within the Phase I Parcels, with the exception of portions of SE OU 2. All of the leaking sewer lines have been repaired, and there is no known soil contamination in the Phase I Parcels associated with leakage of the IWWS.

ENFORCEMENT ACTIVITIES

Since the listing of the two NPL sites at LEAD, all of the remedial activities at the site have been Army-led, in coordination with the EPA Region III and PADEP Southcentral Region. No other potentially responsible parties (PRPs) have been identified.

SECTION 3
COMMUNITY PARTICIPATION HIGHLIGHTS

Pursuant to CERCLA §113(k)(2)(B)(i-v) and §117, the Proposed Plan for the Phase I Parcels at LEAD was released to the public for comment on 30 March 1998. This document was made available to the public in the Administrative Record, located at the Coyle Free Library in Chambersburg and at Building 618 at LEAD.

The notice of availability of notification of the Proposed Plan Public Meeting was published in *The News Chronicle*, *The Record Herald*, and *The Public Opinion* on 30 March 1998. A public comment period was held from 30 March 1998 to 29 April 1998. On 7 April 1998, a public meeting was held at the Building 500 Auditorium to present the Proposed Plan and to entertain questions and comments from the public. A response to the comments received during the

comment period, including those raised during the public meeting, are addressed in the Responsiveness Summary, which is included as part of this Record of Decision. A transcript of the Proposed Plan public meeting is provided as Attachment 3 to this ROD.

SECTION 4
SCOPE AND ROLE OF RESPONSE ACTION

The response action selected for this site is a final action with regard to soils and an interim measure with regard to VOC-contaminated groundwater, which together address the environmental concerns at the Phase I Parcels. This response action is limited to the Phase I Parcels, and is *NOT* intended as a final measure to address the VOC-contaminated on-post groundwater operable units (PDO OUs 2 and 4, and SE OU 3). Final remedial actions for these OUs are being developed separately. A Draft Final ROD for PDO OU 2 is currently under regulatory review. Draft Remedial Investigation (RI) reports have been prepared for PDO OU 4 and SE OU 2, and SE OU 3 is in the Focused Feasibility Study (FFS) stage.

The role of the response action selected for the Phase I Parcels is to mitigate environmental threats at the properties while making the parcels available for beneficial reuse in a timely fashion.

SECTION 5
SUMMARY OF SITE CHARACTERISTICS

NATURE AND EXTENT OF CONTAMINATION

Soil

Numerous studies have been conducted in both the PDO and SE Areas at LEAD. These studies identified several areas of soil contamination. None of the identified soil contamination areas that require action lie within the Phase I Parcels. Most of the other accessible contaminated soils have already been addressed (e.g., the K Areas, IWWS soils, etc.) by on-site treatment, or excavation and off-site disposal, to the extent practicable.

Based on the Environmental Baseline Survey (EBS), several of the Phase I Parcel areas underwent limited investigations of the soils to rule out the potential for soil contamination due to past operations. A screening protocol (including methodology for the field investigations and comparison of the results to available risk-based criteria) was developed by the Army, EPA, and PADEP, and the subsequent investigations were completed in Fall 1997. The results of these investigations were compared against the following risk-based screening criteria:

- EPA Region III Risk-Based Concentrations (RBCs) for Industrial Use (October 1997).
- PADEP Act 2 Medium-Specific Concentrations, Used Aquifers, TDS <2,500, Nonresidential Soil to Groundwater Pathway, and Direct Contact Values.

No Further Action Decision Documents have been prepared to administratively close out these areas of concern (AOCs).

Parcel 24

Parcel 24, which includes Building 500 and adjacent lands, was identified through historical aerial photographs as having been used for open vehicle storage early in LEAD's operation (post World War II). Two test trenches were completed in this parcel, and one sample was analyzed for Target Analyte List (TAL) metals and total petroleum hydrocarbons (TPH). The only compound that exceeded the screening criteria was arsenic, which slightly exceeded the EPA RBC. EPA and PADEP, along with the Army, as part of the BRAC Cleanup Team (BCT), agreed that the detected concentration did not warrant further remedial action for industrial use. Arsenic is a naturally occurring metal, and arsenic results obtained at LEAD are not inconsistent with the published background concentrations for this metal in Pennsylvania (Shacklette and Boerngen, 1984). Residential and child-intense use scenarios were not evaluated.

Parcels 1 and 2

Parcels 1 and 2 are open land located south of Coffey Avenue near Gate 6. Historic vehicle storage and temporary coal storage were observed in aerial photographs, which prompted the screening investigation. Eight test trenches were completed in these parcels, and no visual evidence of contamination was noted. Six soil samples were collected and submitted to the laboratory for analysis. Only arsenic and beryllium were detected at concentrations that exceeded the EPA RBCs. EPA, PADEP, and the Army agreed that the detected concentrations did not warrant further remedial action for industrial use. Arsenic and beryllium are naturally occurring metals, and arsenic and beryllium results obtained at LEAD are not inconsistent with the published background concentrations for these two metals in Pennsylvania. Residential and child-intense use was not characterized.

Parcel 29

Parcel 29 is a large undeveloped parcel that is leased to a private farmer for agricultural use. Evidence from historic aerial photography indicated temporary vehicle storage in this area. Sixteen test trenches were completed in Parcel 29, and eight soil samples were collected and submitted to the laboratory for analysis. Only arsenic and beryllium were detected at concentrations that exceeded the EPA Region III RBCs. EPA, PADEP, and the Army agreed that these concentrations did not warrant further remedial action for continued commercial/industrial use. Arsenic and beryllium

are naturally occurring metals, and arsenic and beryllium results obtained at LEAD are not inconsistent with the published background concentrations for these two metals in Pennsylvania. Residential and child-intense use was not characterized.

Soil borings were advanced within the perimeter of Parcel 29 as part of the investigations for PDO OU 5. (Parcel 29, although initially included as part of PDO OU 5, is being addressed as part of the Phase I Parcels.) Only scattered low levels of PCBs were observed, at concentrations well below action levels. The BCT agreed that no further action was warranted based on continued industrial use.

Parcels 10 through 13

An Installation Assessment Report (1980) indicated that a spill of pesticides had occurred near Dock 45 and that damaged pesticide containers had been stored at this dock. However, a figure in the report showed a much larger area as the site for the spill. To determine whether residual levels of pesticides were present from these incidents, a sampling program was conducted that included all of the sheds along the docks, sampling of adjacent railroad tracks, and topographic low areas (where runoff may have collected). Fifty-one soil borings were completed during the Dock 45 investigations. All samples were analyzed using field screening test kits, which would identify the presence of a wide scan of pesticides, including the target pesticides malathion and diazinon. None of the soil samples were positive for pesticide content. To confirm these results, 20% of the samples were randomly selected and submitted to the laboratory for confirmatory analysis. No pesticides were detected in the laboratory analyzed samples.

Railroad Tracks Within the Phase I Parcels

Information from interviews with former employees indicated that heavy doses of herbicides were routinely used along the railroad tracks, and that oils may have been applied to suppress vegetation. Composited soil samples were collected along the railroad tracks in the SE Area warehouse district. The only constituents that were detected above the screening criteria were arsenic and beryllium, which exceeded the EPA RBCs. EPA, PADEP, and the Army agreed that these concentrations did not warrant further remedial action for continued industrial use. Arsenic and beryllium are naturally occurring metals, and arsenic and beryllium results obtained at LEAD are not inconsistent with the published background concentrations for these two metals in Pennsylvania. Residential and child-intense use was not evaluated.

Groundwater

VOC-contaminated groundwater exists beneath all of the PDO and SE Areas, which include all of the Phase I Parcels. The primary contaminants of concern detected are trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichlorethane (DCA), 1,2-dichlorethene (DCE), and tetrachloroethene (PCE), all of which have been detected at concentrations exceeding their respective Maximum Contaminant Levels (MCLs).

Routes of Exposure

The VOC-contaminated groundwater has been identified migrating off-post for several miles from the SE Area, with VOC detections in numerous springs. On-post, contaminated groundwater is highly interconnected with the surface water; this situation does not occur in the Phase I Parcels. In the PDO Area, a sinkhole is located in the recreational area to the north of South Patrol Road. This sinkhole serves as a conduit for surface water to flow into the groundwater system. Groundwater then surfaces downgradient at the Rocky Spring House, where it flows into Rocky Spring Lake, and then across a man-made dam to an off-Depot stream, which eventually discharges into the Conodoguinet watershed.

Potential routes of exposure include:

- Dermal contact with soil and groundwater.
- Inhalation of soil dust and vapors.
- Ingestion of soil and or groundwater.

For the risk assessments conducted previously for the SE and PDO Areas, all of the above exposure pathways were considered for on-Depot workers, since that was the current and anticipated future use of the property. The probable exposure pathways under the future uses proposed by LIDA are consistent with those for current on-Depot workers.

SECTION 6
SUMMARY OF SITE RISKS

Risk Assessments (RAs) were conducted for specific areas within the PDO and SE Areas at LEAD. These RAs provide the basis for taking action and indicated the exposure pathways that need to be addressed by the remedial action. It served as the baseline indicating the risks that could exist if no action is taken at the Phase I Parcels. This section of the ROD summarizes the results of the RAs conducted for this Site.

CONTAMINANTS OF CONCERN

Soil and groundwater data collected during the RIs were reviewed and evaluated to determine the contaminants of concern at the Site that are most likely to pose risks to public health. None of the soil samples collected during the RIs were located on the Phase I Parcels. However, these data have been considered to include conservative soil concentration values. The selected contaminants of concern for the site groundwater are shown in Table 1 (Tables are

presented in Attachment 2).

EXPOSURE ASSESSMENT

The objective of the exposure assessment was to estimate the magnitude of potential human exposure to the contaminants of concern at LEAD. Current and future receptors were evaluated based on current industrial and potential future (industrial) land use.

Currently, there are workers on-site. The exposure pathways for the current worker scenario group included dermal contact with, and incidental ingestion of, contaminants in surface soils along with the inhalation of soil gases from the volatilization of groundwater VOCs.

Future potential receptors included an on-site construction worker who would be in contact with and would be using groundwater at the site.

The future on-site construction worker potential exposure pathways included dermal contact with, and incidental ingestion of, contaminants in surface and subsurface soils, inhalation of soil gases, and consumption of, and dermal contact with, groundwater.

At the time that the PDO and SE Area risk assessments were conducted, the anticipated future use of the property was industrial. Therefore, no other use scenarios were considered.

The exposure scenarios, mathematical models, and the assumptions that were used to calculate the intakes (i.e., doses) of the chemicals of concern for each receptor through the applicable exposure route are presented in Tables 2 and 3.

TOXICITY ASSESSMENT

In evaluating potential health risks, both carcinogenic and noncarcinogenic effects were considered. The potential for producing carcinogenic effects is limited to substances that have been shown to be carcinogenic in animals and/or humans. Excessive exposure to all substances, carcinogenic or noncarcinogenic, can produce noncarcinogenic effects. Therefore, reference doses, when available, are identified for every chemical selected regardless of its classification, and cancer slopes are identified for those chemicals classified as carcinogenic.

Carcinogens

Slope factors (SFs) have been developed by EPA for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic contaminants of concern. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen in mg/kg-day to provide an upper bound estimate of the excess lifetime cancer risk associated with the exposure at the intake level. The term "upper bound" reflects the conservative estimate of the risk calculated from the SFs. Use of these approaches makes underestimation of the actual cancer risk highly unlikely. SFs are derived from the results of human epidemiological studies of chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans).

The EPA weight-of-evidence classification systems for carcinogenicity is presented in Table 4, and the carcinogenicity classification for the contaminants of concern is presented in Table 5.

Noncarcinogens

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to contaminants of concern exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of contaminants of concern from environmental media (e.g., the amount of a contaminant of concern ingested from contaminated drinking water) can be compared to the RfDs. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). The RfDs used in this evaluation and the references used for each contaminant are listed in Table 5.

RISK CHARACTERIZATION

This risk characterization is an evaluation of the nature and degree of potential carcinogenic and noncarcinogenic health risks posed to the current worker and future construction workers receptors at LEAD. In this section, human health risks are discussed independently for potential carcinogenic and noncarcinogenic effects for contaminants because of the different toxicological endpoints, relevant exposure duration, and methods employed in characterizing risk.

Carcinogenic Risks

For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess life-time cancer risk is calculated from the following equation:

$$Risk = CDI \times SF$$

where:

risk = a unit less probability (e.g., 2×10^{-5}) of an individual developing cancer;

CDI = chronic daily intake averaged over an

estimated exposure period (mg/kg-day); and

SF = slope factor, expressed as $(mg/kg\text{-}day)^{-1}$

These risks are probabilities that are generally expressed in scientific notation. An excess lifetime cancer risk of 1×10^{-6} indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 chance of developing cancer as a result of LEAD-related exposure to a carcinogen over a working lifetime under the specific exposure conditions at the Site.

For the current on-site worker scenario, the lifetime excess cancer risk was estimated to range from 9.6×10^{-11} to 7.5×10^{-8} in the SE Area, and 4.2×10^{-8} to 1×10^{-6} in the PDO Area. For the future construction worker scenario, the lifetime excess cancer risk were estimated to range from 2.4×10^{-9} to 6×10^{-3} in the SE Area and from 1.5×10^{-4} to 4.1×10^{-4} in the PDO. The primary difference between the current and future worker scenarios was the consumption and use of VOC-contaminated groundwater.

Noncarcinogenic Risks

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specific time period (e.g., lifetime) with a reference dose derived for a similar exposure period. The ratio of exposure to toxicity is called a hazard quotient (HQ). By adding the HQs for all contaminants of concern that affect the same target organ (e.g., liver) within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated.

The HQ is calculated as follows:

Noncancer HQ = CDI/RFD

where:

CDI = Chronic Daily Intake

RfD = Reference dose; and

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

The results of the risk calculations indicated that the HI for the current work scenario ranged between 3.6×10^{-6} and 2.5×10^{-2} for the SE Area, and well below 1 for the PDO Area. For future worker scenarios, however, the HIs ranged from 3.3 to 3.5; attributable mainly to the assumed use and consumption of groundwater.

ECOLOGICAL CONSIDERATIONS

The Phase I Parcels include several commercial and industrial buildings, paved roads and paved parking areas, an agricultural parcel, and areas of mowed grassy fields and small stands of trees. This configuration inhibits the formation of habitat areas, as it is completely developed. Given the nature and future use of the Phase I Parcels, it is unlikely that the site would constitute a significant habitat or affect threatened or endangered species identified as being potentially present at LEAD.

RISK UNCERTAINTY

There is a generally recognized uncertainty in human risk values developed from experimental data. This is primarily due to the uncertainty of data extrapolation in the areas of (1) high to low dose exposure, (2) modeling of dose response effects observed, (3) route to route extrapolation, and (4) animal data to human data extrapolation. The site-specific uncertainty is mainly due to the degree of accuracy of the exposure assumptions.

In the presence of such uncertainty, the EPA and the risk assessor have the obligation to make conservative assumptions such that the chance is very small for the actual health risk to be greater than that determined through the risk process. On the other hand, the process is not to yield absurdly conservative risk values that have no basis in reality. That balance was kept in mind in the development of exposure assumptions and pathways and in the interpretation of data and guidance for the baseline risk assessment for this Site. The environmental condition of these parcels is expected to improve based on actions planned or in progress at the other OUs.

REMEDIAL ACTION OBJECTIVES (RAO)

Remedial action objectives for the contaminants of concern in the Phase I Parcels were developed to prevent direct contact and ingestion of soil under residential and other nonindustrial exposure scenarios, to prevent direct contact and ingestion of groundwater under any scenario, and to reduce exposure to levels of contaminants that produce unacceptable risk levels.

Selection of final remedial measures regarding groundwater will be presented in separate RODs.

SECTION 7
DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected final site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction

of toxicity, mobility, or volume (TMV) of the hazardous substances.

Based on the available information, the Army has evaluated the following two alternatives:

Alternative 1: No Action

Alternative 2: Institutional Controls

These alternatives are discussed below. The evaluation of the alternatives against the nine CERCLA-mandated criteria are presented in the following section.

ALTERNATIVE 1: NO ACTION

Capital Cost:	**$0**
5-Year Review Cost:	**$25,000/review**
Present Worth Cost:	**$35,000**

CERCLA guidance requires that the no-action alternative be considered as a baseline for comparison of other alternatives. No remedial actions would be implemented under this technology. The present worth cost is based on two 5-year performance evaluation reviews/reports.

ALTERNATIVE 2: INSTITUTIONAL CONTROLS

Capital Cost:	**$7,500**
5-Year Review Cost:	**$25,000/review**
Present Worth:	**$42,500**
Annual Recurring Cost:	**$1,000**

This alternative involves the use of institutional controls. Initially, the institutional controls to prohibit nonindustrial use of the parcels and activities that would result in any exposure to the contaminants in the groundwater will become part of LEAD policy via an amendment to the LEAD Master Plan. At the time of the property transfer, the institutional controls will take the form of environmental deed restrictions. The environmental deed restrictions shall be protective of human health and the environment by:

- Restricting the property for commercial and industrial use only.
- Not permitting soil excavation activities below a depth of 3 feet above the water table without prior approval of the Army.
- Not permitting construction of any subsurface structure for human occupation, without the prior approval of the Army, PADEP, and the EPA.
- Restricting access or use of the groundwater underlying the property without the prior written approval of the Army, PADEP, and the EPA.

These restrictions will be instituted through an amendment of LEAD's Master Plan for the Phase I Parcels to reflect these controls until the date of transfer. At the time the property is transferred, the restrictions will be implemented through th use of appropriate deed restrictions, which will be recordeo at the time of transfer. In addition, upon transfer of the property, the Army, in consultation with EPA and PADEP, will establish periodic inspection procedures to ensure adherence to the institutional controls. The present worth cost includes two 5-year performance evaluation reviews/reports.

SECTION 8
SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against the following nine evaluation criteria: overall protection of human health and the environment; compliance with applicable or relevant and appropriate level requirements (ARARs); long-term effectiveness and permanence; reduction of toxicity, mobility, and/or volume; short-term effectiveness; implementability; cost; regulatory acceptance; and community acceptance.

A comparative analysis of the two alternatives based on these evaluation criteria is presented in the following sections.

THRESHOLD CRITERIA

Overall Protection of Human Health and the Environment

Alternative 1: No Action

No remedial action would be implemented under this alternative. The current site conditions and property use present no risk to human health because the groundwater is not used and constituents in the soils do not exceed industrial RBCs. This alternative, however, is not protective of an unrestricted use scenario. Furthermore, since soils were evaluated only for industrial use scenarios, there may be potential risk under different types of use scenarios. The potential for exposure and associated risk for exposure to VOC-contaminated groundwater to future land users is high considering activities such as construction.

During periods of high groundwater table elevations, the risk of exposure to VOC-contaminated groundwater would increase.

No permanent habitats for aquatic life exist within the BRAC Parcels. Therefore, no evaluation of aquatic risk was necessary. No significant risk to terrestrial receptors was identified for the Phase I Parcels due to both a lack of sustainable habitat and insignificant levels of bioaccumulating contaminants.

Alternative 2: Institutional Controls

Institutional controls would be implemented under this alternative. The enforcement of the institutional controls, specifically the requirement for industrial use only and the prohibition of contact with, and consumption of, soil and groundwater would eliminate exposure pathways that could present significant risk to future users. The institutional controls would mitigate both the carcinogenic and noncarcinogenic risks described in Section 6 above.

No permanent habitats for aquatic life exist within the BRAC Parcels. Therefore, no evaluation of aquatic risk was necessary. No significant risk to terrestrial receptors was identified for the Phase I Parcels due to both a lack of sustainable habitat and insignificant levels of bioaccumulating contaminants.

Compliance with ARARs

Since this ROD involves an interim measure with regard to groundwater contamination, final remediation goals and, hence, ARARs are not identified here. This ROD, however does present a final action for soils. The soils under both alternatives would be in compliance with all ARARs.

Chemical-Specific ARARs

- PADEP Act 2 Medium-Specific Concentrations, Appendix A, Tables 3A and 4A, Nonresidential Surface Soil 0-2 Feet; and Tables 3B and 4B, Used Aquifers, TDS <2,500, Nonresidential, Generic Value.

Action-Specific ARARs

Neither alternative would be subject to action-specific ARARs.

Location-Specific ARARs

No location-specific ARARs are required.

PRIMARY BALANCING CRITERIA

Long-Term Effectiveness and Permanence

Alternative 1: No Action

Implementation of the no-action alternative could be effective and permanent in the long-term if considering the soil alone because no significant contamination is present, assuming continued industrial use. However, in the long term, other tenants/owners of the property could be exposed to contamination through excavation and contact with the groundwater, and the property could be used for nonindustrial purposes, possibly increasing the risk to human health. Therefore, Alternative 1 does not meet the requirements for long-term effectiveness and permanence.

Alternative 2: Institutional Controls

The long-term effectiveness of the institutional controls will be contingent upon enforcement of use restrictions initially by the Army through the LEAD Master Plan, and after transfer, through enforcement of the environmental deed restrictions. The enforcement of these restrictions will be the responsibility of LIDA, the Army, EPA, and PADEP.

Implementation of this alternative would maintain the industrial use of the property and reduce the future risk of exposure to groundwater by the development and enforcement of environmental deed restrictions. Because these restrictions would become a permanent part of the real estate documentation and would be required to be included in any subsequent sales, transfers, and/or lease agreements, this alternative would be a long-term and permanent remedial action.

Reduction in Toxicity, Mobility, or Volume

Neither alternative results in a change in toxicity, mobility, or volume, since the alternatives do not involve physical remedial actions. The soils do not contain levels of constituents above the EPA Region III industrial RBCs or the PADEP Act 2 criteria, with the previously noted exceptions that are the result of background conditions. Furthermore, because groundwater contamination and the source areas are being addressed under separate operable units, the statutory preference for remedies that employ treatment that reduces the toxicity, mobility, and/or volume as a principal element will be addressed by the final groundwater response.

Short-Term Effectiveness

Alternative 1: No Action

Alternative 1 would not meet the requirements for short-term effectiveness. Currently, LEAD prohibits use or contact with groundwater, and there is only industrial use of the property on the Phase I Parcels. Once the property is transferred to a private entity, there is no legal provision to keep future land users from being exposed to the contaminated groundwater, and from using the property for nonindustrial purposes.

Alternative 2: Institutional Controls

Under this alternative, institutional controls would be implemented to mitigate risk due to exposure to groundwater. This alternative would have short-term effectiveness because the Army will formally document the requirements of the institutional controls by amending the LEAD Master Plan. This will provide effectiveness from the finalization of the ROD until the date of transfer. The environmental deed restrictions would be in place from the date of transfer, which will provide for long-term effectiveness (see above).

Implementability

Alternative 1: No Action

Under the no-action alternative, there are no measures to implement.

Alternative 2: Institutional Controls

Alternative 2 can be easily implemented. The short-term implementation of the preferred alternative would involve amending the LEAD Master Plan to include the institutional controls that are already in place informally at the Depot. Once the amendment is added, appropriate directorates at LEAD (the environmental division, Public Works, security) will be provided with a copy and with the enforcement action chain-of-command for infractions.

Concurrent with this activity, the Department of the Army would be developing deed restrictions for the Phase I Parcels. The BCT has already discussed the property transfer environmental restrictions, and the deed restrictions will be presented to the regulatory representatives for concurrence.

Cost

Alternative 1 solely has the estimated costs of the two 5-year reviews associated with its implementation. The costs presented for Alternative 2 are estimated, and may vary depending on the number of parcels that are transferred separately.

MODIFYING CRITERIA

State Acceptance

PADEP, on behalf of the Commonwealth of Pennsylvania, concurs with the selected remedy.

Community Acceptance

Only one set of comments was received on the Proposed Plan during the Public Comment Period. These comments and responses to these comments are provided in the Responsiveness Summary of this ROD.

SECTION 9
THE SELECTED REMEDY

Based on consideration of the CERCLA requirements, the NCP, the detailed analysis of the alternatives using the nine criteria, and public and state comments, the Army and EPA have selected an institutional controls remedy for this Site. The total present worth costs of the selected remedy are estimated at $42,500, with an annual recurring cost of $1,000/year.

The selected remedy, Institutional Controls, shall include the following components:

- Restricting the property for commercial and industrial use only.
- Not permitting soil excavation activities below a depth of 3 feet above the water table without prior approval of the Army.
- Not permitting construction of any subsurface structure for human occupation without the prior approval of the Army, PADEP, and the EPA.
- Restricting access or use of the groundwater underlying the property without the prior written approval of the Army, PADEP, and the EPA.

These restrictions will be instituted through an amendment of LEAD's Master Plan for the Phase I Parcels to reflect these controls until the date of transfer. At the time the property is transferred, the restrictions will be implemented through the use of deed restrictions, which will be recorded at the time of transfer. In addition, upon transfer of the property, the Army, in consultation with EPA and PADEP, will establish periodic inspection procedures to ensure adherence to the institutional controls.

SECTION 10
STATUTORY DETERMINATIONS

Under CERCLA Section 121, EPA must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous waste as their principal element. The following sections discuss the remedy in light of these statutory requirements.

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy shall be protective of human health and the environment. The institutional controls will mitigate both the carcinogenic and noncarcinogenic risks described in Section 6 above.

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The selected final remedy with regard to soils will be in full compliance with all applicable or relevant and appropriate requirements (ARARs). Since the remedy regarding groundwater is an interim measure, final cleanup objectives

and ARARs will be addressed in subsequent OU RODs.

COST EFFECTIVENESS

The selected remedy, Institutional Controls, was chosen because it provides the best balance among criteria used to evaluate the alternatives considered in the Detailed Analysis. The alternative was found to achieve both adequate protection of human health and the environment and to meet the statutory requirements of Section 121 of CERCLA. The selected remedy was found to be cost-effective. The cost of Alternative 2 has been established to be $7,500.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

EPA and PADEP have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective and timely manner for the Phase I Parcels. The groundwater portion of this action, however, is interim and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

- The selected remedy for the Phase I Parcels, Institutional Controls, does not satisfy the statutory preference for treatment as a principal element of the remedy. With respect to the soils, as long as the property is not used for non-industrial purposes, a treatment remedy is not required. As for the groundwater, since the selected action does not constitute a final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed by the final groundwater response action.

LETTERKENNY ARMY DEPOT

PHASE I PARCELS

CHAMBERSBURG, FRANKLIN COUNTY, PENNSYLVANIA

RESPONSIVENESS SUMMARY

SEPTEMBER 28, 1998

SECTION 1
OVERVIEW

Based on an assessment of site conditions and remedial alternatives, the Army and EPA selected a preferred remedy for the Phase I Parcels at Letterkenny Army Depot, Chambersburg, Pennsylvania. The selected remedy addresses the threat associated with the contaminated groundwater beneath the parcels and the potential threat associated with the soils in the event of non-industrial land use. As specified in the Record of Decision (ROD), the remedy involves the implementation of deed restrictions and other institutional controls that will be protective of human health and the environment.

Based on the comments received during the public comment period, the residents and Letterkenny Industrial Development Authority (LIDA) strongly support the implementation of the institutional controls alternative for the Phase I Parcels. Only one set of written comments was received during the public comment period on the Proposed Plan; these comments came from the legal counsel representing LIDA.

SECTION 2
BACKGROUND ON COMMUNITY INVOLVEMENT

CHRONOLOGY OF COMMUNITY INVOLVEMENT

Community relations activities at LEAD to date have included public meetings; review and coordination meetings with Federal and state regulatory personnel; site visits; meetings with elected Federal, state, and local officials and with community groups; news releases to the local media; and direct contact with nearby property owners.

Community interviews were conducted in 1988 as part of the process of developing the Public Involvement and Response Plan, which was published in 1990. At the time of the 1988 community interviews, the primary areas of concern to the community were the groundwater contamination problem and associated health and property value issues.

LEAD has a Restoration Advisory Board (RAB), which began meeting in 1996 and focuses primarily on the restoration activities related to DERA and BRAC actions. The RAB replaced the Technical Review Committee (TRC), formed in 1988, which was the previous vehicle by which the community could provide comments and review progress on the environmental programs at LEAD. LEAD representatives attend RAB meetings and meetings of the Letterkenny Industrial Development Authority (LIDA) (formerly the Franklin County Reuse Committee) and provide status updates on environmental activities at LEAD.

Meetings with regulatory agency personnel have been conducted regularly and are held with representatives from LEAD, U.S. Army Corps of Engineers (USACE), PADEP, EPA Region III, Department of the Army, and U.S. Army Materiel Command (AMC). Topics of discussion at these meetings generally include review of project status, review of new technical information, resolution of problem areas, and direction and schedule of further studies. In addition to the formal meetings, LEAD, USACE, PADEP, and EPA personnel maintain frequent telephone and E-mail contact on an as-needed basis.

Site visits to LEAD have been made by representatives of the RAB, USACE, PADEP, EPA Region III, and contractors. Numerous site visits by the regulatory agency representatives have promoted communication between LEAD, PADEP, and EPA.

Periodically since June 1982, when the groundwater contamination problem was first identified, formal news releases have been issued by LEAD concerning the groundwater issue and other sources of contamination. These news releases typically contain information on the initial phases of investigation and/or remedial work. Recently, much of the news coverage has concerned cleanup with regard to the BRAC parcels and the status of lease and transfer of the property.

The residents in the vicinity of LEAD have generally reacted favorably to the efforts made by the Department of the Army with regard to the identification and cleanup programs underway and proposed. The off-post sampling of wells for potential groundwater contamination during the 1980s made nearby residents more aware of the contamination problems existing at LEAD. However, the proactive approach by the Army to identify potential problems and mitigate exposure (by providing connection to a public drinking water source for residents whose wells had potential or known

contamination) was received favorably.

KEY COMMUNITY CONCERNS

The community is greatly concerned about the Superfund sites and LEAD in the long-term future. Community interviews were conducted on 26-28 June 1997 at the Depot as part of the revised Community Relations Plan. Telephone interviews were conducted prior to and after the on-site interviews. Each interview participant was asked 37 questions. Nineteen individuals participated in the interviews: 2 Depot residents and 17 Chambersburg-area residents. Persons interviewed for the revised Community Relations Plan identified seven areas of concern.

Cleanup Activities

Generally, the interviewees were pleased with the ongoing environmental cleanup activities. Several noted that for the last 8 to 10 years, Depot staff have worked hard to solve environmental problems at the site. Some interviewees expressed concern that the cleanup activities were taking too long. The majority of interviewees agreed that the government is committed to cleaning up the hazardous waste at LEAD. Most of the interviewees wanted to know the status of specific cleanup activities (e.g., data, results, costs, and schedule). One mentioned that some of the environmental reports were too technical to understand.

Some wanted the government to finish the remedial process as quickly as possible, whereas others thought that the government should take the time needed to be sure to do a thorough remedial process. One individual believed that the Army's environmental standards may not be as stringent as the public's standards in the level of cleanup activities.

Several expressed a concern to return areas to farmland use and to coordinate efforts to preserve existing farmland. A few residents noted that farmers do not seem to be concerned about contamination because farming activities continue on property adjacent to LEAD.

Some were concerned that cleanup activities would continue after areas were open for public reuse. One resident said that $350 million was too much to pay for groundwater contamination cleanup on-site and that documentation of the historic value of a warehouse before tearing it down was "foolish."

Reuse

Noting the economical impact of having fewer civilian jobs with the realignment of LEAD, the majority of the interviewees have accepted LIDA's reuse plan.

Some thought the reuse of areas of LEAD was a positive step in preserving farmland/agriculture and pristine areas of Franklin County.

Some thought the reuse plan was overly optimistic and that the public would have to pay for the reuse activities. Many interviewees were concerned about the feasibility of taking care of the reuse areas of LEAD. Many were concerned with potential liability if additional Army-generated contamination is discovered in the reuse areas.

A few were concerned about the types of industry that may be brought in and the potential for re-contaminating the site and creating noise or traffic problems. Some were concerned how the Army will provide access to the reuse areas, grant public use of the reservoir, and share the Depot infrastructure (electricity, water, sewer, etc.). One person suggested that the state site a low-level radioactive waste disposal facility as a reuse option at LEAD.

Contamination

Several interviewees stated that the extent of contamination is unknown and that more contamination may be discovered. One said that the Army brought materials from across the country for disposal at the Depot. Another said that studies show that the contamination is spreading. Residents are concerned that the solvents in the groundwater and streams will directly affect the population. Several mentioned concerns about specific areas at the Depot:

- The apartment complex (Kenny Gardens Housing).
- The old quarry (Fagan's Quarry).
- Rocky Spring Lake.
- Mercury in the lake.
- Fire practice training areas.
- Lead contamination at the ammunition detonation area.
- Discharge from LEAD (below Gate 6) into streams after a heavy rain.

Air Quality

A few residents said that the Army needs to address air quality in addition to soils and groundwater contamination.

Ammunition Detonation

Many residents expressed concern about the ammunition detonation activities at the Depot. They said the Army sometimes conducts this activity on weekends during the noon hour. Some interviewees believe that the blasting is causing plaster to crack in homes adjacent to and about a mile from LEAD. One resident said that the impact of the detonations is worse for homes a greater distance from LEAD than the homes nearer to the Depot. Several mentioned that contaminants must be released into the air as a result of the ammunition detonation. Residents voiced concern about noise, air quality, and dust control regarding the detonation activities.

Government

Half of the interviewees said that the general public mistrusts Federal and state government agencies. One resident said, "No matter what an individual thinks, the government will do what they want and that the government does not think an individual is important to consider." However, the majority of the interviewees believe that the Pennsylvania Department of Environmental Protection is the most credible government agency regarding environmental issues.

Army

The majority of the interviewees believe that the Army is committed to cleaning up the contamination at LEAD. One resident was pleased that LEAD is a government site because the Army is obligated to clean up the site, whereas a commercial venture could opt to abandon a contaminated property. Some specific concerns include:

- The Army is rushing to transfer areas to the public because of community pressure and could compromise environmental cleanup activities.
- The Army cannot meet the deadlines because of the holdup caused by complex environmental problems.
- Some individuals have reservations about some information received from LEAD and are concerned that they may not be getting all of the information. One individual participated in two tours of the facility and questioned the use and contents of a building with concertina wire. The question was not answered to the individual's satisfaction; therefore, this person believes the Army is hiding something.
- There was a lack of response from the LEAD Public Affairs Officer when residents complained about the blasting and poor quality of the office's answering machine (very short tape).

Eighteen of the 19 interviewees said they had an understanding of the Base Realignment and Closure activities at LEAD. The majority of the interviewees were favorable towards the cleanup activities related to the Base Realignment and Closure parcels. In addition, the majority of the interviewees were supportive of LIDA's reuse plan. Most individuals also were favorable towards the cooperation and interaction between the Army and LIDA in freeing the to-be-excessed parcels as soon as possible.

SECTION 3
SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

The public comment period on the Proposed Plan for the Phase I Parcels was held from 26 March to 27 April 1998. Comments received during this time are summarized below.

RESULTS OF THE SCREENING INVESTIGATIONS

Comment 1: The results of the soil sampling conducted on several of the parcels indicated concentrations of arsenic and beryllium that exceeded EPA Region III Risk Based Concentrations (RBCs) for the industrial ingestion scenario. LIDA expressed a concern that the reuse plan calls for a mix of commercial and industrial uses in the Phase I Parcels area, and requested that confirmation be made as to whether the "no further action" decision is consistent with the proposed reuse. LIDA also requested that DEP provide concurrence on the "no further action" decision.

Response 1: The levels of arsenic and beryllium that were found on the Phase I Parcels are believed to be naturally occurring, and not a result of operations and/or disposal practices. The BRAC Cleanup Team (BCT), comprised of representatives from LEAD, EPA Region III, and PADEP, reviewed these results with consideration of the proposed reuse, and unanimously agreed that no soil remediation is warranted. The reference to a "no further action" decision is more accurately a decision to implement an institutional controls remedy to maintain continued like use of the property. The arsenic and beryllium results obtained at LEAD are not inconsistent with the published background concentrations for these two metals in Pennsylvania. The BCT believes that the commercial/industrial uses outlined in the reuse plan are consistent with the current use of these parcels. In addition, the Army and EPA are signatories on the decision documents for each of the parcels where screening sampling was conducted and PADEP concurs with the decision.

PARCEL-SPECIFIC COMMENTS

Comment 2: LIDA expressed concerns about two fuel spills reported to have occurred on the Building 43 parcel, and the sufficiency of the cleanup.

Response 2: The two spills are documented in the Phase I Environmental Baseline Survey (WESTON, August 1996). The first spill occurred on the paved road adjacent to Building 43 and consisted of leakage of approximately 10 gallons of fuel onto the road. At the time of the spill, the fuel was soaked up with absorbent materials. The second release occurred during tank tightness testing. Contaminated soils were excavated and removed.

RISK ASSESSMENTS

Comment 3: The Proposed Plan cites risk assessments that were performed at a time when the future use of LEAD was continued industrial. LIDA requested confirmation that these risk assessments are consistent with their reuse plans.

Response 3: The risk assessments that were performed included evaluation of future worker scenarios with the assumption of use and consumption of groundwater, at the request of PADEP. The implementation and enforcement of the institutional controls will keep the exposure (and the resulting risk) within acceptable bounds. The two risk assessments (for the PDO and SE Areas) can be found in the Administrative Record for LEAD, either at Building 618 or at the Coyle Free Library in Chambersburg.

ENFORCEMENT OF THE INSTITUTIONAL CONTROLS

Comment 4: The enforcement of the deed restrictions is cited as being the responsibility of LIDA, the Army, EPA, and PADEP. LIDA commented that since these restrictions will be bound by deed, adjoining property owners have jurisdiction to enforce the actions via a private action.

Response 4: The Army and EPA concur.

ATTACHMENT 1

REFERENCES

ATTACHMENT 1
REFERENCES

Acker, R.C. 1955. *Water Supply from Wells for Letterkenny Ordnance.* Letter Report to District Engineer, U.S. Army Corps of Engineers, Baltimore District.

Archaeological & Historical Consultants, Inc. December 1996. *Phase I Archaeological Survey, Letterkenny Army Depot.* Franklin County, Pennsylvania.

Battelle. June 1983. *Geophysical Survey of the Southeast Area of LEAD.*

Battelle. September 1983. *Environmental Contamination Survey of LEAD: Southeast Industrial Area.*

Battelle. October 1983. *Environmental Contamination Survey of LEAD: Property Disposal Office Drainage System.*

Battelle. December 1983. *Environmental Contamination Survey of LEAD: Exploratory and Confirmatory Phases.*

Battelle. May 1984. *Environmental Contamination Survey of LEAD: Multi-Phase Investigation Summary.*

Becher, A.E. and L.E. Taylor. 1982. *Groundwater Resources in the Cumberland and Contiguous Valleys of Franklin County, Pennsylvania.* Pennsylvania Geological Survey Water Resources Report 53. Harrisburg, Pennsylvania.

Berger Associates. 1981. *Army Pollution Abatement Program Studies.*

Building Technology Incorporated. July 1984. *Historic Properties Report, Letterkenny Army Depot.*

Dames and Moore, Inc. 1993. *Asbestos Survey - Letterkenny Army Depot.*

Dames and Moore, Inc. 1996. *Lead-Based Paint Survey— Letterkenny Army Depot.*

Dragun, J. and A. Chiasson. 1991. *Elements in North American Soils.* Hazardous Materials Control Resources Institute, Greenbelt, MD.

EA (EA Engineering, Science, and Technology). 1991. *Site Investigation, LEAD.*

EMC (Environmental Management Consultants). July 1988. *Asbestos Survey, Building 663, Letterkenny Army Depot.*

EMC (Environmental Management Consultants). 1988. *Asbestos Survey - Building 1, Letterkenny Army Depot.*

EMS (Environmental Management Systems). 1989. *Asbestos Assessment Survey for Letterkenny Army Depot.*

EQM (Environmental Quality Management). August 1995. *Dock 35 Closure Report, Letterkenny Army Depot.*

ERM (Environmental Resources Management, Inc.). January 1995. *Letterkenny Army Depot - SWMU Site Investigation Follow-on Report, ELIN A009.*

ESE (Environmental Science & Engineering, Inc.). August 1986. *Remedial Investigation of the Disposal Area at LEAD.*

ESE (Environmental Science & Engineering, Inc.). September 1987. *Remedial Investigation of the Property Disposal Office Area at LEAD.*

ESE (Environmental Science & Engineering, Inc.). December 1987. *Remedial Investigation of the Southeastern Area at LEAD.*

ESE (Environmental Science & Engineering, Inc.). 1988a. *Feasibility Study of the Property Disposal Office Area at Letterkenny Army Depot.* Gainesville, Florida.

ESE (Environmental Science & Engineering, Inc.). 1988b. *Feasibility Study of the Southeastern Area of Letterkenny Army Dept, First Operable Unit.* Gainesville Florida.

ESE (Environmental Science & Engineering, Inc.). 1989. *Feasibility Study of the Southeastern Area of Letterkenny Army Depot, Second Operable Unit.* Gainesville Florida.

ESE (Environmental Science & Engineering, Inc.). August 1993. *Draft Addendum to the Remedial Investigation of the Southeastern Area at Letterkenny Army Depot Contamination Assessment of K Area Soils.*

ESE (Environmental Science & Engineering, Inc.). September 1995. *PDO New OU #5 Site Investigation, PCBs in Rocky Spring Lake, Draft Report.*

FCADC (Franklin County Area Development Corporation). 1993. *1993 Franklin County Data Book.*

Franklin County Reuse Committee (now know as the Letterkenny Industrial Development Authority [LIDA]). May 1997. *Letterkenny Army Depot Reuse Strategy Summary Report.*

Geonex Corporation. August 1995. *Draft Wetlands Mapping Report for United States Army, Letterkenny Army Depot.*

John Milner Associates. 1981. *An Archaeological Reconnaissance of Proposed Development Sites at the Letterkenny Army Depot.*

Kearney, A.T. and The Earth Technology Corporation. February 1988. *RCRA Facility Assessment Phase I Preliminary Review of Solid Waste Management Units.*

Nature Conservancy, Pennsylvania Science Office. December 1992. *An Inventory of Significant Ecological Features of the Letterkenny Army Depot, Franklin County, Pennsylvania.*

Pennsylvania State University and Envirosphere Company. January 1985. *An Archaeological Overview and Management Plan for the Letterkenny Army Depot.*

R.E. Wright Environmental, Inc. July 1994. *Draft Report for Building Investigations for Radon Recommendations.*

R.E. Wright Environmental, Inc. July 1995. *Radon Testing Plan, Letterkenny Army Depot.*

R.E. Wright Environmental, Inc. March 1997. *Draft Report for Building Investigations for Radon Recommendations, Letterkenny Army Depot.*

Root, S.I. 1971 (Reprinted 1974). *Geology and Mineral Resources of Northeastern Franklin County, Pennsylvania.* Pennsylvania Department of Environmental Resources, Atlas 119ab. Harrisburg, Pennsylvania.

Shacklette, H.J. and J.G. Boerngen, 1984. "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States." *U.S. Geological Survey Professional Paper 1270.* U.S. Department of the Interior.

SS&M (Spots, Stevens and McCoy). December 1991. Letter to PADEP on Closure of Storage Pad at Building S26-5, Letterkenny Army Depot.

USATHAMA (U.S. Army Toxic and Hazardous Materials Agency). 1980. *Installation Assessment of Letterkenny Army Depot, Report No. 161., Aberdeen Proving Ground, Maryland.*

U.S. Department of Defense. Fall 1995. *BRAC Cleanup Plan (BCP) Guidebook.*

U.S. Department of Defense. 1995. *DoD Base Reuse Implementation Manual.*

U.S. Department of the Army. February 1987. *Evaluation of Solid Waste Management Units.*

U.S. Department of the Interior, National Park Service. 1992. *Standards for Rehabilitation and Illustrated Guidelines for Rehabilitating Historic Buildings.*

Versar, Inc. May 1994. *Remedial Investigation/Feasibility Study Letterkenny Army Depot Property Disposal Office Area, Operable Units 3 and 4, Work Plan.*

WESTON (Roy F. Weston, Inc.). 1984. *LEAD Remedial Investigation and Feasibility Study.*

WESTON (Roy F. Weston, Inc.). 1996. *Phase I Environmental Baseline Survey, Letterkenny Army Depot, BRAC 95 Action.*

WESTON (Roy F. Weston, Inc.). 1997. *CERFA Letter Report (Final) Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1997. *Technical Plan for Investigation of PCBs in the Rocky Spring System Property Disposal Office (PDO) Area, Operable Unit 5 (OU 5), Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1997. *Finding of Suitability to Lease (FOSL) for Buildings 6, 9, 19, 412, 416, 500, 522, and 2291 (Final) Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998a. *Decision Document for BRAC Parcels 1 and 2, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998b. *Decision Document for BRAC Parcels 8 through 13, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998c. *Decision Document for BRAC Parcel 24, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998d. *Decision Document for BRAC Parcel 29, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998e. *Decision Document for BRAC Railroad Parcels, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998f. *Decision Document for BRAC Buildings 6 and 9, Letterkenny Army Depot.*

WESTON (Roy F. Weston, Inc.). 1998g. *Phase II Environmental Baseline Survey (Draft) Letterkenny Army Depot, BRAC 95 Action.*

Weston Services, Inc. 1989. *EPRDA Soil Gas Investigation Report.*

ATTACHMENT 2

RISK ASSESSMENT TABLES

Table 1—Contaminants of Concern (COC) in the SE and PDO Areas at LEAD

Organic COCs	Inorganic COCs
Acetone (ACET)	Arsenic (AS)
Benzene (C6H6)	Beryllium (BE)
Bromodichloromethane (BRDCLM)	Cadmium (CD)
Carbon tetrachloride (CCL4)	Chromium (CR)
Chloroform (CHCL3)	Copper (CU)
1,1-Dichloroethane (11DCLE)	Lead (PB)
1,2-Dichloroethane (12DCLE)	Manganese (MN)
1,2-Dichloroethene (12DCE)	Nickel (NI)
1,1-Dichloroethene (11DCE)	Thallium (TL)
Methylene chloride (CH2CL2)	Zinc (ZN)
Tetrachloroethene (TCLEE)	
Trichloroethene (TRCLE)	
1,1,1- Trichloroethane (111TCE)	
1,1,2- Trichloroethane (112TCE)	
Trichlorofluoromethane (CCL3F)	
Toluene (MEC6H5)	
Trans-1,2-dichloroethylene (T12DCE)	
Vinyl chloride (C2H3CL)	
Chlordane (CLDAN)	
Heptachlor (HPCL)	
Diethylphthalate (DEP)	
Bis (2-ethylhexyl) phthalate (B2EHP)	
Pentachlorophenol (PCP)	

Table 2—Exposure Scenarios with Applicable Sites and Exposure Pathways

Scenario	Applicable Sites	AA	FS	GW		SE		SO			SW		
		inh	ing	ing	der	ing	der	ing	der	inh	ing	der	inh
Current Worker		-S						X	X	X			
Future Worker		-S		✧	✧			X	X	X			

Note: AA = ambient air (vapors).
FS = fish.
GW = groundwater.
SE = sediment.
SO = soil.
SW = surface water.
der = dermal.
inh = inhalation.
X = This receptor/pathway is evaluated based on measured chemical concentrations at the (sub) contamination area.
✧ = This receptor/pathway is evaluated to estimate the risks associated with future worker use of site groundwater should it ever be used as a water supply.
-S = This receptor/pathway is evaluated based on modeled chemical concentrations in air at the source (over the contamination area).

Source: ESE (Environmental Science & Engineering, Inc.). 1994. *Risk Assessment of the Southeastern Area at Letterkenny Army Depot, Operable Units One and Three-Final Report.*

Table 3—Formulas/Assumptions for Intake Calculations

Ambient Air, Inhalation Exposure (Volatilization from Soil and Surface Water to Outdoor Air)

$$Intake\ (mg/kg/day) = \frac{CAa \times IRaa \times EFaa \times ED}{BW \times AT}$$

Where:

CAa	=	chemical concentration in ambient air (mg/m^3).
IRaa	=	intake rate for ambient air (m^3/day).
EFaa	=	exposure frequency for ambient air (days/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	period of time over which exposure is averaged (days).

Groundwater, Inhalation Exposure (Theoretical Worker Exposure to Vapors While Showering)

$$Intake\ (mg/kg/day) = \frac{CAs \times IRas \times EFas \times ED}{BW \times AT}$$

Where:

CAs	=	chemical concentration in shower air (mg/m^3).
IRas	=	intake rate for shower air (m^3/day).
EFas	=	exposure frequency for shower air (days/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	period of time over which exposure is averaged (days).

Groundwater, Oral Exposure

$$Intake\ (mg/kg/day) = \frac{CGW \times IRgw \times EFgw \times ED}{BW \times AT}$$

Where:

CGW	=	chemical concentration in groundwater (mg/L).
IRgw	=	intake rate for groundwater (L/day).
EFgw	=	exposure frequency for contaminated groundwater (days/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	period of time over which exposure is averaged (days).

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

Soil, Dermal Exposure

$$Intake\ (mg/kg/day) = \frac{CSo \times FCs \times SAso \times AF \times ABS \times EFso \times ED}{BW \times AT}$$

Where:

CSo	=	chemical concentration in soil (mg/kg).
FCs	=	conversion factor for soil/sediment (kg/mg).
SAso	=	skin surface area available for soil contact (cm^2/event).
AF	=	soil/sediment to skin adherence factor (mg/cm^2).
ABS	=	chemical-specific absorption factor (unitless).
EFso	=	exposure frequency for soil (events/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	period of time over which exposure is averaged (days).

Soil, Inhalation Exposure (Suspended Particulates in Ambient Air)

$$Intake\ (mg/kg/day) = \frac{CSo \times (1/PEF) \times IRaa \times EFaa \times ED}{BW \times AT}$$

Where:

CSo	=	chemical concentration in soil (mg/kg).
PEF	=	particulate emission factor (m^3/kg).
IRaa	=	intake rate for ambient air (m^3/day).
EFaa	=	exposure frequency for ambient air (days/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	period of time over which exposure is averaged (days).

Soil, Oral Exposure

$$Intake\ (mg/kg/day) = \frac{CSo \times IRso \times FCs \times FIso \times EFso \times ED}{BW \times AT}$$

Where:

CSo	=	chemical concentration in soil (mg/kg).
IRso	=	soil ingestion rate (mg/day).
FCs	=	conversion factor for soil/sediment (kg/mg).
FIso	=	fraction of soil ingested from contaminated source (unitless).
EFso	=	exposure frequency for soil (days/year).
ED	=	exposure duration (years).
BW	=	body weight (kg).
AT	=	averaging time (days).

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

What Exposure Parameters Were Used for LEAD SE?

ABS

Chromium VI	0.15	Hawley, 1985
Inorganic chemicals (other than Cr VI)	0.01	Ryan et al., 1987
Polychlorinated biphenyls	0.05	Ryan et al., 1987
Semivolatile organic chemicals	0.10	Ryan et al., 1987
Volatile organic chemicals	0.25	Ryan et al., 1987

AF

1.0 mg/cm^2	kaolin clay on hands	EPA, 1992a

Site soils consist predominantly of silty loam (ESE, 1992). Since clay has a higher AF than sand or potting soil, the AF for clay is used as a conservative RME.

AT

carcinogenic effects	70 years x 365 days/year	EPA, 1989c
noncarcinogenic effects	ED (years) x 365 days/year	EPA, 1989c

BW

Adult (Residential, Worker)

70 kg	average (male and female) of 50th percentile values for age = 18 to 75 years	EPA, 1991a

CAa

The concentrations of chemicals in ambient air (at the source and 400 meters downwind of the source) that have volatilized for soil are modeled values based on chemical-specific parameters (i.e., soil concentration, Henry's Law constant, K_{oc}, etc.) and site-specific parameters (i.e., soil depth, soil porosity, wind velocity, etc.).

CAs

The concentration of VOCs in shower air is a modeled value based on the average values presented by McKone (1987) for the chemicals of concern at the site. McKone values were used because they are the most realistic and most conservative.

1) CGW — measured value.
2) Ratio of chemical concentration in shower air to chemical concentration in water (mg/L). — 18 L/m^3

$$CAs\ (mg/m^3) \quad x \quad CGW\ (mg/L) \times 18\ (L/m^3)$$

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

CGW / CSe / CSo / CSW

The upper 95 percent confidence limit (UCL_{95}) of the mean chemical concentration was used to represent the RME exposure concentration. If the UCL_{95} exceeded the maximum detected chemical concentration, the maximum concentration was used to represent the RME.

ED

Adult (Worker)

25 years	national 95th percentile time at one workplace	EPA, 1991b

EFaa

Worker (Adult)—Current

12 days/year	Assumes that grass in the contamination areas is cut 2 times per month during the average growing season of 162 days/year.

Other than incidental dermal, inhalation, and oral exposure to soil by maintenance personnel cutting grass or performing other minor duties in the potentially contaminated areas, no other worker exposure to soil is expected to occur at these sites.

Worker (Adult)—Future

250 days/year	amount of time spent at work	EPA, 1991b

EFgw

250 days/year	number of days spent at work	EPA, 1991b

Site groundwater is not currently used as a water supply on the base. Evaluation of future worker exposure to groundwater has been requested by the regulatory agencies; therefore, this pathway has been included as a conservative estimate of possible theoretical future exposure.

EFso

Worker (Adult)—Current

12 days/year	assumes that grass in the contamination areas is cut 2 times per month during the average growing season of 162 days/year.

Other than incidental dermal, inhalation, and oral exposure to soil by maintenance personnel cutting grass or performing other minor duties in the potentially contaminated areas, no other worker exposure to soil is expected to occur at these sites.

Worker (Adult)—Future

250 days/year	amount of time spent at work	EPA, 1991b

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

FCs

1×10^{-6} kg/mg

FCw

0.001 L/cm^3

IRaa

Worker (Adult)—Current

5 m^3/day	based on a reasonable upper-bound occupational inhalation rate for an 8-hour workday [20 m^3/day (EPA, 1991b)] and assumes that maintenance personnel may work in the area 2 hours/day.	

Worker (Adult)—Future

20 m^3/day	reasonable upper-bound occupational inhalation rate for an 8-hour workday.	EPA 1991b

IRgw

1.0 L/day	reasonable occupational ingestion rate	EPA, 1991b

Site groundwater is not currently used as a water supply on the base. Evaluation of future worker exposure to groundwater has been requested by the regulatory agencies; therefore, this pathway has been included as a conservative estimate of possible theoretical future exposure.

IRso

Worker (Adult)—Current

12.5 mg/day	based on the typical adult workplace ingestion rate for an 8-hour workday [50 mg/day (EPA, 1991b)] and assumes that a person works in the area 2 hours/day.

Worker (Adult)—Future

50 mg/day	typical adult workplace ingestion rate for an 8-hour workday.	EPA 1991b

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

SAso

Values are based on the average adult (male and female) 50th percentile body part surface areas (m^2) in EPA, 1985 multiplied by a conversion factor of 10,000 cm^2/m^2. 50th percentile values are used because surface area is related to body weight, and average body weights over the ED were used in the exposure calculations. It is assumed that workers at LEAD will wear long pants, a long-sleeved shirt, and gloves while at the facility. For conservativeness, it is also assumed that personnel will remove their gloves occasionally, allowing for incidental contact of the hands and half of the head.

hands	904
½ head	602
	1,506 cm^2

References

Environmental Science & Engineering, Inc. (ESE). 1998. *Endangerment Assessment of the Southeastern Area at Letterkenny Army Depot. Final Report.* U.S. Army Toxic and Hazardous Materials Agency, Installation Restoration Division. Contract No. DAAA15-85-D-0017. Gainesville, FL.

Environmental Science & Engineering, Inc. (ESE). 1992. *Remedial Investigation of the Southeastern Area at Letterkenny Army Depot (LEAD). Preliminary Draft Report.* U.S. Army Toxic and Hazardous Materials Agency, Installation Restoration Division. Contract No. DAAA15-85-D-0017. Gainesville, FL.

Hawley, J.D. 1985. "Assessment of Health Risks from Exposure to Contaminated Soil." *Risk Analysis,* 5(4):289-302.

Hazardous Substance Data Bank (HSDB). 1993. National Library of Medicine (NLM). Micromedex TOMES PLUS® System CD/ROM, Version 16, Expires 4/30/93. Managed by Micromedex, Inc., Denver, CO.

Integrated Risk Information System (IRIS). 1993. U.S. Environmental Protection Agency (EPA). Micromedex TOMES PLUS® System CD/ROM, Version 18, Expires 10/31/93. Managed by Micromedex, Inc., Denver, CO.

McKone, T.E. 1987. "Human Exposure to Volatile Organic Compounds in Household Tap Water: The Indoor Inhalation Pathway." *Envir. Sci. and Tech,* 21(12):1194-1201.

National Oceanic and Atmospheric Administration (NOAA), Naval Oceanography Command Detachment Asheville, and USAFETAC. 1990. International Station Meteorological Climate Summary for Glenview, Illinois. Version 1.0. National Climatic Data Center, Federal Climate Complex, Asheville, NC.

Ryan, E.A., Hawkins, E.T., Magee, B., and Santos, S.L. 1987. "Assessing Risk from Dermal Exposure at Hazardous Waste Sites." In: *Proceedings of the 8th National Superfund Conference.* Hazardous Materials Control Research Institute. Silver Spring, MD.

U.S. Environmental Protection Agency (EPA). 1985. *Development of Statistical Distributions or Ranges of Standard Factors Used in Exposure Assessments.* Office of Health and Environmental Assessment, Office of Research and Development, Washington, DC. EPA/600/8-85/010.

U.S. Environmental Protection Agency (EPA). 1989a. *Exposure Factors Handbook. Final Report.* Office of Health and Environmental Assessment, Washington, DC. EPA/600/8-89/043.

U.S. Environmental Protection Agency (EPA). 1989b. *Interim Final Guidance for Soil Ingestion Rates.* Office of Solid Waste and Emergency Response, Washington, DC. OSWER Directive 9850.4.

U.S. Environmental Protection Agency (EPA). 1989c. *Risk Assessment Guidance for Superfund (RAGS). Volume 1: Human Health Evaluation Manual, Part A.* Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89/002.

U.S. Environmental Protection Agency (EPA). 1991a. *Risk Assessment Guidance for Superfund (RAGS). Volume 1: Human Health Evaluation Manual, Part B (Development of Risk-Based Preliminary Remediation Goals).* Office of Emergency and Remedial Response, Washington, DC. OERR 9285.7-01B.

Table 3—Formulas/Assumptions for Intake Calculations (Continued)

U.S. Environmental Protection Agency (EPA). 1991b. *Risk Assessment Guidance for Superfund (RAGS). Volume 1: Human Health Evaluation Manual, Supplemental Guidance (Standard Default Exposure Factors). Interim Final.* Office of Emergency and Remedial Response, Washington, DC. OSWER Directive 9285.6-03.

U.S. Environmental Protection Agency (EPA). 1992a. *Dermal Exposure Assessment: Principles and Applications. Interim Report.* Office of Research and Development, Washington, DC. EPA/600/ 8-91/011B. NTIS No. PB92-205665.

U.S. Environmental Protection Agency (EPA). 1992b. *Health Effects Assessment Summary Tables (HEAST). Annual FY 1992.* Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC. OEHA ECAO-CIN-821. NTIS No. PB92-921199.

U.S. Environmental Protection Agency (EPA). 1992c. *Health Effects Assessment Summary Tables (HEAST). Annual FY 1992; Supplement No. 1.* Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC. OEHA ECAO-CIN-821A. NTIS No. PB92-921199A.

U.S. Environmental Protection Agency (EPA). 1992d. *Health Effects Assessment Summary Tables (HEAST). Annual FY 1992; Supplemental No. 2.* Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC. OEHA ECAO-CIN-821B. NTIS No. PB92-921102.

Table 4—Weight of Evidence Classification System for Potential Carcinogens

EPA Category	Description of Group	Description of Evidence
Group A	Human carcinogen	Sufficient evidence from epidemiologic studies to support a casual association between exposure and cancer.
Group B1	Probable human carcinogen	Limited evidence of carcinogenicity in humans from epidemiologic studies.
Group B2	Probable human carcinogen	Sufficient evidence of carcinogenicity in animals, but inadequate data in humans.
Group C	Possible human carcinogen	Limited evidence of carcinogenicity in animals and no data in humans.
Group D	Not classified	Inadequate evidence of carcinogenicity in animals.
Group E	No evidence of carcinogenicity in humans	No evidence of carcinogenicity in at least two adequate animal tests or in both epidemiologic and animal studies.

Source: U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund (RAGS). Volume I: Human Health Evaluation Manual, Part A*. Office of Emergency and Remedial Response, Washington DC. EPA/540/1-89/002.

Table 5—Chronic Dose-Response Toxicity Constants for the COCs in the SE and PDO Areas at LEAD

Chemical	Oral RfD (UF)	Inhal RfD (UF)	Oral CSF	Oral WoE	Inhal CSF	Inhal WoE
Inorganic Chemicals (IOC)						
Arsenic	3.0E-04 (3)	—	1.8E+00[11]	A	5.0E+01	A
Beryllium	5.0E-03 (100)	—	4.3E+00	B2	8.4E+00[a]	B2
Cadmium (aqueous matrix)	5.0E-04 (10)	—	—		—	
Cadmium (solid matrix)	1.0E-03 (10)	—	—		6.1E+00[a]	B1
Chromium, total[12]	5.0E-03 (500)	nd[13]	—		4.1E+01[a]	A
Copper	3.7E-02[a, 14] (2)	—	—		—	
Lead	—[15]	—	nd[16]	B2	nd[16]	B2
Manganese (aqueous matrix)	5.0E-03 (1)	—	—		—	
Manganese (solid matrix)	1.4E-01 (1)	1.1E-04 (900)	—		—	
Nickel	2.0E-02 (300)	—	—		8.4E-01[a, 17]	A
Thallium	7.0E-05[a,110] (3,000)	—	—		—	
Zinc	3.0E-01 (10)	—	—		—	
Pesticides/Polychlorinated Biphenyls (PCBs)						
Chlordane, total	6.0E-05 (1,000)	—	1.3E+00	B2	1.3E+00[a]	B2
Heptachlor	5.0E-04 (100)	—	4.5E+00	B2	4.5E+00[a]	B2
Semivolatile Organic Chemicals (SOC)						
Bis(2-ethylhexyl)phthalate	2.0E-02 (1,000)	—	1.4E-02	B2	nd[S1]	B2
Diethyl phthalate	8.0E-01 (1,000)	—	—		—	
Pentachlorophenol	3.0E-02 (100)	—	1.2E-01	B2	nd[S1]	B2
Volatile Organic Chemicals (VOC)						
Acetone	1.0E-01 (1,000)	—	—		—	
Benzene	2.0E-02[V1] (na)	5.7E-05[V2] (na)	2.9E-02	A	2.9E-02[a]	A
Bromodichloromethane	2.0E-02 (1,000)	—	1.3E-01	B2	nd[V3]	B2
Carbon tetrachloride	7.0E-04 (1,000)	—	1.3E-01	B2	5.3E-02[a]	B2
Chloroform	1.0E-02 (1,000)	—	6.1E-03	B2	8.1E-02[a]	B2
Dichloroethane, 1, 1-	1.0E-01[a] (1,000)	1.0E-01 (1,000)	nd[V3]	C	nd[V4]	C
Dichloroethane, 1, 2-	7.0E-02[V5] (100)	2.9E-03[V2] (na)	9.1E-02	B2	9.1E-02[a]	B2
Dichloroethene, 1, 1-	9.0E-03 (1,000)	—	6.0E-01	C	1.8E-01	C
Dichloroethene, 1, 2-, total	9.0E-03 (1,000)	—	—		—	
Methylene chloride	6.0E-02 (100)	8.6E-01[a] (100)	7.5E-03	B2	1.6E-03	B2
Tetrachloroethene	1.0E-02 (1,000)	—	5.1E-02[V6]	B2[V6]	1.8E-03[V6]	B2[V6]

Table 5—Chronic Dose-Response Toxicity Constants for the COCs in the SE and PDO Areas at LEAD (Continued)

Chemical	Oral RfD (UF)	Inhal RfD (UF)	Oral CSF	Oral WoE	Inhal CSF	Inhal WoE
Toluene	2.0E-01 (1,000)	1.1E-01[a] (100)	—		—	
Trichloroethane, 1, 1, 1-	9.0E-02 (1,000)	3.0E-01[a] (1,000)	—		—	
Trichloroethane, 1, 1, 2-	4.0E-03 (1,000)	—	5.7E-02	C	5.7E-02[a]	C
Trichloroethene	6.0E-03[V3]	—	1.1E-02[V6]	B2[V6]	6.0E-03[V2]	B2[V6]
Trichlorofluoromethane	3.0E-01 (1,000)	2.0E-01[a] (10,000)	—		—	
Vinyl chloride	—	—	1.9E+00[a]	A	3.0E-01[a]	A

Note: RfD = Reference dose [mg/kg/day].
UF = Uncertainty factor (includes any applicable modifying factor).
CSF = Cancer slope factor [(mg/kg/day)$^{-1}$].
WoE = Weight of evidence for ranking as a human carcinogen (see Table 4).
inhal = Inhalation.
na = Not available.
nd = Not determined.

(I1) CSF for arsenic based on unit cancer risk of 5 x 10^{-5} $(\mu g/L)^{-1}$ proposed by Risk Assessment Forum (EPA, 1991a).

(I2) All values are for hexavalent chromium; a less conservative oral RfD of 1E+00 mg/kg/day for trivalent chromium is also available.

(I3) Inhalation RfD for chromium has been withdrawn from IRIS pending further EPA review.

(I4) RfD for copper based on the MCL of 1.3 mg/L (56 FR 26460) and assumes that a healthy 70-kg adult consumes 2 L/day water.

(I5) EPA prefers to use a biokinetic uptake model to evaluate lead exposure rather than the reference dose method.

(I6) Although EPA has classified lead as a Group B2 suspect human carcinogen via ingestion and inhalation, no CSF has been developed for either of these exposure pathways.

(I7) Inhalation of CSF for nickel refinery dust.

(I10) This value (for soluble thallium salts) has been withdrawn from IRIS pending further review.

(S1) Although EPA has classified this SOC as a Group B2 suspect human carcinogen via inhalation, no CSF has been developed for this exposure pathway.

(V1) RfD for benzene based on the EPA 10-day Health Advisory of 0.235 mg/L (EPA, 1987) and assumes that a healthy 10-kg child consumes 1 L/day water.

(V2) Interim value obtained from EPA Environmental Criteria and Assessment Office (ECAO), as recommended by EPA Region III.

(V3) Although EPA has classified this chemical as a Group C possible human carcinogen via ingestion, no CSF has been developed for this exposure pathway.

(V4) Although EPA has classified this chemical as a Group C possible human carcinogen via inhalation, no CSF has been developed for this exposure pathway.

(V5) RfD for 1,2-dichloroethane based on a chronic oral NOAEL for rats of 7 mg/kg/day (ATSDR, 1988) and an uncertainty factor of 100 (10X for sensitive human subpopulations and 10X for animal-to-human extrapolation).

(V6) CSFs and WoEs for this VOC have been withdrawn from IRIS pending further review; the listed value is from EPA/HEAST (1991).

Table 5—Chronic Dose-Response Toxicity Constants for the COCs in the SE and PDO Areas at LEAD (Continued)

*All RfDs, CSFs, and WoEs are available in IRIS (1993), unless otherwise noted.
#This value is available in EPA/HEAST (1992).

Sources: U.S. Environmental Protection Agency (EPA). 1987. *Health Advisories for 25 Organics*. Office of Drinking Water, Washington, DC. NTIS No. PB87-235578.

Agency for Toxic Substance and Disease Registry (ATSDR). 1988. *Toxicological Profile for 1,2-Dichloroethane*. Prepared by Clement Associates. U.S. Public Health Service, Atlanta, GA. NTIS No. PB90-171422.

U.S. Environmental Protection Agency (EPA). 1991. *Health Effects Assessment Summary Tables (HEAST). Annual FY 1991*. Office of Research and Development and Office of Emergency and Remedial Response, Washington, DC. OERR 92006-303(91-1).

ATTACHMENT 3

TRANSCRIPT OF THE PUBLIC MEETING ON THE PROPOSED PLAN

LETTERKENNY ARMY DEPOT

IN RE: Public Meeting for the Proposed Plan for the Phase I Parcels at Letterkenny Army Depot

TRANSCRIPT OF PROCEEDINGS

BEFORE: BRYAN HOKE, BRAC Environmental Coordinator

DATE: Tuesday, April 7, 1998 at 7:02 p.m.

PLACE: Letterkenny Army Depot
Building 500, Auditorium
Chambersburg, Pennsylvania

Jan L. Bucher
Court Reporter-Notary

I N D E X

MR. HOKE: Good evening. My name is Bryan Hoke, BRAC Environmental Coordinator at Letterkenny Army Depot. I'd like to welcome you to the public meeting for the proposed plan for the Phase I parcels at Letterkenny Army Depot.

I'm going to give a brief presentation, probably last about 10 or 15 minutes, and open up the floor to questions. And I want to remind everybody that if you ask a question, please state your name first. It's being recorded for the transcript and we want to be sure we get your names.

Letterkenny Army Depot is located in South Central Pennsylvania within Franklin County. And on the map here, this is the bottom, this is Chambersburg in relationship. This is the outline of the entire depot. The entire depot is a little over 19,000 acres.

We have an industrial area here in our southeastern corner of the depot. The remainder of the depot comprises approximately of about 16,000 acres for ammunition and storage. We have about 900 igloos for storage. We also do open burning, open demolition on those parcels. We will be concentrating on the southeastern corner tonight for Letterkenny.

The very next slide, please.

MR. GONTZ: (Complied.)

MR. HOKE: This slide shows the corner of the depot which I showed previously. The red area that you're looking at here is the properties that are going to be retained by the government by the year 2001 when BRAC is complete.

The white and gold parcels and also the green parcels, this property is going to be transferred to the public. In this case it's going to be the local reuse agency, which is the Letterkenny Industrial Development Authority, which is known as LIDA, which I'll be referring to as LIDA from now on.

These green parcels, this property, is going to be transferred back, leased back by the government. And we'll keep this map out here for all night so you can keep that for reference. In this case the gold parcels that you see up here are in blue here. These are the same parcels. Here is the red property which is being retained by the government.

Just for reference, this is Gate 6, 997; Gate 1 (indicating). We are here tonight in Building 500. It's located right here (indicating).

Next slide, Gary.

MR. GONTZ: (Complied.)

MR. HOKE: The Phase I parcels were identified by LIDA as priority parcels primarily for early

transferals. They could redevelop in any markets. There are 28 parcels including rail lines, and they comprise of approximately 240 acres. We are handling all these parcels and the rail lines as one unit which we refer in turn as the Phase I parcel.

Next slide, please.

MR. GONTZ: (Complied.)

MR. HOKE: Condition of these parcels, all the parcels are underlain by VOC-contaminated groundwater. For environmental background, here locating we have two Superfund sites. We take a line approximately from this point all the way to Gate 1. You can have it at two sites, eastern side, what we call our southeastern area; the western side is where our property disposal office area is.

In the '50s and '60s within the southeastern area, we had a series of lagoons and other disposal sites where they put solvents into the ground. The solvents were used for degreasing purposes. At that point in time it was an accepted practice to put them into the ground.

What has happened is that we developed soil contamination and subsequent groundwater contamination that has migrated on these -- the whole parcel. It has migrated off Post. Down in our industrial area we have another lagoon over near our Building 350. Industrial

lines serving these buildings also leak causing soil contamination and subsequent groundwater contamination.

This whole side of the parcel is underlain by contaminated groundwater, contaminated by solvents, and they've migrated off Post. On the western side of this parcel is the property disposal office area, other storage areas that cause soil contamination and subsequent groundwater contamination of solvents that it migrates underneath. And it's all -- these parcels are all underlain by contaminated groundwater which migrates off to the west and surfaces at Rocky Spring.

None of these parcels warrant any remedial action based on -- soils based on industrial use. Some sites that we some did -- did some work for, Gate 6, this open parcel -- the field right now is open parcel, agricultural, Building 500. These sites right after World War II were used for the storage of vehicles. Our concerns at that point in time were anything that was leaking into the ground, any minerals or oils.

We did samples there and nothing showed up above the industrial risk standards that would cause any type of remediation to be required. In addition, we also sampled the railroad tracks. We were concerned about the past uses of the railroad tracks plus the herbicides being dumped on there and also oils used for vegetation

suppression on these tracks.

We did samples along these railroad tracks. We found nothing in there that exceeded at a great extent that required any type of remedial action be done at these railroad tracks.

Next slide, Gary.

MR. GONTZ: (Complied.)

MR. HOKE: Remedial action objectives for these Phase I parcels was to manage a potential long-term contaminant migration and protect human health and the environment. The main thing is we want to prevent the human exposure to the groundwater and using the contaminated groundwater.

Secondly, we also want to provide a suitable remedial alternative such that the land transfer recipient can have beneficial reuse of the property with minimal limitations. Primarily what we're looking here for is to help LIDA deal -- we changed this property to LIDA, that they can market that property and bring in prospective customers with new jobs to the community.

Next slide, please.

MR. GONTZ: (Complied.)

MR. HOKE: The two remedial alternatives that were evaluated is no-action and institutional controls. Now, no-action is a CERCLA requirement to compare all

other alternatives against a no-action. So always -- at least have no-action that's comparing.

Second one was institutional controls which comprise of deed provisions and a master plan amendment. The master plan is a document with our Public Works folks. We do an amended master plan to include these institutional controls. So once the ROD is signed, this would be an action until the property would be transferred.

Secondly, with the deed provisions, these institutional controls would be written up as deed provisions and they would stay with the life of the deed through the subsequent landowners.

Next line.

MR. GONTZ: (Complied.)

MR. HOKE: There are nine criteria which are specified by EPA, and they are used to compare against the alternatives. The nine criteria are, number one, the overall protection of human health in the environment; number two, compliance with applicable or relevant and appropriate requirements otherwise known as ARARs; third, long-term effectiveness and permanence; fourth, short-term effectiveness; fifth, reduction of toxicity, mobility, and volume through treatment; six, implementability; number seven, cost; eight, state acceptance; nine, community

acceptance.

There's a little more write-up in your handout, goes into a little more detail of what these nine criteria are. And, also, in the proposed plan it gives you a little more detailed analysis of all these nine criteria with these two alternatives.

Next line.

MR. GONTZ: (Complied.)

MR. HOKE: One of the main drivers of the remedy selection is a site risk. EPA's target risk range for carcinogens is 1 times 10 to the sixth to 1 times 10 to the minus 4. And basically what that translates as is looking for an increased chance of one additional case of cancer, range of one in a million to 1 in 10,000. If you see that 1-in-10,000 range, that requires some type of action to be taken.

There were -- risk assessments were done for carcinogenic risk under industrial-use scenario with the assumption that the workers would be drinking the groundwater. In the southeastern area the assessment was done in 1993. The PDO area was done in 1994. As you can see the numbers there, both of those, the upper range is 6 times 10 to the minus third and 4.1 times 10 to the minus 4 exceed that 1-in-10,000-target risk range, thus, requiring some type of action to be taken.

Next slide.

MR. GONTZ: (Complied.)

MR. HOKE: However, the risk is also calculated if you eliminate the groundwater pathway under industrial-use scenario, here you see the risks now are much less than the 1 times 10 to the minus 6 or the one in a million; therefore, it's within the target range. And, therefore, no action would be taken. So the key is to eliminate that exposure pathway to the groundwater.

Next slide.

MR. GONTZ: (Complied.)

MR. HOKE: Our preferred alternative is Alternative 2, Institutional Controls. Why? First off, it mitigates the risk effectively. It eliminates the groundwater risk by preventing exposure to groundwater; no wells; no drinking; no any other type of use for that groundwater.

Also, it establishes -- institutional controls establish guidelines to prevent groundwater exposure during any type of excavation-type procedures. Secondly, it's easily implemented. First off, with amending the lead master plan during the ROD sign until prior to transfer, it's easy to amend that document. And that document will remain with the Public Works here at Letterkenny.

Once the property is transferred, these institutional controls that were written as deed provisions are inserted into the deed and will stay the lifetime of the deed with subsequent landowners.

Thirdly, and probably most importantly, this provides for timely reuse and community benefits. This allows LIDA to market this property and develop this property, and bring in prospective businesses to bring new jobs to our community.

I want to clarify that this alternative will not address all groundwater here at Letterkenny Army Depot. We are working on a separate access to the southeastern area and also the property exposed to the opposite area. There are several studies that cover groundwater strategy to address the background water and come up with remedial strategy to affect of the groundwater to prevent the -- protect the human health and the environment.

Next line.

MR. GONTZ: (Complied.)

MR. HOKE: A reminder. The public comment period ends April 29, 1998. Any written comments can be sent addressed to myself. There's my name and my address up there. The address is in your handout.

And also a copy of the proposed plan is

currently down at the Coyle Free Library in Chambersburg. So anytime you want to take a look at the proposed plan, it will be on file down there until April 29.

At this point I'm going to open the floor to questions. And I'll remind you if you have a question, please state your name before you state your question.

MS. ANTOUN: DeEtta Antoun, Restoration Advisory Board Co-Chair. I have a question. If something changes in this proposed plan, does it then have to go through the public meeting procedure again and have another 30-day comment period?

MR. HOKE: If the proposed plan would be changed somewhat, I mean, it's going to be addressed in the -- probably a response in the summary within the broad process in the record of the decision.

At this point in time the only changes I would see is, like, public comments that would warrant the change. And those comments would then be addressed in response to this portion of the record of decision. But there would not be another 30-day public comment period unless -- trying to think. Even if the alternative would be changed, I don't think there would be --

MR. ARGUTO: Probably would depend on how significant the change would be. If something happened that would significantly change what this proposed plan

was saying, it would be appropriate to probably reannounce it and give the public an opportunity to comment on that.

What will happen -- what's generally known as a response in this summary is the summarization of all the public comments and Letterkenny's response to those comments.

Bryan, do you agree with that?

MR. HOKE: Um hum.

MS. ANTOUN: If there are little clarification things in there, that's not going to affect whether it has to go through the whole process again, right?

MR. ARGUTO: Right.

MS. ANTOUN: I agree with the choice of the alternative that you're going to use in the proposed plan. But I just have a couple questions about some of the information in the proposed plan itself.

Is it appropriate that I ask those questions now?

MR. HOKE: Okay.

MS. ANTOUN: Okay. On page 6, when you talk about industrial ingestion scenario, could somebody clarify what an industrial ingestion scenario is?

MR. HOKE: Page 6?

MS. ANTOUN: Yeah, page 6 up on the first column, left-hand side. It refers to concentration RBCs

for industrial ingestion scenario.

MR. HOKE: Industrial ingestion. I'm assuming that you're making the assumption that the worker would be exposed through ingestion of soils or something like that, dust. That would be the pathway through. Worst case -- this is a stupid example. A worker takes his lunch out -- and you're never supposed to do this.

But he's working a site, doing some excavations, and they're digging. Right away the whistle blows. He sits down, opens up his lunch, and eats his lunch with dirty hands and things like that. That would be an industrial ingestion scenario.

MS. ANTOUN: Okay. That makes sense. Okay. But that doesn't necessarily have anything to do with the groundwater because it's not -- unless there's, like, groundwater that's worked its way to the surface?

MR. HOKE: Right. Take the same example, doing excavation. And the ground is damp from the groundwater, and they're in the bottom of a hole. He's got that mud -- he's got that mud on his hands, and now he's eating an Oreo cookie with dirty hands. That's some of the assumptions they do when they do their assessments. That's a way of ingestion.

MS. ANTOUN: Arsenic and beryllium keep showing up here and there. Why is that? Why do I keep finding

them?

MR. HOKE: Arsenic and beryllium are like a natural -- showing up as background with the soils and things like that. Also, backgrounds tend to vary from site to site. And with the values that we're seeing, they weren't exceeding it greatly. We were kind of attributing that value as to what Letterkenny's background is.

MS. ANTOUN: Have you ever tested off Post to see what the background is in adjoining areas?

MR. HOKE: We have never tested off Post ourselves. These, the background standards, are developed from existing data from other locations; but not for Franklin County specific have we done any sampling off Post.

MS. ANTOUN: And the last thing is would arsenic and beryllium be components of the explosions that you -- the ammo demolition? Would they be by-products of doing that?

MR. HOKE: For ammunition, from what I know, you'd probably be seeing, like, lead. You primarily would be seeing, like, lead.

MS. ANTOUN: But not arsenic?

MR. HOKE: No. The main thing you'd be seeing would be the explosive compounds like TNT, RBX.

MS. ANTOUN: And what are the ingots? Refresh

my memory as to what we have in those big piles of ingots.

MR. HOKE: The ingots are stored right across the road from Building 441, which is lead. Another area here in the white is nickel and zinc.

MS. ANTOUN: So we have lead, nickel, and zinc?

MR. HOKE: Right.

MS. ANTOUN: And you test around those areas, right?

MR. HOKE: We will be. We've done a little bit in the past. And we will be doing additional in order to facilitate that transfer.

MS. ANTOUN: But they're not on the land that's been transferred --

MR. HOKE: No, they are white parcels.

MS. ANTOUN: I have one overall concern about this. The basis of the proposed plan talks about cleaning the land to an industrial usage. And I have a question about the gymnasium and -- I think I brought this up at the last RAD meeting -- the gymnasium and the church. Those two facilities won't necessarily be used for industrial usage or commercial usage.

Do you consider a gymnasium a commercial usage or --

MR. HOKE: To me a gym falls into an

industrial/commercial scenario. When -- anything you take because of future activities of -- which you're restricted to indoor activities. There won't be any outdoor activities such as any outdoor volleyball or playgrounds or any daycare. So that's where it falls entirely in industrial/commercial setting. In order to do anything additional in residential, you have to do more sampling and do additional risk calculations in order to support that usage.

At this point in time -- that is not what the reuse for those two parcels are at this point in time.

MS. ANTOUN: What is the difference between an industrial usage and a residential usage environmentally when you guys are talking about -- I believe you said something about it has to do with how long a person is exposed to the materials.

So an industrial usage is -- how long are you exposed to materials to qualify it as an industrial usage as opposed to a residential usage?

MR. HOKE: Under industrial scenario you're looking at eight hours, which is a typical working day. Under residential exposure, you're looking at 24 hours a day. So that's a big difference. That's the assumptions that you make from industrial to residential.

MS. ANTOUN: So that what makes

industrial/commercial okay for the gymnasium is the fact that even though you're breathing real hard when you're there --

MR. HOKE: The big difference also is that you are inside.

MS. ANTOUN: Yeah, I know, but -- just because you're not touching the soil. Okay. We kind of went through that one. One more question about the church and the -- the church and the gymnasium. On page 10 under parcel 33 and 34 in the proposed plan, every other parcel that you comment on in the proposed plan has a statement in there that says there is documented VOC-contaminated groundwater beneath parcel whatever.

And in parcel 33 and 34 that statement isn't included in the description of those two parcels. Is there a particular reason for that omission?

MR. HOKE: I would have to say no at this point in time. I don't think that's --

A VOICE: It's just an oversight.

MS. ANTOUN: That should be part of that as well?

MR. HOKE: It should have said that, yeah.

MS. ANTOUN: Because I thought if it wasn't on there in the proposed plan, then someone could say then it doesn't have to adhere to all the deed restrictions.

MR. HOKE: Right. Right. That is an oversight. At least somebody's reading these documents.

MS. ANTOUN: I just find them so fascinating. Let me see what else I've got here. I have a question about the agricultural field that you've done all sorts of tests on and you know there's groundwater pollution, etcetera, etcetera. But you're still finding arsenic and beryllium on that land that you think is background, but it's still above the levels that are accepted. And that's used for agriculture, right?

MR. HOKE: Currently at this point in time, yes.

MS. ANTOUN: And it said that agriculture is not an industrial use, but the land is going to be okayed for industrial use. I'm kind of wobbly on that. I don't understand if that's going to stay with -- at least as an agricultural usage, then how can it be okay for agriculture one minute and then only okayed for industrial another minute? I'm kind of --

MR. HOKE: From risk-wise pertaining to that property it still falls into, like, an industrial exposure for a farmer. He's farming that property eight hours.

MS. ANTOUN: But how about the product that comes off that land? When the product comes off that land if it's contaminated with arsenic or beryllium, it goes

into the food supply. I assume -- what are they putting on their corn or --

MR. HOKE: Like I said, these values which people contribute the background as natural soil that you're going to find elsewhere --

MS. ANTOUN: But you've never tested it elsewhere.

MR. HOKE: No, we haven't tested it elsewhere. But we have no inkling that it's any different from any other farming properties around here at all.

MS. ANTOUN: But it does go above the accepted standards?

MR. HOKE: Yes, it does.

MS. ANTOUN: So I was just wondering if that agricultural usage was a good usage for that land considering the fact that it has those contaminants on it.

MR. HOKE: That's been farmed for almost 40 years. And based on these results, it doesn't -- if it really blew the limit way above it, then that would be a concern. But at this point in time it's creeping above the limit only by a little bit.

MS. ANTOUN: Is that done with no-till? Does that have pesticides?

MR. HOKE: He's doing both there, both no-till and farming.

MS. ANTOUN: Okay. You can take someone else's question while I go over what I have here.

MR. SILVERMAN: Carl Silverman, Waynesboro. I just want to ask what Army agency is in charge of actually transferring the properties to the development authority? And can you give me a contact name because I have an issue not related to environmental that I need to contact them about.

MR. HOKE: The Army agency in this case, I would say -- Gary, you want to help me out, AMC?

MR. GONTZ: Army Material Command. They are the proponents responsible for the actual transfer. Jeannie Gillen would be the point of contact. And if you give me your name and number afterwards, I can see that you get it.

MR. SILVERMAN: I have to leave in a second. I'll give it to you.

MR. HOKE: Anybody else have questions?

MS. ANTOUN: I'm back. Back in the deed covenant back there, I just have a question about one term. And I couldn't contact my attorney to get a definition for it. He's out of town. What can I say?

MR. HOKE: What page are you on now?

MS. ANTOUN: Page 4 of the covenant. It's Section E of Section 4, letter E. Going down to that

section it says, Or is not sage for a particular purpose.

MR. HOKE: That should be safe.

MS. ANTOUN: Oh, safe. Oh, thank you. I thought maybe someone -- I was going to ask my legal counsel what sage is in the legal world. And what is the Federal Facilities Agreement? Is that the agreement that you were talking about before or is that a separate thing, Letterkenny's Federal Facilities Agreement.

MR. HOKE: That is what we call our IAA, interagency agreements signed between EPA, DEP, and the Army. It was signed in 1989. Any other questions? Going once.

MS. ANTOUN: Okay. One more. You always put advertisements for these public meetings and the little public service ads in the back of the newspaper. I was wondering if it would be possible to somehow, using tag money or something, have a display ad advertising any environmental meetings that are back here. Is that an issue that -- I know that's not necessarily related directly to this particular issue, but it's something that might improve the attendance at meetings if it was a little more in people's face.

MR. HOKE: We can look into that. You're looking for in the advertisement section or somewhere within the newspaper?

MS. ANTOUN: Anywhere that it would be more prominent.

MR. HOKE: Okay. Take note. We'll ask the -- I didn't work the ad myself. I had someone else work the ad. I can find out a more prominent place to do that to make sure that people see it.

Any other questions? Last chance. All right. Like I say, the public comment period ends April 29. Any questions, you can call me. I don't see my phone number anywhere. My phone number is 267-9836.

Thank you very much for coming. See you the next time.

(Whereupon, the hearing was concluded at 7:30 p.m.)

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me on the within proceedings, and that this copy is a correct transcript of the same.

Jan L. Bucher
Court Reporter-Notary Public

Notarial Seal
Jan L. Bucher, Notary Public
Carlisle Boro. Cumberland County
My Commission Expires June 5, 2000